Practical Reason and Technology: A Philosophical Study

by Hugh Simpson Baughan

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Supervisor: Professor Johan P. Hattingh

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Hugh Simpson Baughan

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OPSOMMING: Die praktiese rede kan help sin maak van die besluite wat die mensdom in ʼn komplekse planetêre era in die gesig staar, veral met betrekking tot die ontwikkeling en gebruik van tegnologie. Menslike agentskap en funksionering as ʼn persoon met selfbegrip, sowel as sekere idees oor kompleksiteit en ko-evolusie is almal deurslaggewende aspekte van hierdie sy van die praktiese rede. Deur hierdie aspekte vanuit verskillende perspektiewe te ondersoek, kan konstruktiewe insigte blootgelê word in die besondere aard van die morele doelwitte en die uniek-menslike betekenis van die bedoelings en handelinge wat ons besluitneming oor die ontwikkeling en gebruik van tegnologie onderlê. Die insigte wat hier verwerf word, kan daarby help om bepaalde hoofstroom-opvattings in die Westerse intellektuele kultuur oor die aard van die rede as sodanig te verruim – opvattings wat uit ʼn klassieke of naturalistiese standpunt stam. Volgens laasgenoemde standpunt vereis die rede gewoonlik duidelike maatstawwe, en lê dit in wese grondslae en stel prosedures daar. Só ʼn siening is belangrik en bruikbaar, maar op grond van die model van praktiese redenering wat hiermee gepaardgaan, word ʼn tipies skeptiese beeld geskets van redelike keuses binne die morele ruimte. Hierdie skeptisisme is egter nie altyd geregverdig nie. ʼn Verruimde model van die praktiese rede word eerder benodig, veral as menslike agentskap en selfverstaan, asook die idees wat met kompleksiteit en ko-evolusie verband hou, ernstig opgeneem word. Só ʼn benadering kan help om die betekenis wat ons in ons maatskaplike keuses vind in ryker en minder skeptiese terme uit te druk. Dit geld veral vir daardie besluite vir tegnologie waarvoor die mensdom in ʼn inklusiewe, interafhanklike era te staan kom.

In die lig hiervan is die proefskrif ‘n poging om ʼn oorsig te gee van ʼn paar sentrale naturalistiese opvattings binne die Westerse intellektuele kultuur oor die aard van die rede en patrone van praktiese argumentvoering wat daarmee verband hou. Die proefskrif poog om sommige van hierdie opvattings se ontologiese en epistemologiese voorveronderstellings uit te wys, hulle sterk- en swakpunte aan te toon en hulle in verband te bring met rasionele modelle wat in die natuur- en menswetenskappe gebruik word, veral dié oor die aard van verklaring en verstaan. Daarby word hierdie voorveronderstellings gekoppel aan ʼn algemeen skeptiese, maar by tye ongeregverdigde, ingesteldheid teenoor die sfeer van praktiese morele argumentvoering. Hierdie aspekte word in die eerste twee hoofstukke van die tesis behandel.

Hierdie twyfel ten opsigte van die morele sfeer kan egter anders voorgestel word as alternatiewe idees oor menslike agentskap en selfverstaan in ag geneem word, asook kompleksiteit en ko-evolusie. Die begrippe wat hierdie perspektiewe ten grondslag lê, dui op bepaalde ontologiese en epistemologiese insigte wat stellig kan help dat ons denke die gebruiklike grense van naturalistiese abstraksies kan oorstyg. Die gevolg is dat die kenmerke of patrone van die praktiese rede anders verwoord kan word, wat kan bydra tot die hersiening van die gebruiklike regverdiging vir skeptisisme wanneer ons die betekenis van ons bedoelings en handelinge beoordeel.

Om in terme van menslike agentskap, selfverstaan, kompleksiteit en ko-evolusie te dink, hou ook ʼn verdere voordeel in. Sodanige konseptualiserings kan ook dien om ʼn beslissende verband te lê tussen die praktiese rede en raadpleging [oftewel konsultasie] – of dit nou op die vlak van individue, gemeenskappe of samelewingsinstellings plaasvind. As sodanig vind hierdie gedagtes gedeeltelik aanklank by opkomende idees oor kollektiewe volwassenheid in die organisering van menslike aangeleenthede, en die strewe na die welsyn van alle samelewings wêreldwyd. In die besonder, raadpleging kan bykomende hulpmiddels bied om die ingewortelde konflikpatrone in die samelewing te help vervang met patrone wat meer verenigend en regverdig is. Dit kan ook voorsiening maak vir ʼn soort volwasse begrip van die beginsels en kwessies wat ter sprake is. Die verkenning van hierdie en verwante idees begin met die bespreking in Hoofstukke Drie en Vier en word in die daaropvolgende hoofstukke voortgesit.

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In onderskeiding van die naturalistiese interpretasie kan hierdie patrone van die praktiese rede vir ons ook help om die belang van ons keuses oor die samelewing en ontwikkeling op planetêre vlak in ‘n breër perspektief te plaas. Die bespreking in hierdie tesis beoog om ’n paar van hierdie idees van nader te ondersoek. Dit wil onder meer let op die implikasies van hierdie idees vir die konsep van ontwikkeling in die algemeen, met ander woorde vir die ontsluiting van die mensdom se maatskaplike, kulturele, etiese en spirituele potensiaal, asook vir die voorstellings van tegnologie wat direk op hierdie ontsluiting afgestem is. Die studie konsentreer ook op die idee van toekomsgerigte sosiale keuses en die omvormende potensiaal van tyd. Van daar verskuif die fokus na wat dit sou kon behels om bestaande tegnologiese aspirasies te herontwerp in die lig van die dringende behoefte aan ’n ko-evolusionêre wêreld, en daarmee saam die noodsaak om die belange van die mensdom in die geheel te beskerm. Hierdie en verwante onderwerpe word in Hoofstukke Vyf en Ses aangespreek.

Laastens het drie oorkoepelende vrae ’n beduidende rol gespeel as agtergrond tot die studie. Eerstens: Wat is die aard van die verband tussen ons vermoë om die wêreld in ’n epistemologiese sin te kan ken en ons vermoë om die morele betekenis van ons handelinge te kan beoordeel? Tweedens: Op grond waarvan kan ons bepaal of ons besluite oor tegnologie ‘n bydrae maak tot die bevordering van die mens se sosiale welsyn, of tot die ondermyning daarvan? Derdens: Watter insigte kan ons verkry oor ons patrone van praktiese redenering en ons besluite oor tegnologie wanneer ons dit binne die konteks van ’n planetêre era en in die lig van die beginsel van menslike eenheid beskou?

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ABSTRACT: Practical reason can help make sense of the decisions that face humankind in a complex planetary age, and notably so regarding the development and use of technology. Human agency and functioning as a self-understanding person, as well as certain ideas related to complexity and co-evolution are crucial aspects of this side of practical reason. Exploring these aspects from different perspectives can help uncover some constructive insights into the special nature of the moral goals, and the uniquely human significance of some of our intentions and actions that inform our decision-making on the development and use of technology. The insights gained here can furthermore serve to expand certain mainstream conceptions in Western intellectual culture on the character of reason as such, which proceed from a classical, or naturalistic stance. In the latter case reason typically calls for the use of explicit criteria, and is foundational and procedural in nature. This view is important and useful. However, the model of practical argument that accompanies it paints a characteristically sceptical picture of rational choice in the moral sphere. Yet such scepticism is not always warranted. Instead, an expanded model of practical reason is called for, notably if human agency and self-understanding, as well as ideas related to complexity and co-evolution are taken seriously. In this thesis it is demonstrated that such an approach can serve to express in richer, less sceptical terms the sense of significance we find in our societal choices, and particularly so in those decisions for technology that confront humanity in an inclusive, interdependent age.

In light of the above, the thesis discussion attempts to review some central naturalistic beliefs in Western intellectual culture on the nature of reason and related patterns of practical argument. The thesis aim is to point out some of their ontological and epistemological assumptions, note their particular strengths and weaknesses and relate them to models of reason employed in the natural and human sciences – especially those that concern the nature of explanation and understanding. Furthermore, these beliefs are linked to a generally sceptical, but at times unwarranted attitude towards the sphere of practical moral argument. Such matters are treated in the first two chapters of the thesis discussion.

Other ways of picturing this attitude of doubt towards the moral sphere can be found in alternative notions about human agency and self-understanding, as well as from complexity and co-evolution. The concepts behind these perspectives point to certain ontological and epistemological insights which arguably take thinking beyond the normal range of naturalistic abstractions. As a result, different characterizations, or patterns, of practical reason become possible, the nature of which can help to rework the usual warrants for scepticism when it comes to judging the significance of our intentions and actions.

Thinking in terms of human agency, self-understanding, complexity and co-evolution holds another advantage. These conceptualisations can also serve to formulate a defining link between practical reason and consultation, be it among individuals, communities or the institutions of society. Such ideas speak in part to emerging notions of collective maturity in the organization of human affairs, and the well-being of all peoples. More particularly, consultation can offer additional resources for replacing entrenched patterns of conflict in society with patterns that are more unifying and just. It can as well provide for a certain quality of understanding of the principles and issues involved. The exploration of these and similar ideas begins with the discussion in Chapters Three and Four, and continues into subsequent chapters.

In addition to their naturalistic counterpart, these patterns of practical reason also suggest some useful notions regarding the broader import of our societal and developmental choices on a planetary scale. The thesis discussion will attempt to explore some of these ideas. Among other things, it considers the implications they have for notions of development in general *viz* the unfolding of humankind's social, cultural, ethical and spiritual potential, as well as for conceptions

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of technology that speak to that unfolding. It will include in its study the notion of future-regarding social choices and the transformative potential of time. From there the focus will shift to what it might mean to recast existing technology aspirations in light of the urgent requirements of a co-evolving world, and with it the need to safeguard the interests of humanity as a whole. These and related topics are addressed in Chapters Five and Six.

Finally, three broad questions have played an important background role in carrying out this study. First, what is the nature of the unity that exists between our capacity to know the world in an epistemological sense, and our ability to judge the moral significance of our actions? Second, on the basis of what can we make sense of our decisions about technology in so far as they might be said to contribute to an advance or a decline in human social well-being? Third, what insights can we gain into our patterns of practical reason and decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind?

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Preface

This work comes from years of effort which occupied my late night hours after each day's work was done. In essence, I have written a reasoned account of my personal exploration of a set of related questions, this not just with the aim of doing research at the doctoral level, but also to make gains in the way I think about and make sense of the world in which we live.

The ideas I have tried to explore are woven around three questions, namely, i) What is the nature of the unity that exists between our capacity to know the world, and our ability to judge the moral significance of our actions within it? ii) What sense can we make of our decisions about technology in so far as they might be said to contribute to an advance or a decline in human social well-being? iii) What insights can we gain into our patterns of practical reason and decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind?

The thesis is written in an attempt to explore these three questions. In doing so I have tried to uncover their various interconnections. In practice this means that in the attempt to argue from within a well thought-out point of view, I have also been guided by the insights or realizations that came to me as I went along. My efforts here have not been, and for me could not be, exhaustive or systematic in nature. I have instead tried to be thorough-minded in my thinking, either through a detailed analysis of a particular set of ideas, or in the attempt to use them to work towards a broader perspective. In the effort to reach a certain depth of analysis I did not hesitate to follow the insights I gained as I reflected on certain key notions, and to make these insights more real and present in my argument by writing about them.

The key ideas I have used in the thesis have mostly come in the form of intriguing texts from a set of well known authors who write from distinct traditions of thought. The main purpose in my analysis of these authors was not to critique unnecessarily, or to find inconsistencies in their points of view. My chief aim was to learn as much as I could form their own insights, and thereafter to look for ways in which these different insights might join or unite around some unexpectedly similar idea. By doing so I hoped to make gains in understanding my main thesis questions.

A note about sources is needed. The thesis discussion contains numerous quotations from a range of authors. Among these are Charles Taylor, Ilya Prigogine, Basarab Nicolescu, Erich Jantsch, Edgar Morin, and Ervin Laszlo. The reader will also find texts from UNESCO, The Universal House of Justice, the Institute for Global Prosperity and the Baha'i International Community – an NGO having observer status at the United Nations. All of these texts were chosen for the insights they offered into the exploration of my main questions. The inclusion of quotations from a faith-based organization is therefore not an attempt to advance a particular religious perspective, but to provide added depth of analysis to my chapter discussions.

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Introduction

Decisions for technology in a planetary age

The twentieth century was witness to profound shifts in people's thinking about themselves and their relations with others, about the communities in which they live, and the manner by which societal decisions are considered and made. Such shifts have led, for example, to recognition among global nations that self-sufficiency is not possible, and that humankind inhabits an age which is centred on an evolving interdependence of all peoples. Ervin Laszlo in *The Multi-cultural Planet* (1993) writes of the significance of the transition through which humankind is passing:

> We are now living in a world where there are no longer groups or states that dominate others; there are no states that could even survive without the others. In some measure, each community, each state has become dependent on others, both for its socio-economic development and for its ecological and territorial security. It has thus become essential that relations between communities and states be informed by practices leading to a higher unity within the present diversity.[1]
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> ...
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> If the peoples of this planet perceived mutual complementarities and forged relationships of mutual benefit and support, they could join together, like the diverse organs of a single body, to maintain the whole systems in which they are a part. That system is now the entire human community and its planetary home.[2]

The following passage from a text written by The Universal House of Justice, in Haifa, Israel (2002) suggests some of the chief avenues in this transition:

> The enduring legacy of the twentieth century is that it compelled the peoples of the world to begin seeing themselves as the members of a single human race, and the earth as that race's common homeland. Despite the continuing conflict and violence that darken the horizon, prejudices that once seemed inherent in the nature of the human species are everywhere giving way. Down with them come barriers that long divided the family of man into a Babel of incoherent identities of cultural, ethnic or national origin.[3]

Commenting further on the manner by which barriers between peoples are brought down – such as the growing recognition and acceptance of the principle of the equality between men and women, the questioning of absolute national sovereignty, and the rejection of ethnic, racial, and religious prejudice as defensible positions to take – the House of Justice in the same text goes on to argue:

> It is not that a dark past has been erased and a new world of light has suddenly been born. Vast numbers of people continue to endure the effects of ingrained prejudices of ethnicity, gender, national, caste and class. All the evidence indicates that such injustices will long persist as the institutions and standards that humanity is devising only slowly become empowered to construct a new order of relationships and to bring relief to the oppressed. The point, rather, is that a threshold has been crossed from which there is no credible possibility of return. Fundamental principles have been identified, articulated, accorded broad publicity and are becoming progressively incarnated in institutions capable of imposing them on public behaviour. There is no doubt that, however protracted and painful the struggle, the outcome will be to revolutionize relationships among all peoples, at the grassroots level.[4]

Laszlo offers a similar analysis:

> If humanity is to regain the balance necessary for social economic and human development, it must enter a phase aimed at the unity within diversity that results from successful integration. Current calls for world peace, for a new world order, and for economic justice already reflect and express this need.[5]

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Referring to newly created patterns of relation among peoples he goes on to write:

> It is far from Utopian to maintain that human groups and communities could put these ideals into practice. Interactive, mutually complimentary patterns of existence have already evolved in various social, economic, political and religious communities in different parts of the world.[6]

The following passages from *Culture and the Future* (1988) and the United Nations World Conference on Cultural Policies refer to similar ideas:

> Universality is not the same as uniformity ... it is with his own inner resources that each person must face up to the common destiny of mankind.[7]

> In all their rich variety and diversity, and in the reciprocal influences they exert on one another, all cultures form part of the common heritage belonging to all mankind.[8]

Such points of view speak to the idea that an exceptional range of decisions are faced by people in contemporary societies. The kinds of social choices faced, the growing requirements for mature consultation they necessitate, the manner by which problems and possibilities are characterized, and the way in which knowledge is conceived, organized, harmonized and evolves, are diverse and varied. However, in the words of one text, common themes and challenges have emerged both in the way people relate to each other across the planet and in the organization between global nations.[9] In a sense, new species of decisions have arisen in order to live with the requirements of an evolving, or co-evolving, age. The received truths of specific social worlds which people experience and share are changing all out of proportion to past principle and practice.[10] The transformations being brought about in the organization between nations creates a host of social decisions for which prior experience is generally not a sufficient guide.

The following two passages, again by Ervin Laszlo and from a second work commissioned by The Universal House of Justice respectively, offer two related characterizations of the extent to which the choices faced by individuals, communities and the institutions of society are removed from past practice:[11]

> New ways of living and acting are necessary if the global goals of peace, economic development and a safe environment are to be effectively pursued. Without unity in diversity it will not be possible to do away with nuclear, biological, chemical, and other weapons or to create a joint peace-keeping system; to reduce the family size in high-fertility populations; to tackle environmental problems; to share useful skills, technologics, and capital with poorer or less developed partners; or to channel investment towards education, communication, and human resource development. With the new, complimentary patterns of existence, on the other hand, the culturally diverse world of the late twentieth century could gain the unity it needs to survive and develop.[12]
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> ...
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> Democratic decision-making has fundamentally altered the relationship of the individual to authority. With growing confidence and growing success, women justly insist on their right to full equality with men. Revolutions in science and technology change not only the functioning but the conception of society, indeed of existence itself. Universal education and an explosion of new fields of creativity open the way to insights that stimulate social mobility and integration, and create opportunities of which the rule of law encourages the citizen to take full advantage. Stem cell research, nuclear energy, sexual identity, ecological stress, and the use of wealth raise, at the very least, social questions that have no precedent. These, and countless other changes affecting every aspect of human life, have brought into being a new world of daily choices for both society and its individual members. What has not changed is the inescapable requirement of making such choices, whether for better or worse. It is here that the spiritual nature of the contemporary crisis comes into sharpest focus because most of the decisions called for are not merely practical but moral.[13]

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Added to this is the way peoples or communities relate to or regard one another, including a groundswell of individuals at the grassroots level who are moved to investigate reality for themselves, re-evaluate their own ideas and positions, and look again at those received truths they might have inherited from their respective leaders or forebears.[14] It is worth noting that, among other things, such a re-evaluation has moved people to form or join organizations and associations linked by a like-minded spirit, and inspired by a world-embracing vision – each with the intent of responding to the crises of the times, or improving the well being of a suffering, fellow humanity.[15]

As suggested in the quote immediately above from The Universal House of Justice, one set of decisions called for concerns the manner in which science-based technology is used in society, especially where revolutions in science and technology "change not only the functioning but the conception of society, indeed of existence itself".[16] As is also stated above, this raises an entire class of social questions concerning "[s]tem cell research, nuclear energy, sexual identity, ecological stress, and the use of wealth ..." that have no precedent.[17]

In a related sense, Edgar Morin and Anne Brigitte Kern in their work *Homeland Earth: A Manifesto for the New Millennium* (1999) refer to the period of growth humanity is entering as the planetary era.[18] They write of principles of action and patterns of practical reason, that, instead of being focussed on a strictly materialistic view of life, also include the unfolding of what they refer to as mankind's "psychic, spiritual, ethical, cultural, or social" potential.[19] Following Morin and Kern, an appeal to become more inclusive regarding our principles of action and patterns of practical reason calls for modes of thought that are richer than those typically found in a strictly materialistic view of life. More particularly, thinking about mankind's various capacities, powers, and spiritual potential, to paraphrase Morin and Kern, need to be conveyed in ways that can expand existing notions of economic growth and material advantage.[20] As a result, ideas concerning economic growth, often subsumed under the term development, would themselves be changed or evolve in relation to an evolving grasp of mankind's "psychic, spiritual, ethical, cultural, or social" potential.[21] It is in this sense then that forms of practical reason that accompany a mainly materialistic sense of development and prosperity constitute only one step towards making sense of the collective decisions required of humankind in an evolving planetary age.

Such patterns of reason necessarily include certain distinctive forms of consultation concerning human social well-being, without which the requisite maturity of knowledge and understanding is less likely to be achieved. These forms of consultation are closely aligned to notions of collective maturity in the organization of human affairs, and with it a desire to promote the well-being of all peoples. They are furthermore linked to those "mutual complementarities and forged relationships of mutual benefit and support" noted by Laszlo in the quote above, and with it the sense of unity within diversity that is central to relations among the planets inhabitants.[22] Indeed, it is worth noting that, for this thesis, the particular forms of consultation, to be highlighted as the discussion unfolds, can be regarded as being part and parcel of practical reason.

One feature of an expanded, or richer, mode of thought is the way in which it can strand together a set of ideas that help to link our capacity for knowing the world in a planet-wide sense, to our capacity for judging the worth or significance of our actions within it. More particularly, the link applies to a broad range of questions regarding what technology is, how people may regard it as a tool for productive outcomes, the values that accompany it as a societal process, and the specific motives or higher aspirations in terms of which individuals, communities, and the institutions of society make sense of decisions about its development and use. On the whole, notions of development, prosperity and social well-being, and hence too decisions about technology, can be tied to a people's understanding of themselves. Such understanding is arguably shown up in part in the uncovering of our various potentials – psychic, spiritual, ethical, cultural, or social – or what the

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thesis discussion will more generally describe as the spiritual dimensions of life.[23] Using ideas from Charles Taylor, we might refer to these as the significance our lives have in so far as we are self-understanding beings.[24]

Crucially then, as ties between the peoples and nations of the world multiply and their interdependence is strengthened, then efforts to make sense of global decisions and actions need increasingly to involve questions of what is worthy of us as individuals, the dignity due to others, the significance of our forms of community life, and the manner by which the institutions of society speak to matters of justice, dignity and equity in human relations – matters that collectively concern what the thesis discussion will refer to as the spiritual dimensions of life. Such ideas arguably serve to trace out a guiding image of unity, one tending the "peoples of the world to begin seeing themselves as the members of a single human race, and the earth as that race's common homeland".[25] Putting things in such terms is also suggestive of a searching reflection into a people's inner sense of self and motive, from which might arise questions of who, what and why we are. Such questioning may occur, for example, among people who, accustomed traditionally to a relative social seclusion, experience a world of beliefs and ways of life from across the globe never before witnessed, or if previously witnessed could have been forgotten or ignored.

The shifts in thinking sketched in the above paragraphs paint a picture of individuals, communities, and institutions of society which almost everywhere confront unprecedented choices on a wide set of topics, including questions regarding the development and use of technology. In the contemporary age, these choices are often world-wide in their repercussions, calling in turn for consultations between people on an equally wide basis. Furthermore, these choices are not only practical in nature but moral as well: In a material sense, but above all in a moral and spiritual sense, they are made "for better or worse".[26] The general question this confronts humankind with, is how, and on what basis, can it be determined which decisions are instances of advance, and which are instances of decline in human social well-being? More specifically, the question that arises here is: What are the characteristics of practical reason and consultation that can aid humankind in making sense of such decisions? What patterns of reason can be of assistance in answering questions of worth in relation to the fundamental choices humankind faces, this in order to determine whether the forms of life and action people choose are thereby yielded to the contemporary requirements of an evolving global humanity? How might these patterns of practical reason include or contribute to the quality of a mature reflection and consultation that takes place on a planetary basis? In what ways can such patterns of reason add to judgements of worth concerning the implications and consequences of the social decisions humankind makes, or is required to make? More generally, how might we learn to incorporate these patterns of practical reason and consultation in planning for a future-in-waiting, in rethinking what might be called the aspirations that accompany those desires that move or guide our larger lives, and in making sense of decisions that speak to issues of human significance, questions of a "good/decent/acceptable form of life", the attempt to sound out more fully the unfolding of our human potential, and to perhaps better grasp the unity that exists between our capacity to know the world and to judge the merit of our actions within it?[27]

Problem statement

The general focus of this thesis will be on exploring patterns of practical reason and consultation as might be called for by a planetary age. The problem addressed in the thesis is twofold. First, that the widely dispersed conventional assumption that reasoning is procedural in nature, and that the universe makes no claims of worth or significance on human persons, together serve to colour ideas regarding what constitutes practical argument. The type of foundational and critical, or absolute, forms of reason that accompany these assumptions contribute to sceptical views regarding the rationality of practical moral disputes. This is particularly so given the principle that sound

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reasoning requires the use of external criteria in order to decide between fully articulated but rival positions – here meaning that to accept the one position is to reject the other. However, in circumstances where the procedural, foundational and the critical nature of reason *per se* takes precedence, then the conclusion tends to follow that moral disputes are immune to any kind of rational resolution.[28] As the thesis discussion will try to show, such ideas can also have a distinct impact on conceptions of what technology is, on decisions regarding how it is to be developed and used, and particularly so on what it is to judge its worth or significance for human persons.

However, this family of conceptions which in part makes up the naturalistic standpoint is incomplete, its sceptical judgments premature. There is more to practical argument than what is acknowledged in solely procedural or foundational patterns of reason.[29] Other patterns of practical reason exist. Some of these emerge in part from a "richer ontology than naturalism allows", and arguably call up different conceptions of what it is to reason in practical terms.[30] For example, that it involves a being open to matters of significance and an ability to be transformed by the way we engage with them.[31] These richer patterns of reason imply an expanded way of thinking about human worth and agency, which in turn can, as will be argued in this thesis, have a distinct impact on conceptions of technology and on what it is to judge its development and use in a planetary age.

Second, the same procedural views of reason and of a neutral universe are not always well suited to understand some of the complex and co-evolving characteristics of our planetary age. Such characteristics are partly made up of complex forms of knowledge and organization as are found in the mutual relations that obtain among the Earth's peoples and nations. The sort of planet-wide awareness called for here, and the type of complementarities that often emerge, are such that some of the central ideas involved in naturalistic abstractions do not contribute as they might to a grasp of our contemporary socio-cultural processes. Additional patterns of practical reason and consultation are needed, as well as a different sense to thinking about the ontology involved. Central to the thesis argument is that some of these patterns derive from thinking in terms of human agency and what it is to be a self understanding person, as well as ideas from complexity and co-evolution.

More particularly, strictly materialistic assumptions about the workings of the universe and the typically machine-like or inanimate explanations of life that tend to accompany them have exerted a wide influence on conceptions of human nature and the workings of society. Included here is a relatively broad set of underlying assumptions about language, human agency and motivation that tend to misconstrue the sense of who we are as beings partly constituted by self-understanding. The same arguably holds for man's capacity for self-reflection and the complex, co-evolving interactions among peoples and nations that have emerged on a planet-wide basis. These require an awareness of a certain oneness of human relations, and of links to a terrestrial world which were nearly inconceivable a century and a half ago. They also ask that a different, arguably richer sense be given to the human capacity for knowing the world and judging our actions in it. Such concepts and levels of awareness as emerge from the perspective of human agency and self-understanding, as well as from complexity and co-evolution, can arguably offer gains in understanding these issues. This is notably so when one considers the richer ontology they involve. These kinds of gains can also assist in coming to terms with what technology is about in a planetary age, as well as aid in making sense of the practical decisions that are to be made regarding its development and use.

Purpose and scope

The purpose of the thesis discussion is twofold. First, to consider a variety of ideas regarding the nature of reason and resulting conceptions of practical moral argument, both those indebted to the range of abstractions in the naturalistic stance as well as those that work outside its conceptual scheme, so as to better understand a) the nature of contemporary moral scepticism, and b) the conditions under which such scepticism may be unwarranted or premature. Second, to explore what

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this analysis of practical argument implies for our conceptions of development in general, as well as the significance of the decisions we make regarding technology in a planetary age.

In the attempt to carry out these two tasks, the thesis will explore three broad areas. First, an analysis of naturalistic abstractions in Western intellectual culture as exemplified in the notion of explanation on the one hand, and of understanding on the other. In order to do this the thesis discussion will explore patterns of reason found in the natural and quantitative social sciences related to explanation, as well as the patterns of reason found in the qualitative social sciences related to understanding. The main concern here is to highlight the relationship these patterns of reason have to a sceptical stance towards practical moral argument.

Second, an analysis of the notion that humans are self-understanding beings, as well as ideas from complexity and co-evolution, so as to uncover expanded patterns of practical reason that i) are not expressly indebted to the abstractions of the naturalist stance, ii) which might therefore provide a different set of perspectives concerning the sceptical attitude towards practical argument usually associated with that stance, and iii) offer a range of insights into notions of worth and significance so far as concerns the nature and conduct of practical reason in a planetary age.

Third, to use the four notions of practical reason that concern the thesis discussion, namely those based on the naturalistic standpoint, self-understanding, complexity and co-evolution, to explore a range of ideas concerning contemporary conceptions of technology and what sense can be made of our decisions regarding its development and use in a planetary age.

Furthermore, the thesis argument will be guided by three broad questions. First, what is the nature of the unity that exists between our capacity to know the world in an epistemological sense, and our ability to judge the moral significance of our actions within it? Second, what sense can we make of our decisions about technology in so far as they might be said to contribute to an advance or to a decline in human social well-being? Third, what insights can we gain into our patterns of practical reason and decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind?

Two further ideas add to the point of view from within which the thesis argument is carried out.

Point one, the learning needed to engage with co-evolving planetary processes and practices goes hand in hand with the consciousness of the oneness and wholeness of the entire human race. Taken as the first principle for learning to live with the requirements of the age, the principle of the oneness of mankind forms the guiding idea in terms of which the thesis discussion will explore the sense we can make of decisions about the development and use of technology in the context of a planetary age. The same principle is equally central to the question of what it might mean for such decisions to contribute to an advance or decline in human social well-being.

Point two, our human capacity for knowing the world and for discerning the significance of our actions within it together form a complementarity, and display a unity of expression, which can be partly marked out by patterns of practical reason and consultation indebted to self-understanding, complexity and co-evolution. The thesis discussion will explore these patterns in some detail, but especially from two perspectives. First, the relation they have to notions of the human person, with special emphasis on the self-defining subject and the self-understanding person. Second, the links they have to questions of worth and significance posed in light of an evolving planetary age. Doing so may help mark out some of those pathways by which thorough-going doubt over our ability to judge moral disputes need not always take hold of practical reason.[32] Such ideas also lead to a conception of consultation as being part of what it is to reason practically, and hence to think in

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terms of the worth or significance of the decisions people make, be it at the level of the individual, the community or the institutions of society.

This being the case, the scope given to evolving planetary levels of awareness as a proper context for making sense of decisions about the development and use of technology is accompanied by five additional points. These points are used throughout the thesis discussion, often implicitly so. In general they will serve to broaden the scope of its treatment of practical reason and consultation. This is particularly so where such ideas might not otherwise be associated with thinking about technology, as well as the way we might judge or discern its significance.

First, mankind constitutes a diverse yet single human race, one that is evolving across broad social, cultural, spiritual and intellectual forms of life.

Second, with this comes an emerging, somewhat unique sense of significance in the idea of our shared capacity or potential as the inhabitants of one planetary home.[33]

Third, such an emerging sense of significance implies that various worthwhile institutional forms of life, admirable community practices, and the merits, virtues, and accomplishments of individuals need to be recognized, fostered, and held in mutual esteem.

Fourth, the quality of our shared potential (point two) and the sense of significance in our forms of life (point three) need to be understood in relation to the nature of the complex, co-evolving interdependencies which are coming into being in the organization of life across the planet.[34]

Fifth, gains in making sense of such interdependencies can be made in part through two complementary processes: i) incorporating deeper-current notions of consultation into conceptions of practical reason, notably in matters of worth and significance, and ii) fostering an associative, "peace-inducing aspect" in the way we think about the problems and possibilities of the age in which we live, and hence in coming to terms with the significance of the decisions that face us.[35]

It is worth noting that the manner by which the processes suggested in these five points interact could itself evolve over time. Such an evolving interaction could in turn serve to alter those same processes. If so, then such ideas may speak to a basic complementarity, the characteristics of which could be said to be co-evolving.[36]

Having noted these ideas, however, it is important not to miss the point. Our age is racked by entrenched patterns of conflict.[37] Indeed, in many cases the assumption has grown that human beings by their very nature are wedded to conflict or aggression.[38] And yet at the same time we have entered a period of life wherein the majority of the planet's inhabitants seek forms of life based on co-operation and reciprocity, or, as one text puts it, that "... people of all nations proclaim not only their readiness but their longing for peace and harmony, for an end to the harrowing apprehensions tormenting their daily lives".[39] It is in light of these ideas that the above five points are placed within the scope of the thesis discussion, not to be understood as ideals, but as a possibly fruitful contribution in coming to terms with the problems of the age in which we live.[40] Or, to put it differently, they constitute part of an effort to find those ideas in terms of which we can trace out widening circles of unity in the way the peoples of the world might learn to relate to one another.[41]

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Some comments on method

The thesis will follow various avenues in order to argue from within its point of view. The following paragraphs are an attempt to outline some of these methodological aspects.

As stated above, the ideas explored in this thesis are organized around three themes, namely, the unity that exists between our capacity to know the world and our ability to discern the significance of our actions within it, the sense we can make of our decisions about technology in so far as they might lead to an advance or to a decline in human well-being, and the forms of practical reason we might use in the attempt to better recognize the worth of our decisions and actions.

In general the thesis narrative will attempt to interweave these themes in answer to the question: What insights can we gain into our patterns of practical reason and hence decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind?[42] As such the thesis discussion is largely conducted around an attempt to uncover the various interconnections in these themes. This means that in working from within a well thought-out point of view, a range of insights will also be gained along the way. These insights will be incorporated into the thesis narrative. In addition, the narrative will not be exhaustive in approach. However, it does aim to be thorough-minded, either through a detailed analysis of a particular set of ideas, or in the attempt to use these ideas to work towards a broader perspective.

Throughout the thesis discussion an overarching methodological approach will be to explore the ontology that accompanies patterns of practical reason based on the naturalistic standpoint, human self-understanding, complexity and co-evolution. In general, in working through this approach the thesis discussion will attempt to argue first, that in order to make gains in understanding our decisions so far as their significance or worth is concerned, then we need to engage in patterns of practical reason that involve a richer ontology than is found in the naturalistic standpoint. Second, the thesis discussion will attempt to argue that notions regarding self-understanding, complexity and co-evolution offer such a richer ontology, and hence provide for a different view of what constitutes practical reason. The general method here will be to a) search out some of the reasons why scepticism towards practical reason appears to be characteristic of thinking from within the naturalistic standpoint, b) look for expanded patterns of practical reason, the ontology of which need not give warrant to a thoroughgoing scepticism, and c) explore what these ideas might contribute to an understanding of the decisions we face regarding the development and use of technology in a planetary age.

In following this general methodological approach, the thesis argument will attempt to explore a more specific set of ideas that serve to expand the normal range of naturalistic abstractions in terms of which scepticism towards practical reason is usually understood. Three thematic avenues will be used in this regard, namely: i) the relation between naturalistic abstractions and models of practical reason, with special focus on the "primacy of the epistemological" and the ontology implicit in the natural sciences[43], ii) the work of Charles Taylor that specifically attempts to recast patterns of practical argument according to ideas based on human agency and what it is to be a self-understanding person, and iii) further perspectives on practical argument as suggested by developments from within the natural sciences themselves, notably in complexity and co-evolution. These three avenues serve to address one of the main thesis questions, namely: What is the nature of the unity that exists between our capacity to know the world, and our ability to discern the significance of our actions within it?

With regard the first of these avenues, and as part of a general discussion on explanation and understanding, the thesis discussion will explore the links that obtain between key assumptions in the ontology of a neutral universe as adopted by the natural sciences and the general attitude of

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doubt in Western intellectual culture concerning the ability to reason in any conclusive sense when it comes to questions of significance or worth – or as Taylor sometimes puts it, about good, decent, or acceptable forms of life.[44] These are all closely joined to what he calls the primacy of the epistemological.[45] The thesis discussion will latterly link these sceptical beliefs to a classical conception of technology, posed in terms of what Frederic Ferré in his *Philosophy of Technology* (1995) calls practical and theoretical intelligence, as well as to some related characteristics of development thinking which the thesis will argue are only partially adequate to make sense of the decisions humankind faces in a planetary age.[46] However, it is important to emphasize that the thesis discussion does not aim to discredit the abstractions of the naturalistic stance and the model of procedural reason *per se*. Following Whitehead, the thesis argument instead explores what appears to be a somewhat intolerant use of these abstractions, and the unexamined warrant given to scepticism in judging matters of worth that they tend to imply.[47]

Concerning the second avenue, the thesis discussion will consider a host of ideas from Charles Taylor regarding his notion that reason is not only procedural but is also substantive in nature. Such ideas also accompany a change in conception of what constitutes a person, as well as this conception's link to an understanding of human intents. It also involves questions that concern what it is to reason about or explain people's actions, and the kind of ontology that obtains in ideas regarding human agency and the notion of strong evaluation.[48] The thesis discussion will try to highlight how such ideas can work outside the usual range of ideas regarding i) the ontology of a neutral universe, and ii) judgments as to the significance of our actions in such a universe. Included here as well will be an attempt to explore some implications these ideas might have for thinking about the development and use of technology in the context of a planetary age.

A special note is needed regarding the use of Taylor's works in the thesis argument. Martha Nussbaum notes that Taylor's position is somewhat unique in the debate concerning evaluative issues in the social sciences.[49] Furthermore, his ideas speak in direct terms to one of the major points in the thesis discussion, namely, the nature of practical reason. As such Taylor's ideas take the preponderating share in the discussion of practical reason from the point of view of self-understanding. And indeed, numerous insights from his works have been incorporated into the thesis argument.

More specifically, Taylor has produced a large body of work covering a range of topics that extend far outside the point of view from within which the thesis has tried to argue. The aim of the thesis narrative is to explore forms of practical reason that speak to a richer ontology than is found in the naturalistic standpoint. Taylor offers important insights around this theme, and these have been used in the thesis discussion. His many other works, while important, are not directly related to the specific aims of this thesis, and have therefore not been considered. Furthermore, Taylor works within a broad field of study. Other authors in this field may well have particular insights into forms of reason from a hermeneutical frame of thought.[50] However, the thesis is not designed to be an extended study of a particular field of knowledge. It is instead organized around broad philosophical themes and questions. As such the thesis discussion cannot attempt an extended analysis of each field of knowledge that is relevant to its theme. Taylor's ideas have therefore been used for the unusually rich starting point they offer the thesis argument, one from which a wide range of other ideas can be related.

In the case of the third thematic avenue, the thesis discussion will focus on a range of ideas that fall generally into the arena of complexity and co-evolution. It will not, however, treat the technical aspects of these areas. It will instead examine a broader range of ideas, based mainly on the sense of mutual relation between people that is characteristic of an evolving planetary age. The discussion here will speak to such matters as time and transformation, complex knowledge and complex

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organization, evolving values, a vision of man-in-the-universe and cultural guiding images, and the need to realign development thinking in such ways as to include notions of worth, significance and the spiritual dimensions of life.[51] These ideas will then be used to explore the notion of technology aspirations, what it might mean to recast these aspirations in light of the urgent requirements of a co-evolving world, this in light of the need to safeguard the interests of humanity as a whole.
Furthermore, and as an additional part of its methodological framework, the thesis narrative will attempt to string together the above three avenues so as to highlight a defining link between practical reason and consultation. Such a link will be based on the idea that a deeper-current picture of consultation exists which can be incorporated into the very notion of practical reason, and that there are good reasons to do so. The link between practical reason and consultation will be exemplified at the level of individuals, communities and the institutions of society. Furthermore, the range of ideas involved here speaks to emerging notions of collective maturity in the organization of human affairs. One key aspect that will be highlighted is that the link between practical reason and consultation can offer additional resources for learning how to replace entrenched patterns of conflict in society with patterns that are more unifying and just.[52]

In following this methodological framework, the discussion of the link between practical reason and consultation will take place in a variety of contexts. Some of these include what Morin and Kern describe as the unfolding of humankind's psychic, spiritual, ethical, cultural and social potential.[53] Others concern judgements of what is worthy significant in our human actions, a searching reflection into who we are as persons, questions as to what might constitute good or acceptable forms of life, as well as what Prigogine and Stengers call man's new dialogue with nature. The discussion of cultural guiding images will also pick up on the same idea. Each of these speaks in its own way to the unity that exists between our capacity to know the world, and our ability to discern the significance of our actions within it – one of the main research themes of the thesis.

As the thesis argument progresses, it will also attempt to explore a range of ideas that arguably add to those patterns of reason and consultation as might post gains in making sense of decisions about technology in a planetary age. This constitutes another main methodological approach followed in the thesis narrative. In doing so, the narrative will not take up positions against or in favour of specific decisions for technology. The thesis discussion will instead try to suggest how patterns of practical reason that concern matters of worth or significance, together with related notions of agency, human potential, and cultural guiding images, to mention a few, can help expand notions of development, be they economic, social, scientific or human, and hence offer gains in the way we make sense of decisions about technology in a planetary age. The methodological approach employed here will thus link up with another of the main thesis questions, namely: What sense can we make of our decisions about technology in so far as they might be said to contribute to an advance or a decline in human social well-being?

In the attempt to discuss these matters, the thesis approach will try to expand our conceptions of what technology is about, as well as the range of ideas that might be brought to bear in discerning the worth or significance of our choices regarding its development or use. In order to do this, notions from the naturalist standpoint, self-understanding, complexity as well as co-evolution will come to the fore. These ideas will be linked to matters such as human agency, motives and intents, and the relation between language and significance. These considerations will go beyond notions of development as involving economic growth, increased productivity and technology innovation.[54]

Turning to a different line of thought, the various methods in science that can be said to aim at explanation or understanding tend to generate a vast debate on the scientific status of social research. However, the debate *per se* does not concern the work of these chapters.[55] Instead, the

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thesis discussion will argue from the position that, following Taylor, both approaches give expression to a set of underlying assumptions regarding the nature of reason which have a common root in the naturalistic standpoint. Furthermore, the models of reason used in both approaches tend to support a general scepticism regarding practical argument. The thesis discussion will explore at some length these naturalistic assumptions and the models of reason that accompany them. In this regard a central technique employed in the thesis discussion will be to analyze patterns of reason as exemplified by the natural and social sciences, this in order to better grasp some of our assumptions about practical augment. Here the thesis discussion will be organized around an idea from Taylor, that to gain a more prescient grasp of the one is to be able to make clearer sense of the other.[56] Overall, this method will be used throughout the thesis discussion, and notably so in order to: a) highlight some of the sources of the general scepticism towards practical reason found in Western intellectual culture, and b) to explore what more recent developments within science itself might say regarding an expanded conception of practical argument.

Hence, a central methodological approach employed in the thesis involves a close exploration of the relation between the forms of reason used in the modern sciences and our patterns of practical argument. The particular focus of this methodological approach is five-fold. First, the thesis discussion will highlight the links that exist between forms of reason used in the classical or mainstream natural and social sciences, and Western conceptions of explanation and understanding. The abstractions and forms of reason associated with the naturalist standpoint will make up the core of the discussion here. Second, the thesis will examine the ways in which such Western-inspired conceptions of explanation and understanding, together with patterns of reason indebted to the naturalistic standpoint, serve to cast doubt on the validity of practical moral argument. Third, the thesis discussion will explore Taylor's ideas regarding patterns of practical argument that are not indebted to the standard range of naturalist abstractions and its forms of reason. By doing so an expanded conception of practical argument comes to the fore, one in which the usual warrants for scepticism tend to fall away. Fourth, the thesis narrative will look to developments within the modern sciences themselves, out of which have tended to emerge a different, non-classical dialogue with nature. The focus here will be on complexity and co-evolution. The kinds of dialogue with nature that emerge in these areas employ different forms of reasoning from the usual naturalist sort. The thesis will use these non-classical notions of reason in science to explore some analogous patterns of practical argument. Fifth, and finally, the thesis discussion will attempt to connect Taylor's ideas about the nature of practical argument with those that emerge from complexity and co-evolution.

Finally, a word is needed regarding the third main research question, namely: What insights can we gain into our patterns of practical reason and decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind? In the first case, the thesis argument takes it as a given that we live in a planetary age. The question here then is: How do we learn to live in it? This is notably so in light of the threat of destruction and the potential for growth that such a planetary age presents to us. Such issues form the context for the entire thesis discussion. However, the principle of the oneness of mankind is different from the fact that we live in a planetary age. The latter serves as context, while the former is a normative guide. As such, the thesis discussion will not explicitly attempt to establish the principle or to demonstrate its truth. However its connection to and value for thinking in terms of a planetary age will become evident as the narrative develops. In this respect then, the principle that mankind is one helps give direction or sense to the overall thesis exploration. For instance, by thinking in terms of a deeper-current sense of human diversity which the principle implies, we may be able to uncover some fruitful ideas for making sense of both the threat and potential that accompanies our decisions in a planetary age. In addition, the principle is independent of the fact that our historical choices are

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currently driven by struggle. The application of the principle does not lead one to ignore or discount such struggle, but it can help us think about our historic choices in different, more unifying terms.

To close these comments on method, some remarks need to be made about the sources that are used in support of the point of view from within which the thesis argument is carried out. The key sources for the thesis argument are a set of texts from Charles Taylor, Ervin Laszlo, Ilya Prigogine, Edgar Morin, Basarab Nicolescu and Erich Jantsch. The ideas they contain contribute to the majority of the thesis narrative.

Standing more in the background of the discussion are a large number of additional, secondary texts from writers such as Johann Mouton, John Casti, Martha Nussbaum, Yvonna Lincoln, Egon Guba, Arnold Toynbee, John B. Thompson, Jacob Bronowski and Alfred North Whitehead. These texts generally add a range of background ideas so as to help make more clear what it is to think in terms of the naturalistic standpoint, self-understanding, complexity and co-evolution, together with decisions for technology. It is worth noting that of these secondary authors, the ideas of Bronowski and Whitehead are most in evidence in the thesis discussion – notably Bronowski's ideas regarding the democracy and aristocracy of the intellect, and Whitehead's general treatment of the ontology and epistemology that accompanied the growth of the modern empirical sciences.

Lastly, within the thesis discussion one will find cited a number of texts published by organizations or institutions, the content of which speaks directly to the thesis plan. These include UNESCO, The Universal House of Justice, the Institute for Global Prosperity and the Baha'i International Community – an NGO having observer status at the United Nations. Here an added word is needed since most of these latter references are from a faith-based organization.

Some readers may be concerned that the use of ideas presented by a faith-based organization could compromise the independence of the thesis as a philosophic study. In other words, that they will be read as authoritative in a way that differs from the texts of individual authors, or perhaps that one is obliged to formulate his argument according to a particular religious point of view. However, the motives for the use of such texts do not support such a reading of this thesis.

In the first instance, these very texts were originally composed so as to examine or explore important questions that face humankind. They are not written from an authoritative stance, but as part of an ongoing, reasoned engagement with the problems of the age in which we live.

Second, if the thesis argument attempts to advocate a particular point of view, then it is that the principle of the oneness of mankind can be used to help see the problems of our age in different, possibly fruitful terms. The institutional texts chosen for use in the thesis argument speak to this very principle, as do ideas from of Laszlo, Jantsch, Prigogine, Nicolescu and Morin, for example.

Third, some of the ideas borrowed from these institutional texts were not found elsewhere in the literature. For example, the concept of consultation as constituting part of our notion of practical reason, and the ideas regarding the recasting of our contemporary technology aspirations or incentives are important aspects to the thesis argument, and were first suggested in the reading of these texts. The ideas they contain take the thesis argument one step further, contributing in some way to the particular theme being explored, and have therefore been included in its narrative.

A last note is in order. One important thread in the thesis discussion is to trace out some of the key links between ideas of human agency and self-understanding as expressed by Taylor on the one hand, and notions of complexity and co-evolution as treated by Prigogine and Stengers, Morin and Kern, Laszlo, Jantsch and Nicolescu on the other. The respective traditions from which these authors write are quite distinct, and yet arguably there are points of contact which display a certain

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unity of thought. An attempt to highlight such unity of thought is one of the explicit goals of the thesis discussion. Therefore, in the attempt to explore these points of contact between ideas, each chapter will serve as a next phase in the exploration of a broad theme or research question. A range of ideas and insights from prior chapters will therefore be revisited in each subsequent chapter. This is not a simple repetition of ideas. It is a way of discovering further depth of insight into the implication the ideas contain as the thesis exploration covers new ground.

Thesis context

Given the above problem statement, purpose and scope, as well as comments on method, it is useful to suggest where the thesis discussion fits into existing areas of study and well marked conceptual lines, as well as where it may perhaps expand them. However, since the question of values in relation to technology constitutes a broad field of study, then only a general indication will be given as to where the thesis argument can be placed within it. The discussion that follows will also provide a broad background against which the various themes of this study can be profiled.

The general notion of human capacity, powers or potential used in the thesis discussion links to a broad range of questions regarding i) the character of technology as such, ii) the sense in which it might be viewed as a neutral tool for human productive purposes[57], iii) the values that accompany the processes by which it becomes part and parcel of a social world or community within which people live, understand themselves, and make decisions, iv) how it can thereby influence the very conception of society, hence v) some of the assumptions made about what is doable or realizable in that society, and finally vi) the specific motives, higher aspirations and guiding images in terms of which individuals, communities, and institutions might make sense of their decisions about the development and use of technology in a planetary age. Such distinctions generally mirror the debate about technology and values concerning the question whether or not technology is a value-laden activity, as, for example, highlighted by Craig Hanks in his work *Technology and Values* (2010).[58] The thesis argument picks up on the various poles of this debate. It discusses them as part of its aim to explore patterns of practical reason that speak to the decisions about technology that confront us in a planetary era.

With regard to making sense of our decisions about technology, this is linked to questions of development that go far beyond a "mere amelioration of material conditions".[59] In this respect the thesis discussion is not about technology *per se*, but about patterns of practical reason and consultation that might offer gains in making sense of decisions made concerning its conception, development and use. The distinguishing feature here is that all these questions concern whether or not such choices can be thought of as constituting an advance or decline in human social well-being. The thesis discussion presents notions of well-being as being linked to a planet-wide perspective concerning the relations among the peoples of the world, as well as the idea of an evolving humanity marked out by a consciousness of its oneness and wholeness. This is one area which may distinguish it in the literature on technology and values. For example, much work exists in the area of the global uses of the internet, or the net and self, but these are very much tangentially related to the thesis discussion.

As Edgar Morin and Anne Brigitte Kern note in *Homeland Earth* (1999), there is a need to bring into development thinking more concrete notions of being and existence, and to relate them to what they call the transformative potential of time.[60] In this sense Morin and Kern mirror in some sense the ideas of Martin Heidegger, as they have been articulated in his *The Question Concerning Technology* (1977).[61] These ideas are picked up at some length in the thesis discussion, though the works of Heidegger will not be used. The thesis displays a certain gratitude to hermeneutics, but only in so far as Charles Taylor's work as a whole is situated in the broad study of human agency,

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language, community meaning and the notion that humans are self-understanding beings. Larger issues concerning what constitutes a hermeneutical science and the extended effort to analyze meaning and text such as in some of the works of Paul Ricoeur, do not concern the thesis and are not discussed. While a few sections of the thesis treat the ideas of John Thompson in *Ideology and Modern Culture* (1991), the thesis discussion makes no effort to apply his methodological ideas.[62]

The point of departure for this study is the abstractions of the naturalistic stance, their particular tendency towards procedural reason together with the ontology of an inanimate universe, and the resulting scepticism towards judgements of worth or significance. This is pure Taylor, but is also part of a diverse literature that deals with the philosophical abstractions created in the sixteenth century Western scientific revolution. These abstractions arguably colour a whole gamut of conceptions concerning what technology is about, as well as what sense can be made of our decisions regarding its development and use. However, Taylor has little to say about technology as such. In this sense then the thesis discussion is an extension of some of his ideas. However, the thesis argument is not against the explanatory power of the natural and social sciences, nor the way in which technology extends or amplifies human powers. As Taylor notes in his, *Sources of the Self; The Making of the Modern Identity* (1989), there is no ignoring or getting around the ideas that partly characterize an entire intellectual tradition.[63] We need to come to terms with them, understand their limits and influences, and find ways to enlarge the circle of ideas we use from their given centres of thought.

Much of the thesis discussion turns on a broad notion of evolution. This, however, is not the theory of natural selection and the mutation of genes according to the ideas of modern molecular biology. The authors discussed in this thesis acknowledge the credibility of accounts based on modern biology. They also turn to broader conceptions of evolution emerging from complexity and co-evolution. Erich Jantsch's work, *The Self-Organizing Universe* (1980), is the more heavily indebted to the theory of evolution, but he uses it to generate a distinct conception of co-evolution.[64] Edgar Morin and Anne Brigitte Kern in *Homeland Earth* (1999), also premise their thinking on established principles of evolution.[65] They then rework some of these principles according to insights derived from a critical understanding of complexity. Theirs is largely an explorative effort from which the thesis discussion attempts to develop some additional insights regarding practical reason, notably those that accompany a world-embracing view centred on humanity's oneness and wholeness. There are, no doubt, numerous schools of thought that could not accept the premises contained of either of these works. The thesis narrative does not engage in the specific objections possible here, but simply works from the idea that given these ideas, how can they help to explore the question: What are some of the patterns of practical reason and consultation that can help make sense of decisions about technology that face humankind in a complex planetary age?

Prigogone and Stengers in their work *Order out of Chaos: Man's New Dialogue with Nature* (1984), provide a scientifically inspired account of changes in conception of scientific explanation offered by relatively recent research in the natural sciences.[66] The thesis discussion will use their ideas to help trace out and bring together different perspectives on practical reason. Similarly, the notion of levels of reality as marked out by Basarab Nicolescu in his *Manifesto of Transdisciplinarity* (2002) and the ideas of Ervin Laszlo in *The Multi-cultural Planet* (1993) regarding the manner in which values operate at the highest level of realty in a systems view of culture, also play key roles in the development of the thesis argument.[67]

It is useful to note the distinctions made by Alan Drengson in his Four Philosophies of Technology (2010), namely, technological anarchy, technophilia, technophobia and appropriate technology.[68] He sees these in part as four stages in the development of a more mature philosophising about technology. Briefly, and oversimplifying, technological anarchy deals with the creation of a diverse

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and uncoordinated set of technologies seen as tools for some end. Technophilia is the pursuit of technology as if it was an end or good in and of itself. Drengson likens it to a form of adolescent infatuation. Technophobia comes with the recognition that technology is something of a false promise, and that only humans and human values can curb the use of technology out of control. Drengson likens it to the disenchantment of early adulthood. Its chief focus concerns the relation between technology and the self. Appropriate technology, not to be confused with intermediate technology, aims to work towards a mature reciprocal relationship between technology, person, and world. It asks that we reflect on our ends and values before committing or recommitting to any technology, the aim being to foster human development. Drengson also reasserts Heidegger's view that a confused metaphysics will produce a confused conception of technology, one that cannot give proper sense to one's being in the world, and which would otherwise pass over a certain recognition of who, what and why we are.[69]

Given this four-level distinction, the thesis discussion in general works at the level of appropriate technology. However, in an attempt to reflect over patterns of practical reason and consultation, there may be strands in the thesis argument that examine aspects of technology from each of these levels. In addition, however, the thesis argument could well point to a fifth level. More specifically, in a co-evolving world it is no longer sufficient to reflect on our ends and values before committing to a technology, the aim being to help foster human development. Needed as well is a searching inquiry into those ends and values in light of the requirements of a planetary age which have "compelled the peoples of the world to begin seeing themselves as the members of a single human race, and the earth as that race's common homeland".[70] Values, ends, and conceptions of human development, to use Drengson's phrasing, need to be recast in light of the principle of the oneness and wholeness of the entire human race. To do so would serve to rethink, or perhaps relocate, what makes up a mature reciprocal relationship between technology, person, and world, now conceived at a planetary level of significance, or what Morin and Kern call the concrete universal.[71] The thesis argument will suggest that this is not a matter of extending the notion of appropriate technology, but forms a different kind or level of significance. If so, then it is one from which our understanding of the problems and possibilities of the age can take on a different sense.

Finally, as noted in the closing paragraph to the sub-section, Some comments on method, a key thread in the thesis argument is to link Taylor's ideas of human agency and self-understanding with analogous notions from complexity and co-evolution. The main contribution the thesis arguably makes is towards expanding our conception of the links that obtain between these seemingly disparate fields of thought.

Clarifying notes

Before bringing this Introduction to a close it is useful to highlight a few specific ideas that tend to repeatedly appear in the narrative. First, from the point of view argued in this thesis, attitudes that are constructive or outward looking have become central to the aspirations of the age in which we live. These attitudes are especially crucial where contemporary societal life tends to foster divisions between people based on the belief that conflict and struggle are the chief movers of history, even as the expression of human nature is taken to be inherently self-seeking or aggressive.[72] In support of the former idea, Morin and Kern argue that in a planetary era a spirit of associative wholes needs to replace struggle as the main driver of history, or what they call the "transformative potential of time".[73] This latter idea in particular appears repeatedly in thesis argument.

Another important idea appearing in the thesis discussion is that Western intellectual culture tends to paint a truncated picture of relation between our capacity to know and to judge. Jacob Bronowski highlights this via the distinction he makes between two attitudes towards knowledge: an

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aristocracy of the intellect and a democracy of the intellect.[74] The former tends towards a dogmatic position as to what is true and false. The latter recognises that all knowledge is imperfect and that without a deeper-current sense of the complementarity between human values and the sciences, then both will fall into confusion.

Putting this in personal terms, autocratic intellects, besides desiring to know with certainty, likely tend towards making assertions of fact and conception in such a way as to constitute the universe of discourse. This attitude can at times spill over into the domain of specific judgements of worth, as shown by, say, the intent to include or exclude specific positions without having to or wanting to investigate the truth. In general one might say an aristocracy of intellect begins when conviction towards a position tends one to believe it is the only acceptable stance to take, and hence that all other positions are rivals. Full aristocracy would then be a desire to counter or otherwise thwart every differing stance, conceived as a rival.

In a similar vein, W. C. Hatcher in *The Unity of Science and Religion* (1980) holds that with an overdrawn commitment to knowledge as mastery, manipulation, leverage or control can be associated a sense of omnipotence, and an inordinate pride in one's powers.[75] With this comes a tendency towards a certain blindness or insensitivity to the consequences one's decisions might have on people's lives. In its more extreme from it can permit harm or cruelty to be done to masses of people or extended damage to the natural world, at times perpetuated in the name of what is taken to be some greater good. Hatcher writes:

> In such a case people have a sense of being in control when, in reality, their control is very limited and relative. This is the situation which largely characterizes modern Western technological society. Western man has given in almost totally to the scientific urge, the urge to dominate, manipulate, control, and direct. Because he has lost his humility before his ignorance, he has gradually overproduced, overdirected, and overcontrolled. The results of this immoderation are to be seen everywhere. It has led to pollution and destruction of the natural cycle, as we begin to discover, perhaps too late, just how much damage we may have unwittingly done. It has led to manipulation of the public through mass media. It has produced engines of war of unimaginable destructive power.[76]

As already suggested in this Introduction, the thesis narrative will argue that one contributing aspect to a somewhat ragged dance between knowing and judging is a tendency to conceive of practical reason in terms indebted to the assumptions of the naturalistic standpoint, followed by a sometimes unwarranted scepticism concerning practical judgements of worth. So far as the thesis discussion is concerned, the attitude of doubt towards practical reason that emerges here, as well as the assumptions that support such attitudes, have tended to influence thinking on a scale well beyond the confines of what Laszlo calls the West's rationalist and pragmatic culture.[77]

However, a clarification is also in order. The thesis argument supports the idea that an unchecked desire to manipulate or control, an aristocratic use of intellect or a rampant technoscientific mindset may be harmful overall, in the sense that they may further compound the harrowing choices that confront mankind in a planetary age. Yet this need not imply that science and technology are suspect as such. For example, the thesis discussion will argue that the imaginative and inventive thinking they call for is one expression of the human spirit. Similarly, the tools, processes and engineering works we have created have added much to our human well-being. In like manner, the world view of science is part of a rich tradition of thought, and is a source of creative insight into an understanding of our world and ourselves.

The unity of thought in evidence here also speaks to the aims of thesis argument as a whole, namely, that our patterns of practical reason and consultation can aid in making sense of the kinds of decisions that confront humanity in a planetary age, including those that concern the decisions

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we face regarding the development and use of technology. Accordingly, the main point of departure for this thesis is that it is not possible to answer these questions adequately, or to otherwise judge aright the development and use of technology, in isolation from the requirements of an age that has "compelled the peoples of the world to begin seeing themselves as the members of a single human race, and the earth as that race's common homeland".[78]

Overview of chapters

Chapter One: Rational argument, explanation and the naturalistic standpoint. The first two chapters attempt to explore the question: In what sense do background notions in explanation and understanding serve to cast doubt on the validity of practical moral argument? In order to do this Chapter One discusses a broad set of ideas concerning rational argument, explanation and the naturalistic stance. More specifically, it covers five key ideas from the naturalistic stance: the epistemic imperative, the full scientific mentality, the machine-like view of the world, intersubjective reason, and methodological integrity. Each of these ideas is the focus of one of the chapter's main parts. In a supporting role, but no less important, emphasis is also given to the way foundational reasoning, and the primacy of the epistemological help form a basis for such explanatory accounts. In concert these ideas arguably contribute to a general climate of Western thought that support some widely influential notions of rationality and rational choice, and which lead to generally sceptical notions of practical reason. These in turn arguably influence thinking about the development and use of technology.

Chapter Two: Qualitative reasoning, understanding, and the human sciences. Chapter Two continues the discussion from the first chapter, and looks at some specific aspects of the qualitative social sciences that aim at understanding. Its aim is to highlight a selected set of background ideas concerning understanding so far as it contrasts with explanation. These in turn will lead to a more clear position on what it is to reason practically. There are in fact many forms of reasoning in the qualitative social sciences that aim at understanding, and the term is used in a host of contexts. The scope of treatment here is highly focused, looking in particular at the ideas of Lincoln and Guba in their text *Naturalistic Inquiry* (1985), who adopt an axiomatic approach to the social sciences that aim at understanding, the starting point to which is that the social world consists of multiple constructed realities.[79] Also discussed are a few ideas regarding the nature of understanding that can apply to notions of practical reasoning that will be taken up and developed in a more critical sense as the work of the thesis continues.[80] The discussion here therefore proceeds by looking at a few representative views of what is an unusually wide field of study.

At the same time the chapter discussion will highlight how both explanation and understanding adopt a variety of abstractions in the naturalistic stance – such as foundational reason and the primacy of the epistemological – that lead both to adopt similarly sceptical attitudes towards practical reason. In doing so it will also consider some introductory ideas from Charles Taylor regarding a conception of practical reason that steers away from such an attitude of doubt.

The chapter discussion proceeds along three main ideas. First, the nature of understanding and some evaluative issues that are reflected in patterns of reason that are used in the social sciences. Second, an axiomatic approach to the qualitative social sciences as is found in the ideas of Lincoln and Guba. Third, a brief summary of some naturalistic assumptions, ideas regarding what the thesis discussion calls substantive reason and a few brief comments on technology

Throughout the first two chapters some introductory comments will be made about the connection of ideas to the development and use of technology. However, questions about technology and technology values in a planetary age will only be treated in greater depth in Chapters Five and Six.

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Chapter Three: Human agency, complexity and co-evolution. Given the kinds of distinctions set out in Chapters One and Two, the discussion in Chapter Three will attempt to lay the groundwork for a set of ideas that i) aims to rework some central notions in both explanation and understanding so as to avoid the kinds of naturalistic reductions that arise in each, and ii) attempts to set out some conditions under which scepticism about practical reasoning is unfounded, or better, is a non-issue. There is a close relation between these two points, the most obvious being the naturalistic bias towards a neutral universe that makes no claim on people as ethical creatures. Either ethical argument cannot get off the ground because there is no external platform on which to base criteria for ethical judgements, or is to take place only from within a thoroughgoing relative point of view based on the idea that humans as subjects are the locus of values – the basic starting point to the idea that the world consists of multiple constructed realities, a topic treated in Chapter Two. The thesis will argue in later chapters that points i) and ii) can be used to formulate a conceptually enriched approach to evaluative questions, and that these can in turn help think through some key approaches in making decisions about the development and use of technology in a global context. The discussion overall is intended to help think about the gap between knowledge on the one hand, and judgements of worth or value on the other.

In particular, the chapter discussion in the main treats the works of Charles Taylor, Ilya Prigogine, Edgar Morin, Ervin Laszlo, Basarab Nicolescu and Erich Jantsch. The chapter is divided into three parts. The first looks broadly at the ideas of Charles Taylor regarding a different conception of explanation and its links to practical reason. The second part discusses a range of ideas related to systems thinking, irreversible processes and co-evolution, with particular focus on the ideas of Prigogine and Stengers, and Jantsch. The third main part presents ideas concerning complex wholes, levels of reality and a systems view of man as are found in some of the works of Morin and Kern, Nicolescu, and Laszlo.

However, the chapter is not a summary of the work of these authors. Specific ideas are explored so as to help lay additional groundwork for a treatment of practical reason first, and then how this connects to questions about the development and use of technology. The point is to begin building up a set of ideas that can move away from the epistemological assumptions of the naturalistic stance and the ontological abstractions that are usually associated with explanation, as treated in Chapter One, while avoiding the kind of subjective view, bound to a thoroughgoing, axiomatic relativism, that seems to follow from ideas such as Lincoln and Guba's as treated in Chapter Two.

Chapter Four: Qualitative contrasts, strong evaluation and reasoning about transitions. The work of Chapter Four picks up on the broader discussion started in the first half of Chapter Three, and seeks to present a set of ideas, limited in range, about practical reflection that can link to questions concerning the development and use of technology in a planetary age. The chapter discussion will focus on the works of Charles Taylor. Some ideas from John Thompson will play a supporting role. However, the chapter argument will not treat specific questions regarding patterns of reason used in decisions about technology. These are left for discussions later in Chapters Five and Six.

A number of ideas will be discussed in Chapter Four, each of which is the central focus of one of its five main parts. These are, namely, i) significance, ii) the expressive use of language, ii) interpretative reason, iii) reason, self-interpretation and understanding, iv) qualitative contrasts and strong evaluation, and v) the *ad hominem* form of practical reason.

In addition, some ideas from the previous chapter will be brought back into focus, namely, substantive judgements and humans as self-interpreting persons. In order to contrast *ad hominem* arguments with what Taylor calls apodictic arguments, the latter being based on some of the central abstractions of the naturalistic stance, mention will also be made of selected topics discussed in

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Chapter One – representation, the designative use of language, procedural judgements, the self-defining subject, and foundational reasoning. An important point in exploring these various topics is to review and comment on Taylor's notion of practical argument which he presents most succinctly in his work Explanation and Practical Reason (1995).[81]

Overall, the chapter discussion will try to map out some basic distinctions at work in practical reason which move away from those naturalistic abstractions that either regard intersubjective accounts as the basis for objective argumentation, or view the procedures involved in understanding as issuing from the accounts of subjects. Both support a sceptical stance towards practical reason, and hence, by implication, tend to colour thinking about the development and use of technology, notably in the way knowledge and judgements of worth appear to relate as if they were strangers.

Chapter Five: Complexity, co-evolution and technology values. The ideas discussed in Chapter Five explore an analogous set of questions about explanation, understanding, and practical reason that were posed in the previous chapter, but will now use a relatively broad set of notions coming out of particular developments within the contemporary natural sciences, focusing in particular on the themes of complexity, co-evolution and technology values. The chapter argument will try to build on the preliminary ideas discussed in the second half of Chapter Three by looking at some selected implications for reasoning in general, and practical reasoning in particular, that lie outside the circle of concepts typically involved in the naturalistic stance. Ideas coming out of complexity and co-evolution make up the centrepiece for discussion. The intent here is to develop preliminary notions based on a few texts that might serve to characterize evolving technology values. Questions regarding technology will be discussed again in Chapter Six.

The ideas to be presented in Chapter Five are not designed as a study of complexity or co-evolution as such. Instead, a set of broader based texts are used to help work out a group of ideas that are relevant to the thesis plan. Ideas from Prigogine and Stengers, Laszlo, Nicolescu, Jantsch and Morin and Kern, as first discussed in Chapter Three, are the inspiration for the chapter discussion. However, ideas from Jantsch and Morin and Kern, and an extension of their ideas in line with the goals of the thesis argument, form the backbone of the chapter narrative.

In this respect the ideas treated in the chapter will help to link notions of substantive reason with ideas about the organic character of complex organization and conceptions of socio-cultural co-evolution, ideas taken from Taylor, and Morin and Kern respectively. Said simply, practical reason in dealing with technology values will be done from a broad social perspective, but in doing so one is not necessarily bound to a sceptical stance towards judgements of worth. In this chapter questions of social justice, human obligations (be they personal, communal or institutional), as well as various distinctions as to worth or significance are worked out from within an organic and evolving dynamic of interdependent peoples and nations. Arguably, taking on such a stance can lead to gains in knowledge and judgements of merit concerning questions of worth or significance in the choices we make regarding the development and use of technology in a planetary age.

Some of the ideas treated in this chapter discussion concern socio-cultural evolution and the notion of man as a self-reflexive creature, ethical choices in an evolutionary context, complex organization and the parts-whole relation in general. These are then linked to questions about the dynamics of technology in a complex, global world and what Morin and Kern refer to as Earth-centred goals.[82] The chapter discussion will also examine the relation of these ideas to the broadly economic incentives and aspirations for material well-being that appear to drive much development thinking and technology choices. In this regard Morin writes of a tight economic matrix within which development decisions are made and which tends to view material prosperity as the main fulcrum to advance social well-being. The thesis will argue, however, that to the extent that the desire for

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material prosperity comes to occupy centre stage in thinking about people's aspirations in a given society will that society fail over time to meet even the material goals it has set itself to achieve.

Chapter Six: Practical reason and technology in a planetary age. The discussion in Chapter Six will focus on exploring some basic aspects to a planetary dynamic. The main assumption here is that such a planetary dynamic can serve as a proper context for making sense of technology choices, and with it patterns of practical reason and forms of unity-based consultation about such choices. The chapter discussion in general will lead to ideas about reforms in thinking and the accompanying requirements for learning in a planetary age that can help to suggest pathways for change in existing technology aspirations. In this thesis such reforms in thinking will be linked to a conception of the human person that concerns the unfolding of our social, cultural, ethical and spiritual potential. Combined with this, the chapter discussion will also explore the way consultation is part and parcel of practical reason in a global age, together with its many implications for planning as a future-regarding activity and the making of institutional decisions concerning the development and use of technology.

More particularly the discussion will consider some broad issues around global choices and human action, a classical conception of technology, alternative notions of what technology is about, and related patterns of consultation and practical reason. It will also consider a range of issues around technology and development thinking, including a number of goals that are in line with the requirements of a planetary age. The chapter will close with a discussion of consultation and future-regarding decisions as part of the work of practical reason.

On the whole the discussion in Chapter Six is situated in a global context made up of interdependent peoples and nations, and the kinds of transformations that are called for in learning to recognize and value common human meanings in a planetary age.

Chapter Seven: Findings and conclusion. Chapter Seven reviews the work of the thesis and in so doing highlights a number of findings and conclusions as they relate to its three main research questions. The chapter is divided into four main themes, namely, our planetary age in relation to complexity and co-evolution, self-understanding and practical reason, the development and use of technology in a planetary age, and suggested recommendations for further study.

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Chapter One: Rational argument, explanation and the naturalistic standpoint

Introduction

In what sense do background notions in explanation and understanding serve to cast doubt on the validity of practical moral argument? This is the question that the discussion in Chapters One and Two in this thesis will attempt to explore. As noted in the thesis Introduction, in order to speak of broader ideas regarding the advance or decline in human social well-being, and specifically in questions about the development and use of technology in a planetary age, the generally sceptical attitude in Western thought towards the human capacity to judge practical matters of worth or significance needs to be explored.

According to Charles Taylor, modern scientific thought offers a particularly influential model of reason.[83] In the West's intellectual culture, secure and reliable knowledge is typically epitomised by the kinds of procedural thinking used in the modern sciences. Such procedural patterns of thinking have become part and parcel of ideas regarding the nature of reason *per se*. Here the undoubted success of the scientific enterprise and science-based technology has helped cement such patterns as a first choice for maintaining integrity in reasoning in its various forms. These patterns have in turn influenced fields of knowledge that extend well beyond empirical science proper.

However, within that same intellectual tradition practical argument tends to be viewed with suspicion, at least in so far as it concerns reasoning about what actions to take or pursue, and which deal with matters of worth or significance. Here the modern standpoint tends to regard moral grounds as a set of beliefs that cannot be secured by reason. As Taylor has observed, such doubt in Western rationalist-empiricist culture has become the intellectually acceptable position to take.[84] From this point of view, as Taylor argues, the moral sphere being what it is, no good arguments are to be found there.[85] In this regard he writes of "the widespread belief that moral positions can't be argued, that moral differences can't be arbitrated by reason, that when it comes to moral values, we al1 just ultimately have to plump for the ones which feel/seem best to us."[86]

According to Taylor, such a sceptical view is based in part on a set of ideas concerning what constitutes a procedural model of rationality, and which is part and parcel of what he calls the naturalist reduction.[87] He argues that Western intellectual culture has come to adopt a model of reason that requires external criteria be set down as the basis for judging the validity of rational debate.[88] Given that matters of value cannot measure up to these criteria, then this preferred model of reason tends to cast a general shadow of doubt on practical forms of argument, and this most clearly so when it is used in the attempt to argue for the worth or significance of human actions and their accompanying motives.

Added to this, scepticism towards moral argument is also widespread thanks to what Taylor describes as the "actual experience of moral diversity".[89] In other words, as he notes, a general relativity of moral views is widely regarded as the intellectually acceptable position to take.[90] Both add weight to the belief that moral positions as a whole are suspect and so cannot be rationally argued for – a conclusion that is bolstered by the position of the naturalistic stance in Western intellectual culture. This is also where notions regarding both explanation and understanding are brought to the fore in the thesis discussion, and particularly so since both notions are deeply influenced by this stance.

The view that notions of both explanation and understanding are deeply influenced by the naturalistic standpoint yet at the same time partly comprise it is a central working idea in the thesis

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discussion in both Chapters One and Two. On the one hand, some of the main aspects of the naturalistic standpoint can be traced out in assumptions taken on by both the modern physical and life sciences as well as the quantitative and qualitative social sciences. These assumptions concern what the world is like, what it is to know and reason about it, or what can be said about it. At the same time, and on the other hand, the modern sciences and how they are conducted evolved from within the sweep of ideas making up the naturalistic standpoint. There is a close mutual relation at work between them. To talk of the one is to refer to the other in ways which can help highlight some important aspect within each. The discussion in the first two chapters in this thesis reflects this relation of ideas, one that will be picked up repeatedly as the thesis argument develops.

The discussion in thesis Chapter One therefore aims to do three things. First, it attempts to delineate a restricted set of ideas in the natural and social sciences regarding explanation and understanding respectively. Second, it attempts to point out how such notions of explanation and understanding, far from being set off one against the other in the debate on the scientific status of social research, in fact harbour common ontological and epistemological assumptions that originate from within the naturalistic stance. Third, it helps set the stage for discussions in later thesis chapters concerning how these same assumptions in Western intellectual culture have i) tended people to view the procedural model of reason adopted by modern science as constituting reason *per se*, and ii) established criteria for certainty in argument that cannot be met when it comes to reasoning about matters of worth or significance.

The general point of view behind the discussion in Chapter One is that there is a tendency to apply naturalistic abstractions to a range of experiences for which they are not entirely suited. Such is the case when it comes to human motivation or intents, and hence judging the worth or significance of our actions. If so, then the ontological abstractions in the naturalistic stance, together with the procedural approach to knowledge it presupposes, would tend one to misconstrue questions about that which is worthy of our human intents and actions, at least in some respects. In other words, naturalistic abstractions will not always hit the mark in the attempt to answer questions about what kind of a thing is a practical moral argument. As a result, one may be able to work out an expanded notion of what it is to formulate a rational account of human motivation, one that can arguably sidestep some of the sceptical readings of practical reason that accompany the naturalistic stance.

This being the case, the discussion in Chapter One will focus on the notion of explanation. It will do so by considering five main characteristics of the naturalistic standpoint, each of which will be discussed in a separate main part, as follows: Part A) The epistemic imperative, Part B) Full scientific mentality, Part C) The machine-like image of the world, Part D) Intersubjective reason, and Part E) Methodological integrity. Part E also includes a brief discussion of technology dealing in part with links between tools and action, between evolution and performance for survival, and on how technology can be viewed as involving the amplification or the extension of human powers. The final Part F offers a brief chapter summary.

The discussion in Chapter One will also emphasize Taylor's notion of foundational reason and the primacy of the epistemological. These two characteristics in particular contribute to a climate of Western thought and its analytical/empirical culture that adopt widely influential notions of rationality or rational choice, which take on a certain ontological view of the universe, and which, by implication, adopt generally sceptical ideas towards practical argument.

Finally, it is worth noting that explanation is a general term that can be used in a variety of ways. In an attempt to distinguish its meaning in the discussion to come, additional descriptive terms such as instrumental, mechanical or procedural will sometimes be used depending on the context.

A few background ideas need to be highlighted as a lead-in to the five main Parts in Chapter One.

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Explanation in science

Alfred North Whitehead makes the point that those who do science tend not to be particularly bothered by purely rational criticisms or philosophical scruples. The ideas of science work, and little else than this needs to be asked of them.[91] In this respect the modern scientific enterprise typically ignores the criticism of its abstractions which others might attempt to revise. And if the enterprise does hesitate, if one of its ideas, observations or techniques is proven faulty, the next generation of researchers picks up on some unsolved problem of the day and moves the search for knowledge forward. There is in this approach then something uncommonly interesting about the discoveries scientists make, and which lends credence to the belief that their work constitutes an actual advance in our knowledge of the world in which we live.

There is also a certain degree of confidence in the scientific enterprise itself that comes with these successes. In its most strident form, the assertion is that the results of science can provide complete explanatory accounts of nature, at least in principle and if given enough time.[92] And in cases where the natural sciences cannot give complete accounts, then they at least provide the best explanations available such that it is "foolish to ignore what science says on any topic."[93] Such positions have tended to become part of an overall view of the status of both the natural and empirical social sciences. More importantly for this discussion, the patterns of reason used in the enterprise are regarded as the first choice for intellectual integrity, not only in science proper, but also in the broader intellectual culture. In other words, the intellect of man has discovered a rational method for investigating all aspects of the observable world. It is here then the abstractions of science that work so well for the study of a restricted set of physical phenomena, and which have come to set the benchmark for intellectual integrity, are also adopted and applied to the study of a much broader range of phenomena. The social sciences are an obvious case in point, such as psychology, sociology and anthropology, but areas such management sciences, economics, and geography also come to mind. However, the reservation I want to highlight here is not about the intellectual integrity which science guards, but the tendency to conceive of what knowledge is based on the results of reasoning via one form or pattern.

Nevertheless, scientists are rightly committed to seeking true statements about the observable order in nature, be it physical, biological, human, or social. Included here is the technology and intellectual know-how which accompanies the growth of science as part of the development of contemporary societies. These together form part of the West's analytical/empirical culture. As such they tend to colour a range of notions not only of explanation, rational choice, and intelligent human action, but also about the nature of the human subject. Included here as well are some defining characteristics of our natural and social worlds, what it is to know ourselves and what it is to judge our actions in relation to those worlds. I take this constellation of ideas regarding the nature of the world, how we come to know it and what our actions entail, to be part of what Charles Taylor refers to as the naturalist reduction.[94] It is a set of conceptions about the world that is partly characteristic of a broader intellectual culture. So far as the chapter discussion is concerned, its main importance is in the way it is adopted as the preferred pattern of thought in order to investigate the world around us, and to make sense of what our sciences say to us. In this regard the naturalistic standpoint goes hand in hand with a scientific mindset.

An upbeat account of the scientific mindset is noted in the following passage from Howard Kahane:

> Although no information system is absolutely reliable and no theory exempt from at least a small measure of doubt, the most reliable and accurate information comes from the well established sciences of physics, chemistry, biology, and – to a lesser extent – from psychology, the social sciences, and the applied sciences such as engineering. The scientific enterprise is an organized, ongoing, world-wide activity that builds and corrects from generation to generation. The method of science is just the

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> rigorous, systematic and dogged application of cogent inductive reasoning (mixed with all sorts of deductive – in particular mathematical – reasoning) from what has been observed over many centuries to theories about how the universe as a whole has and is likely to function. Theories falsified by experience are tossed out, no matter how comforting and no matter whose pet ideas happen to get stepped on. Absolutely no one, starting from scratch, could hope to obtain in one lifetime anything remotely resembling the sophisticated and accurate conclusions derived over time through any of the sciences, even if that person were a Galileo, Newton, and Einstein all rolled into one. It is the height of folly to believe what is clearly contradicted by well-established scientific theory in the physical or biological sciences, and foolish to ignore what science says on any topic.[95]

These sentiments show a high level commitment to science's pursuit of truth, such as in the belief that its method delivers "sophisticated and accurate conclusions" that are far beyond the ability of any one man or generation to produce. Obviously, Kahane's assertions of folly and foolishness in the last sentence of the passage can only be reasonably made by someone who has a strong sense of confidence in the kinds of explanations modern scientific methods provide.

Even if Kahane's comments are overstated in places, there is no need to doubt the success of the modern empirical sciences. However, the problem I want to note here is that scientific rationality has come to stand for rationality in general, and where what might be called instrumental thought, joined to modern science and technology, is called upon to do duty across a range of experience for which it may not be particularly well suited.[96] Still, the naturalistic standpoint tends to hold a kind of independent appeal in Western ideas. The point of argument here then is not to reject naturalist abstractions. It also does not aim to undermine the kind of procedural reasoning used in the modern sciences, nor does it set out to question the gains in knowledge and know-how that modern science and technology provides. The point rather is to emphasize that such success is based on a particular set of abstractions that work well in specific domains of experience, but which are also applied in other domains to which they are less appropriate. In other words, our use of abstractions can assume too much regarding the nature of the human subject, what makes up the world and how we come to know it, and the kinds of judgements that can be made regarding our actions within it.

A related notion here is what Whitehead refers to as "the fallacy of misplaced concreteness", namely, the tendency of the intellect to mistake the abstract for the concrete.[97] Following Whitehead, the fallacy can be further described as the tendency to forget that the theories and concepts of science regarding the universe in which we live are "framed in terms of high abstractions".[98] To do so is thereby to lose sight of the bounded set of observations that gave rise to them, to assume that the theories based on them describe actual, concrete reality, to presume they extend to phenomena that may not in fact suit them, and so make possibly faulty inferences about the functioning of these kinds of phenomena and the workings of their antecedents.[99]

One possible argument in positions such as Kahane's is that the human intellect has found a way of asking empirical questions about observable phenomena, the response to which gives intelligible answers. Intelligible here means something like offering up testable, explicit, public answers that explain how the universe "has and is likely to function".[100] Even if certain limits do exist in our ability to explain things in terms of these abstractions, then i) useful knowledge will still result from their application to the study of any specific phenomena and ii) such limits may be temporary, meaning that if given enough time then advances in theory and the development of more sophisticated techniques of observation might overcome them. No doubt some of the founding abstractions of classical science born of the 17th century European revolution in natural philosophy have outlived their time. Yet the explanations offered by the modern, classical natural sciences and mainstream social research remain a successful and influential pattern for human thought in general. Furthermore, there are good reasons why scientists are among the intellectual leaders of Western culture. The goal of science is the pursuit of testable, correctable truths about the physical,

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biological, human, social and technology worlds. Being part and parcel of the naturalistic stance, the objective posture illustrated by science's dialogue with nature, together with the methodological path it has set for itself, have come to be incorporated into broader conceptions of rationality, or of a rational enterprise. Such conceptions in turn have largely come to constitute what it is to formulate an explanation of things, or at least the best explanations available at any one time.

From this classical standpoint then, the goal of science is to explain what can be observed. In a more subtle formulation of this idea, Neils Bohr is reported to have said that "the task of physics is not to find out how nature is", but that it "concerns what we can say about nature".[101] The laws that scientists seek in order to give a successful explanation of observed phenomena are formulated in such a way as to give a nomological account of what has been observed, so as to be able to predict what will next be seen.[102] In other words, from this point of view the laws of science set out clear and distinct concepts, and precise rules of calculation that can be used to explain in detail the underlying workings of phenomena. To do so is to offer an account of the way they actually function. In many cases these explanations centre on an attempt to offer accounts of the antecedents of what was or will be observed. In the naturalistic stance these antecedents are classically mechanistic in their conception. Famously, the Newtonian image of the universe as an exquisite clockwork-like mechanism made up of vibrations and oscillations, inspired early conceptions of the scientific method and the view of nature that accompanied it.[103] The image in one form or another has prevailed in Western intellectual culture for 350 years, thanks in part to the demonstrated capacity of science to do what it says it could do, that is, explain and predict in exquisite detail the functioning of observable phenomena. While more recent developments in twentieth century physics have shown distinct limitations to the clockwork-like image of a natural order, the notion of providing a predictive, procedural explanatory account based on laws or correlations arguably remains the central task for a vast range of contemporary sciences.

Having just mentioned the Newtonian world view of science, it is worth noting that Einstein's universal speed of light and Plank's constant are non-Newtonian in conception – though they are still part of a theory that offers a time-reversible account of phenomena based on some kind of underlying mechanism.[104] This is because there are no universal constants in Newtonian science, whereas the existence of a universal constant is the starting point for both Einstein's theory of relativity and Quantum Mechanics. Said differently, according to Prigogine and Stengers, the existence of universal constants refers to some limitation or impossibility in the classical formulation of physics. In this regard, Prigogine and Stengers note that: "The ambition of Newtonian science was to present a vision of nature that would be universal, deterministic and objective".[105] In Newtonian physics scientists choose a set of primary concepts and definitions in terms of which all other concepts and definitions are ultimately specified. Again in the words of Prigogine and Stengers, this is the reason "why [Classical physics] can be applied in the same way whatever the scale of objects: the motion of atoms planets and stars are govern by a single law".[106]

Famously so, Newtonian science makes no assumption about an individual observer. This is one meaning of objective, that is to say, the world as it is without reference to an actual observer.[107] However, in the case of Einstein's Theory of Relativity and Quantum Mechanics, observations and theoretical accounts are carried out in relation to a universal constant.[108] Said differently, they are not universal in the sense that they do not apply equally across all events or phenomena. More particularly, in the case of Relativity the universe cannot be contemplated from the outside. First, there is no such thing as two distant events occurring simultaneously, and second, there is no one preferred frame of reference.[109] In other words, there must be an observer, and he cannot be in two places at the same time.[110] Simultaneity and frames of reference are relative to the constant speed of light. However, what is not relative in Relativity are the laws of nature as such. The laws of nature are not subjective. They just have to be formulated from within nature.[111]

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Part of the strength of this kind of scientific explanation, at least of the natural world, is that it takes what was formerly a host of diverse and seemingly unrelated observations regarding objects of study and simplifies them as instances of relatively simple rules – a simplification which then allows scientists to conduct reasoning via the abstract principles they embody. The conclusions that are deduced in the abstract also apply to an entire range of particular cases. This is one reason why Whitehead thinks mathematical physics works so splendidly as the model for explanation in science.[112] It is a general scheme in the sense that the one set of explanatory rules can apply across a fantastic variety of phenomena. And, since the rules do in fact apply, in other words, since what theory says should happen corresponds to what is (or was) observed, then it is reasonable to think that the underlying or hidden workings of those phenomena are similar in some way.

One classical example of this is Newton's realization that the force which makes objects fall on Earth is the same force that keeps the moon in its orbit and the planets in their specific, predictable paths around the Sun. Newton's law of gravity unified what was till then unrelated accounts of the terrestrial and heavenly domains. This is part of the success of the seventeenth century scientific abstractions from which emerged the idea over time that the functioning of the universe could in principle be explained in terms of the clock-work like workings of matter and energy.[113] What unites all phenomena in this scheme of thought is that they are all instances of matter and energy in motion, vibration and oscillation. Once again, the idea of a clockwork universe, and hence a mechanistic one, comes from this notion that the universe in which we live is almost everywhere periodic in its movement. That is to say, things repeat themselves in regular patterns that speak in some way to a clockwork-like movement of their hidden components.

However, and crucially for this discussion, the law of gravity for example was shown to hold not by a "metaphysical analysis of the nature of things", but by careful systematic reasoning, calculation, and theorizing with the evidence of experiment and trained observation.[114] Of course, such systematic aspects in the doing of science are accompanied by creative insight, inspiration, fortuitous event, imaginative realization and the like. Obviously, these creative dimensions in science are not part of a formalized method. As method then, the doing of science bit by bit is an attempt to reconstruct in the mind of man the way the universe "has and is likely to function".[115] These ideas speak to a particularly deep-seated belief in science, namely, that rigorous, public, and clearly defined and testable procedures constitute the basis for rational explanation.[116]

With these ideas, a conceptual setting is in place for the five main Parts of the chapter discussion.

Part A: The Epistemic Imperative

The epistemic imperative, a phrase taken from Johann Mouton's *Understanding Social Research* (1996), refers to the notion that science and scientists are committed to the pursuit of truth – that the aim of science as a social enterprise, and that the goal of individual scientists who drive that enterprise through their research, is to formulate true, or truthful, statements about objects of study.[117] Alternatively, and using an idea from Neils Bohr, science asks the question: What can we say about the way nature functions?[118] This imperative applies to all fields of empirical science – physical, chemical, biological, human, social, technological – and arguably to each scientist or researcher who works in these fields. Mouton has this to say about the epistemic imperative:

> The search for truth is not just another option or matter of choice. Scientists who are engaged in scientific research are bound, as it were, in a 'moral contract' to commit themselves to the pursuit of truth. In fact, violation of this imperative implies total rejection or suspension of the notion of 'science'. This is another way of saying that the terms 'science' and 'truth' are intrinsically linked. We would argue that once we relinquish the ideal of truth we no longer have the right to claim that we are involved in the game of 'science'.[119]

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It is worth noting at the onset that the truths of science are not limited to specific experimental measurements and observations, or findings empirical patterns in data. The scientific pursuit of truth extends right up to its concepts, definitions, methods, techniques, procedures, models, laws, and theories. Furthermore, and as will be argued later, the epistemic imperative in science assumes that the observable universe will stand up and make itself known, as it were, to the probing questions of scientific method. In other words, operating in conjunction with the imperative is the belief that the human intellect has found a way of asking questions of nature that give intelligible answers – perhaps subtle or counterintuitive, but intelligible nevertheless. This in turn is made possible by virtue of the fact that nature or the natural order consists of phenomena that exist in some different sense from the mind that knows them.

The search for truth is not something scientists in the tradition of procedural explanation being outlined here alone commit themselves to – there are many species of inquiry, systematic and otherwise, that aim to formulate true statements about their objects of study. There are however arguments to the effect that of all the different ways of investigating reality, the most secure and reliable is found in the objective, explicit, public methods of modern scientific explanation. John Casti in *Searching for Certainty* (1991) has the following to say on this matter:

> [T]he point of the practice of science as science is to offer *convincing* explanations for these [worldly] events as well as to back up those explanations with accurate reliable predictions about what will be seen next. But what do we mean by a "scientific" explanation or prediction? Scientific explanation and prediction is explanation and prediction *by rule*, or, as it is sometimes put, *by law*.[120]

Having clarified this Casti goes on to state that:

> Basically, there are two properties tending to distinguish scientific rule-based schemes for prediction and explanation from their many competitors. The first is that scientific schemes are *explicit* i.e. the rules and the way they are to be applied are spelled out with sufficient clarity and in enough detail that they can be used by anyone. In short, it doesn't require any special insight or inspiration to make use of scientific rules or laws.[121]

Continuing, he notes that:

> The second distinguishing characteristic of scientific rules is that they are *public* ... science has no private truths ... This is the essential content of the testability of claims, one of the fundamental elements underpinning the ideology of science.[122]

Such ideas are one likely reason why Mouton can confidently assert that science and truth are linked in intrinsic ways, where without the ideal of truth there is no such thing as science. More particularly, the link has arguably become an intrinsic one within the broad character of the West's analytical/empirical culture, given that it has grown up over 350 years of organized, productive, and influential work in science.[123]

It is perhaps worth noting that Mouton, in voicing a key position in science with regard to the way scientists are bound to the pursuit of truth, puts the reference to a moral contract in inverted commas. The point here being that it is not an actual moral commitment that scientists make, only that the level of obligation in the one is akin to that which obtains in the other. In other words, although it has nothing to do with questions of morality *per se*, the particular form of commitment to the truth, or to truthfulness, that comes with the naturalistic stance charges the scientist with the same notion of urgency and sense of "inescapable commitment" as do people's deepest moral obligations.[124] It is the analogue in the pursuit of knowledge to attempts to come to terms with a judgement of the good. What is imperative then within our capacity for knowledge is not to misplace the intrinsic link between truth and science, or truthfulness and the procedural methods of

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science. The moral-like commitment of a scientist is that the status of this pursuit towards truth be preserved above all others. And how is this obligation actually carried out? Through a dogged commitment to the validity of one's research. In this way then, the imperative is held and defended by the practice of a scientific methodology.

From this point of view then, it makes good sense that the scientist's first call is to the validity of method. This commitment encapsulates a proud history of scientific research which has set itself the norm of objectivity, of an unbiased mind, and "the gradual removal of prejudices", as reportedly stated by Neils Bohr.[125] Jacob Bronowski speaks of it as a habit of truth.[126] From the naturalistic standpoint this implies that so far as the phenomena being observed are concerned, as researchers scientists are to be free of unwarranted values throughout the whole of their research, including the interpretation of its results. One point worth making here is that those researchers who commit themselves to the epistemic imperative also commit themselves to a set of values without which science could not proceed, such as its habit a truth.[127] Unwarranted values would thus be those which, if subscribed to, would threaten the epistemic imperative, and hence counter the procedures for valid research. It is also worth noting that so far as research is concerned, the naturalistic standpoint implies that what is being studied belongs to an observable universe that exists apart from the mind that thinks about it, is independent of human commitments, and hence silent with respect to human desires and hopes. It is part of being able to answer to the question: "What makes up the universe?" by asking: "How do phenomena function?". From this posture, things function the way they do no matter what humans want, regardless of their hopes or desires regarding them.

Being free of unwarranted values, or biases, is a different matter. It points to the state of mind of the researcher as one who is doing the observing. To design and conduct a study based on personal opinion or attitude would spell the end of empirical research, at least according the ontology of the natural sciences. The notion of value-free refers to an approach to research by scientists who, as subjects, is to be adopted so as to obtain the least possible error in research, hence to maximize validity. From this point of view, the idea of objective science tends to be used in an ambiguous sense. Either it can refer to the nature of the universe – that it consists of observable entities of a particular sort that function independently of human wants – or it can refer to the way scientists conduct research outside the sphere of personal whim or extra-scientific values.

Mouton does not speak of science or scientists as actually finding the truth, only that it is an ideal the absence of which would spell the end of science.[128] This is certainly true for the physical, and biological sciences, as well as for the engineering sciences and technology. But for him it applies equally well to the human and social sciences. In the case of social research Mouton holds that in practice, due to "various ontological and sociological constraints", social scientists can at best "only produce better or worse approximations of the truth".[129] In part this is due to the fact that it is difficult to get a hold on the multidimensional world of social life as an object of study. Still, the entire text from which the above excerpt is taken is devoted to communicating the procedures and practices of sound social science – the logic and design of research, the elimination of all bias and error, procedures for hypothesis testing, measurement and sampling, data collection, calculation and analysis. All in all, these are among the chief methods for "either minimising or eliminating all foreseeable threats to validity in the research process".[130]

Mouton goes on to note that the function of research design is in "maximizing validity", where this is based on a clear idea of what the criteria for validity are.[131] He adds that without such external criteria there is no way to know how to manage and remove those threats to validity that appear in various guises throughout the entire research process.[132] In such a view, only in this way can one judge how well a particular study approximates the truth, or compare one study with another. Practically speaking, if scientists cannot actually attain the truth, then valid research – an

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approximation that is in the power of the human intellect to obtain – is the next best target. Crucially, in order to maximize validity then mistakes in and hence threats to the reasoning/measuring process must be systematically eliminated so as to be reduced to a minimum.

Part B: Full Scientific Mentality

The second aspect of the naturalistic stance to be discussed in this chapter is what Whitehead calls the full scientific mentality.[133] As already noted, the epistemic imperative extends beyond the physical, biological and technical sciences into mainstream social research. Indeed, part of the debate over the scientific status of the social sciences is presumably due to the fact that mainstream research attempts to carry on with this broad tradition of explanation. However, the imperative to pursue the truth starts from a prior assumption that is adopted by empirical research. Alfred North Whitehead calls it an instinctive faith: that there is a rational order to things which the mind of man is able to discover in a conscious and systematic way, an order in the world which can be reconstructed by the human intellect via careful observation and well ordered thought. According to Whitehead:

> Faith in reason is the trust that the ultimate natures of things lie together in a harmony which excludes mere arbitrariness. It is the faith that at the base of things we shall not find mere arbitrary mystery. The faith in the order of nature which has made possible the growth of science is a particular example of a deeper faith. This faith cannot be justified by any inductive generalisation. It springs from direct inspection of the nature of things as disclosed in our own immediate present experience.[134]

Obviously, we can call it an intelligible order precisely because the human intellect has found a way to make logical sense of it.

Whatever else makes up this order of nature, we see its workings in the functioning of the physical universe, as well as in the behaviour or practices that make up our human and social worlds. Yet the truths that can be found in the order of nature are not immediately available to the human intellect. They are hidden in a profusion of details and a welter of events, possibly conflicting observations or measurements. In Whitehead's terms, each researcher who is dedicated to the methods of his or her particular specialist science carries a shared instinctive faith. Namely, the belief that this order, often hinted at by everyday experience, can be traced in detail in the phenomena that serve as the object of their study.

However, Whitehead goes on to note that, so far as everyday occurrences are concerned, while things do happen again and again, no two phenomena ever recur in exactly the same way.

> It is unnecessary to labour the point, that in broad outline certain general states of nature recur, and that our very natures have adapted themselves to such repetitions.
>
> But there is a complementary fact which is equally true and equally obvious:-nothing ever really recurs in exact detail. No two days are identical, no two winters. What has gone, has gone forever. Accordingly the practical philosophy of mankind has been to expect the broad recurrences, and to accept the details as emanating from the inscrutable womb of things beyond the ken of rationality. Men expected the sun to rise, but the wind bloweth where it listeth.[135]

According to Whitehead then, the fact that events repeat themselves in what appears to be some orderly fashion is the starting point for all science, be it physical, chemical, biological, human, social or technological. It is in recurring phenomena that scientists are first alerted to general rules and abstract principles that might account for the patterns they see, and which could be used to anticipate future events from present conditions. The point here is that the scientific enterprise

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accepts as a matter of faith and without reservation the fact that recurring patterns in phenomena say something about an order in nature, even though no two events ever actually recur in exactly the same way. Such a faith that nature is intelligible in its workings serves to overcome the challenge of the chance or merely random event. Thereby one will push through all the apparently conflicting data of experience, to eventually formulate those abstractions in terms of which the pattern hidden in the data can be revealed.

To put the idea differently, one could argue that if chance and arbitrary events prevail, then scientists should not be able to find evidence of some kind of order to things. Yet scientists do find such evidence, and so it cannot be the case that the merely arbitrary event prevails, or at least not entirely so. In a sense however, this argument is trumped by the scientists' intrinsic faith in a natural order, one which permits them to frame their conceptions in the first place. The question thereafter becomes: What kind of rational order does nature exhibit?

In this regard, Whitehead uses the phrase "the full scientific mentality" for the scientist's faith that nature harbours detailed truths that, by using well formulated abstractions and careful observation, can be found out by the human intellect.[136] Such a mentality, according to Whitehead, "instinctively holds that all things great and small are conceivably as exemplifications of general principles that reign throughout the natural order".[137] Again, such a full scientific rationality is not restricted to the physical sciences. Over time it has been taken up in the methods and goals of mainstream social research, as well as in a vast range of other scientific disciplines. One main aspect here is that in Western intellectual culture the norms of objective research, and faith in a rational order are central to the conception of intellectual integrity.

The emergence of such scientific disciplines points to the success of modern scientific reasoning in that part of what is meant by rational explanation is that it involves the pursuit of scientific law, however expressed, through objective methods.[138] In other words the method is assumed to be universal. Perhaps it can be thought of as a kind of analogue in the realm of method of that faith in a general order in nature that characterizes the full scientific mentality. Together they offer a level of intellectual integrity that cannot reasonably be ignored by anyone interested in finding true results about objects of study.

The same argument can be approached in a slightly different manner by looking at the chance or random event. Even if events never actually repeat themselves in exactly the same way, standards can set out for observing phenomena and recording empirical detail that speak to general principles, definitions, concepts, explanatory laws and theories. Said differently, the naturalistic stance tends to embody a habit of thought which holds that "every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles."[139] In the same passage Whitehead goes on to state that: "Without this belief the incredible labours of scientists would be without hope".[140] Indeed, Mouton could be rephrased *à la* Whitehead to say science is committed to, has a passionate interest in, finding truths about the relation of general principle to irreducible and stubborn fact. It is worth quoting Whitehead more fully here:

> I mean the inexpugnable belief that every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles. Without this belief the incredible labours of scientists would be without hope. It is this instinctive conviction, vividly posed in the imagination, which is the motive power of research: - that there is a secret, a secret that can be unveiled.[141]

It is worth repeating that, so far as this thesis argument is concerned, such a belief is another key aspect of the naturalistic stance.

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In the case of the sciences of man, the "secret that can be unveiled" are the truths about the order found in the social world, the valid knowledge of which is obtained by the established methods of social research. I take it then that Mouton's references to a moral contract, quoted above on page 39, is related to what Whitehead refers to as the scientists "inexpugnable belief" and "instinctive conviction" as quoted immediately above.[142] It is worth noting here as an aside that belief, conviction and imagination are also chief characteristics in judgments of worth, and hence in patterns of practical moral argument. As such both ideas appear to be deeply linked to a particular capacity for knowledge.

Mouton admits that social research can only provide approximations to the truth, and so he turns to the ability of scientists to state clearly the various specific criteria for validity, in other words, for determining how good the approximations are. From this perspective then, it is in the criteria for validity – those required to remove all possible sources of error across the entire research process – that social scientists find ways of correlating detailed occurrences with their antecedents "in a perfectly definite manner, exemplifying general principles".[143] Of course, this is done in a perfectly definite manner fitted to the sciences of man. For example, Mouton speaks of sociological, ontological and methodological constraints to the pursuit of valid knowledge regarding the social world.[144] Science and scientists in both natural and mainstream social research are moved by this passionate commitment of a full scientific mentality to finding true results about objects of study.

The discussion in Parts A and B above considered the notion that there is an intrinsic link between science and the truth, and that scientists subscribe to an unalterable faith that "every detailed occurrence can be correlated with its antecedents in a perfectly definite manner, exemplifying general principles".[145] The third aspect to the naturalistic standpoint that is displayed in the notion of scientific explanation being discussed here concerns the link between the primacy of epistemology and the machine-like image of the world. This link will be discussed in Part C.

Part C: A Machine-like image of nature

The primacy of the epistemological

If science pursues truths about observable phenomena in the natural and social worlds, then a next reasonable question would be: What do the conclusions of science say about those phenomena? A central aspect in coming to understand what the naturalistic standpoint entails for a conception of knowledge, or the capacity to know, is that what the truths of science say about the observable world are shaped by the methods it uses to find them. In other words, and in line with the ideas of Prigogine and Stengers, modern science establishes a particular dialogue with the natural as well as the social world.[146] The character of this dialogue is such that what is said about phenomena – what they are related to, what comprises them or how they function – turns on the manner by which they are known. This is not a question about the validity of research (nor is it some 'new age' truism about how one's focus determines one's reality). In simple terms, in order to say something true about what the world is like, which philosophically is a matter dealing with ontology, then trying to answer what makes up the world will tend to be worked out according to how we come to know it, which is a function of method, or epistemology. Charles Taylor calls this the primacy of the epistemological. He views it as a distinctive feature of a naturalist mode of thought. In Taylor's words, the primacy of the epistemological refers to "... a pervasive feature of modern intellectual culture: the tendency to think out the question of what something *is* in terms of how it is *known*."[147]

Of all the characteristics of explanation and the naturalistic stance being surveyed in this chapter, the implications behind the primacy of the epistemological reach the furthest. In particular, and picking up on Taylor, one aspect of the argument here is that the order of nature is understood from

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a metaphysical bias in favour of neutral descriptions, that is, descriptions of a vibrating and oscillating universe that make no claim on humans as beings for whom judgements of worth and matters of significance are central.[148] This of itself is not a problem for a mathematical explanation of nature.[149] The problem is that such a pattern of reason, and the assumptions behind it, are accepted as the norm for rational debate in modern intellectual culture without sufficient reflection. Its accompanying epistemological bias in favour of procedural accounts thereby tends to set the benchmark for intellectual integrity. As a result, the characteristics of one model of reason – admittedly one with an extraordinary record of success – has come to exemplify the characteristics of reason *per se*. Hence, for example, for reasoning to be sound it needs to be procedural, explicit, based on external criteria, and have some grounding at the level of basic premises. In this way judgements concerning what is known may be worked free of unwarranted assumptions, bias and error. Of course, in addition to this the empirical sciences use all sorts or experimental evidence and inductive reasoning based on that evidence.

Furthermore, the world view behind this model tells us that on the one hand we have the conscious subject as the locus of knowledge, reason and judgment, and on the other a differently existing and independent universe – one that the mind of man can represent or know through experience and experiment, but which does not "make a claim on us" as moral agents, hence, neutral.[150] Because observer and object are in some sense distinct, the question of how the universe "has and is likely to function" or "what we can say about it" is to be answered by looking to the methods for attaining knowledge of it.[151] In other words, the question looks to methods that guide the study of nature or of society. Part of this involves formulating a basic conception of things that are adequate to the kinds of dialogue that modern science is engaged in.

The argument here is that the primacy of the epistemological – "the tendency to think out the question of what something *is* in terms of how it is *known"* – together with the ontological ideas that accompany it, makes up a common, usually tacit thread running through the notion of scientific explanation being delineated here.[152] It represents a key aspect in our capacity for knowledge within an analytical/empirical culture, and is one of the central assumptions that tend to create a divergence when it comes to judgments of worth, or matters of moral value generally. In later chapters the thesis discussion will consider more carefully the implications of this aspect of the naturalistic stance, especially in the case of practical reason in general, and more specifically what it is to make sense of decisions about the development and use of technology in a planetary age.

The sub-sections that follow will attempt to bring to light some of the ways in which the primacy of the epistemological shows itself as part of a machine-like image of how the universe functions – the third aspect of the naturalistic stance being discussed here. In doing so, the discussion will also attempt to relate these ideas to patterns of reason which Taylor describes as procedural or foundational.[153] Thesis Chapters Three and Four will then expand on these patterns by exploring some of Taylor's ideas about the naturalistic standpoint and its implications for practical reason.

The oscillating universe

As a first approximation, classical mechanism presumes that the universe is divided between mind and a world of independent objects. Physical science takes these objects to be made of matter and energy in various configurations of vibration, oscillation, interaction or transformation. Famously, this is where the image of the mechanical clock and its oscillating, regular inner workings came to stand for the functioning of the universe. As Whitehead notes, the order in nature is one based on the observation that the world is filled with events that repeat themselves.[154] Without such repetition we would not have faith in a clockwork-like order that can be explained through the use of general principles. As Prigogine and Stengers have also noted, in the historic development of this

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image of the universe, natural motion was "conceived of in the image of a rationalized machine".[155] They furthermore write: "Why did the clock almost immediately become the very symbol of world order? ... A watch is a contrivance governed by a rationality that lies outside itself, by a plan that is blindly executed by its inner workings. The clock world is a metaphor suggestive of God the Watchmaker, the rational master of robot-like nature".[156] Of course, the classical image of the universe as the endless turning of the parts of a machine no longer suffices some of the more recent developments in science. However, the belief that there is an order in nature which, because it is regular in its workings, can be sounded out by the human intellect remains a first idea in science.

In the sciences of man, of course, the objects of study are the actions and behaviours of individuals and their societies. Nevertheless, as objects of scientific study both nature and society are to be broken into component parts, to then be reassembled in a coherent way through the use of various intellectual tools. Modes of thinking are devised by the scientific intellect so as to analyze, divide or dissect phenomena into those parts that make them up. The explanation of an object of study is thus obtained by mastering an explanation of its parts. Experiment, measuring, methods of reason, the basics of the world view, all presume that the whole is to be taken apart, studied, and put back together again in thought so as to gain a clear and distinct grasp of its machine-like workings.

The image of the oscillating universe also assumes that the way phenomena function locally – whatever scale of observation local might refer to – can be used to describe similar phenomena elsewhere. The most profound laws of science are those having universal application, namely, laws that can explain phenomena across the observable universe or the entire terrestrial world. The same idea would apply for those correlations that hold across a wide range of human and social behaviour. Thus, laws or correlations that are worked out and validated in one place and time, can be used to understand how phenomena work in distant or seemingly unrelated environments or conditions. In this way an account of things formulated locally is taken to have a wider application. Said differently, the detailed or particular situations within which phenomena appear and are observed, can be treated as instances of a more general theory. For example, any study requires a set of abstractions in terms of which phenomena will be analyzed. The question is: Do these abstractions and analyses actually tell us something interesting about our object of study? Do they provide a degree of explanatory power, or predictive ability? To what extent does this lead to an account of things that extends beyond the immediate data that gave rise to it? Depending on the answers to these kinds of question, we would have in our hands a general account that can be put to various uses, or which can explain or predict a range of other phenomena.

The physical sciences have excelled in such explanation and prediction. Here the confidence in the abstractions of science has become part of the West's intellectual tradition. Hence, for example, we have the idea expressed by Kahane, and which was cited earlier: "It is the height of folly to believe what is clearly contradicted by well-established scientific theory in the physical or biological sciences, and foolish to ignore what science says on any topic.[157] A similar idea can be found in Whitehead's comment regarding "the main stream of scientific thought", namely that "Its general success made it impervious to criticism, then and since. The world of science has always remained perfectly satisfied with its peculiar abstractions. They work, and that is sufficient for it".[158]

One aspect that emerges out of this confidence in the abstractions of science is the claim that we can use them to account for all phenomena across the observable natural and social order. In this regard, Prigogine and Stengers note that:

> The dialogue between man and nature was accurately perceived by the founders of modern science as a basic step towards the intelligibility of nature. But their ambition went even farther. Galileo, and those who came after him, conceived of science as being capable of discovering *global* truths about

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> nature. Nature would not only be written in a mathematical language that can be deciphered by experimentation, but there would actually exist only one such language. Following this basic conviction, the world is seen as homogeneous and local experimentation can reveal global truth.[159]

This clearly is one implication of the view that the universe finctions as if it were a "rationalized machine".[160] As a further example, the Nobel laureate Stephen Weinberg, some of whose ideas will be discussed later, takes on the same kind of thinking regarding human behaviour and its links to brain function. Weinberg is writing in the broader context of the ability of science to explain the emergence of life in the universe. He states that: "In principle, no obstacle stands in the way of explaining the *behaviour* of other people in terms of neurology and physiology and, ultimately, in terms of physics and history."[161] I take it that by history Weiberg is referring to the theory of evolution by natural selection. His claim makes sense in terms of the assumptions of the machine-like image of the world, although whether his claim can succeed is an other question.

In this regard, and as an aside, from one perspective the claim itself might be thought of as reason to question the universality of the machine-like image by virtue of the absurdity of its intended conclusion. Whitehead makes a comparable observation from a related context when he writes:

> And yet – it is quite unbelievable. This conception of the universe is surely framed in terms of high abstractions, and the paradox only arises because we have mistaken our abstraction for concrete realities.[162]

However, from another perspective the absurdity of the plan is of no consequence if it can in fact be carried out. Whitehead again makes a related comment concerning the system of abstractions first worked out in the European seventeenth century, and upon which the scientific investigation of the universe has since been based:

> In the first place, we must note its astounding efficiency as a system of concepts for the organisation of scientific research. In this respect, it is fully worthy of the genius of the century which produced it. It has held its own as the guiding principle of scientific studies ever since. It is still reigning. Every university in the world organises itself in accordance with it. No alternative system of organising the pursuit of scientific truth has been suggested. It is not only reigning, but it is without rival.[163]

Prigogine and Stengers support this view when they write that:

> [C]lasscial science still aims at discovering the unique truth about the world, the one language that will decipher the whole of nature – today we would speak of the *fundamental level of description* from which everything in existence can be deduced.[164]

In other words, Weinberg is pointing to the laws of physics and chemistry as providing the fundamental level of description in terms of which we can make sense first, of neurology and physiology, but then, ultimately, of human behaviour. It is worth noting here that the contemporary science of cosmology would also appear to subscribe to the idea of a fundamental level of description in the attempt to explain the origins of the universe. Such global views are characteristic of the classical mechanistic image, and hence too as part of a naturalistic standpoint.

Whatever the case, naturalistic assumptions regarding the nature of the universe and the methods formulated by science in order to know it continue to influence the West's analytical-empirical culture. Here the broad philosophic notions as to what constitutes explanation, and in terms of which Weinberg appears to be reasoning, have been adopted across a wide range of intellectual endeavours. They form one aspect to the modern climate of thought around Western notions of rationality. As will be argued later in the thesis, these naturalist abstractions appear to influence a wide range of views regarding practical reason and what it is to form judgments of worth.

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However, and despite Weinberg's position, what is less evident is how the sciences of man could give a machine-like account of social behaviour in the same vein as physics, chemistry and biology do of the physical and living worlds. Still, the ideal of such an explanatory account in the physical sciences and the methods used to bring it about have doubtless played an influential role in mainstream conceptions of the human sciences. In simple terms, it makes sense for the mind of man to gain knowledge of a common world of human social behaviour through the building of methods and procedures adequate to its object of study, one that would seek to correlate detailed occurrences with their antecedents in order to exemplify general principles, to paraphrase a previous quote from Whitehead. From this point of view, the results of social research need not be expressed in terse mathematical form for them to demonstrate the full scientific mentality. In this respect mechanism refers to an account of phenomena – be they of the natural or human worlds – that emerges from the Cartesian distinction between the conscious subject who knows and is the locus of intent, judgment, thought, imagination and understanding, and the common social world as the object of study. Here the observable social world stands as an object of conscious knowledge.[165] Once these ideas are set out, then the key issue becomes: How is it possible to obtain reliable knowledge of that social world? As just suggested, the procedures that ensure valid social research are arguably a very practical working out of that problem in the sciences of man.

In support of this line of thinking, and with respect to the beginnings of modern social theorizing, Whitehead states that:

> [T]he men of the eighteenth century rationalized the social life of modern communities, and based their sociological theories on an appeal to the facts of nature.[166]

To this Whitehead adds:

> They were men of genius, clear headed and acute, who applied the seventeenth century group of scientific abstractions to the analysis of the unbounded universe. Their triumph ... was overwhelming; whatever did not fit into their scheme was ignored, derided, disbelieved.[167]

He then goes on to note that:

> We cannot overrate the debt of gratitude which we owe to these men. For a thousand years Europe had been prey to intolerant, intolerable visionaries. The common-sense of the seventeenth century, its grasp of the obvious facts of human suffering, and of the obvious demand of human nature, acted on the world like a bath of moral cleansing.[168]

It is of course an interesting question to see how contemporary social research may have emerged out of the rationalizing spirit of the eighteenth century. However, the point being made here is less a matter of the history of ideas, but of highlighting some key aspects of the naturalistic stance. Arguably then, something of that rationalizing spirit lives on in the contemporary human sciences, and notably so with the tacit faith in an order of nature and in the social world, the truths of which can at least be approximated via the procedures of valid social research.

One additional point is worth adding here. A key aspect to this faith in the order of nature is that the truths which science pursues can provide credible claims to knowledge when based on an explanation of the underlying mechanisms that account for the phenomena that we observe, measure and analyse. The most successful theories, or models, are those that provide convincing accounts of phenomena which stand up to a range of tests. To give an account would mean showing how it is that what is observed or measured in a particular study is the result of the working out of general laws, principles or correlations. In other words, a relatively strong assumption in the naturalistic standpoint is that explanation by its nature provides the mechanisms and their

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antecedents in terms of which we can make sense of what is observed in our study. According to John Casti, explanations can do this poorly or well. In order to decide between them he argues that our explanations can be judged against four criteria: simplicity, agreement with known facts, explanatory power, and predictive capability.[169] The latter two are particularly relevant to discussion in the next subsection.

Antecedents, events and hidden structures

Based on the above ideas, another aspect to the naturalistic notion of explanation involves the conviction that, in terms used by Whitehead, events and their antecedents can be related in a definite way using general principles.[170] To be able to do so is to say something intelligible about the order found in nature or society. This is where the notion of cause and hidden structures comes into the picture of explanation being painted in this chapter. A few introductory comments are useful before looking further into this.

The kind of general principles one gets in physics or chemistry obviously differ from those in biology, and even more so from what one finds in sociology or psychology. Here the objects of study which occupy the attention of researchers in the human sciences are quite unlike those that concern, say, mathematical physics. And mathematical physics is a useful example to cite in this regard, since it arguably leads to the idea that the machine-like image of an order in nature can be expressed in terms of laws or correlations.

For example, Whitehead places considerable emphasis on mathematical physics for the part it played in the historical development of the modern natural sciences. Whitehead writes: "The more you study this subject [mathematical physics], the more you will find yourself astonished by the almost incredible triumphs of intellect which it exhibits.[171]

To emphasize his point, and after summarizing some of the developments in mathematical physics that were central to the emergence of the modern natural sciences, Whitehead notes that, so far as its originators and admirers might be concerned,

> The beauty and almost divine simplicity of these equations is such that these formulae are worthy to rank with those mysterious symbols which in ancient times were held directly to indicate the Supreme Reason at the base of all things.[172]

Of course, in terms of the rise of modern science it is reasonable to assume that "the Supreme Reason" can be translated into to the machine-like workings of the universe. In addition, and to explore further, for Whitehead the chief preoccupation of the empirical sciences is not classification, but the measurement of concrete fact.[173] Out of this preoccupation with measurement has arguably emerged the emphasis that our modern sciences place on the discovery of laws or correlations, which, as their formulation deepens, serves to further enhance our powers of explanation and prediction of such facts. Whitehead writes:

> Classification is a halfway house between the immediate concreteness of the individual thing and the complete abstraction of mathematical notions ... Classification is necessary. But unless you can progress from classification to mathematics, your reasoning will not take you very far.[174]

Here Whitehead is concerned with the difference between a mind which seeks to classify and one which seeks to measure, the latter arguably being the source from which the modern sciences derive their impetus. Whitehead goes on to note that:

> Nothing is more impressive than the fact that as mathematics withdrew increasingly into the upper regions of ever greater extremes of abstract thought, it returned back to earth with a corresponding

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> growth of importance for the analysis of concrete fact. The history of the seventeenth century science reads as though it were some vivid dream of Plato or Pythagoras.
>
> The paradox is now fully established that the utmost abstractions are the true weapons with which to control our thought of concrete fact.[175]

By way of introduction, the point here is that the order we find in nature or in society relates to measurement and the uncovering of facts, the patterns of which can be expressed according to general principles. In the case of the natural sciences, such principles are expressed through formulae, laws, equations or rules.[176] With respect to the order found in society, such as in the case of sociology, psychology and the like, general principles tend to be put in terms of correlations.

The need to use correlations in an attempt to explain the order found in society points in the direction of the debate on the scientific status of social research. The debate as such is outside the scope of this discussion. Instead, the argument here is that if the sciences of man aim for true results about their objects of study, and if valid research is within the grasp of these sciences, then as a result of such research we should be able to make approximately true statements regarding human social life. In general this is the point Mouton is making. In other words, there are correlations to be found that are not applicable to only one case or individual. They hold for a range or class of events precisely because each particular event exhibits an order to things that is common or shared. What turns abstractions into generalization, or correlation, is the way they are shown to hold over a range of circumstances. One might say then that event A and condition b are correlated in the way our research shows, given some specific bounded universe of discourse, or that a given set of circumstances obtain. However, outside this set of conditions the correlation either falters or has not yet been established.

So, at least at this stage of the discussion, the epistemic imperative as well as the full scientific mentality can be closely linked to the way scientific explanation centres on the use of some kind of law or correlation to account for the way we see phenomena function or behave, whether it is in the natural sciences or in mainstream social research.[177] As a result, in order to explain something in approximately true terms, that is to say, in order to give the most reliable account of it possible under the circumstances, then researchers need to provide the mechanism by which the phenomena function. In the case of the social sciences we need to provide the evidence and inferences by which the correlation holds. From this point of view scientific explanation would fail if one could not specify in sufficiently precise terms what the most probable mechanism or factors are that tell us how something "has and is likely to function", or behave.[178] This idea of what it is to give an account of phenomena also suggests that causal relations are at work. Indeed, within the naturalistic standpoint scientific explanation appears at times to be indistinguishable from explanation by law, or by correlation.[179] In other words, explanation proceeds according to laws and correlations that specify how events are related to their antecedents.

The notion of cause is complicated. It also stands outside the scope of the thesis discussion. However a few brief points are in order. Despite all the philosophical difficulties around the idea, classical mechanism is founded on some notion of cause as a key explanatory assumption. Of course, classical notions of cause are reworked in quantum mechanics, where a well defined but probabilistic notion of events and their antecedents comes on board.[180] The practical status of cause is perhaps less clear in the social sciences. Obviously, humans are not simply composed of matter and energy in complex configurations. They are conscious actors. This requires of social research that it proceed differently from research in the physical and life sciences. For example, most of the objects of study in the social sciences cannot be isolated one from another. The attempt to focus on one aspect of some phenomena, then to manipulate it and study it in detail would normally be done in order to unravel the string of antecedents from the events to which they give rise. In the study of

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human and social behaviour however such manipulation cannot normally or ethically be carried out. Mouton refers to this as the sociological obstacle to valid research.[181] Of course, there are many cases in the physical sciences where such manipulation is also impossible. Weather prediction, the study of earthquakes and the nature of global warming are obvious examples, in response to which scientists develop various models or simulations. That social phenomena have causes is not in doubt. This is part of that instinctive faith that makes the sciences of man possible in the first place. The problem is in deciphering societal events from their antecedents.

For the sake of this discussion, and as just suggested, the notion of cause refers to the antecedent-event connection such that given some occurrence, the event, one can expect to be able to specify that which brought it about, the antecedent. The terminology used here is indebted to Whitehead.[182] Naturally, the expectation is given assurance by the scientist's faith in a machine-like order in nature that passes beyond "mere arbitrariness", to cite Whitehead again.[183] In other words, it is a faith based first on the image of the universe as a rationalized machine, the method of inquiry into which can as well be adapted to a study of the social order and its workings.[184] In addition, the assumption here is that the event is the result of something else at work either before its occurrence in time, or as a condition for the event to come about. Events just don't happen by themselves.

Broadly speaking then, antecedents are such that without them a given event would not have occurred precisely when it did, or exactly in the way it did. It is worth highlighting the assumption here, that, in the naturalistic stance, phenomena emerge from a chain of antecedents. However, the antecedents themselves could be thought of as events in their own context. But then these events too were brought about by other antecedents, and so on. In the context of the naturalistic standpoint then, to describe one thing as antecedent and another as event is simply a necessary convenience of thought that makes it possible to pose intelligible questions about the order in nature, or to conduct social research at a particular level of analysis.

Furthermore, there appear to be many cases where antecedents and events are so intricate or subtle in character that scientists are not able give a full account of them. It could be argued that there are a large number of events – physical, human, social – that are complicated like this. However, from the classical view such a state of affairs is not based on principles that limit empirical knowledge. They instead result from a lack of skill, or a deficient methodology, or the insufficient subtlety of instrumentation, or the absence of a sufficiently powerful theory. Belief that the machine-like image of nature reflects an order that is not arbitrary but rational, that it exhibits a clear link between concrete fact and general principle, ensures that the efforts of scientists to explain phenomena will not be in vain. Hence, all setbacks aside, scientists continue try to isolate the different contributing antecedents in these events, analyze them separately and assemble their analyses into a coherent picture. The scientist's faith ensures that such a method will yield fruit in the form of an account that can stand up to the evidence. In other words, a method is used that can deliver an account of the inner workings of events in such a way as to expand our powers of explanation and prediction. Presumably, this approach to method reflects the machine-inspired image of a universe that functions according to the way its constituent parts work together. As was noted earlier, the use of a method that breaks apart, analyzes, and rebuilds so as to formulate an explanation of things is typical of thinking from within the naturalistic stance. In this respect it could be described as a practically minded approach to knowledge.

In general then, from the naturalistic standpoint being discussed here, explanation of either the natural or social order means in part to be able to identify the precise characteristics of an event, and thereafter to provide evidence and valid reasons as to how a chain of antecedents gives rise to what is observed. The question: Why did event p happen? has the answer: Because of the action of antecedents y and z. The precise working out of the manner by which y and z bring about p constitutes the explanation of p. From the naturalistic point of view, explanations is based on

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methods that can give a procedurally convincing account of those factors that serve to produce the phenomena. In other words, such accounts offer i) a formulation of the mechanisms or factors that give rise to the event, and ii) provide results that be used to further measure or predict concrete facts regarding its occurrence.

This basic assumption of the naturalistic stance, that the machine-like image of order found in the world can be analysed in such a way as to show up its underlying workings or a hidden structure, is also one aspect of the full scientific mentality. In other words, the belief "... that all things great and small are conceivably as exemplifications of general principles which reign throughout the natural order."[185] Indeed, the actual success of this analytical/empirical approach to explanation is taken to be evidence of man's dialogue with nature, at least at some level.[186] This view arguably forms one of the main reasons behind the general acceptance of the naturalistic abstractions in Western modes of thought. A first principle of scientific discovery – to ask precise questions of our natural or social world and let the answers speak for themselves – has worked in practice. From this point of view then, the intellect of man has discovered a way of interrogating the world so that its hidden mechanism, laws, structure and correlations can be found out via well defined methods.

An inanimate conception of life

Changing gears slightly, one important aspect of a machine-like image of the world is the tendency to associate machine-like explanations with a fundamentally inanimate conception of the universe and its workings. The belief in a natural order, and hence, too, a social one, that is exemplified in its details by general principles has tended to side with the view that deep down only the inanmate exists, that ultimately all observable events can be explained in terms material antecedents only. Since such views can have a very considerable influence on social theorizing in general and what is involved in judgements of worth, a few comments are in order.

What Whitehead calls scientific materialism is the notion that the universe can be explained in principle by internally self-consistent laws of interaction between matter and energy only. These are taken to be wholly and entirely inanimate in their nature. Internally self-consistent means something like the explanations of things rest solely on evidence gathered from the phenomena being observed, together with the established laws of physics. The sum total of all phenomena actually or potentially observable would thus constitute the observable material universe.

The following text from Whitehead helps put the notion of scientific materialism it context. Writing with reference to the "successes and failures of the particular conceptions of cosmology with which the European intellect has clothed itself in the last three centuries", Whitehead states that:[187]

> There persists, however, throughout the whole period the fixed scientific cosmology which presupposes the ultimate fact of an irreducible brute matter, or material, spread throughout space in a flux of configurations. In itself such a material is senseless, valueless, purposeless. It just does what it does do, following a fixed routine imposed by external relations which do not spring from the nature of its being. It is this assumption that I call 'scientific materialism.' Also it is an assumption which I shall challenge as being entirely unsuited to the scientific situation at which we have now arrived. It is not wrong, if properly construed. If we confine ourselves to certain types of facts, abstracted from the complete circumstances in which they occur, the materialistic assumption expresses these facts to perfection. But when we pass beyond the abstraction, either by more subtle employment of our senses, or by the request for meanings and for coherence of thoughts, the scheme breaks down at once. The narrow efficiency of the scheme was the very cause of its supreme methodological success. For it directed attention to just those groups of facts which, in the state of knowledge then existing, required investigation.[188]

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The importance of these ideas for the broader thesis discussion is twofold. First, as Whitehead also notes, developments in science itself have arguably called up a set of concrete facts that cannot be made sense of in terms of scientific materialism. Second, the working out of this cosmology has arguably contributed to a wide range of sceptical questions regarding meaning and coherence that have particular relevance to the anxious decisions humankind faces in a planetary age.

Based on this notion of scientific materialism, then one is looking here at a world that is conceived to function independently of any reference to a prime mover, spirit or any other unobservable essence. Our conceptions of it are also to be free of nay anthropomorphic traits. Such notions are taken to be extra-scientific assumptions which can be deleted without loss of generality from the scientific explanation of the machine-like image of the universe and the motion, vibration or oscillation of its inanimate constituents. In addition, all observed effects and phenomena are ultimately made of energy and matter as their most basic constituents. As such, deep down, all observables emerge from the fundamental properties of the physical and chemical world. In other words, there is only one kind of cause of things, and this is to be described according to a single level of reality, namely, the machine-like working of inanimate matter and energy. Whitehead has summarized this kind of naturalistic thinking when he writes that, in the world view of classical science, "the universe moves endlessly, meaninglessly."[189]

However, and as will be brought up in later chapters, scientific materialism and mechanism need not imply the other. For example, Whitehead tries to work out a case for organic mechanism.[190] More particularly, the idea that explanation need not be based on the notion that the natural order is essentially inanimate will be of interest as the thesis argument develops its ideas of human agency, self-understanding, complexity and co-evolution. Still, it is probably fair to say that developments in classical science support some kind of ontological assumption to the effect that all observable events can be explained in terms of material antecedents only. As such there is no real distinction between animate and inanimate, or between machine and organism. That is to say, the universe is solely inanimate and machine-like in its most basic character. Whatever life is must ultimately be understood in terms of a "*fundamental level of description* from which everything in existence can be deduced".[191] So far as the thesis discussion is concerned, this is part of the ontology that constitutes one of the central features of the naturalistic standpoint.

The assumption that there is a fundamental level from which everything in existence can be deduced, as Prigogine and Stengers put it, and that this level is inanimate in nature, arguably remains the mainline view in classical science. Later chapters in the thesis discussion dealing with ideas from Taylor, Prigogine and Stengers, Jantsch, Laszlo and Morin and Kern will highlight recent developments in science that arguably satisfy key requirements of scientific explanation without adopting the classical view of a machine-like image of order in nature. These ideas will then be used to gain greater insight into various assumptions about practical reason.

It is proper to include here some further comments. Assumptions about materialism carry through to questions of our human and social nature, namely, that: i) ultimately, all human behaviour derives from individuals who possess consciousness, and ii) although science may not yet be able to formulate the laws of physics and chemistry in such a way that we can account for human consciousness, nevertheless, whatever consciousness is must be driven first by the action of physical nature at the level of brain function and physiology, and ultimately at the level of molecular forces, energy and matter interactions. This view is summed up in the following quote from the Nobel laureate Stephen Weinberg, a part of which was cited earlier:

> The experience of the last 150 years has shown that life is subject to the same laws of nature as is inanimate matter. Nor is there any evidence of a grand design in the origin of evolution or life ... In principle, no obstacle stands in the way of explaining the behaviour of other people in terms of

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> neurology and physiology and, ultimately, in terms of physics and history. When we have succeeded in this endeavour, we should find that part of the explanation is a programme of neural activity that we will recognize as corresponding to consciousness.[192]

Here Weinberg appears to exemplify a strong school of contemporary thought carried out in the spirit of classical science. It is a school of thought which holds that nothing in principle keeps scientists from explaining human behaviour and human consciousness in terms of the more fundamental workings of the physical world.

Weinberg goes on to make a relevantly strong claim, holding in effect that consciousness, and hence human behaviour, is an emergent property of matter at sufficiently complex levels of organization. Brains are, after all, just extremely complicated biological mechanisms made of neurons made of cells made of molecules made of atoms, all held together by the laws of physics. The argument here is that once the laws of physics and chemistry provide sufficient mastery knowledge of all the component interactions between atoms, molecules, and cells then thoroughly mechanical explanations can follow regarding the workings of neurons. The models for neural activity based on such knowledge would then be coded back to what people call consciousness.

One possible implication of this idea is that human action is part of a general theory that makes no distinction between inner states and outer behaviour, or between the universe of inanimate objects and a world of conscious desires. These can all be explained by one (large) theory. Such arguments rely on certain mechanistic assumptions about how the order found in physical and social worlds exemplify the same general laws. If so, then in the end conscious human behaviour can be explained in terms of laws that deal with energy, matter, neural activity and the evolution of life on the one hand, or economic and behavioural mechanisms at the societal level on the other. It is perhaps worth noting that a critic of such views might want to ask what kind of consciousness is it that wants only to explain consciousness. Instead, the more important question for practical reason is not about consciousness as such, but about that which one seeks to be conscious of.

However, this criticism may not be completely fair. One key aspect of rationality emerges in these notions about science: reason must dislodge our thinking from a parochial stance. Formulated differently, it must free our ideas from pre-judgements and points of view that do not stand up to dispassionate inspection. What someone imagines to be the case, the particular ideas people hold dear, or what a person believes to be valuable, may be just surface features that form no basis for rational judgement. As such they are to be abandoned when confronted by scientific evidence to the contrary. Hence, Whitehead's applauding of seventeenth century ideas and the acute minded men who formulated them: "We cannot overrate the debt of gratitude which we owe to these men. For a thousand years Europe had been prey to intolerant, intolerable visionaries. The common-sense of the seventeenth century, its grasp of the obvious facts of human suffering, and of the obvious demand of human nature, acted on the world like a bath of moral cleansing."[193]

This brings up a central point first suggested in the sub-section above on Explanation in science. The seventeenth century ideas that struck a fundamental chord in thinking about nature as a vibrating and oscillating machine, and which in time became the cornerstone of modern cosmology, also served to help rethink the nature of human motivation in terms of which man's moral sphere of life made sense. Ironically, the apparent legacy of those ideas in contemporary Western society is a general scepticism towards moral argument, one that presumably accompanies a general acceptance of naturalistic abstractions.

As Taylor has argued it, based on the naturalist reduction the proper form for reasoning is a procedural, foundational and critical one.[194] It requires external criteria be used in terms of which the rationality of an argument is to be tested, whether it be based on the inductive analysis of

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empirical evidence or on a theoretical deduction. However the moral sphere being what it is, practical arguments that deal with human motivation and matters of worth or significance are almost always found wanting. Agreements in such matters, where they occur, appear to be a matter of coincidence.[195] Furthermore, because the ontology of the neutral universe is part and parcel the naturalistic stance, it is difficult to gainsay these sceptical conclusions. The universe really does just move on "endlessly, meaninglessly", as Whitehead notes.[196] In more contemporary terms, in an inhospitable universe the Earth is a kind of terrestrial life-boat from which individual human consciousness first emerges only thereafter to decompose back again.

In addition, and according to Taylor, one source of the modern Western sense of identity turns in part to what he calls the self-defining subject. In other words, someone for whom "[h]is world is one of potential means which he understands with a view to control", whose world is such that he "determines his own purposes, or finds them in his own natural desires".[197] Taylor argues that this notion is joined to the ideal of the individual's freedom to act.[198] More particularly, such an identity has developed in partial response to the notion that, since the workings of the universe are silent when it comes to our experience of worth or significance, then these must be devised by the individuals themselves. It may even be that the moral pluralism of contemporary society has some relation to a practical working out of this modern sense of individual identity. Yet, according to Taylor, the ontology inherent the naturalistic standpoint can be questioned. Human motivation need not be conceived as one's individual devising only. Other resources exist for the conduct of moral argument that need not lead to a thorough-going sceptical stance towards practical moral argument.

The remaining Parts D and E, as well as the ideas to be discussed in thesis Chapter Two, help set the stage for further discussions later in the thesis regarding a general doubt towards practical reason, and possible resources for reasoning that need not always deliver a sceptical conclusion.

Part D: Intersubjective Reason

Introduction

Intersubjective reason is the fourth key idea of the chapter discussion, and points to another central characteristic of the naturalistic standpoint. The phrase is taken from Taylor who writes at some length on the notion of what he calls inter-subjective meaning.[199] However it is essential to note that his use of the term is unlike that being employed in this Part D. In Taylor's case, and in an approximate sense, he uses the term inter-subjective and common meaning when speaking of the way our social practices have meaning only in so far as they are shared and spoken of among a community of self-understanding persons.[200] Here however, and as a first approximation, intersubjective refers to the notion that all the concepts and methods used in the modern sciences, in so far as they guide its efforts towards obtaining objective results, are formulated in such a way that every individual scientist in principle possesses the same, detailed grasp of the concepts and methods involved. Said differently, such ideas and procedures should be as free from interpretation as is possible.[201] In this discussion then, the notions of intersubjective and objective are closely linked, whereas at times Taylor tends to use them in a contrasting sense.[202]

To begin, the notion that the same conceptions, definitions, formulas etc. are employed in a science also refers to the community of science as a whole, as well as to the work of its individual researchers. Mouton has the following to say:

> I believe that commitment to the epistemic imperative provides the best explanation for the distinguishing features of science. It explains for instance why rules of evidence and validation are accorded far more priority in science than in any other sphere of human knowledge. There is no other domain of human knowledge in which we place such strong emphasis on following methodological

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> rules and in which we value notions of objectivity and rigour as we do in scientific research. There is no other domain of knowledge in which we accord the development of increasingly sophisticated methodologies such high priority.[203]

In the same passage Mouton goes on to argue that the epistemic imperative appears in the social organisation of science, such as in the high premium it places on public scrutiny, open debate, peer evaluation, and scientific honesty. With this is connected the rejection and vehement criticism accorded those who violate the imperative.[204] More characteristics can be added to the list. These might include the removal of bias and error from all research design, adopting a neutral stance and value-free posture when doing and reporting science, the use of clearly specified criteria in arguing through to conclusive results, and the attempt to formulate explanations that are grounded in underlying mechanisms or structures. To some extent the quantitative sciences involve all these aspects. To make this possible, individual scientists adopt the same procedures and concepts. Otherwise they will end up talking to each other at crossed purposes. In other words, the concepts definitions and formulae of science are to be formulated in such a way that they can be shared in an intersubjective sense. Similarly, fields of study in the qualitative sciences may fail to produce research that approximates the truth if they do not have methodological rules as well as clear notions of objectivity and rigour in concept, definition and measurement that act as a kind of shared first principle for all scientists to follow.

From a position such as Mouton's, valid research methods lead the search for statements that are true, however approximately truthful they might be. The key idea here is not just that the objective of science be the truth, but that the truths it pursues be objective. When put this way the following actually holds: The way we think about what something is, or what is true about it, is determined through the intersubjective methods by which it is known.[205]

As noted earlier, for the modern sciences theoretical and empirical research is not concerned with questions of ontology. The ontology involved in the naturalistic standpoint is a tacit part of research. For science, what the universe is like translates into the way phenomena function or behave. These are chiefly revealed in the scientific dialogue with nature – in the posing of well formulated questions, the reliance on evidence and the validity of research procedures. These ideas raise the question: What sense can be given to the notion of object in science, and how does this differ from the notion of objectivity? This is not simply a question of procedure in the sense of steps that provide for research that is valid. While there are mutual links between the objects of study in science, and the objective procedures scientists employ to study them, the notion of objectivity often appears to be used in an ambiguous sense. What follows then is one attempt to come to terms with the ambiguous notion of objectivity by refining the sense we can give to the notion of intersubjectivity, according to the aspects of the naturalistic stance being discussed here.

A key starting point is to consider how the dialogue that science enters into with the order in nature turns on what can be said about the way the phenomena it studies behaves or functions. However, all that can be said in public by professional scientists rests on methods that lead to statements about phenomena that all other colleague observers would accept as being true, at least if they were to reflect on the same data and ask the same questions. The acceptance of such statements would then be based on the reasoning and evidence at hand, irrespective of the personal beliefs or opinions an individual might otherwise espouse.[206]

Intersubjectivity

Valid research conclusions in science rely on specific approaches to concept formation, measurement and inference, to name a few. The approach is such so as to lead one to formulate true statements about the object of study. However, none of this occurs in isolation. The concepts and

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definitions employed, for example, are to be understood and used (e.g. the making of calculations) in the same way by all other researchers who study them. Otherwise none could know for sure what the other is talking about. Without this faithful reproduction of ideas and method in the minds of individual scientists, then convincing results would be hard to come by. Maintaining such a faithful reproduction of ideas is a main part the community of science, and is in part made possible by the use of a well crafted symbolism in terms of which those ideas are formulated, communicated, manipulated and interpreted.

It is worth noting the observation made by Whitehead that modern science and modern philosophy began in the same age under common climates of European thought, and partly by the same men.[207] The development of the machine-like image of the universe, the place of valid scientific methods or patterns of procedural reason, and issues in philosophy concerning how the fallible human intellect attains to sure knowledge of an external world all have a shared history. This is also in part why the primacy of the epistemological plays such a central role in naturalistic thinking. A key organizing idea of seventeenth century European philosophy was the search for a method to rightly guide thought. Epistemology was placed at the cornerstone of reflections about how to know the workings of an extended universe in so far as it exits and functions without regard to the human mind that might know it. Descartes' claim, after all, was to have found a method for sure knowledge, and to thereby counter the "intolerant, intolerable visionaries" that according to Whitehead had preyed on the minds of Europeans for a thousand years.[208] In such ideas the key question is not so much what steps can be followed so that an individual can know what is true, but in what sense and to what extent is it possible for humans be sure of what they know. In this regard, the chief assumption behind the machine-like image of an order in nature tends to hold sway, namely, that the categories of conscious mind and the universe of objects are distinct and separate. Hence questions of epistemology turn first on a specific ontology. From the naturalistic standpoint then, objectivity has two connotations. In the first instance it refers to procedures and reasoning involved in the study of phenomena. In the second it qualifies the kind of the existence had by that which makes up the natural and social worlds, and which one seeks to study.

In a classical way of thinking, patterns of reason used in science follow a procedural approach and are designed to function independently of any one person's specific point of view. The conclusions that come from the use of such forms of reason are couched in statements about the world that are true for all observers, not opinion based on idiosyncratic states of mind, or ideas inherited from the past that are accepted without question. In another sense, William Hatcher in his work *Minimalism* (2004) defines objective knowledge as "knowledge which is invariant under changes of point of view."[209] Hatcher's formulation may be intended to give a generalized definition of objective knowledge, not one related only to the kind of knowledge that science can provide. This is not unlike Mouton's point earlier in the discussion about the epistemic imperative, where the scientist's commitment to the truth, a moral-like imperative, is realized in the way the mind's ideas are constructed through research procedures so as to be clearly and precisely available to everyone's understanding, or, at least to all colleague researchers in the same field of study. This is where the notion of intersubjectivity comes to the fore – the principle that only those ideas, observations, calculations, symbols, theories or inferences are allowed that can be communicated in precise terms and without loss of generality to every individual researcher who enters a field of study. The communication is furthermore based on the faith in a rational order shown by those who commit themselves to the demands of a scientific search for truth, and who come to join a community of like-minded researchers. This notion of a community of like-minded researchers is discussed at greater length later in this chapter in Part E concerning a number of Robert Merton's ideas.[210]

In this way of thinking, the order found in nature cannot be confirmed from within the private world of personal experience, that is to say, in idiosyncratic states of mind or individual

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speculation. The point of doing science is to say something about how the universe "has and is likely to function", to quote again from Kahane. In other words, for the order in nature to be recognizable in the way it functions, be it either in the physical universe or in the common social world, it must possess some kind of existence that is independent of any one mind, or of any one person's particular perception or conception of it.[211] Hence, Hatcher's definition. Thinking in these terms allows every person to say: There is something about the way the world is ordered which does not depend on who I am, or what I think, to be what it is. Hence, true for all. Given that the order in nature is knowable, then, at least from the naturalistic standpoint, the manner of its functioning should be knowable in a way all minds who study it can agree on.

Obviously, then, if there is no order in nature, then no agreement about it would be possible. That there *is* such an order is a first principle of the scientist's dialogue with nature, one which is part of that intuitive faith Whitehead refers to in that "the ultimate natures of things lie together in a harmony which excludes mere arbitrariness". One key question that follows is: How far does the order in nature extend? A second idea also follows, namely: If there is no intersubjective agreement, then there can be no dialogue with nature.[212] If so, then intersubjective agreement serves as a condition for one to have a successful dialogue with the order in nature. When put this way, statements, or hypotheses, about the order of nature must be posed in such a way that the methods of valid research can be used to determine if they are true or not. Without the shared intellectual tools that intersubjectivity calls for, then what we say about the order in nature would depend instead on each person's own act of perception. This however is different from question of validity, which is a judgement on how free of error are the efforts to know something about the order of nature, and hence whether or not what is said about that order can be defended.

Intersubjectivity is instead a statement about the complementarity between what the order in nature is like, and the capacity of human intellects to obtain a shared recognition of it. It is furthermore worth noting that part of achieving such a shared recognition concerns the way in which our formulation of concepts. definitions and the like meet external criteria, for example, the criteria set down for correct reasoning about them. Crucially, in the classical sense the correctness of our reasoning with concepts, definitions and the like defers to the conditions set out by the order in nature, this by virtue of the fact that at some level of description the order in nature exists independently of any mind that can reason about it. Once again, from the naturalistic standpoint intersubjective is not methodology, but a condition that methodology must meet if we are to have a successful dialogue with the order found in nature.

As an aside, and from the point of view being highlighted here, the image of a machine-like order in nature employs a distinction between matter and mind, or extension and thought. Once this is granted, then a line between object and subject can be drawn. With this comes a whole range of philosophical problems in objectivity verses subjectivity. More particularly, once the distinction is posited as part of the fabric of things, to borrow a phrase from Charles Taylor, then the first problem for philosophy is to figure out how the mind can gain knowledge of the objective realm that stands over and against it.[213] It is worth qualifying mechanism here with the term material, or inanimate, since, as with Whitehead, a position of organic mechanism can be worked out.[214]

Methods of science are set up then so as to meet the condition that they be intersubjectively available. This becomes the basis for research design, but, again, is not itself a methodological procedure. It may even point to some kind of condition of possibility for the human intellect to possess knowledge of a natural order, but that is another question. Even if the methods of science and the standards of valid research change and shift, they still work to ensure that the results of research, whatever they might be, meet this intersubjective condition. It is in this way then that conclusions in science can be discussed, debated, confirmed or rejected. The context of such

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discussion makes it possible for individuals to say something about what is or what is not the case in the common human world – if not exactly so, then at least to the best approximation available.[215] From this mainstream point of view then, the pursuit of true or truthful statements about objects of research in science rests centrally on intersubjectivity, and this term is used here to replace the ambiguous notion of objectivity. It is perhaps worth adding that for intersubjectivity to be possible, then certain assumptions are made about what kinds of things make up the universe, the functioning of which can be observed and known intersubjectively. Obviously, scientists avoid asking the question: In what way can we say the universe exists? Instead they ask the question: What can we say about how the universe "has and is likely to function"?[216]

In terms of the naturalistic standpoint then, intersubjectivity is a problem of epistemology. However the way the problem is posed arises by virtue of adopting a particular ontology – one in which intersubjectivity serves as a kind of litmus test for knowing phenomena that exist independently of our idiosyncratic perceptions of them. In other words, if in the attempt to know object A we succeed in formulating an intersubjective account of it, than to that extent object A can be said to possess an independent existence. If so, then the contra-positive statement will also hold, namely, that to the extent object A does not possess an independent existence, then we will not succeed in formulating an intersubjective account of it. As an aside, it is interesting to suggest that the contra-positive statement as it stands here does not say that we already know in advance that it is impossible to construct an intersubjective account of A.

At the same time, in the naturalistic standpoint the individual mind is a part of that ontology. It stands separate from a world of objects in that it is the locus of consciousness. Once this distinction is accepted, then it is entirely proper to focus on what stance the mind must take in order to obtain knowledge of the world. Hence, the idea of the naturalistic standpoint. In this case the term objectivity is ambiguous. It is not only a matter of following procedures that are trusted to give valid results. It is as well a standpoint to the world from which an intellect can commit itself to the epistemic imperative. By so doing one can have faith that we can formulate mechanically inspired explanations of an intersubjective sort that say something about a rational, but neutral, order in nature. Here the mind takes on a stance in accordance with the kinds of objects that stand over and against it. Such a view however is not without its critics, of which R. D. Laing in his well known work first published in 1982 is a good example, posing the question: What is the matter with mind?

R. D. Laing

The objective viewpoint has come under much criticism, from the time the abstractions of modern science were worked out in the seventeenth century right to the present day.[217] R. D. Laing in What is the Matter with Mind (1982) provides a useful opening into questions around the world of the subject, or the subjective, as initially discussed in the previous sections.[218] Laing has this to say about the scientist's act of adopting what he calls an objective mode of thought:

> Our subjectivity cannot be seen, touched. It is not an object. It exists, and yet the immediacy of our experience is closed to, is not available for, is inaccessible to natural scientific study. We know that meaning, value, quality, love and hate, good and evil, beauty and ugliness, exist in some way, which is not a number or a quantity, or a thing. We know, therefore that we, our existing selves, are immeasurable. The natural scientist explicitly excludes that subjective morass, he leaves all of that behind, he sheds all he can of it, before even embarking on his voyage of discovery.[219]

To this he then adds:

> The starting point for science is an already sophisticated transform of naive experience. But science does not stay within its initially already objectified, quantified, de-experimentalized experience. It goes beyond all experience however experientially ablated, which remains its starting- and returning-

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> point, to explain it, to predict it, and so better to manipulate and change it, to control it, to destroy it, maybe, who knows, to create it. The scientist 'explains' the realities or fictions of experience from inferred non-experientable events, real or fictional, and he tests the reliability and validity of his *explanans*, by reference to his unreal *explananda*.[220]

Laing is writing as a psychologist. In that regard it makes sense that he sees the objective stance from the point of view of the scientist's personal mental act which changes his own perception of the world. What makes Laing suspicious, if that is the correct choice of word, is that the scientist forgets what he has done to his own way of seeing things, as if science can be accomplished without there being a person who does it:

> In order to begin to be a scientist, the pre-scientist, the prospective scientist has to perform a number of entirely subjective operations on his own subjectivity. These entail an attempted de-subjectification and objectification of his scientific domain. This requires (1) the ablation or elimination of some or all sense data; (2) the temporary suspension of any subject of cognisance; (3) the cutting off of any relation of intersubjectivity, or interiority; (4) the derealization of any subjectivity out there.[221]

He then proceeds:

> Erasure of subjectivity, in order to be objective, is itself a subjective act. What else can it be? The self-desubjectified-objectified scientist in a de-subjectified-objectified world is already an altered reality, he is looking at altered reality in an altered way. Science originally is a way of seeing.[222]

Of course, Laing's use of the term intersubjectivity differs from how it is being developed in this chapter. Part of this objective-subjective way of thinking, deriving as it does from the naturalistic assumption that matter and mind are distinct categories, is a division between objective science and subjective values. In the same article Laing later on states that:

> Objective science, being non-subjective, has nothing to say about knowledge of subjectivity, about the knowing subject and his relation to other known subjects. Our intersubjectivity, our hopes, our fears, our promises, our oaths, our intentions, our betrayals, our faith, our belief, our hate and our love, our sense of right and wrong – all our subjective values are objectively valueless. Perception, Merleau-Ponty used to claim, was an act of communion. This communion is not part of the scientific method and is scientifically, objectively, epistemologically worthless.[223]

While Laing is suspicious of the kind of thinking involved in the scientist's act of objectification, at least in so far as it tends to misshape the richness of shared subjective life (which he calls intersubjectivity), he does seem to take on some implications of the original assumption behind naturalism (i.e. that matter and mind are distinct). In the first instance, he relies heavily on objective *vs* subjective notions, which appears to call up the philosophical legacy of the modern age. Also, if an additional quote from Laing is not out of place, he seems to accept that all things can be explained as patterns of matter, or patterns of material mind, the notion of which appears to adopt the one pole of the distinction that gave rise to such questions in the first place. Laing writes:

> We are transforms of materia[l], patterns of the ultra-microscopic dust. From dust to dust, the patterns that survive are those which best fit into the patterns we are. It is no use asking what pattern is *that*, but it is, at any rate, clear that patterns in the dust are not themselves dust. A pattern of pipes is not a pipe. No painting without paint, although the painting is not the paint.[224]

Laing then concludes as follows:

> We are mental matter, material minds. To say, on the other hand, that matter is mind, is like saying a television set is the programme it is showing ... Without the hardware there would be no programme. Without the programme there would be no point to the hardware.[225]

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His use of terms perhaps suggests that he does not entirely escape the broader scheme of naturalist thought in his attempt to formulate a critique of the scientist's act of objectification. In any event, Laing's position helps bring into focus a tradition of thought that would put limits on reasoning about experience in singularly objective terms. The general idea here is that part of what constitutes our existence as human persons is that we see the world from somewhere. The attempt to know the world in intersubjective terms, as it is being developed in this chapter, is an important step in coming to terms with what it is to be a human person. However, it would be a mistake to forget, on the strength of our intersubjective abstractions, those other aspects of our being that cannot be so easily netted by them. Here then, other patterns of reason are perhaps better suited to make sense of the ways in which matters of worth or significance form an intrinsic part of who we are.

Some further implications

In a classical sense then, science is a way of seeing intersubjectively.[226] What we see is a neutral world that exists in a certain way. Abstractions are used in that select specifically measurable characteristics of that world. Scientists establish methods of study fitted to those characteristics. They chooses external criteria for the making of valid inferences and subscribe to forms of public evaluation appropriate to its abstractions. Taking up an objective stance, at least in a classical sense, then implies two things.

First, that one adopts the view, whether reflectively or not, that the neutral universe is a world of objects or events that in some sense function independently of those who observe it or otherwise reason about it. Second, that the only way to obtain secure and reliable knowledge of such a universe is to reach intersubjective agreement in a dialogue with it, but where such agreement has little to do with the act of reaching a kind of community or political consensus.[227] In the effort to reach intersubjective agreement with nature, criteria are needed for the making of measurements, the drawing of inferences and the formulation of concepts. Such criteria help to ensure the scientific enterprise meets the highest standards of intellectual integrity. In other words, intersubjectivity carries forward the line of foundational reason that is central to the modern dialogue with nature. The point of the dialogue then is to pose questions of the human and natural worlds in such a way as to give intelligible responses of an intersubjective sort. Given these ideas, one might say there are two dialogues going on here, namely, the dialogue scientists have among themselves about the dialogue science has with the order found in nature and in the human and social worlds.

There is a third implication to taking on this kind of an objective stance, one which can be brought out in two steps. First, the universe is silent with regard to human intents, hopes and aspirations. As Taylor remarks, it makes no necessary claim on human choices in so far as the worthiness or significance of our actions is concerned.[228] The mind rather is the locus of consciousness, and is as well the determiner of the value to be put on human action. Second, to grasp the workings of such a universe, to be able to decipher how the human and natural worlds actually function, we are to free our thinking from the various pre-judgements and values that would get in the way of a detached search. The objective world presents itself to a trained observer. In order to know that world, the observer is to approach it on its own terms. If so, then one's personal hopes, emotional ties, and inherited judgements about what the human or natural worlds are like are to be put aside. To the extent this can be done, the mind will be better able formulate a more or less representative picture of the world. In other words, it will be better able to achieve minimum error in observation and research, which then translates into maximum validity of results, that is, the best approximation to the truth one can reasonably achieve. This then might be one possible rejoinder to Laing's criticism, at least from the naturalistic standpoint. Yes, science is a way of seeing, a way of seeing how the world behaves that is not coloured by the kinds of possibly faulty prejudices that in the past prompted men to act out of dogmatic belief in things unseen and imagined, and which at times contributed to the unnecessary suffering of men.[229]

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However the light of such success can also cast a shadow. Phenomena that are not intersubjectively available in the sense being discussed here can be labelled as subjective, in that they are no longer open to the procedures of science. In other words, phenomena that are not open to scientific study in that they are not intersubjectively available, will not have an objective status in the common human world. They instead become kinds of experiences perhaps imaginative, perhaps real, but certainly only for the individuals who have them. Here the term, subjective, has come to be used in a pejorative sense so as to designate the status or level of the possibly imagined reality of that kind of experience.[230] Taylor, for example, speaks of the projections of subjects.[231]

Science however is not just the work of individuals or even of a collaborative group. It can also be viewed as the work of a community of researchers as well as an institution. Be it at the level of the individual, the community or the institution, it has a task, as it were, to maintain intellectual integrity and so avoid movement either towards merely personal forms of knowledge or those tending towards a kind of aristocracy of ideas.[232] The scientist's commitment to the integrity of his method comes out of a belief in the unequalled status the institutional knowledge its community of researchers aims to provide. These ideas provide a lead-in to the way in which some contemporary notions regarding science as an institution are part and parcel of a naturalistic standpoint.

Part E: Methodological Integrity

Methodological integrity, a term adapted from Martin Gibbons' reference to methodological purity, is the fifth and final part of the chapter discussion.[233] The idea of methodological integrity, namely, that the institutional norms of the scientific community possess a distinctive character independent of other institutions of society, will be raised in various contexts in the paragraphs that follow. Such a notion is unique among the previous topics covered in this chapter. Its institutional character partly serves as a carrier of the naturalistic stance in the social world, and specifically in Western intellectual culture. More particularly, the discussion that follows will examine some basic ideas behind the idea that science is an unavoidably public and institutionalized effort. Some implications for making rational choices will also be considered, particularly those regarding the way patterns of reason used by institutions in making technology decisions are indebted to naturalistic ideas, at least to some extent. These kinds of issues also come to the fore later on in the thesis discussion, notably in Chapters Five and Six, when matters of practical reason are discussed in relation to the development and use of technology in an evolving world-dynamic, and where the work of a community of science can be viewed in part as an inheritance for all the world's inhabitants.

Scientific research

To begin with, the logic of scientific research, the care with which it is practised, the review procedures of the scientific community, the autonomy given to the institution of science, the conviction of the scientists themselves regarding the work they do and the seriousness with which the reports of scientific research are taken, all contribute to the high marks awarded to modern science as an institution. In the view of writers such as Mouton or Casti, the institution of science is bound to the norms of disinterested, testable knowledge.[234] Yes, so they might argue, mistakes or misjudgements do happen. A particular avenue of research might turn out to be a dead end, or individuals may attempt to promote a bogus or pseudoscientific position. But, on the whole, the social norms of science commit the enterprise to finding true statements about objects of study, or at least the best possible approximations to the truth under the circumstances that obtain in a study.
Arguing from an upbeat stance, such knowledge is demonstrated practically through the benefits it offers society. Specialised fields of research in the natural and biological sciences focus on the creation of materials or the engineering of organic matter that fit the needs of sophisticated industrial processes, technology innovation, agriculture and human health. Research in the human

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sciences provides the preferred source for making informed and rational social choices in such wide ranging areas as management practices, the delivery of public health, education provision, food security, and transportation logistics. Agricultural research has produced successful forms of food production, storage and processing techniques in what may be the planet's single most widespread application of industrial technology. The rise of computer technologies, based on mathematics, artificial intelligence, microelectronics and solid state physics, has led to a host of primary patents and the creation of a vast industry.

In such an argument, science is viewed not just as an institution for discovery and exploration of the natural order and the common human world, but also one that provides the means and knowledge to create technologies, support industrial development, and craft or synthesize new materials that contribute to material well-being. More generally, so the argument might go, its methods and conclusions influence conceptions of what society is and how it functions, as well as the general character of knowledge and the manner by which rational decisions are made within it. Indeed, to the extent that sociology is part of the scientific enterprise, then the study of society itself relies on concepts of science which in turn help shape the very same notions regarding the workings of society. The notion of Western analytical/empirical culture speaks to the weight given to the rationality of science and its institutional judgements. Included here would be the role of technology in what is typically called innovation. If so, then from this standpoint the kind of knowledge and institutional judgement science can provide speaks somewhat directly to technology development, as well as offering expert information and advice for all manner of public and private enterprise.[235]

This kind of thinking – that the institutional judgements and norms of science have a unique status in society – partly reflects certain aspect of the naturalistic stance in Western intellectual culture. For example, the community of science, through its norms based on the search for disinterested and testable truths about the observable order in nature and society, defends a view of knowledge that is taken to avoid a whole class of disagreements that emerge in other fields of thought. From this point of view, these other fields either fail to have a clear and precise method, or adopt norms and values that eventually fall away as its adherents confront problems they cannot resolve. Internal disagreement, or the passing of its originators and first defenders, then tends to shatter the common vision that helped create the field in the first place. Contentions arise that cannot be settled to anyone's satisfaction, resulting in a fragmented school of thought, or one that simply dies away. In comparison, again arguing from an upbeat naturalistic standpoint, the modern empirical sciences have a three hundred and fifty year-long history to their name – something few other Western institutions can approach. However, John Casti argues that these other institutions, such as the Roman Catholic and Greek Orthodox Churches and the Muslim Caliphate until its demise in the last century, unlike the empirical sciences, do not place at their core a publically instituted method for establishing true results about objects of study.[236]

More particularly, and arguing in the same vein, science as an institution is unique because first, the intellect of man has found a way of questioning the order of nature and society so as to receive intelligible answers, and second, the methods by which scientists question the order in nature and society are embodied in institutional norms based on the search for disinterested, testable truths that are intersubjectively available. One implication of these ideas is that the enterprise of science as an institution is otherwise free of unwarranted influence by the specific social or cultural contexts within which in it carries out its work. In other words, and continuing from this standpoint, in the ideal case the truths which the institution of science discovers and formulates are, in their central aspects, independent of the particular circumstances of its researchers and to some extent of historic time and place of their discovery. Yes, so the argument might go, Newton's line of thinking in *Principia* was couched in terms of Euclidean geometry which is essentially unintelligible to the

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modern scientist. However the concepts he used and the conclusions he reached can be translated into contemporary formulations. In this sense they still speak truly to the order found in nature. Said simply, Newton's laws of gravity are used today to land robot spacecraft on the surface of Mars

The argument that the discoveries of science are in some sense independent of the historic time and place in which they were made, would, from this point of view, presumably hold when it comes to the natural sciences. However, in the case of the social sciences this is less evident, especially where the results of social reach specifically concern a contemporary state of affairs. For example, the results of a poll designed to determine the views of a given population concerning a specific issue would only hold for a certain time, and would only make sense in a given place or set of social and historical circumstances. The point though is that the results of the poll are not in doubt, given the limits of that kind of study. In other words, general methods exist in terms of which researchers can generate true results about objects of study, even if its results are true only at a given time and place. Overall then, the naturalistic argument here is that since science does keep finding truths about the observable order in nature and society, then its institutional norms possess a special status among mankind's other various fields of study as well as other institutions of society.

A unique status

The following quote from Weinberg is a useful starting point for a discussion on the special status that science is thought to enjoy in relation to other fields of study, or institutions of society. It is worth noting that in the context of his comments, Weinberg is referring strictly to the natural sciences. He writes:

> If the content of science is ultimately impersonal, its conduct is part of human culture, and not the least interesting part. Some philosophers and sociologists have gone so far as to claim that scientific principles are, in whole or in part, social constructions, like the rules of contract law or contract bridge. Most working scientists find this 'social constructivist' point of view inconsistent with their own experience.
>
> Still, there is no doubt that the social context of science has become increasingly important to scientists, as we need to ask society to provide us with more and more expensive tools: accelerators, space vehicles, neutron sources, genome projects, and so on ... To earn society's support, we have to make true what we often claim: that today's basic scientific research is part of the culture of our times.[237]

Weinberg clearly does not want to say that the established principles and laws of nature in science derive from or are determined by a particular culture. In other words, he counters the notion that the laws of nature formulated by science would be different depending on the cultural context in which their discovery took place. His point instead is that science as an institution cannot remain aloof from the concerns of culture. However, he also appears to take a stronger stance, that the principles and content of science are not the result of a particular social construction. In other words, in such a view the institutional principles of scientific discovery as well as that which is discovered, are not determined at their core by extra-scientific societal or cultural factors. As an institution, the disinterested tenets of science arise from within the logic of scientific discovery itself, confirmed by the experience of working scientists, and which together ensure that its results are free of any deep forms of cultural construction.

Indeed, and arguing further from the same point of view, if the reality of the natural order does not depend as such on a knowing mind to be what it is, and if science does succeed in formulating true statements about the order in nature, then these statements represent in some important sense a part of the actual order of things, at least within the limits of the human mind to gain knowledge of them. The particular language in terms of which science as an institution works to formulate the

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truths that scientist's discover about the order of nature might differ, but what is essential as to its content would be the same. In other words, and for example, given any two different but valid formulations of the laws of physics, the one formulation could be shown to be isomorphic to the other. Simply, the formulations might look different but deep down they still say the same thing about how nature is observed to function. Such an idea calls to mind Bohr's comment that science does not investigate what nature *is*, it instead attempts to find out what we can say about it.[238] Bronowski has made like comments about Newton's approach to science which are apropos here:

> When Newton was challenged on such questions as 'You have not explained why gravity acts', 'You have not explained how action at a distance could take place' or indeed 'You have not explained why rays of light behave the way they do', he always answered in the same terms: 'I do make hypotheses'. By which he meant, 'I do not deal in metaphysical speculation. I lay down a law and derive the phenomena from it'.[239]

In Weinberg's terms then, scientific research cannot but be carried out in a particular society, and it is therefore wise to pay attention to the callings of that society. However, for him the actual content of science is not socially determined. From this point of view the institution of science is an institution *in* society but its norms and results are not fixed by that society, nor by the particular context in which its discoveries take place. In other words, science and the approximate truths it finds are not *of* society. Extending this line of reasoning, results in science derive instead from an independent method that is embedded in a rigorous public logic which is conducted by the judgements of a community of researchers whose criteria is the test of nature and the social world itself. In such arguments science is not created out of social whim, human imagination, or the ethical convictions, moral beliefs, and the personal values of its practitioners. Those who practice its methodological norms aim to describe and explain what is true about the observable world. From this standpoint its institutional norms derive from those principles of rationality that embody the epistemic imperative, full scientific mentality and intersubjective reason. It seeks to operate via intersubjective terms outside this or that flux of changing societal context and value by working down to the basic conditions for sound reasoning and discovery. Its communal and disinterested method works to find such laws or correlations as can be used to say how phenomena have been observed to function, and in some cases what will next be seen. From this point of view, the explanatory and predictive accounts of science, in part because of their evident success, have tended to be adopted by thinking humanity as a rational means to knowledge and informed choice.

Context and value

One implication of the notion that the established results of science are not dependent on the historic circumstance of its researchers, or the time and place of their discovery, is that knowledge gained through intersubjective reasoning can be largely free of context. In other words they work with facts that are as free as possible from interpretation. Here the truths, or facts, of science and the methods of reasoning by which they come to be established are often taken to be largely free of influence from outside the scientific enterprise. Particular discoveries may be made at different times based on the research of the day, but the discovery itself is not void of its objective content. Conclusions are always demonstrated through the empirical and rational requirements of an institutional science – requirements as they are exercised at a particular time in the tradition. Results and methods can always be revisited and corrected in the light of new knowledge and technique. Ideas that don't refer to actual properties in nature or characteristics in society will eventually fall away – like Lamarkian genetics or heat transfer through phlogiston. Furthermore, every result in science is approximately true. There is no absolute knowledge. As the work of science advances then the boundaries or limits of a particular theory become more clear. If so, then an adherence to i) the concrete facts of experiment and ii) established theories that continue to

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posses explanatory and predictive power, will ultimately show up faulty conclusions, incomplete conceptions and erroneous theories.

From the point of view adopted in the thesis, such a schema of knowledge is both indebted to and is part of the naturalistic stance. Here the knowing mind is that to which phenomena in the world are represented. It surveys nature or society, necessary commitments or prior judgments. The scientific mind takes a neutral stance: the physical universe or the common social world, whatever the object of study, exists to some extent independently from the mind and is best approached on its own terms. That which belongs to the mind is not be ascribed to the world being studied.

This view is arguably a holdover from the seventeenth century contrast between primary qualities that properly exist in the world of extension, and secondary qualities which are products of the observing mind but not properly residing in the common world.[240] Secondary qualities, such as what something smells or sounds like, or its taste, touch and colour, or whether it is hot or cold, are produced in the mind and are not part of an external world. In a sense this is what the naturalistic standpoint tends to also say about aesthetics and human expressions of emotion in that they are experiences which stand outside the workings of phenomena that are objectively real. As such they hold only for a person's personal descriptions, perceptions or constructions.[241] If so, then questions of aesthetics or emotion cannot be argued for in an intersubjective way, they being matters of personal taste or preference. It is a short step from here to related views about resolving moral or ethical disputes.

This is also where a scientist's value-free posture comes into play, here referring to Weinberg's observation in the quote above that "Most working scientists find this 'social constructivist' point of view inconsistent with their own experience".[242] In the ideal case, to ensure judgements are correct scientists remove all possible sources of bias and error from their research design. These in particular involve the personal ideas, opinions or pre-judgements on the part of the scientist that do not apply to a valid study. A scientist's personal values are suspended within the research process – except those such as the epistemic imperative, which he has adopted as his own as being intrinsic to science. Otherwise, private convictions or attitudes might be introduced into the experimental design, and this would threaten the validity of research results.[243] Hence, unlike a neutral stance which implies the universe exists in such a way that true results about objects of study are possible, a value-free posture is an attitude toward research design and execution that helps to ensure the scientist trains an unbiased intellect and his skills as an observer on what is being studied, and so help remove or minimize every possible threat to the validity of results.[244]

This combination of a neutral stance and a value-free posture is arguably part of that "habit of truth" which is highly regarded in the West's analytical/empirical culture.[245] It may contribute in part to that integrity of thought which makes up science as an institution. One implication of such a neutral stance and value-free posture is the need to foster the goals of an objective and unbiased mind, an unprejudiced attention to the results of inquiry no matter how contrary to human wishes. These goals emerge from the abstractions of the naturalistic stance, and arguably stand among the main drivers of the work of science as institution. From this point of view then, attention to a habit of truth can challenge long-held parochial views and prejudices that simply do not stand up to careful, dispassionate inspection.[246]

An institutional ethic

It is useful to return to ideas regarding intersubjective patterns of reason as a way of highlighting the links that exist between the methods of science and its institutional norms. From the naturalistic standpoint being discussed here, science comprises a host of methodological features that serve to cut away what is unwieldy or obscure. It moves from concrete experience to well formed

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abstractions open to the logic of theory and experimental design. In this way of thinking, events in nature, or in the common human world, are taken as phenomena to be measured, analysed and interpreted. Such ideas are suggested in the above quote from Bronowski, attributed to Newton: "I do not deal in metaphysical speculation. I lay down a law and derive the phenomena from it."

Experiments are designed around these abstractions. They proceed by isolating some measurable property or phenomena of nature or society. Where possible, this is done in a controlled setting so that those specific identified factors under study can be isolated, and bias and error be partly factored out from observations. Research is conceived and designed in such a way so that it is possible to draw conclusions from the results of experiment, whatever those results might be. These must face science's public review process, serving to confirm, extend, reject or revise.[247]

In this way of thinking, the process of theoretical and experimental research involves a whole community of work that is built up over time. Its procedures and results are to be communicated and scrutinised in open debate. Indeed, scientific knowledge is communally judged, a key characteristic of which comes in part from adopting an intersubjective platform. But, as might be argued from within the naturalistic standpoint, the communal nature of science develops out of the growing body of research that in principle tests itself via a rigorous public logic. Ideally, this is free from the play of personal values and vested interests. If so, then such a logic accompanies both the process of confirming individual discoveries, and the way science as an institution grows over time. From this point of view, although research mistakes can happen, and scientists can pursue lines of study based on inadequate concepts or an erroneous theory, in time the empirical test of science will clarify and correct. In other words, the scientific dialogue with nature, if doggedly pursued, will in time remove faulty notions, mistaken interpretations of data, and the like. Its results will eventually be corrected or certified by an institutional ethic centred on the "habit of truth" and via a shared intersubjective posture.[248] In this respect then, so the naturalistic argument might go, instead of being dependent on societal conditions or extra-scientific institutions, the results of science can serve as footing from which those societal conditions and institutions can themselves be studied.[249]

Technology and social progress

Arguments in favour of science's distinct institutional status can also look to the way technology transforms research into a means for altering the built environment. Such means are often taken to provide an effective approach to crafting, maintaining and improving the built environment, and with it the quality of people's lives. A common position taken here appears to be that without science and technology we will not solve well or easily the problems that stand in the way of societal progress. Jean-Marie Lehn in his article, Science and Society: the Natural-Unnatural Dualism (1996) offers a particularly upbeat statement of this view:

> [Science] promises a more complete understanding of the universe; ever greater creative power of chemical sciences over the structure and transformation of the inanimate as well as the living world; an increasing ability to take control over disease, ageing, and even over the evolution of the human species; a deeper penetration of the working of the brain, the nature of consciousness, and the origin of thought ... In a time when questions about the justification of continued scientific research are being asked, we must take a strong stand. Between continuing our investigations and stopping them, there is only one valid option: we must continue, because it is the fate of mankind to pursue the quest for knowledge, because it is the only way to solve problems that go unsolved, because we can not, we do not, have a right to close the road to the future.[250]

Lehn's "quest for knowledge" arguably refers to empirical science and technological know-how as carried out in the West's analytical/empirical culture. However, a caution is in order. Given the widespread adoption of the procedural norms of science as central to the making of rational choices, and given that its ideal of the pursuit of truth is embodied in an institutional ethic that is

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also part carrier of the naturalistic stance, then the very nature of problems people solve in order to "open the door to the future" may well tend to be seen in terms of the kinds of instrumental or procedural forms of reason that are part of an intellectual culture.

One implication here might be that the only conceivable solutions which institutions and decision-makers would be willing to risk trying are those supported by science and technological know-how. If so, then technology, science, and procedural patterns of rational choice would tend to take centre stage in decisions that might "open the door to the future" of a rapidly expanding technology age. Such thinking may restrict the approach one might take to understanding the nature of the problems one faces, as well as the kinds of responses they may call for. This might be particularly so when new materials or processes must be crafted and engineered in order to meet, or to further promote, the sophisticated operation of modern societies. The notion that our use of technology opens the door to more sophisticated forms of living suggests the distinction Laszlo makes in *The Multi-cultural Planet* (1993) between the technologization of culture, which is a largely divisive and monolithic process, and the acculturation of technology, which can open a different kind of door to unity in diversity. Such ideas will be considered in more detail in thesis Chapters Five and Six.[251]

These kinds of arguments suggests that there is an interplay between the methods of science designed to establish true or truthful results about objects of study, and the fact that science and technology are social enterprises the results of which no one person or age could alone reproduce. The following sub-sections pick up on this theme and attempt to explore it further.

Social norms

Robert Merton, in a variety of texts, has argued that the methods of science, in so far as they are universal, communal, disinterested, and sceptical, also constitute the values of the community of scientists. Together they constitute an expression of methodological integrity: that science as a communal activity rests on institutional norms that guide valid methods for study and research. However, these norms also derive from the scientist's own individual commitment to a communally expressed epistemic imperative. On the one hand, the epistemic imperative guides the decisions that maximise validity in research, while on the other, the principle of methodological integrity speaks to the institutional norms or canons of science that that are used to direct the various avenues by which intersubjective agreement is reached. In this way the work and results of scientists can come to be labelled legitimate, autonomous and valid. The following account, based mostly on the works of Merton, will attempt to detail some of these aspects.[252]

As a starting point, from the naturalistic standpoint science is valued for its intersubjective stance towards explaining the world, including man's life in society. As noted above, if the explanations of science are to remain objective, then its methods and results must not depend on the personal motives of individuals. This includes private discoveries, idiosyncratic states of mind, and a scientist's personal values. It ideally also includes vested interests, the demand of funders, the play of egotistical minds, and a desire for recognition, influence, wealth or authority. As hinted at by earlier quotes from Kahane, Weinberg, and Lehn, the patterns of reason used in science require that individual scholars subscribe to the norms and practice of research built up over generations of effort. By avoiding a personal or private approach, the results of science can be certified, corrected or extended by a community of thinkers whose shared ideas meet the condition that they be intersubjectively available. If so, then science is an autonomous and self-validating enterprise which exists *in* society but is not *of* society, where this means not having to adopt extra-scientific norms or requirements for it to certify its results.[253] The community of science works by its own methodological canons, either implicit or explicit, that are believed to ensure its pursuit of truth (the epistemic imperative) and to guarantee the integrity of its conclusions (intersubjective reason).

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According to Merton, such canons serve a twofold purpose, or function.[254] On the one hand they are technical requirements for experimental design. On the other hand, they are moral-like prescriptions for the integrity of knowledge. These help create a set of largely standardized convictions that come to characterise the ethos of the scientific community. Their acceptance and adoption by individuals forms a main entry point into scientific scholarship.[255] From this point of view, the tenets that guide scientific method are transferred from generation to generation of scientists through training or apprenticeship, and are reinforced by professional sanctions that might be meted out to those who would otherwise ignore them. This is one aspect where the notion of normal science comes into play.[256] These tenets are shared by all within the scientific community as core values and matters of a kind of intellectual conscience, giving to those who practice science a belief in its distinct status as an institution dedicated to discovering truths about man and nature.

In Merton's terms, the ethos of science, namely, those values and norms held to be binding on a researcher and in terms of which he or she may be called a scientist, are transferred across generations through the function of science as an institution.[257] In other words, the researcher is held to norms and procedures that guide and direct the enterprise as a whole. As an institution, science maintains technical procedures and normative research values, and so produces a commitment to a general will that, through the communal sense of integrity each individual scientist commits himself to, exerts a kind of decentralized control by virtue of shared commitment by each individual researcher to the aims of their profession.[258] Control is needed for one reason: to obtain true or truthful results about objects of study. Thus, as noted earlier, the institutional structure of science is based on its epistemic imperative, full scientific mentality and viewing the world from an intersubjective stance. Meanwhile, methodological integrity ensures that its results and procedures can and will be inherited from generation to generation.[259] Together these help to ensure that science as in institution remains both impersonal in its aims, and autonomous in its functioning. From this ideal case, the work of science then is the advancement of the human capacity for knowledge. To do this it must follow its methodological ethos to the exclusion of all else. Otherwise it would risk becoming something other than science.

One implication here is that to maintain the integrity of its methods, and hence the validity of its results, research will focus only on problems that can be defined intersubjectively. In part this means that researchers avoid conceptualizing their work in terms of its social repercussions. In other words, while a particular research project may be taken up because of a specific social problem, the research carried out is expected to produce results that stand independently. From this point of view, the design and results of research cannot be measured by the importance of the social problem it seeks to address, or the size of its funding. Conclusions stand first on the accepted procedure for valid research, and reasoning based on externally defined criteria.

At the same time, scientists as researchers refrain from judging the particular human value of the problem they are studying, or avoid judging the worthiness of people's actions or the conduct of society's institutions which their research involves. If science as an institution is to continue producing valid results then these kinds of value-questions remain outside the concerns of scientific research proper.[260] Furthermore, even as science cannot judge matters outside the sphere of its own competence, then other institutions in society cannot judge the proper functioning of science.[261]

Some implications for practical reason

The belief that research focuses on questions that can be defined intersubjectively, and is free of the immediate concerns of any particular value debate, links to some relatively deep ideas in the naturalistic stance, particularly those derived from seventeenth century Cartesian conceptions of extension and matter in the observable universe, and of thought in the arena of the perceiving mind. The following line of argument, adopted from Michael Gibbons, picks up on these ideas.[262]

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From the classical stance, the observable universe is composed of matter and energy that are endlessly moving, vibrating, oscillating. Composed solely of inanimate matter put together in a fantastic variety of complex configurations, the order in nature carries with it no intrinsic value or significance, save that which human persons might choose to ascribe to it. Under the same supposition, mind is the locus of consciousness and experience. In the form of the human subject it constructs its own values and sense of purpose, and defines for itself norms to monitor and guide human action. In this context, science sets out to study the order found in nature and the common human world. However, the terms of this study, or dialogue, are such that it has no access to the values and judgements which the subject constructs for his self. Put another way, the intersubjective stance does not operate in the realm of private experience in so far as it concern such matters as the determination of human purpose or the judgement of value and right.

In such arguments the means provided by a scientific knowledge of the way the "world has and is likely to function" may be seen as a necessary part of providing solutions to social problems.[263] This is the thrust of Lehn's argument. However, it may also be that sophisticated and powerful scientific knowledge and techniques have become so influential that even the ends of that prosperity are determined. In other words, ends are conceived in terms of, or characterized by, the achievable outcomes that science and science-based technology can provide. The point here is that not only are other ends not considered worth achieving, but that eventually none others can be effectively contemplated given the vastness of the means provided by scientific schemes of thought, practice, and influence which have become part and parcel of the institutions of society.

These ideas furthermore lead to the notion that the institutional character of science is part guarantor of its intellectual integrity. From this point of view, the institutional norms of science ensure that its results have a distinct status in that they provide the most trusted account of how to go about gaining knowledge of the world in which we live. Its explanations tend then to eclipse other conceptual schemes in Western thought. In such an account, science has a sophistication and exactness that makes other attempts at understanding more or less arguable matters of opinion. As a model of rational choice it has few peers. And yet, based on the argument from the second paragraph above, matters of values and commitments *per se* have no place in its abstractions. Science does not provide knowledge about what human goals and commitments to pursue. These lie outside the work of empirical science proper.

The general idea seems to be that given the factual diversity of ethical and value commitments as well as the evident inability of reason to arbitrate the differences found practically everywhere among those commitments, then procedural or instrumental patterns of reason do not apply here.[264] Such a diversity of ethical views suggests that values occupy a realm outside the working of reason since, in matters of worth generally, positions are adopted on the basis of differing sets of prior commitments.[265] Reason here is notoriously inept at affecting or bringing about a change of view in a person's beliefs.[266] Meanwhile, science and technology are valued for the theoretical and practical knowledge they offer, and which serves to demonstrate the powers of the human intellect. Yet those choices that concern human ends are outside the province of science *per se*. Here then the empirical sciences can see through things, but not much beyond them.[267]

Craft and innovation

One additional point needs to be added in the discussion of methodological integrity. Technology innovation and the role that science plays in crafting materials or processes, has served to change some basic notions about scientific explanation. Gibbons for one has argued for a new role of knowledge production.[268] He holds that contemporary science has developed into a range of specialist research problems. Science is not the pursuit of truth only; it is now also deeply connected to the task of crafting materials, processes, techniques, data, sophisticated information, or

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applicable models for specific industrial development and innovation. These require support from an equally large range of institutions in society that extend beyond the above account of methodological integrity. If so, then this clearly is a change from the traditional view, namely, that science is the pursuit of truths about the physical, human and social world. The issue then involves asking the question: What is the new role of knowledge as craft in the working of society?

In this context, science and technology have moved from explanation and prediction, to making materials, processes, and devices that meet the needs of an industrial and information society. Research centres on synthesising some technical phenomena that is of possible use to humans. Such efforts offer solutions to a specific problem, or which fulfils some human need or want. Furthermore, the systematic crafting of phenomena (or information) is quickened by the pace of technology innovation, which in turn requires the production of new knowledge.

Gibbons argues that as craft, science and technology share the same method.[269] While this contemporary role erodes the view that science involves a commitment to finding the truth, both still come out of the inheritance of the machine-like image of the order in nature. As Gibbons argues it, Descartes started with his fundamental doubt: that acquired knowledge is suspect, values are to be questioned and that, so far as knowledge is concerned, tradition is to be discounted.[270] Instead, mathematical-like reason, operating in the province of the mind, is the chief means to obtain secure and reliable knowledge. In order to be known, nature is to be reconstructed out of deliberate observation, and made sense of out of concepts in our minds. If so, then the things we can best understand are those which we ourselves make and control. Here our intelligence is more effective when applied to those uses we select and make according to our own chosen ends.[271] The point then to scientific research and technology innovation is not only to reconstruct for ourselves the processes in nature we seek to know, but to use those same skills and methods to build or synthesize materials and processes that suit our own needs. From this point of view, contemporary research as innovation and craft involves a similar kind of dialogue with nature as is carried out in the classical notion of what science is about. However the emphasis is different.[272]

From this general point of view then, contemporary scientific and technology research involves the crafting of tools, processes, and materials for innovation's sake. However, its methods and procedures are still linked to naturalistic assumptions regarding the nature of the world and what it is to know it, namely, that the neutral universe is distinct from the conscious mind.[273] If so, then choices about goals, the judgement of consequences, and the value placed on what people do with their knowledge still cannot be addressed by the ethic of research for craft sake. In other words, a sceptical attitude to judgments of worth still obtains. In part this is because the notion that knowledge is factual, not evaluative, has become part of the structure of research generally and of Western intellectual culture at large. Since the concept of rationality remains partly indebted to norms of scientific thought, then these kinds of evaluative questions are taken to remain outside the realm of rational arbitration or scientific formulation, even though science understood as craft is much more intimately connected with social needs.

Technology and intelligence

The previous discussions serve to suggest that Western modes of thought are still influenced by the ontology of a neutral universe and how the mind might come to know it. For example, and according to Taylor, the model of procedural and foundational reason used in the sciences is often adopted as reason *per se*, and it is commonplace to think out questions about what something is in terms of questions that concern how it is known.[274] Here then the ontology of a neutral universe, procedural reason and the "primacy of the epistemological" are aspects of the naturalistic stance.[275]

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Some notions of technology appear to fit comfortably into this point of view. For example, technology can be seen as a particularly efficient form of instrumental reason, as evidenced by the way we use it to craft a superabundant range of tools, techniques and processes. More generally, in such a view these tools, techniques and processes could be thought of as artefacts that reflect a certain kind of thinking. The notion of intelligence based on the evolution of brain-hand co-ordination is another related idea. Here the human central nervous system has evolved in such a way as to require outside devices to demonstrate its potential. It then uses these devices to act intelligently, that is to say, to act in ways that increase its chances for survival.[276] This manner of thinking also suggests a view of technology as involving the fabrication and manipulation of various resources for the sake of human ends or purposes. In another version, the world can seen as a place of neutral resources that humans can use as they choose, one in which technology innovation and the building of an industrial society are particularly noteworthy. In a related sense, technology serves to amplify and extend human powers through what might be called prosthetic devices.[277] Such devices enable humans to control and manipulate processes found in nature, and to fabricate or synthesize new ones according to their own ends, wants, desires, needs and the like.

Given these ideas, Richard Heersmink, suggests two ways of thinking about technology, which he refers to as the weaker and stronger version. Quoting from Heersmink, he notes that: "Weaker versions define technology in relation to but distinct from the human organism, whereas stronger versions define technology in relation the human organism as symbiotic, co-constitutive, and define human and technology as one integrated functional system".[278] Here the importance of instrumental reason is shown in the way scientific models of the world are applied to the construction of technologies that work according to human design. Since the technologies work as designed, then the scientific models of nature upon which those designs rest are correct in some sense.

Similar ideas carry over to questions about our choices for the development and use of technology. A variety of questions can be posed here. What kind of an analysis is needed so as to understand the choices we face as clearly and precisely as possible? What are the foundational issues involved? What are the relevant factors that must be considered? On what basis do we calculate the risks and benefits, and so make a rational choice? What criteria do we use to select the correct course of action? In terms of the naturalistic standpoint, such questions tend to rely on instrumental thinking when making decisions about the development and use of technology. In addition, these kinds of questions are arguably based on notions of utility and rational action that reflect much about a neutral universe, particularly how in such a universe the human intellect relies on constructing its own criteria for practical choice in what is otherwise a field of neutral resources.

What then about issues of moral principle or ethical choice in the way we use technology? Here the question arises: Which decisions regarding the way we use technology are morally justified? Or, alternatively: Which choices are ethically correct? From the point of view of instrumental reason, the only sensible way to get at these questions is to ask: How can we know?, which is where Taylor's notion of "the primacy of the epistemological" comes to the fore.[279] In other words, what rational procedure can be set up to establish which decisions have a moral justification, or which choices are ethically correct? Here, however, the criteria for intersubjective knowledge seemingly cannot help us, since questions of human values, and matters of worth and the higher emotions are not open to intersubjective reason. If so, then the answer would appear to be in the negative, or at least that we cannot know in an intersubjective sense. This either first, because the moral sphere being what it is, the naturalistic model of reason simply cannot get a hold on it, or second, because there are no external criteria in terms of which the morally valid or ethically correct position can be rationally established (or the invalid or incorrect ones necessarily ruled out). In this case, either such criteria do not exist, or they exist, but then none can agree on what they are in any kind of

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intersubjective sense. On the whole, something else will decide our actions regarding technology, say for example, some model based on utility theory or rational decision-making.[280]

The kind of sceptical argument illustrated above, instead of prompting us to question our thinking, is instead one reason why procedural models of reason and the kind of useful knowledge science-based technology provides are sometimes viewed as a superior means to finding solutions to human problems. Lehn, cited above was a good example. Otherwise we will likely end up spinning our wheels, as it were, around inconclusive moral debate. However it may also be the case that the high marks given to procedural reason and practical know-how as means for solving human problems, can overshadow other patterns of practical reason about the character of human knowledge, moral judgement and our social choices. For example, assumptions about procedural reason may serve to colour the way in which we go about understanding a problem and finding a solution. Also, if it is assumed that there is a superior way of thinking rationally and acting effectively in the world, then this may serve to set down in advance the kinds of choices about the development and use of technology that will likely be made. The point here is not to object to thinking in such a rational and effective manner, only that there may be other patterns of reason that can offer fruitful gains in thinking about the development and use of technology, and especially so in a planetary age.

Part F: Chapter Summary

Five central notions have been discussed over these pages: the epistemic imperative, full scientific mentality, the machine-like image of the universe, intersubjective reason, and methodological integrity. Each of these contributed to the attempt to characterize the naturalistic stance as part of the West's intellectual inheritance and which influences thought and practice in its analytical/empirical culture. This is particularly so for conceptions of rationality, where the primacy of the epistemological and foundational criteria of argument play a role. In this chapter it has also been suggested how this conception of rationality can influence sceptical attitudes towards practical reason, and in turn how decisions about the use development and use of technology are made.

The discussion in Chapter One therefore has attempted to survey various ideas regarding explanation in relation to the naturalistic stance, and more particularly via a discussion of scientific method and rational choice. The point of these sections was not to offer a systematic study of explanation, although some key links between them have been repeatedly highlighted. Its key function has been to set out those preliminary ideas that will play an important part in the work that is still to come. The discussion in Chapter Two will attempt to do the same with understanding.

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Chapter Two: Qualitative reason, understanding, and the human sciences

Introduction

The discussion in Chapter Two will attempt to examine patterns of reason that are related to understanding. It constitutes the second of the two-part instalment in the thesis discussion on the naturalistic standpoint, following the first chapter's treatment of explanation. This second chapter discussion aims then to highlight a set of background ideas in dominant notions of understanding. It will do so by highlighting a set of concepts regarding qualitative research as is found in certain of the human sciences. As with the first chapter, the discussion here will be structured so as to get a clearer picture of notions of reason in general, and practical reason in particular, that are indebted to naturalistic assumptions. This will help set the stage for the treatment of ideas later in the thesis argument that aims to expand thinking beyond the usual range of abstractions found in the naturalistic stance, and which are relevant to a discussion of decisions regarding the development and use of technology in a planetary age.

Since a wide range of views exist pertaining to understanding, a few comments are needed regarding those that will be used in the following discussion. In the social sciences understanding is perhaps most typically linked to the methods and results of qualitative research. This will also hold for the discussion in Chapter Two. In other words, the discussion in thesis Chapter Two will explore patterns of reason used in the qualitative social sciences. The overall assumption behind the chapter narrative is that making better sense of the patterns of reason used in the social sciences related to understanding can help illuminate thinking about patterns of practical argument. A similar view was adopted in the previous chapter, although applied to explanation.

However, and furthermore, this chapter will only focus on a number of core themes, it being an attempt to introduce some useful ideas regarding understanding that can apply to notions of practical reason to be taken up and developed as the work continues. Since the field is extraordinarily wide, the aim of this chapter is not to be exhaustive in treatment, but to keep the discussion manageable, and therefore, to focus only on a specific set of ideas that will contribute to the discussion in subsequent chapters. As will be reemphasized at various points in the chapter narrative, the view of understanding being developed here, or more particularly, the pattern of reason that is taken up in the qualitative social sciences that aim at understanding, comes from the dominant assumptions found in the naturalistic standpoint. These assumptions, therefore, underlie the chapter discussion as regards various characterizations of understanding, the specific background conceptions in qualitative social research it treats, and the links it makes to explanation. The point, however, is not to enter the debate on the scientific status of the social research. The discussion will not question the aims and methods that accompany qualitative research. The chapter aims only to highlight some chief characteristics as regards understanding, and, where necessary, to point out some of the central shortcomings in the patterns of practical reason that accompany these.

For the sake of further clarity, in ordinary language the terms understanding and explanation are sometimes used interchangeably. For example, it can be said that one understands phenomena when the laws of physics are used to successfully account for what has been observed. However, the view taken up in this discussion is one that contrasts understanding with explanation. More particularly, explanation is said to aim at finding true results about objects of study in order to give an account of phenomena from a neutral and disengaged stance. The former is said to aim at making sense of people's daily lives in so far as their life and practices make sense to them. The discussion in Chapter Two employs the same distinction.

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It is also worth noting that the kind of scepticism towards practical reason highlighted in thesis Chapter One was based on a discussion of explanation from the point of view of a neutral universe that exists independently of the individual minds that know it. In the discussion in thesis Chapter Two a kindred scepticism towards practical argument will emerge, but this time from conceptions that accompany understanding. Doubt regarding the existence of conclusive practical moral arguments, whether they be viewed in terms of explanation or understanding, arguably speaks to what Taylor refers to as the contemporary Western experience of a morally pluralistic world.[281] In other words, when it comes to the moral sphere, a belief in the relativity of knowledge and judgement has become the intellectually acceptable position to take.[282]

The discussion in thesis Chapter Two is divided into five main parts. Briefly, Part A looks at a set of ideas from Martha Nussbaum in *The Quality of Life* (1993) that serve to introduce some main distinctions between quantitative and qualitative social research, or between explanation and understanding, and how each of these in their own way subscribes to an attitude of doubt towards the moral sphere of argument, at least so far as the naturalistic stance in Western intellectual culture is concerned.[283] Part B focuses on the ideas of Yvonna Lincoln and Egon Guba's *Naturalistic Inquiry*, (1985), and their particular conception of what constitutes the qualitative social sciences that aim at understanding.[284] Their ideas are discussed for a twofold purpose: first, to develop a richer contextual sense of the place of understanding in the human sciences, and second, to therefore gain some added insight into those patterns of reason found in the naturalistic standpoint that contribute to an attitude of doubt towards practical argument. Lastly, the discussion in Part C looks at three aspects that serve as a lead-in to the remainder of the thesis discussion. Part C will first highlight a few ideas from Charles Taylor *Philosophical Arguments* (1995) regarding some epistemological and ontological assumptions that contribute to an attitude of doubt towards the moral sphere of argument as is found in Western intellectual culture.[285] Second, it will point out a few aspects of what Taylor calls substantive reason that arguably serve to expand our notions of practical reason in such way as to give a different reading of scepticism. Part D highlights some ideas related to technology and understanding, based on the ideas discussed in both Chapters One and Two. Part E provides a brief chapter summary.

As the discussion proceeds the point will be made that the attempt to characterize qualitative research as being in opposition to quantitative research, or that understanding and explanation run along two different conceptual tracks, cannot be carried off beyond a certain level of analysis. The discussion in the chapter will argue that patterns of reason used in both are indebted to key naturalistic assumptions, are therefore closely related, and that their inability to resolve evaluative questions in a study of the social world is due to the abstractions under which they tend to operate.

Finally, although the discussion in each of the main chapter Part has a particular focus, the same root question is addressed in each, namely: In what sense do background notions in explanation and understanding based on the naturalistic stance serve to cast doubt on the validity of practical moral argument? Hence, similar themes are covered in each Part, whole each works from a different perspective. Where necessary a specific idea discussed earlier will be referenced again in another, not as a repetition of ideas but to help clarify or deepen a particular argument where needed.

Part A: Understanding and evaluative questions in the social sciences

The following paragraphs are written to highlight a few key notions related to understanding from the point of view of the naturalistic standpoint. Background ideas in the qualitative social sciences will be used to draw out these notions. More particularly, the discussion will explore three aspects related to understanding. First, the general contrast that is often made between quantitative and qualitative research, which, so far as the thesis argument is concerned, reflects a basic conceptual

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contrast between explanation and understanding. Second, the tendency for positions based on understanding to accept as given the broad scepticism towards matters of practical moral argument which is arguably part of contemporary Western intellectual culture. This attitude of doubt towards practical reason is also taken here to be one implication of thinking in terms of naturalistic abstractions. Third, the tendency for the qualitative social sciences that lead to understanding to adopt as given the concept of a person which Taylor describes as the self-defining subject, or self-defining individual, and which in turn contributes to a sceptical attitude towards practical reason.[286]

Two main views of practical reason

Martha Nussbaum, in Nussbaum and Amartya Sen's *The Quality of Life* (1993), offers a set of useful distinctions regarding quantitative and qualitative research.[287] Although her observations are set in the context of how to make sense of evaluative questions in the area of social and economic development, the ideas she puts forth are also relevant to the overview of understanding being attempted here in this chapter.

She notes that one will find two main stances in the contemporary philosophical discussion on the nature of the social sciences, namely explanation and understanding. Concerning explanation, and written in the context of someone who is trying to survey the field of social research for a model of reason that can help think through some of the evaluative issues development planners face, Nussbaum writes:[288]

> On the one hand she would find an approach that conceives of the social sciences as a kind of natural science, and of the reasoned understanding of human beings that is the goal of social science as an understanding detached from the commitments and self-understandings that are characteristic of human beings in their daily lives. Such approaches usually involve some sort of reduction of qualitative distinctions to quantitative distinctions; and they attach a great deal of importance to the simplified mathematical representation of complex human matters. This approach, which has had enormous influence in shaping economic approaches to development, seems to have the advantage of promising truly rational solutions to difficult problems of choice. But it may, in the end, seem unacceptable because of the way in which it obscures or denies the richness or plurality of human values and commitments (both across societies and within each single society), and because of its reductive understanding of what human beings and communities are.[289]

It is important to note that Nussbaum's use of the term understanding, in so far as it involves being "detached from the commitments and self-understandings that are characteristic of human beings in their daily lives", is what the thesis discussion has referred to as explanation. She portrays this kind of thinking in the social sciences as involving a reduction of experience to its quantitative terms, and, quoting from the passage, she link this reduction to the "simplified mathematical representation of complex human matters" as well as the accompanying prospects for "truly rational solutions to difficult problems of choice". These three aspects, the reduction of experience to quantitative terms, representation, and the search for truly rational solutions are very much in line with the discussion of explanation carried out in thesis Chapter One.

Also in terms of the discussion in the first chapter, part of what Nussbaum is arguably referring to here is the way a designative use of language takes concrete experience and represents it in terms of a rigorous and/or abstract syntax. Because the world of concrete experience is unwieldy so far as concerns the intellect's attempt to make clear and distinct sense of it, quantitative social research goes about the task of observing concrete social life with the aim to represent it in abstract terms that are amenable to various kinds of exacting measurement, unambiguous deduction, and the formulation of clear correlations in data. In other words, this is part of its epistemic imperative.
Although this general mode of analysis may have an enviable record of achievement in the empirical social sciences, Nussbaum notes one of its main shortcomings, namely that such a

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representation filters out "the richness or plurality of human values and commitments", to quote again from the above passage. The telling phrase she uses for this filtering of experience is that it "obscures or denies" some of what is of central importance to us as persons. It is worth noting that the sense of loss or compromise she connects with the reduction of human values to quantitative terms is also echoed in the views of Charles Taylor, for example as when he writes that "the attempt to separate out a language of neutral description, which combined with commitments or pro/con attitudes might recapture and make sense of our actual explanations, analysis, deliberation, etc., leads to failure and will always lead to failure".[290]

The link Nussbaum also makes between the quantitative reduction of experience, and prospects for "truly rational solutions to difficult problems of choice", is an important one in notions of explanation as highlighted in thesis Chapter One. Indeed, the discussion in the main sections of that chapter concerning the epistemic imperative, intersubjective reason, full scientific mentality and methodological integrity together speak to a particular rational approach to all manner of decisions. Another point to emphasize here is that, given the high marks awarded to the enterprise of science for its intellectual integrity and the success of its rational dialogue with the order found in nature and society, then the patterns of reason employed by modern science may at times be taken to exemplify reason *per se*, or at least stand as the clear choice for thinking to follow.[291] This appears to be particularly so in the West's intellectual tradition. There is a close connection here also to what the discussion in thesis Chapter One called explanatory power, in that man's dialogue with nature reveals the hidden mechanisms of phenomena in terms of which their prediction and control become possible.[292]

And yet, because of its tendency to filter out or explain away the richness of human values in research design, as well as the tendency for its conceptions of things to dominate other positions or perspectives, the practice of quantitative social science has generated what Nussbaum refers to as a reaction to its methods and ideas, one that has led to the qualitative social sciences based on understanding. Referring to qualitative research, or understanding, as an "alternative approach", that is to say, as an alternative to its quantitative counterpart, and once again written in the context of someone who is trying to survey the field of development research for a model of practical reason, Nussbaum writes:

> On the other hand, she would find a reaction against this [quantitative] approach, a reaction now well entrenched in the social sciences. This alternative [qualitative] approach insists in restoring human self-interpretation to the sphere of social analysis in all their richness and variety. But its proponents frequently give up on practical reason, holding that there is no way reason can really resolve evaluative disputes. It is held that once we understand that the points of view of the participants in the dispute, to be correctly represented, must be represented from within the participants' own perspective on the world, and once we understand, in addition, that cultural value schemes are highly various and largely incommensurable with one another, we will realize that practical reason has no effective part to play in such disputes.[293]

It is worth emphasizing that Nussbaum characterizes this qualitative reaction as something that is now well entrenched in the social sciences, and may in this regard be thought of as a substitute stance to the usual, mainstream empirical positions towards the study of our social world. While she stops short of calling it a rival position, meaning that to accept the one is to deny the other, the descriptive terms she uses serve to place special emphasis on the way the two positions are generally conceived as standing in contrast one to the other. In addition, Nussbaum is not putting forth an argument in favour of or against either form of social science. She is attempting to describe what one would find in contemporary philosophical discussions regarding those sciences.

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While it is perhaps typical to picture qualitative and qualitative social science as standing on opposites sides of the river, so to speak, it may be that at another level of analysis their contrary conceptions of things share a common root in the naturalistic stance. In other words, at some level of description both explanation and understanding subscribe to the same assumptions. If so, then at a different level of analysis they are not in fact rivals or contrasting positions. Instead, they branch from a common, more rooted conception regarding the nature of the world and what it is to know it.

Nevertheless, and in terms used by Nussbaum, the qualitative reaction to quantitative research seeks to bring to the human sciences a depth of insight into the way people live their lives as the object of good social research. By good social research is meant in part that both qualitative and quantitative studies be awarded full marks for their intellectual integrity. However, from the qualitative point of view, the focus of research is now directed at understanding people's behaviour and their practices. In other words, the researcher seeks to know these practices using the same terms and meanings by which the people being studied make sense of their own selves and their community lives. Here then, the qualitative approach seeks to incorporate into its research aims precisely those aspects which thinking in quantitative terms tend to exclude from its research design.

And yet crucially, Nussbaum goes on to make the point that the kind of qualitative social research she is discussing cannot by design enter into the arena of a critical evaluation of those practices it seeks to study. This is in part because, in the sphere of qualitative research, the point to understanding is to uncover, describe and give insight into a people's practices, beliefs or social contexts, and not to judge them in terms of the particular values of the researcher. This is probably one way of describing the epistemic imperative of qualitative research. Working behind this principle of research, namely, to bracket off the researcher's personal beliefs and judgements, is the conception that in the world of values there is no external platform upon which one can stand so as to judge the worthiness of someone else's form of life. If so, then the task of finding external criteria that can be used to decide between differing value positions is a very problematic one.

Some background ideas in knowing and judging

Picking up on the point that social scientists cannot presume to judge the practices of those people they seek to know, and referring to qualitative research or understanding as "This alternative approach" to explanation, Nussbaum writes that:

> This alternative approach [understanding] ... has an obvious appeal, where development studies are concerned, since it restores to the field of analysis so much of human life that the other approach [explanation] omits. And yet it may well seem in the end to be as unpalatable as the other, since it tells us that we cannot succeed in establishing by practical reasoning any conclusions critical of things we might like to criticise in societies whose traditions we are examining ... [It] tells us that any attempt we might make to criticize [another society's practices] is and can be nothing more than a kind of cultural imperialism.[294]

It is worth emphasizing one point made in the preceding passage, namely, that an approach towards understanding which "insists in restoring human self-interpretation to the sphere of social analysis in all their richness and variety" (to quote from Nussbaum) can in fact post relative gains in our knowledge of the social world. Meanwhile, however, by setting its aims on understanding the practices of those people it studies, and by doing so through the very terms and meanings the people themselves employ, then this kind of social analysis will of necessity avoid all forms of critical evaluative judgements regarding the worth of those practices. In simple terms, a researcher's job is to try to know the practices, not to pass judgement on them. The habit of truth that informs what scientists do, to use a phrase from Jacob Bronowski, is such that to pass judgement as to the moral rightness of the values of a people's beliefs or their social practices is not

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only invalid, but is to cloud the entire research process, and thereby allow errors or misconceptions to creep in and compromise its results.[295] To attempt to do so would be to counter its epistemic imperative.

Furthermore, Nussbaum's concluding observation above is that, from the point of view of good social research, in a world view where each culture or society adopts its own incommensurable standards of behaviour, then to presume to criticize or pass judgement on the worthiness of another's practices is "nothing more than a kind of cultural imperialism", to quote from the last line in the passage quoted above. If so, and if it is the case that there are no external criteria that can serve to adjudicate rival moral disputes or otherwise settle questions about acceptable forms of life, then the attempt to perform a critical evaluation of some other society or people is at least unconsciously ethnocentric. In the worst case, it is an attempt to act on the belief that one's own cultural point of view is the superior.

However, according to the view taken up in the thesis discussion such sceptical conclusions derive in part from the hold the naturalistic stance has on the conception of reason in Western intellectual culture. If we look further into the assumptions at work here, then we may find that other patterns of reason emerge, and some of these may be such as to give a different reading of what it is to be sceptical towards the moral sphere of argument.

Another point to make here is that the epistemic imperative for qualitative social research, namely, that it aims at understanding the practices of those people it studies through the very terms and meanings the people themselves employ, may tend one in the first place to take on board a range of sceptical views regarding the validity of practical argument in the moral sphere. To clarify, this is not a question of researchers having to suspend judgements of worth regarding the object of their investigation. Rather, and picking up on the discussion from thesis Chapter One, the very background conceptions to qualitative research, and not just its methodological norms, arguably serve to create an attitude of doubt around the status of practical reason. If so, then knowledge is not the kind of thing that one can gain from practical debate in the moral sphere. What is gained, or lost, in debates about the moral worthiness of our intents, actions, policies or decisions is something more akin to influence, stature or recognition. The sceptical stance that emerges here is such that it cannot be overcome or be resolved from within the usual range of naturalistic abstractions. Hence, and for example, even if one should like to debate the worthiness of some practice that speaks to a particular form of life in another culture, the West's largely unreflective acceptance of the naturalistic stance, and the accompanying unexamined beliefs about the nature of reason or rationality *per se*, makes of this debate a suspect act from the start. In this regard, the methods of science appear to be a reflection of these ideas.

The gap between reason, or knowledge, on the one hand and the ability to judge or to discern the worth of a form of life on the other, is arguably a reflection of the naturalistic standpoint in a number of ways. Among these is, first, the reality of the neutral universe such that it makes no claim on persons as moral creatures, or, as Whitehead puts it, "the universe moves endlessly, meaninglessly".[296] Second, that the individual mind or person is the locus of consciousness and alone determines the value of things. For instance, only individual human beings can be conscious of the observable universe, the content of their own thinking and judging, the thoughts and judgements of others, and one's own and other people's actions in the world at large. Third, people act in a world of neutral resources as individual agents according to their own intents and purposes.

It is worth noting that one particularly influential concept of a person in Western intellectual culture, what Taylor calls the self-defining subject, is arguably linked to the above three points.[297] In other words, in the Western tradition there is a tendency to think of persons as beings who make their own life plans, who act in the world according to their lights and talents, and who use the

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resources available in order to create forms of life as they might choose. Charles Taylor uses the phrase, "the freedom of the self-defining subject", to refer to these kinds of ideas regarding what it is to be a person.[298]

Of course, the concept of a person is no simple matter. The actual extent to which the notion of a self-defining individual is at work in notions of explanation and understanding is a moot point. However, the idea here is that, again following Taylor, the study of people and their practices in the social sciences at least tends to subscribe to the idea that people are self-defining individuals. In other words, researchers would not normally go about choosing which concept of a person to employ in their study. To the extent that the notion of a person in Western intellectual culture is influenced by this notion of self-definition, then researches would likely tend to take this on as an unexamined background idea.

With these ideas in place, the gap between reason, or knowledge, and the ability to judge or to discern the worth of a particular form of life, can be seen at least in part as resulting from a set of ideas indebted to the naturalistic stance. In particular, the background notions that qualify the practice of the social sciences, the ideas regarding both explanation and understanding that relate to the aims of those sciences and their epistemic imperatives, the shared assumptions adopted in both quantitative and qualitative social research regarding what constitutes reason as such, and the unexamined view that what the social sciences study are persons taken as self-defining subjects, go to make up a circle of ideas that are part of thinking from within the naturalistic standpoint.[299]

The naturalistic posture of doubt

In order to tie together the above set of ideas, it is worth exploring some of Nussbaum's observations regarding the posture of doubt towards the moral sphere of argument that arguably tends to accompany thinking from within the naturalistic standpoint. Once again, the context of Nussbaum's comments concerns the role of practical reason in trying to resolve the kinds of evaluative disputes that arise in development decisions:

> If it [practical reason] tries to take up a position of neutrality, detaching itself from all the competing conceptions, it will be unable to do so coherently, since no such external standpoint is available. If on the other hand, it remains within the perspective of one of the parties, it seems that it must prove unfair and insensitive to the concerns of the other party, and be, really, nothing more than an attempt to dominate the other party. At the bottom of all so-called reasoning, then, is nothing but power.[300]

As a point of clarity, Nussbaum regards this state of affairs as untenable, and she is looking instead for patterns of reason that can speak to the kinds of evaluative judgements workers in the development field have to face. She does concede, however, that, thanks to the influence of the naturalist reduction, to borrow a phrase from Taylor, such scepticism is commonplace in Western intellectual culture.[301] In either case then, whether one is thinking in terms of explanation or understanding, the generally accepted view is that practical reason does not succeed in making valid conclusions in the moral sphere of argument. Instead, practical reason is either a matter of being incoherent with regard to the moral sphere, or it involves the attempt to dominate others. In the end, the appearance of rationality, or the appearance of being rationally motivated, when it comes to people's moral choices would instead be more a matter of employing practical reason so as to exercise power over a given situation.[302]

It is worth noting a few things about the sense of doubt towards practical reason Nussbaum is trying to highlight in the above passage. First, and from a naturalistic standpoint, quantitative social analysis based on explanation works from a value-free, neutral and intersubjective stance. In other words, the ideal of methodological integrity as discussed in thesis Chapter One expects of the

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observer that he adopts a value-free analysis of any given social situation under study, and that it be carried out from a neutral conception as concerns the objects in that study. Such demands for a value free analysis and a neutral conception are arguably direct decedents of naturalistic assumptions. Second, and as Nussbaum observes, to think in terms of quantitative research leading to explanation, that is to say, to posit explanation as something integral to the epistemic imperative for a quantitative science, is to lose any coherent way of thinking about evaluative questions. Typically, this view tends to dismiss a constructive role for practical reason in making rational choices since the question "Which values are worthy of a form of life?" cannot be handled intersubjectively. That is to say, while the values people espouse may be studied, no critical judgment can be made about values *per se*. Third, given the above, then the conclusion tends to follow that, at least in the naturalistic perspective and from the point of view of explanation, there are no good arguments to be had when it comes to practical reason.[303] If the question of values is to be posed, then it might be approached in the social sciences as a study of people's pro-con preferences or the analysis of responses to rigorously formulated survey questions, and in this way bracket off what it is to make evaluative judgements.[304]

Second, and again from assumptions in the naturalistic stance, qualitative social analysis based on understanding requires that, metaphorically speaking, the human observer enters into a social world that is itself the point of study. Here then, people's values and commitments as they are shown up in daily behaviour and societal practices become part of the inquiry. To ignore their intentions and what they regard as being worthy or of value, would be to mutilate the hope of gaining a fuller grasp of the life they live. This approach thus constitutes good qualitative science. Yet, as the researcher enters into such a field of study, the only way to do this, so the argument goes, is to enter into some kind of rapport with the life of that society or with the practices of its peoples. If so, then it would make no sense to adopt an external standpoint. Neither would it be acceptable to stand in judgment of the lives of those people being studied. In other words, if understanding is integral to the epistemic imperative for the qualitative social sciences, then the whole point to knowing is to grasp the way people actually live, not to form judgments critical of their intentions, aspirations or cultural guiding images.[305] In this framework of ideas then, to judge those whom one is researching would be to compromise the integrity of research results.

Standing in the background to this point of knowing the world versus judging the worthiness of our intents or actions in it, is the naturalistic idea that the individual person is the locus of consciousness and the determiner of value. In other words, persons are self-defining individuals in so far as their values are concerned. But here the notion of self-definition connects to a primary trait of reason, namely, that external criteria are required to judge between two positions, or two arguments. Otherwise self-definition could degenerate into the idea that each person inhabits a self-constructed reality. And yet when it comes to judging the worthiness of that which people believe, famously, no such criteria exist. Either the criteria simply cannot be found, or the parties involved cannot agree on what they should be. We therefore come to Nussbaum's observation in the quote cited immediately above, that practical reason based on understanding is "... nothing more than an attempt to dominate the other party. At the bottom of all so-called reasoning, then, is nothing but power". Of course, some people might seek to dominate others, but the point here is that you cannot rationally get there. Said differently, to seek to dominate the world of ideas by regarding all contrary positions as rivals to be eliminated is what the thesis Introduction called the aristocracy of the intellect.[306] At the same time, the intellectually acceptable position to take in contemporary Western intellectual culture tends to be that, in a morally pluralistic world, anything like a conclusive moral argument is something of a misnomer, and particularly so for the pattern of reason exemplified by the qualitative social sciences that aim at understanding.

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The above discussion of the contrast between quantitative and qualitative social research, together with the sceptical attitude towards practical reason that tends to accompany their naturalistic assumptions, will be brought back into focus again in Part C of the chapter discussion. There the chapter narrative will explore in greater detail Taylor's analysis of a few of these of assumptions. The next Part B will attempt to offer some further ideas regarding understanding that emerge from the axiomatic approach to the qualitative social sciences adopted by Lincoln and Guba.

Part B: An axiomatic approach to the qualitative social sciences

Before beginning with the discussion in Part B, it is worth noting that Lincoln and Guba's argument in *Naturalistic Inquiry* (1985) is wide-ranging.[307] The pages that follow will not attempt to summarize or to critique their text as a whole, but to highlight some key aspects in their thinking that are relevant to the thesis argument. It also needs to be emphasized that the following discussion is not an attempt to enter into the debate on the scientific status of qualitative social research. Its point instead is twofold. First, to examine Lincoln and Guba's conception of the qualitative social sciences that lead to understanding. This will be done in order to provide some added context to the thesis discussion as a whole. Second, to highlight some naturalistic assumptions Lincoln and Guba arguably take up in the way they develop their topic, and which in turn mirror a generally sceptical attitude towards practical reason as tends to be found in Western intellectual culture.

It is important to note, however, that not all ideas Lincoln and Guba employ in their thinking are wholly naturalistic in spirit, and it would be erroneous to represent their thinking as such. They entertain a number of ideas that are distinctly non-naturalistic in tone, in that they move away from the usual machine-like conception of things. Their notion that the knower and what is known are interlinked, or that there is a kind of mutual interaction or shaping that characterizes cause-effect relations, are such examples. Indeed, some of Lincoln and Guba's ideas echo developments that will be discussed further on in the thesis, such as those regarding complexity, and which offer examples of thinking that tend to move away from the usual range of naturalistic abstractions.

Their thinking about what they term postpositivist inquiry does, however, offer something of an exemplar account of the qualitative social sciences that lead to understanding. And, as noted in the discussion of Nussbaum in Part A, such qualitative social sciences tend to assume as a matter of course a notion of reason that is part and parcel of naturalistic thinking. It is these kinds of naturalistic assumptions about reason, or what it is to give a rational account, as well as those that deal with ontology, that arguably lends their thinking to adopt a sceptical stance towards practical argument in the moral sphere, notably when it comes to their notion of a values-based inquiry.

The object then to the following discussion of Lincoln and Guba's ideas is not to represent their thinking as if it is everywhere naturalistic (in the sense used in this thesis), which it is not, but to try to highlight those aspects that arguably show a naturalistic indebtedness. This is particularly so in the way they adopt a naturalistic notion of reason that typically accompanies the attitude of doubt in Western intellectual culture towards practical argument in the moral sphere.

On a final note, Lincoln and Guba use the term naturalistic in a different way from the use of the tem in this thesis. Their use refers to an approach to social research, whereas in the thesis discussion the term refers to a general standpoint in Western intellectual culture.

Section 1: Irreconcilable paradigms

Lincoln and Guba begin with an extended discussion of what they call the naturalist paradigm. Briefly, they argue that inquiry in the physical and social sciences has passed through a set of paradigm eras, or periods, which they call prepositivist, positivist and postpositivist.[308] They write:

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> [E]ach period had its own set of basic beliefs or metaphysical principles in which its adherents believed and upon which they acted. We shall take the position that the positivist posture, while discredited by all vanguard thinkers in every know discipline continues to this day to guide the effort of practitioners of inquiry, particularly in the social or human sciences ... [S]ince these methods are based on metaphysical principles that are dissonant with the principles guiding the vanguard development of substantive (discipline) thought, it is imperative that inquiry itself be shifted from a positivist to a postpositivist stance. *For, if a new paradigm of thought and belief is emerging, it is necessary to construct a parallel new paradigm of inquiry.*[309]

Before continuing it is important to offer some clarifications regarding Lincoln and Guba's use of terms. In general, their notion of positivist inquiry, or the positivist paradigm, corresponds to what the thesis discussion has called the quantitative social sciences, or explanation. Whereas their notion of postpositivist inquiry, or the postpositivist paradigm, corresponds to what has been referred to in the thesis discussion as the qualitative social sciences, or understanding. The relation between these terms is not one to one, as there are cases where Lincoln and Guba point to developments in some twentieth century natural sciences which they think also give expression to "a new paradigm of thought and belief" which they call postpositivist.[310] However, there is, generally speaking, broad agreement between these terms, especially where Lincoln and Guba make it clear that theirs is an attempt to formulate a "new paradigm of inquiry" for the qualitative social sciences, as was quoted immediately above. It is also worth noting that the distinctions Lincoln and Guba make between positivist and postpositivist paradigms, or forms of inquiry, generally mirror the contrasts Nussbaum makes regarding the quantitative and qualitative social sciences, as discussed in Section A above. In the next discussion then, all these terms – positivist inquiry, the positivist paradigm, and quantitative research, as well as postpositivist inquiry, the postpositivist paradigm and qualitative research – will be used in an attempt to convey some of Lincoln and Guba's main ideas.

It is also important to note the distinction Lincoln and Guba make between two different types of paradigms. The first type encompasses a world of thought, reasoning and belief – a general world view – one which they argue is currently taking root across an entire intellectual culture. One could call this emerging intellectual culture a world-view paradigm, or Paradigm with a capital P. As just noted, Lincoln and Guba use the name postpositivist for this emerging Paradigm. The second kind of paradigm is a generalized conception of inquiry, under which can be subsumed a number of the qualitative social sciences, namely, those that have grown out of the postpositivist world view. Such a generalized conception of inquiry, or a paradigm of inquiry with a small case p, applies to a number of the qualitative social sciences, and is what Lincoln and Guba attempt to formalise in their axiomatic approach to postpositivist inquiry. Obviously, the two kinds of paradigms are closely related, and it would not make much sense to regard one in the absence of the other.

As a final, but crucial clarification, Lincoln and Guba use the terms the Naturalist Paradigm, or naturalistic inquiry, interchangeably with the terms the Postpositivist Paradigm or postpositivist inquiry. Hence, their use of the words naturalist, or naturalistic, is quite unlike what the thesis discussion has called the naturalistic stance or standpoint, a term it has borrowed from the writings of Charles Taylor. Therefore, and in order to avoid unnecessary confusion, henceforth in the chapter discussion what Lincoln and Guba call the naturalist paradigm or naturalistic inquiry will instead only be referred to as the postpositivist paradigm, postpositivist inquiry or a postpositivist stance – terms they also employ. The use of the terms naturalist or naturalistic stance in the thesis discussion will be restricted to those ideas first developed in Chapter One, and which the discussion in this chapter serve to further highlight as contributing to a generally sceptical attitude towards practical reason in Western intellectual culture.

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Given these clarifications, Lincoln and Guba attempt to draw out the implications of the radical distinction they make between the postpositivist and the positivist world views, or paradigm eras. Similar distinctions are then carried through in their discussion of the positivist versus postpositivist paradigms of inquiry. For example, and as they state at one point in their discussion regarding any attempt to join positivist and postpositivist thinking:

> [P]ostpositivism is not merely a perturbation, a wrinkle, a new angle that simply needs to be accommodated to make everything right [between positivist and postpositivist inquiry]. Postpositivism is an entirely new paradigm, *not* reconcilable with the old.[311]

Given that Lincoln and Guba's notion of Paradigm is crucial to their approach, it is therefore worth looking in more detail at their notion of Paradigm as world view, and especially so since it leads directly to their axiomatic approach to formulating the principles for a qualitative social science.

Lincoln and Guba begin their discussion of paradigms with the distinction between four different meanings of the term truth, namely empirical truths, logical truths, ethical truths and metaphysical truths.[312] More specifically and following Lincoln and Guba, empirical truths are statements that are consistent with nature, that is, they consist of those claims or hypothesises of science that can be shown to be or not to be in conformity with some observable aspect of the way the world functions. Logical truths consist of statements that are logically or mathematically consistent with other logical or mathematical statements, or with some basic postulate or belief. Meanwhile, a claim is ethically true "if the person who asserts it is acting in conformity with moral or professional standards of conduct".[313]

Crucial to Lincoln and Guba's point of view regarding paradigms concerns the point they make that each of these three kinds of truth carries with them a test by which one can in principle decide if a claim is true or not – the test of nature, of logical deduction or adherence to existing codes of ethical conduct respectively. In other words, there is some kind of external criteria at work. However, according to Lincoln and Guba, metaphysical statements carry no external criteria against which one can decide if they are true or not. As they write:

> Metaphysical beliefs must be accepted at face value ... Basic beliefs can never be proven ... They represent the ultimate benchmarks against which *everything else* is tested, for if there were something more fundamental against which a test might be made then that more fundamental entity would become *the* basic belief whose truth must be taken for granted.[314]

Given this stance regarding the existence of fundamental beliefs, Lincoln and Guba present their characterization of a paradigm:

> Now certain sets of such basic or metaphysical beliefs are sometimes constituted into a *system of ideas* that "either give us some judgement about the nature of reality, or a reason why we must be content with knowing something less than reality, along with a method for taking hold of whatever can be known". We shall call such a systematic set of beliefs together with their accompanying methods, *a paradigm*.
>
> Paradigms represent a distillation of what we think about the world (but cannot prove). Our actions in the world, including actions we take as inquirers, cannot occur without reference to those paradigms.[315]

One crucial aspect to this notion of paradigm that Lincoln and Guba emphasize is that, to the extent paradigms become world views, then they become part and parcel of one's thinking and acting. In other words, they make it possible to reason and judge without entering into an extended philosophical debate. If so, then a paradigm is a set of unquestioned, tacit beliefs about the nature and workings of the world, one in terms of which each person reads his or her own immediate reality. More precisely, they are not just unquestioned, but are also unexamined in the sense that

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they are taken up without reflection, or without any recognition that one has done so. They are the first readings of the world in terms of which all subsequent readings make sense.[316]

Given that paradigms are comprised of a set of metaphysical beliefs, together with methods for gaining knowledge, and given that "postpositivism is an entirely new paradigm not reconcilable with the old [positivist paradigm]", then, according to Lincoln and Guba, the positivist and postpositivist paradigms constitute two closed disjointed sets of ideas concerning the nature of the world and what it is to know it.[317] Lincoln and Guba then translate these world views into paradigms for inquiry, where, by implication, the quantitative and qualitative social sciences are conceived as constituting independent systems of thought each with their own set of primary definitions and fundamental postulates, theories corollaries and riders, as well as distinct methods of inquiry that follow a different, unlike set of norms, procedures and patterns of reason.

To be more accurate, Lincoln and Guba do not come to such a conclusion immediately. They lay the groundwork for their paradigms of inquiry by trying to show not only why positivist science, or the positivist era, succeeded in having such a widespread impact on all forms of inquiry, but offer a number of challenges to its assumptions and conception of things as to why they think its world view has fallen apart.[318] They argue that in its place is emerging a wholly new postpositivist paradigm era, the main features of which they wish to reconstruct using their axioms for postpositivist inquiry in the qualitative social sciences.

A final point of emphasis is needed about Lincoln and Guba's conception of paradigm as world view. Part of the criticism they level against the positivist paradigm is that it gives credence to the idea that its assumptions about reality are true. In other words, it gives credence to the belief that the claims about nature or the social world which it established are true statements about the real world. Lincoln and Guba refer to this as naive realism, and describe it as one of the three main assumptions in positivist inquiry.[319]

However, Lincoln and Guba make it clear that their expressed purpose is not to replace one world view with another, and by so doing to therefore perpetuate the illusion of truth which they regard as one of the fundamental failings of the positivist paradigm. In this regard they write:

> Since all theories and leading ideas of scientific history have, so far, been shown to be false and unacceptable, so surely will any theories we expound today ... We are not setting forth a new orthodoxy, instead we aim to make it a little more difficult to hold onto the old.[320]

Presumably then, their aim is to construct a view of the world which will not labour under that faulty belief that its theories and leading ideas deliver true statements about that world. It is worth noting that such a view is in line with the axiomatic approach they adopt.

A related kind of argument has been summarized by James Ladyman, though it is posed under a less sceptical attitude regarding the way science works. Here Ladyman is writing in the context of the debate over different notions of scientific realism:

> i) There have been many empirically successful theories in the history of science which have subsequently been rejected and whose theoretical terms do not refer according to our best current theories.
>
> ii) Our best current theories are no different in kind from those discarded theories and so we have no reason to think they will not ultimately be replaced as well.
>
> So, by induction we have positive reason to expect that our best current theories will be replaced by new theories according to which some of the central theoretical terms of our best current theories do

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> not refer, and hence we should not believe in the approximate truth or the successful reference of the theoretical terms of our best current theories.[321]

An important observation to make about their thinking here is that, in general, Lincoln and Guba's views regarding the postpositivist paradigm are based on a set of ideas that stand in direct opposition to the positivist stance. However, while admitting this they suggest that portraying things in this way is not entirely accurate. First, Lincoln and Guba argue that there is in fact widespread divergence on what constitutes the natural and empirical social sciences in the first place.[322] In other words, for Lincoln and Guba the positivist paradigm is not as monolithic as is perhaps believed. Instead, for Lincoln and Guba a world of contemporary thought and inquiry has emerged over time which, when carefully investigated, cannot be reconciled with the old in that, according to them, "we are dealing with an entirely new system of ideas based on fundamentally different – indeed, sharply contrasting – assumptions".[323]

According to Lincoln and Guba what is needed then is to uncover the foundational ideas of this new emerging paradigm, and from there to set down its specific metaphysical and epistemological assumptions in such a way as to avoid the faulty belief that these assumptions are true. To do this they turn to the main features of axiomatic systems.

The next step in the discussion in Part B is to examine more closely Lincoln and Guba's axioms for naturalistic inquiry, to see how Lincoln and Guba contrast them with their positivist counterparts, to try to highlight the picture of understanding that emerges, and so be in a better position to make sense of the patterns of practical reason that accompany it.

Section 2: Axioms for a postpositivist paradigm

At the start of Section 2 a few words are in order regarding the notion of an axiomatic system. Axioms state the first principles in terms of which all other propositions in a system of ideas are to be derived. Axioms are regarded either as being self-evidently true, hence needing no proof, or as statements that are chosen to serve as first principles for an abstract system of though, and are simply taken as such. This latter case deals with what are called formal axiomatic systems. Here the question of axioms being self-evidently true need not arise. However, in either case the choice of statements that will serve as axioms for a deductive system tend to meet certain criteria. For example, the axioms must be logically independent such that no one of them can be derived from the other. Also, no contradictory propositions are to be derived from the same set of axioms.

As suggested above, formal axiomatic systems do not involve statements that are true about some aspect of the world. Instead statements are formulated that follow deductively from the system's axioms and primary terms, that is, those terms for which no definitions are offered. This is done in accordance with the rules that specify the operations that can be performed on those terms. However, having set up a formal axiomatic system, then it may be possible to find what is called a model of that system. Models are sets of phenomena or conceptual schemes that can be observed or are known, the functioning of which satisfies the fundamental characteristics of the formal axiomatic system. If such a model can be found, then the system can be used to make better sense of the model, and to explore how good the fit is between axiom system and the phenomena or conceptual scheme they purportedly represent.

Having said this, thinking need not always proceed in terms of formal axiomatic systems. For example, attempts have been made to approach classical dynamics in physics as well as the theory of relativity in an axiomatic way.[324] Since the whole point in trying to create such a system of ideas is presumably to represent a body of established knowledge, then its axiom statements would not be strictly formal in nature. They would deal with what is known to be true about, say, the science of

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classical dynamics or relativity. If so, then for such non-formal systems another particularly important criterion comes on board regarding the choice of axioms. Not only must the axioms be self-evidently true, but they must be sufficient to generate the body of true statements that make up the field of knowledge the system is supposed to model. With these introductory comments regarding axiomatic systems out of the way, the discussion can now turn to some of the specifics found in Lincoln and Guba's standpoint.

An axiomatic approach to the social sciences

Lincoln and Guba adopt an axiomatic approach that arguably exhibit traits found in both formal and non-formal system building. For example, they have attempted to espy the main current of ideas in an emerging world view regarding the qualitative social sciences, and to formulate a set of self-evidently true axioms which they think are sufficient to model that world view – what they call a postpositivist paradigm of inquiry. At the same time, and according to their ideas regarding paradigms, they argue that the notion of a true statement only makes sense in the context of to a set of basic beliefs or independent world views. In other words, their axioms constitute one set of arbitrary statements among other sets of arbitrary statements, none of which can be said to be true of the world as such.

Such a hybrid approach serves to support Lincoln and Guba's position in two respects. First, by formulating their ideas in axiomatic terms they are relying on a respected method of reasoning. Because of its generality, it can be applied to a host of specific cases, these being types of inquiry within the qualitative social sciences. Second, by also taking a more formal view of their axioms they presumably hope to circumvent the mistaken judgement that by thinking or reasoning in terms of their system of ideas, or paradigm, one will be able to formulate true statements about a real world, a judgment it appears they particularly want to avoid.

To comment further, an axiomatic approach offers a way of thinking that can be defended on the basis of its internal consistency, in the sense that the axioms one chooses are logically arbitrary. In other words, in the formal axiomatic game one can chose axioms for any reason. Different sets of axioms will generate different, logically independent systems, or world views, if one likes. Some might be interesting and some might not be, but they all have equal logical status. That is to say, so long as they meet the criteria for axiomatic systems, then neither one is more true to reality than another. By thinking in this way, Lincoln and Guba can argue that they have not set out to formalize a new orthodox view to replace an old one. Instead, the object for them is to drive home the idea that, even as Euclidean Geometry was mistakenly taken to *be* geometry, that is to say, it was mistakenly taken to be true of the world until non-Euclidean geometries were invented, neither do the positivist nor the postpositivist paradigms offer the true picture of things. A multitude of paradigms exist, each logically valid as a paradigm, and each offering some one or another constructed view of the world which, no matter how promising they may at first appear to be, will eventually be recognized as being "false and unacceptable".[325]

This being said, Lincoln and Guba offer five axioms, or suppositions, for their postpositivist paradigm of inquiry. The following table, adapted from their *Naturalistic Inquiry* (1985), serves to underline the key differences they see between positivist and postpositivist suppositions.[326]

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Basic Issues:	Suppositions of the positivist world view (explanation):	Suppositions of the postpositivist world view (understanding):
1. What makes up the world ?	There is one common reality. It can be analyzed into parts and be reassembled again so as to explain reality and provide for prediction and control	Reality is multiple and constructed. These are social-psychological constructions, the various inquiries into which diverge. At best, one may gain some level of understanding of these constructions.
2. What is the link between knower and known?	The knower stands outside the object of knowledge. A neutral stance is possible, as is an objective explanation.	The knower and what is known are interdependent and influence each other. A neutral stance is impossible, and there is no final objective account.
3. What kind of generalizations are possible?	Explanations are based on laws, rules or correlations that can be generalized across time and place.	Understanding is tentative, is situated in a unique time and place, and is decided by the context of the case.
4. What kinds of causal links are possible?	Events proceed temporally from their antecedent causes, and in principle can be isolated.	Cause-effect is non-linear and forms a complex system of mutual interactions that cannot be determined.
5. What role do values play?	A value-free analysis ensures valid research and the best approximation to the truth.	Values are part and parcel of what is to be studied. To dismiss them is to miss-shape one's understanding.

The ideas in the table serve to highlight at a glance one main aspect in Lincoln and Guba's thinking, namely, that for them the two world views stand in clear contrast to each other. The table also helps to point out some of the broad distinctions Lincoln and Guba's ideas imply for the notions of explanation and understanding, although their discussion of the axioms is not presented in terms of explanation and understanding as such.

Five axioms

These tabulated ideas obviously require further discussion. What follows therefore is the statement of Lincoln and Guba's postpositivist axioms and the corresponding positivist versions, together with some comments. The order of the axioms is according to numbering used by Lincoln and Guba. The same numbering was used in the table above. The wording of the axioms is quoted directly from Lincoln and Guba. However, their use of the term, naturalist, has been everywhere replaced with the bracketed term, postpositivist.[327] The italics are from the original.

Once more, it is worth recalling that the aim here is to i) give further context to a qualitative social science that leads to understanding, and ii) offer an analysis of ideas that can help highlight the model of reason Lincoln and Guba use, and iii) suggest what relation this model might have to matters regarding scepticism towards practical reason. The discussion of Lincoln and Guba's axioms follows.

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Axiom 1: The nature of reality (ontology).

> *Positivist version:* There is a single tangible reality "out there" fragmentable into independent variables and processes, any of which can be studied independently of the others; inquiry can converge onto that reality until, finally, it can be predicted and controlled.
> [*Postpositivist*] *version*: There are multiple constructed realities that can only be studied holistically; inquiry into these multiple realities will inevitably diverge (each inquiry raises more questions than it answers) so that prediction and control are unlikely outcomes although some level of understanding (*verstehen*) can be achieved.

It is worth noting at the outset that in Lincoln and Guba's postpositivist paradigm, reality is not singular, but plural, that is to say, it is multiple and constructed. The matter of how many constructed realities there actually are is probably an uninteresting question for them, since these realities are not static, hence capable of being counted. They comment that there could be as many constructed realties as there are people and their situation in society who construct them.[328] In this regard Lincoln and Guba make the following comment:

> There is, in this ontological position, always an infinite number of constructions that might be made and hence there are multiple realities. Any given construction may not be (and almost certainly is not) in a one to one relation to (or isomorphic with) other constructions of the same (by definition only) entity.[329]

Given these ideas, the thesis discussion will henceforth use the phrase multiply constructed reality when discussing the "infinite number of realities that might be made" as referred to in the quotation immediately above from Lincoln and Guba.

Concerning the different constructions which individuals make of what they elsewhere call a "common referent term", Lincoln and Guba cite examples such as Harvard University, handicapped children, good manners, educational research, a Camperdown elm tree, the Manhattan atomic bomb project and welfare mothers.[330] As they note: "None of those things exist in a form other than those constructed by the persons who 'recognize' the term ... Nor is any of those things 'really' the sum or aggregate of the individual constructions".[331] Presumably then, and in other words, they begin and end with the individual. Here Lincoln and Guba do not appear to be thinking in terms of levels of description, or levels of reality. At least on the surface, it would appear that their notion of multiply constructed realties constitutes a kind of pluralism of individual constructions joined to some notion of group agreement or consensus.[332]

With regard to this lattermost point, they go on to note that, in so far as a theory of truth is concerned, the one that conforms to the notion of multiply constructed realities is a consensus theory. Such a theory, they state, "asserts that observation sentences are those that are reinforced as such by the consensus of the community ... In general, group agreement determines the truth".[333]

Another point to make here is that for Lincoln and Guba, the notion of understanding as referred to in their postpositivist version of Axiom 1 has a quite specific character to it. A few comments are worth making in this regard.

First, Lincoln and Guba phrase their postpositivist version using broad generalities. In part the use of broad generalities is what axioms are all about. Lincoln and Guba have before them a very wide range of qualitative social science methodologies and practices to try to bring together under one set of axioms.

Second, construction is central to their conception of inquiry. The point may be to convey the sense that people make their own social-psychological reality. In other words, their reality could have

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been otherwise than what it is and that it need not remain so, here meaning that some kind of alternative construction can be carried out.

Third, and finally, Lincoln and Guba also make the point that postpositivist inquiry has as its aim the reconstruction of those multiply constructed realities.[334] In other terms, the inquirer who aims know something of the human world does so by reconstructing for himself the multiply constructed realties of that human world he seeks to know. To the extent a person achieves this, then one could say he possesses a certain level of understanding. In short, understanding is what comes from an inquirer's own reconstruction of other people's multiply constructed realities.

In addition, these realities are not "out there" as Lincoln and Guba put it in their positivist version of Axiom 1. The reality of a constructed world is of a different sort than this. In some sense it involves what individuals make of it, or how they regard it. In simpler terms, empirical research attempts to explain the world, while postpositivist inquiry seeks to understand the world view. In other words, inquiry seeks to reconstruct people's grasp of reality, which in the end and ultimately is itself a constructed view.

In Lincoln and Guba's formulation, the various reconstructions drawn up by the pens of inquirers can never converge to a common reading of things. In the terminology of Axiom 1, "inquiry into these multiple realities will inevitably diverge".[335] Presumably then, there is no lasting consensus among inquirers as to the content of their common referent terms or observation sentences. As such, they contain no objectively true statements regarding those terms or observations. Apparently then, an intersubjective account as discussed in thesis Chapter One Part D just isn't on the cards so far as inquiry goes within those qualitative sciences that satisfy Lincoln and Guba's axioms for a postpositivist paradigm.

Elaborating some, and arguably from a point of view such as Lincoln and Guba's, while some points of similarity may exist in a particular set of reconstructions, they do not converge to a single reality. Perhaps one could say that no uniform points of similarity will emerge. Said differently, the meaningful content of those reconstructions dealing with the same multiply constructed realities would never coincide or reach consensus. If so, then to claim that a particular reading is true as such would perhaps raise suspicions that someone is trying to stake a superior or dominant claim. Or, as Nussbaum puts it, the attempt to do so is nothing more than an attempt "to dominate the other party".[336]

Finally, Axiom 1 states that "multiple constructed realities can only be studied holistically". There are at least two senses in which the notion of holistic could be used here. First, that multiply constructed realities are to be studied in their totality as a collective, or second, that a particular inquiry into multiply constructed realities can only be approached in holistic sense, that is to say, by trying to taking everything about them into consideration. Looking at the rest of the axioms will held give further sense to Lincoln and Guba's use of the term.

> Axiom 2: The relation of the knower to the known (epistemology).
>
> > *Positivist version*: The inquirer and the object of inquiry are independent; the knower and the known constitute a discrete dualism.
> > [*Postpositivist*] *version*: The inquirer and the "object" of inquiry interact to influence each other; knower and known are inseparable.

As with the first axiom, the positivist and postpositivist versions of Axiom 2 are expressed in contrasting terms. In the former, knower and known are independent. In other words, the one exists without any necessary reference to the other. For example, from the point of view of explanation a general theory that is applied to the study of specific phenomena does not alter the phenomena or

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the theory. In the case of Lincoln and Guba's postpositivist paradigm however, the knower and what is known mutually influence each other. They do not occupy separable categories, but interact or communicate in some sense. Hence, Lincoln and Guba's use of inverted commas in the phrase, "object" of inquiry. Such a view has a contemporary spirit, and may be influenced by developments in 20th century physics, notably quantum mechanics.[337] If so, then theirs is evidently an attempt to counter the dichotomy between knower and known which they hold is part of the practice of classical science.

However, it may be that in trying to circumvent this dichotomy Lincoln and Guba tend to dismiss one of its poles, and take up the other. At least such a reading of Lincoln and Guba seems possible. Clearly, Lincoln and Guba do not accept the notion of a tangible reality "out there" and instead adopt the ontology of multiply constructed realties.[338] However, to the question, Who is doing the construction?, their answer appears to be, ultimately, the individual mind or actor.[339] For example, Lincoln and Guba argue that the notion of constructed reality is best suited to the social and behavioural world addressed in their postpositivist paradigm. They note that the ontological position adopted regarding constructed reality is that "*it doesn't exist until* ... it is *constructed* by an actor".[340] They also note that the idea of a constructed reality is held by "those who see reality as a construction in the minds of individuals."[341] If so, then one could perhaps say that the individual conscious mind is the locus of construction. Furthermore, given that individual minds differ, then we appear to be left with a pluralism of constructions, and, as note earlier, Lincoln and Guba argue that a world of multiple realities is accompanied by an infinite number of constructions.[342]

In any event, the point of rational inquiry in Lincoln and Guba's postpositivist sense is to enter the human world being studied, and to interact with it (hence actor) in such a way as to have a reasonable chance of creating in one's own mind and thought a trustworthy picture, a carefully crafted account, narrated in the same terms and constructed meanings the people themselves have made. In Lincoln and Guba's terms, an inquirer's approach would i) be placed within the broader framework of that which is to be studied, ii) map out certain initial bounds regarding the extent of the inquiry, and iii) establish a focus so far as concerns the specific aspects to study.[343]

For Lincoln and Guba, those who pursue a postpositivist approach to inquiry face added challenges when trying to reflect on, seek out, document, or otherwise uncover or disclose that which is tacit or hidden in a world made up of multiply constructed realities. They refer to this kind of inquiry as entering into the natural setting of those whom the inquirer seeks to understand.[344] Hence, the title of their work, *Naturalistic Inquiry*. Multiply constructed realties are taken as is, so to say, to be interacted with in the given context in which they have been constructed.[345] This way of thinking carries its own version of the epistemic imperative, namely, that inquiry aims at formulating the most authentic, trustworthy, real to life reconstruction possible.[346]

Such ideas lead to Lincoln and Guba's statement of Axiom 3.

> Axiom 3: The possibility of generalization.
>
> > *Positivist version*: The aim of inquiry is to develop a nomothetic body of knowledge in the form of generalizations that are truth statements free from both time and context (they will hold anywhere and at anytime).[347]
> > [*Postpositivist*] *version*: The aim of inquiry is to develop an ideographic body of knowledge in the form of "working hypotheses" that describe the individual case.[348]

In the postpositivist version of Axiom 3, it is not possible to formulate generalizations that apply to a host of cases irrespective of time or place. If generalizations are possible, then they are contextual. They are useful for the inquiry immediately at hand. Such a notion of generalization, or perhaps better, its impossibility, in Lincoln and Guba's conception of a postpositivist paradigm relates

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directly to their statement in Axiom 1 regarding the existence of multiply constructed realties such that "inquiry into these multiple realities will inevitably diverge".
Lincoln and Guba's postpositivist version of Axiom 3 posits what they refer to as an ideographic body of knowledge, in that it focuses on the particular, nuanced subtleties and tacit knowledge found in a given human or social context. A body of work is reconstructed around this context. Its findings are meant only for that particular case. It is worth noting that, from this point of view, a notion of intellectual integrity regarding the nature of inquiry might still apply – that is to say, a kind of scientific mentality is at work – only that it would not be the same sort as that which obtains in the mainstream case, and this because the epistemic imperatives at work in the positivist and postpositivist paradigms differ. More specifically, and in Lincoln and Guba's positivist sense, research aims at establishing true results about objects of study, whereas in the postpositivist case inquiry looks to put forth an authentic contextual reconstruction of people's lives and their practises in terms of their notion of multiply constructed realities.

For Lincoln and Guba, postpositivist hypotheses are works-in-progress. Various forms of open-ended learning about a situation are the norm. As such, the inquirer makes no claim to the effect that the conclusions he finds in his reconstruction can be generalized to other cases. There are a few senses in which this latter point might be so. First, the particular and context-specific circumstances that go hand in hand with the notion of multiply constructed realities would, for Lincoln and Guba, make it impossible to formulate statements that hold across place and time. Also, people's multiply constructed realities are always open to changing conditions which would make generalization a practical impossibility. This is perhaps one reason why they introduce the notion of working-hypotheses. Furthermore, and in principle, every postpositivist reconstruction is ultimately rooted in the perspective of some individual person, namely, the inquirer as a subject. If so, then no inquirer's reconstruction could be taken as constituting the general case.

It is perhaps also worth mentioning that, in the context of the above points concerning generalization, postpositivist inquiry would not necessarily start out with a fixed research hypothesis, the study of which is designed to establish its truth or falsehood. If so, then postpositivist research in Lincoln and Guba's terms would not regard an inquiry as failing by virtue of not formulating its results in such terms.

Said differently, as a system of thought the postpositivist paradigm stands logically independent from its positivist counterpart. So long as it is consistent within itself, then it need not be bothered by criticisms to the contrary, and, for this discussion, especially so where these criticisms are posed in terms of the positivist paradigm. However, it is interesting to note the similarity these ideas have with an observation made by Whitehead regarding the mainstream empirical sciences: "Its general success made it impervious to criticism, then and now. The world of science has always remained perfectly satisfied with its peculiar abstractions. They work and that is sufficient for it."[349] The similarity may not be surprising, at least to the extent that contemporary ideas regarding axiomatic systems are in some sense indebted to the naturalistic standpoint.

> Axiom 4: The possibility of causal linkages.
>
> > *Positivist version*: Every action can be explained as the result (effect) of a real cause that precedes the effect temporally (or is at least simultaneous with it).
> > [*Postpositivist*] *version*: All entities are in a state of mutual simultaneous shaping so that it is impossible to distinguish causes from effects.

The question of cause and effect, the point of Lincoln and Guba's Axiom 4, is once again posed in the postpositivist version as a counter to classical notions of explanation, which aims to account for events in precise mechanical terms according to their definite antecedents. This denial of the

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mechanistic assumption of positivist inquiry implies that postpositivist inquiry will not result in the kind of knowledge that explanation delivers.
In the postpositivist version of Axiom 4, Lincoln and Guba instead posit the idea that it is impossible to distinguish causes from effects, and this because of what they describe as a state of mutual simultaneous shaping that obtains for all entities, presumably meaning the multiply constructed realities of the postpositivist world. Theirs is arguably a somewhat radial position, and may have been formulated in such a way as to negate its positivist counterpart, or to at least accentuate Lincoln and Guba's view that the positivist and postpositivist paradigms are irreconcilable at their core.

In any event, the point here appears to be that the nature of things is such that subsequent states cannot be described in terms of, or as resulting from, the actions of former states. Instead, the multiply constructed realties that constitute the social world mutually and/or simultaneously influence and shape each other. For Lincoln and Guba, the nature of this mutual interaction makes it impossible to ferret out what is cause and what is effect. If so, then it would make no sense for postpositivist inquiry to try to offer reconstructions that are posed in terms of events and their antecedents. Given this, then accounts based on Lincoln and Guba's postpositivist inquiry would seek to reconstruct something of the rich, nuanced character of those interactions that are observed to take place in people's own constructed forms of life and societal contexts. It may even be that at this level too, notions of cause and effect may not apply. In other words, people may make sense of their own constructed forms of life and societal contexts not in terms of cause and effect, but as a matter of mutual simultaneous shaping. Interestingly though, should people in fact construct their realties in terms of cause and effect, then presumably the inquirer's reconstruction would have to reflect this, although the reconstruction as such could not be phrased in terms of cause and effect.

The role of values in inquiry constitutes Lincoln and Guba's fifth and final axiom:

> Axiom 5: The role of values in inquiry (axiology).[350]
>
> *Positivist version:* Inquiry is value-free and can be guaranteed to be so by virtue of the objective methodology employed.
> [*Postpositivist*] *version:* Inquiry is value-bound in at least five ways, captured in the corollaries that follow:
>
> *Corollary 1*: Inquiries are influenced by *inquirer* values as expressed in the choice of a problem, evaluand, or policy option, and in the framing, bounding, and focusing of that problem, evaluand, or policy option.
> *Corollary 2*: Inquiry is influenced by the choice of *paradigm* that guides the investigation into the problem.
> *Corollary 3*: Inquiry is influenced by the *substantive theory* utilized to guide the collection and analysis of data and in the interpretation of findings.
> *Corollary 4*: Inquiry is influenced by the values that inhere in the *context.*
> *Corollary 5:* With respect to corollaries 1 through 4 above, inquiry is either *value-resonant* (reinforcing and congruent) or *value-dissonant* (conflicting). Problem, evaluand, or policy option, paradigm, theory, *and* context must exhibit congruence (value-resonance) if the inquiry is to produce meaningful results.

Lincoln and Guba's last axiom reads differently, needing five corollaries in their postpositivist version to clarify what the value question in inquiry is all about. Its wording arguably suggests that behind Lincoln and Guba's thinking is the view that, first, when it comes to inquiry in the social sciences, the values people espouse are subtle and hard to get at, and second, clear and explicit criteria are needed so as to specify where values fit into postpositivist inquiry.

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Obviously, in Lincoln and Guba's conception, values cannot be removed from any postpositivist inquiry due to the nature of the world as multiply constructed realities. Contributing to this point is the notion from Lincoln and Guba's Axiom 2, that "knower and known are inseparable", as well as the ideas from Axioms 3, that postpositivist inquiry deals with "working hypotheses" fit the single case, and Axiom 4, that all entities in the postpositivist paradigm "are in a state of mutual simultaneous shaping".[351] Equally so, since values cannot be removed from an inquirer's reconstruction, then it make no sense to pursue forms of inquiry that try to work around them as if they are a threat to the validity of one's research. At the same time, however, Lincoln and Guba word their five corollaries so as to emphasize that care that must go into the design of all postpositivist forms of inquiry precisely because they are value-laden.

It is also useful to note that Lincoln and Guba appear not to restrict the notion of value to any one sphere of experience. When it comes to their postpositivist inquiry in the social sciences, the whole range of value ascriptions could well apply. For example, aesthetic values, economic values, educational values and the like. This idea may be one of the distinguishing features of Lincoln and Guba's thought, namely, that all values are of similar impotance in so far as inquiry is concerned. If so, then it may also suggest links to a generally pluralistic point of view that appears to follow from their statement of Axiom 1. A further possible implication of their notion of multiply constructed realities is that there are no levels of reality, or some kind of hierarchy, in such a world.

Since their wording of the corollaries is posed so as to embed values, as it were, across multiple aspects of inquiry, then a likely point behind their statement of Axiom 5 is to stress one of their principle ideas: that one cannot in fact formulate statements about values that are true for everyone. From a point of view such as Lincoln and Guba's this is so because either i) values change in unknown ways across different social contexts as well as within the perspective of the individual (self-defining?) person, or ii) in any given paradigm, individuals construct their own definitions of what it is to reason about, or come to terms with, things like values. Another way of saying this is that in the case of Lincoln and Guba's postpositivist paradigm, values have no objective status, hence true for everyone.[352] Of course, people possess varying degrees of certitude in the values they espouse, but from a point of view such as Lincoln and Guba's, this would simply be part of a world of multiply constructed realities. Of course, it remains possible within a certain specific context for an inquirer to make sense of how people think about their values, or act with respect to them. But here the notion of making sense of them has nothing to do with passing judgement as to their worthiness or blameworthiness.

To be fair, it is important here not to misplace the point Lincoln and Guba's are arguably trying to make in their fifth axiom, that, so far as postpositivist inquiry is concerned, people's values are neither tangible nor immaterial. They are important intellectual constructions belonging to a world of multiply constructed realities. As such Lincoln and Guba use their five corollaries to specify the criteria in terms of which a values-based inquiry is to proceed towards a trustworthy reconstruction.

Three possible suppositions

Looking back on the discussion of these axioms, it is possible that Lincoln and Guba's formulation has incorporated three main suppositions from the naturalistic standpoint, at least as it is being discussed in this thesis. Although a more thorough study of their ideas would be needed, it is worth pointing out what these suppositions may be.

First, that so far as the values of people are concerned, we are dealing here with self-defining subjects. In other words, Lincoln and Guba may have taken up the naturalistic distinction between the neutral universe (the tangible reality of Axiom 1) and individual minds that are the determiner of value or standards of judgment. All such hopes, aspirations or purpose reside instead in the

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individual intellect or mind, which can know the universe and which judges actions within it. The notion of self-definition comes in part from the way persons act in such a universe according to their own standards and chosen criteria of judgement. In this sense, the word constructed might be appropriate here. However, it is important to note that Lincoln and Guba do not use the term self-defining subject. So far as the discussion in this chapter is concerned, all that can be said is that some of the ideas they employ appear to point in the direction of such a conception of what it is to be a human person.

Second, they also appear to have picked up on the naturalistic model of reason that requires external criteria be applied in order to make a rational judgement or choice. Lincoln and Guba appear to apply this model in a strong sense when it comes to the link between multiply constructed realities as constituting some kind of pluralism, and a thorough-going plurality of constructed values such that no external criteria exist among them. In this view, such agreement as people might have with regard to the values they espouse would be either coincidental, or a matter of consensus, or perhaps entail one party's attempt to dominate the other, as Nussbaum puts it.[353] Howsoever such agreement may come about, it is not a conclusive one in the naturalistic sense that external criteria are needed to make rational judgements.

There may be an additional supposition which suggests that some of Lincoln and Guba's ideas carry a naturalistic indebtedness, namely, the foundational model of reason. Exploring this possibility, there is perhaps no more complete example of the foundational model of reason than the axiomatic approach itself. For example, Lincoln and Guba argue that paradigms are irreconcilable due to the existence of a set of radically differing basic beliefs about the nature of the world and its workings. It is in terms of these basic beliefs that all thinking and reasoning is to be carried out.[354] If so, then in order to make sense of some aspect of thinking in a given paradigm world, the relevant ideas or conceptual confusion could be argued back to those first background beliefs, that is to say, back to its foundations. This idea comes in part from the way we reason in axiomatic systems. Furthermore, in Lincoln and Guba's case it appears that there can be no transitional arguments between two given axiomatic systems, or world view paradigms. Firstly, axiomatic systems stand logically independent of each other, and may work with a set of entities that are disjoint, that is to say, they have no elements in common. Secondly, Lincoln and Guba make it clear that there can be no reconciliation between the postpositivist and positivist paradigms. In general then, this tendency to see things in separate, irreconcilable beliefs is arguably characteristic of what the thesis discussion has called foundational reason.[355]

Some comments related to the first two suppositions mentioned above can be made in terms of the perspective of the individual inquirer. Here the key point to note is that each inquirer can only make sense of his own world and self in so far as they are constructed. Indeed, based on Lincoln and Guba's first axiom, this is true for every individual, here arguably conceived of in terms of the self-defining individual.[356] Ultimately then, the inquirer cannot help but see and understand the world from the perspective of those realties the construction of which he himself has axiomatically played a part.

If so, then three main points can be made. First, not only does each inquirer rely on a different set of values in order to make sense of himself and his world, but each may have a differing conceptualization of what values are, what role they play in making sense of one's life (or that they play no role at all), and how to reason practically about them. Hence, Lincoln and Guba's use of the word paradigm with a small case p. Secondly, the paradigm an inquirer uses to make sense of what his values are and how to reason about them can change. Third, it is impossible for an inquirer to reconstruct another person's values if a) he has not made sense of his own and b) he does not try to come to terms with the way his own way of thinking about values can lead him to a reconstruction that may be either trustworthy or not. It is worth noting that this last point appears explicitly in

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Lincoln and Guba's statement of Corollary 1, where they state that "Inquiries are influenced by *inquirer* values".[357] The upshot to these three points is that an inquirer cannot presume to pass critical judgement on those who are the object of his reconstruction.

Summary comments

To summarize, the axiomatic approach is used by Lincoln and Guba to formulate what they consider to be first principles for the qualitative social sciences, or what they more broadly call postpositivist inquiry, and thereafter build up a general approach to inquiry that is consistent with these principles, or axioms. To be more clear, in Lincoln and Guba's thinking the qualitative social sciences are not synonymous with their notion of postpositivist inquiry. This is because some of the ideas behind their axioms arguably come from recent, non-classical developments in the physical or biological sciences that place thinking outside what the thesis discussion has sometimes called the usual range of naturalistic abstractions. Furthermore it may be the case that there are some forms of research in the qualitative social sciences that cannot be modelled on their choice of axioms.

From the start they make it clear that the conception of postpositivist inquiry they are formulating as well as the foundational or world view principles upon which it rests, are not reconcilable with the established, mainstream sciences, natural or otherwise. The central reason for this is probably due to their conception of what constitutes a paradigm, or paradigm era. As noted earlier in the discussion, Lincoln and Guba argue that there have been only three such historical eras of scientific inquiry, namely, the prepositivist, the positivist and the postpositivist. Given such a conception of things, it is perhaps not surprising to find that the emerging postpositivist world view is a radically different one from the existing, well established positivist paradigm. It is important to add that, according to Lincoln and Guba, the fact that positivist and postpositivist inquiry are not reconcilable is not an invention on their part, but is the result of their looking into what they see as an emerging world view, one that challenges the established positivist paradigm era.[358] Indeed, the axiomatic approach is arguably used by Lincoln and Guba to help cement the irreconcilable differences they argue are inherent in the two paradigm eras. Not only are we dealing with two independent stances, but for Lincoln and Guba the one cannot accommodate the other.

There is also a strong sense here that, for Lincoln and Guba, axiomatic systems and paradigms (small case p) are constructed realities, each standing separate from the other, first by virtue of their founding premises which by definition differ, and second, by the fact that as logical systems the only condition that need apply to them is their own internal self-consistency.[359] In this sense they could perhaps be thought of as systems that turn on the notion of self-definition.

In addition, and finally, when it comes to the question of Lincoln and Guba's indebtedness to naturalistic ideas, here meaning according to the way they are being characterized in this thesis, it is crucial to note that thinking in terms of the naturalistic standpoint need not be an all or nothing affair. According to Taylor, its assumptions are an influential part of an intellectual tradition, some of them deeply so, but they do not constitute in any sense the whole of that tradition.[360] The task then arguably is to come to terms with what the naturalistic standpoint has to offer in Western intellectual culture, to see where it influences our conception of things and how it perhaps tends us to reason in certain ways over others. To do this is also to seek out currents of thought in the same and in other intellectual traditions, and to try to integrate them into our understanding. In other words, not to simply make better sense of the tensions that might arise between these currents of thought, but to use them to make gains in knowledge of our world and the significance of our actions within it. As such, a given position need not always be everywhere naturalistic, or other than naturalistic. If so, then, so far as the thesis argument is concerned, the trouble with naturalist abstractions is not the naturalist stance as such, but the way in which a thorough-going sceptical attitude towards practical reason tends to follow from some of its assumptions.

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It is therefore important to emphasize that not all of Lincoln and Guba's ideas are naturalistic as such. Some of their ideas arguably land outside the usual naturalistic abstractions. A few of them echo ideas to be discussed later in the thesis argument. This is not unexpected since, as Lincoln and Guba note, developments in the contemporary natural sciences provided some examples as to the formulation of their postpositivist axioms and world view. At the same time, however, some of their notions appear to naturalistic in conception, a few perhaps deeply so, and particularly those that lead to scepticism.

However, this comment is not meant as a criticism of Lincoln and Guba's programme of inquiry. As noted repeatedly, the discussion here is not an attempt to enter into the debate on the scientific status of social research. As such the use of naturalistic assumptions in science need not imply something untoward in its conceptualization or methods of research. It does however suggest that one look to the model of reason a science employs, and the ontological notions it tends to adopt, in order to find those background beliefs or patterns of reason the assumption of which gives unnecessary warrant to scepticism towards practical argument.

This brings to an end the discussion in Section 2 regarding Lincoln and Guba's axioms for a postpositivist paradigm. Although Lincoln and Guba formulate the differences between the positivist and postpositivist world views in irreconcilable terms, the key point here is that despite this both world views take up a similarly sceptical stance towards practical reason, and this is due to the way they share some epistemological and ontological assumptions that are part of thinking in terms of the naturalistic stance. The next Part C is intended, among others, to give a summary account of three of these assumptions based specifically on Taylor's ideas.

Part C: Naturalistic assumptions and substantive reason

The discussion in the first chapter as well as the discussion thus far in the second has tried to make the point that the pattern of reason taken up in explanation and understanding, as exemplified by both the quantitative and qualitative social sciences respectively, returns a sceptical judgement towards practical argument in the moral sphere. This because both take on similar background assumptions in the naturalistic standpoint regarding the nature or character of reason as such. In other words, and based on some of Taylor's ideas, both share certain assumptions regarding what constitutes rational argument, or the conditions that are to be met in order to give a rational account.[361] Given that the conditions for rational argument as per the naturalistic stance are such that practical reason cannot meet them, then, as Taylor notes, the moral sphere is generally regarded as a place where valid conclusions cannot be reached.[362] Either we just cannot make satisfactory sense of values as an object of study (as in the case of explanation), or we incorporate values into all aspects of inquiry (as in the case of understanding), but then avoid formulating judgments regarding the worth of a people's form of life and their practices.

In Taylor's view, however, it is possible to expand the conditions for rational argument that come from the usual range of naturalistic abstractions. By so doing other patterns of practical reason become possible.[363] Among these is a conception of reason worked out by Taylor himself. In his view, practical reason can offer what he calls a substantive grasp of the moral sphere of argument, not just a procedural or foundational one.[364]

In order to close out the argument in thesis Chapter Two, the discussion in Part C will attempt to offer a brief introductory overview of Taylor's conception of substantive reason. The aim here is to provide only an initial picture of some of his ideas in this regard. These will form a connecting link to a fuller treatment of his ideas in thesis Chapters Three and Four. More specifically, Part C is divided into three short sub-sections. First, it will attempt to work out in more detail three

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naturalistic assumptions in terms of which, according to Taylor's thinking, one tends to adopt a sceptical stance towards practical reason. This will be followed by a few brief introductory notes regarding Taylor's notion of substantive reason, that is to say, a pattern of reason that need not always result in an attitude of doubt towards practical argument in the moral sphere. Lastly, some ideas regarding understanding and technology will be highlighted, the purpose once again being to offer a connecting link to the thesis discussion on the development and use of technology in a planetary age, to be pursued in thesis Chapters Five and Six.

Three assumptions

This first sub-section will attempt to offer a brief introductory account of some of those ideas which Taylor argues contribute to the view that, the moral sphere being what it is, no conclusive arguments are to be found there. It is worth noting that some of the ideas in the paragraphs that follow have already been touched on in Parts A and B above. However, such references were generally brief and occasional. It is therefore useful that these ideas are collected and expanded in more detail here. The discussion that follows is heavily indebted to ideas from Taylor in his Explanation and Practical Reason (1995).[365]

Among others, Taylor notes three assumptions concerning what it is to give a rational account that he thinks contributes to a sceptical stance towards practical argument, namely, a) the ontological and procedural assumptions that are part and parcel of the naturalistic stance, b) foundational reasoning, and c) the appeal to external criteria in order to rationally judge between positions.[366] These three assumptions are discussed below.

The first concerns the ontological assumptions which turn on the Cartesian distinction between the extended material world and conscious existence. In other words, the world consists of a neutral, inanimate universe on the one hand, and individual conscious minds on the other. The former moves "endlessly, meaninglessly" to quote Whitehead, and is silent when it comes to human hopes aspirations or purpose.[367] In its more extreme form, the conclusion is that human purpose is something of an illusion. The latter constitute the locus of knowledge, intent and judgement.[368] The former is made up of matter and energy in endless, ceaseless change and combination; the latter is the seat of individual thought, values, meaning, imagination and the like. The distinction, for example, is pictured by Taylor in such a way that the neutral universe, being without intrinsic worth, makes no necessary claim on human commitments.[369] The universe thus stands up on its own, as it were, such that knowledge of it is the same for all inquiring minds. In other words, it stands apart, independent of human concerns such that its underlying mechanisms and hidden structures can be observed and known intersubjectively. Taylor refers to this as the ontology inherent in the natural sciences.[370]

In contradistinction, matters of worth and significance, as well as human hopes, dreams, desires and the like belong to an intangible realm of thought, idea or intellect which works to create its own standards of judgement. Simply, such things as these reside in the minds of individuals, and are so arbitrated by them. Yet the ideas of men differ and diverge, each tending to see the world from within their own idiosyncratic perception of things. Unlike the neutral universe, there is no external or independent existence in this realm. As a result, and as regards human concerns and commitments, such intersubjective accounts as obtain in the knowledge of a neutral universe turn here into the accounts of individual subjects. Of course it is through such accounts that we come to know something about others, as well as about ourselves. In this sense they can be shared, admired, commented on and argued about. However to try to study and analyze our human commitments to dignity or worth, for instance, from a neutral or external position would deliver unintelligible results. It would have to conceive of such commitments in neutral terms, as if they were part of a

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universe that was the same for all. But obviously, from this point of view, they are not part of the neutral, inanimate universe. They are ultimately defined and arbitrated by each human intellect.[371]

Elaborating along a slightly different line, and once again based on thinking in terms of naturalistic abstractions, since ethical values and meaning exist only in the mind, then only the human intellect can consider, determine, evaluate and understand them. Obviously, not all intellects are the same, and considerations differ about the character of particular ethical or moral values and their place in one's life. Since intellectual judgements are determined by the mind, the question follows: Whose standards of ethical conduct or moral principle are people to accept? From this point of view, different persons adopt different sets of standards. Yet there are no considerations available to independent minds capable of deciding between these kinds of human commitments. Each can adopt his own attitude, and if attitudes differ – as they appear always to do so in a morally diverse world – then there can be no external criteria of judgement capable of deciding the case. From this point of view, one could argue that it is axiomatic that each person sees the world from within an own point of view, and that part of this view is to subscribe to certain standards of judgement regarding what makes up an acceptable form of life.[372] If so, then additional or alternate factors will likely come into play for someone to adopt one person's set of standards over those of another person. To quote Taylor: "In a neutral universe, what agreement there is between attitudes seems merely a brute fact, irrelevant to morals, and disagreement seems utterly unarbitrable by reason, bridgeable only by propaganda, arm-twisting, or emotional manipulation".[373]

The second factor, or what Taylor sometimes calls the foundationalist or canonical form of reason, involves the notion that in order to be certain about an argument's conclusion, then the individual statements in the body of the argument are to be analysed down to the level of fundamental position or premise, and so establish the argument's validity from there.[374] Part of Taylor's point is that people hold many ideas that are not clear. For example, the positions people take involve ideas they may not be aware of, or which may make no sense when listened to, or which the person may refute if made explicit or which once revealed involve the person in a contradiction. Only by analyzing both the soundness of the reasoning used, and the content of all intermediate steps in the argument, can certainty in conclusion be possible. Here, according to Taylor, foundational reason requires one to work back from the unexamined or implicit statements in a position or belief to the most prescient account possible of the foundations of the argument they contain. All side issues are cleared away in order to establish what is "unconfusedly and undividedly" espoused.[375] Taylor goes on to state that: "Our knowledge claims are to be checked, to be assessed as fully and responsibly as they can be, by breaking them down and identifying their ultimate foundations, as distinct from the chain of inferences which build from these towards our original unreflecting beliefs".[376]

At its most basic, such reasoning tends to be procedural. It involves devising a plan or algorithm based on the application of external criteria which, if followed, will lend itself to certainty in conclusions. This is done first, by making all steps explicit, and second, by being open to a full accounting through the use of some test or criteria. Taylor argues that Western intellectual culture has tended to associate this pattern of reason with reason as such.[377] He suggests that this is partly the case because it fits with the model of reason adopted by the modern sciences, or naturalism.[378] Among the more important of these are the steps a researcher follows in order to ensure that conclusions are valid.[379]

Taylor's third point is the naturalistic assumption that external criteria are required to judge rationally between differing positions. Of the three points being discussed here, this third requirement is perhaps the most central when it comes to making sense of the West's sceptical attitude towards practical argument. The question to ask is: How can moral disputes be judged or arbitrated rationally? As with all rational disputes, the assumption is that criteria are needed, meaning in part that there must be externally defined standards capable of deciding the case.[380]

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Following Taylor, let us assume a person wants to judge between two rival positions. By rival positions is meant that both positions cannot be held at the same time, meaning that to accept the one is to reject the other. Following the requirement that reasoning be foundational, both positions are to be clearly and explicitly argued for, such that no confusion exists regarding the statements being defended and, being clear about these, no divided loyalties emerge in the implications that might follow. Criteria for settling the dispute rationally must then satisfy at least two conditions. First, each side in the dispute must acknowledge the criteria. That is to say, they must recognize and accept the criteria. Second, the criteria must be sufficient to show which argument is invalid. The problem is that, according to Taylor, in the naturalistic view of practical reason, for any important moral dispute both conditions are never met.[381] Either the rival proponents cannot agree on the criteria, or the criteria they do agree on are not sufficient to establish which position is to be upheld, (or that in fact no such criteria can be found).[382] If so, then the message here is that, in moral disputes, it is simply not possible to come up with externally defined standards capable of deciding between two rival positions such that one can be shown to be false. If you think there are, the cynic might say, then consider the actual divergence in moral positions people unceasingly and inconclusively argue for.

If so, then in the absence of external standards differing positions as to what is the right moral course of action to follow cannot be arbitrated conclusively by reason. In other words, scepticism about practical argument is justified.[383] Obviously, this is not to say that questions of morals or ethics are unimportant, only that, from the point of view of the sceptic, the way we regard them or come to terms with them cannot be carried out on the basis of conclusive rational argument.

A point about the pattern of reason exemplified in either explanation or understanding is needed here. The pattern of reason used in those sciences that can be said to aim at either explanation or understanding cannot be regarded as the source of these sceptical attitudes. Such attitudes come from a broad intellectual culture in the West. However, and as argued so far in this thesis, the patterns of reason used in sciences and the abstraction of the naturalistic standpoint have grown together, so to say. In this sense it may be the case that such scepticism has been amplified by the success of our scientific schemes of thought, at least in so far as they attempt either to explain things from a detached, neutral stance, or to understand the values people espouse as they themselves make sense of them. In either case the procedures and methods of science are rightly regarded as a vanguard for intellectual integrity, and so the pattern of reason they adopt is given high marks for other forms of inquiry to follow, including argument in the moral sphere.

This point about the procedures and methods of science returns the chapter discussion to some of the basic ideas at work in both the qualitative and qualitative sciences, in so far as they are conceived of in terms of the naturalistic standpoint. To summarize, in the viewpoint of explanation as was discussed in thesis Chapter One, practical reason is suspect since there is no objective content to evaluative disputes. Human values *per se* are not the kinds of things that reason can get a handle on, and this is because no intersubjective agreement is possible here. In other words, and in terms used by Taylor, values *as such* are simply not part of the fabric of things.[384] If so, then thinking in these terms makes it difficult to formulate a coherent stance towards the moral sphere of argument. From the point of view of understanding discussed in Chapter Two, but again according to naturalistic assumptions, practical reason is rejected since in the realm of human values or beliefs no external criteria exist to adjudicate between positions, and this because ultimately the intangible nature of values results from the way they exist only as a matter of each individual's perception of things. From this point of view, values are real and moving, and it is vital to try to grasp people's beliefs regarding them in all their richness. However, their reality is such that a valid and critical evaluation of them is not permissible. So far as naturalistic ideas are concerned, to perform such a judgement would be ethnocentric, or involve one form or another of cultural imperialism.[385]

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In general then, from the point of view of the naturalistic stance there are good reasons why it makes bad social science for a researcher to judge the moral values of the people or society being studied. It turns out that what makes it bad science in qualitative research also makes it bad science for research on the quantitative side. Quite similar considerations are at work in both despite their differences elsewhere. So far as the thesis argument is concerned, this is because, at a different level of analysis, both share a set of assumptions regarding the notion of rationality in general, and more particularly the procedures and conditions that are needed to establish rational conclusions or to make rational choices.

The next subsection introduces briefly and somewhat inaccurately a few of Taylor's ideas regarding a pattern of practical reason that arguably works outside the usual range of naturalistic abstractions, and which might therefore give a different account of scepticism regarding its conclusions.

Substantive reason

Taylor's response to these kinds of assumptions is that it is possible to argue in such a way that one need not always take up a position of doubt when it comes to judging or discerning the worthiness of our intents or actions. The discussion to come in thesis Chapters Three and Four will explore in detail a number of Taylor's ideas in this regard, notably his notion of substantive reason.[386] As a clarifying note, Lincoln and Guba employ the notion of substantive theory as part of their ideas about postpositivist inquiry. This was discussed above in Part B. However, their use of the term is notably different from Taylor's thinking. As a lead-in then to a range of discussions still to come as the thesis argument develops, it is worth painting a brief introductory sketch of a few ideas behind Taylor's notion of substantive reason. Four ideas will be considered, namely, i) arguing about transitions, ii) self-understanding persons and the self-defining individual, iii) the notion of significance, and iv) practical reason as being open to distinctly human significances.

i) Arguing about transitions. Based on the above discussion, foundational reason proceeds by analysing rival positions down to their basic premises, and to adjudicate from there the soundness of the arguments involved. This form of reason tends to work in what might be called an absolute-like manner and this in two senses. First, it seeks to find the one correct position among the contending positions at hand. Second it proceeds in such a way as to not only consider the positions at hand but all possible present and future positions.[387] It works on the assumption that for any well defined question, there is only one true or correct answer. The task then is to go through all possible answers, disproving or rejecting them until the true one is left standing.

However, for Taylor some useful forms of practical argument are not foundational in nature but concern attempts to argue between positions that are not fully explicit.[388] Crucially, he regards practical reason as being about transitions between positions, not one of seeing positions as rivals such that only one can stand up to rational scrutiny.[389] For example, in the case of transitions one need not think in terms of external criteria against which both positions are weighed. Instead, we consider the sense each position can make of the other. Suppose there is an issue at hand concerning which the advocate of position A, say, is facing certain incongruities in his argument. Perhaps there are a set of niggling inconsistencies he is struggling to come to terms with. Suppose however that the argument from another position, say, position B, is such that not only can it make reasonable sense of the issue at hand, but it can also be used to see where it is the person who advocates position A is struggling, where his incongruities or inconsistencies are coming from. In other words, position B can make better sense of Position A than can Position A make sense of itself. If so, then Taylor holds that, comparatively speaking position B is the stronger.[390] Of course, such a comparative conclusion has nothing to say about a possibly unknown third or fourth position, only that, to quote from Taylor, "[W]hatever else turns out to be true, you can improve your epistemic position by moving from X to Y; this step is a gain".[391]

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Taylor offers a variety of scenarios here, each progressively more involved with the notion that practical argument is i) about transitions between positions that are not fully explicit and ii) that judgements regarding these kinds of transitions can proceed without recourse to external criteria.[392] In this sense then, they are working outside the usual naturalistic model of reason.

ii) Self-understanding persons and the self-defining individual. Taylor offers an extended analysis of what he calls the self-defining subject, or self-defining individual.[393] This idea was introduced earlier in the discussion in Part B. His conception here is based on the ontology of a neutral inanimate universe that is silent with respect to human hopes aspirations and the like, and of individual knowing minds who are the locus of value and judgement. To the extent that each mind sets for itself its own values and makes its own judgments, then we have the early makings of the self-defining subject. This notion tends to go along with the idea that, in a morally diverse world "we al1 just ultimately have to plump for the ones which feel/seem best to us".[394] In other words, we live in a world where no one person's point of view is any more true or right than another's

Taylor's notion of what he calls self-understanding persons is arguably based on a richer ontology than is found in the naturalistic stance. However, it does not appear to be a contrary or irreconcilable one.[395] Taylor's conception is hard to summarise in a few sentences, but is based on the notion that understanding goes hand in hand with our existence as persons. Humans are creatures for whom understanding is in some sense constitutive of who and what we are.[396] We are born into and grow up in a world where humans understand themselves and others, their intents and actions, and the comings and goings of the society in which they live. However, they do so not only as self-defining individuals who construct the world for themselves, but also as persons who exist in a world constituted by understanding as such. Here, for example we need not limit our notions of human intent and action to what procedural reason says to us about ourselves, with its ontology of an inanimate universe on the one hand, and individual minds on the other. We can grasp something of our intents and action in a more substantive, less procedural sense as beings for whom understanding, and the world that comes with it, is a real and present given of life. The task then is to enrich or refine our understanding, to come to a greater sense of how it is understanding lies at the root of some of what makes up who we are and the world in which we live.

It is worth noting that Taylor's notion of the self-understanding person is not of an individual whose grasp of things is based on his own intellectual constructions, but that there is a certain quality of understanding that only comes with a community of self-understanding persons who, by virtue of being who and what they are as a community, can understand their world.[397]

iii) The significance feature. As just noted, Taylor argues that humans are creatures partly constituted by understanding, and that in part this understanding involves grasping ourselves as a community of self-understanding persons, or, as he puts it, "[W]e are aware of the world through a 'we' before we are through an 'I'".[398] But understanding is not some kind of untapped potential or a capacity waiting to be turned on and used. It is always understanding of, or understanding for.[399] Extending this idea, our world is filled with meaningful actions and intents, with fellow language users with whom we write, speak, communicate and share, of social practices each of which convey varying degrees of significance for our lives. In other words we can see in all these things various dimensions of meaning and significance, some superficial others more profound, some obvious and apparent, others implicit or difficult to comprehend, some that divert our attention, others that keep us on a particular path, focused and alert.

Arguing from Taylor's point of view, meaning and significance are part and parcel of the world in which we live by virtue of the fact that we are self-understanding beings. We cannot separate the significance we see and know from our understanding of who and what we are, and still be a human person. Taylor also argues that there exists an aspect of our lives as moral beings, that is to say,

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certain kinds of intentions, actions or goals, such that to ignore them, or to misjudge them, or to turn aside from them would be to necessarily compromise something of who and what we are at the core of our being.[400] In other words, not to attend to them would be to show us up necessarily as a lesser creature, or as Taylor puts it, "[*W]e* would be shown up as insensitive or brutish or morally perverse".[401]

These matters of significance in our life and being, such that to disregard them is to be the lesser for it in a strong sense, is what Taylor calls inescapable commitments, and which the thesis discussion will refer to by the phrase distinctly human significances.[402] Thinking then in terms of Taylor's ideas, to regard and consider distinctly human significances, to find ways to increase our grasp of them, is to deal substantively with questions regarding the worthiness of our actions and intentions. Here then to see things in terms of distinctly human significances requires us to reason in a substantive sense, not just a procedural one. In other words, we come to reason in terms of our existence as self-understanding beings, whose grasp of meaningful actions and the significance things have in life is partly constitutive of who and what we are.

iv) Practical reason as being open to these distinctly human significances. Taylor argues that the notion of reason found in naturalist thinking, for example that it be foundational, procedural and require external criteria, has a close relation to what he calls the primacy of the epistemological, or as Taylor puts it, "the tendency to think out the question what something *is* in terms of the question how it is *known*."[403] As such these sets of ideas arguably have a part to play in the way we come to the know the world and to judge our actions in it. However, this procedural pattern of reason is not necessarily well suited to make sense of our intents and actions as self-understanding persons. As noted repeatedly throughout the discussion in the first two thesis chapters, thinking in terms of naturalistic abstractions implies a sceptical stance towards practical reason, even as it tends one to misconstrue at least in part what kind of a thing a moral argument is. Furthermore, almost by definition scepticism and the notion of the self-defining individual tend to go together. If so, then it makes little sense to adopt a naturalistic model of reason in the hopes of coming to terms with who we are as self-understanding persons. In order to do the trick we need an expanded account of practical argument.

Taylor's characterization of practical reason is that it involves being open to, being able to be transformed by, distinctly human significances. His attempt here is to convey two key aspects to reasoning about our intents and actions as self-understanding persons. First, to be open to distinctly human significances implies that we need not necessarily be open to them, in the sense, say, that they can be avoided, dismissed or neglected in some way. Furthermore, in the moral sphere of argument we often simply can't flesh out fully explicit foundational premises. We have to take up a more modest stance, so that, since some of what we espouse is tacit in our understanding, we need to remain open to the possible presence of some previously unconsidered factor, or of a set of meanings which we had not formerly considered or thought about, but which, when brought into our understanding of things, may alter some of what we had previously regarded as not being open to question. It may also mean simply that as a person, for example, someone may not yet have sufficient experience to make sense of the particular moral act that is required of him under the circumstances he faces, and that he should therefore be open to the discovery of new meanings.

The second aspect to Taylor's notion of practical reason that we be able to be transformed by distinctly human significances, arguably refers in part to the idea that practical reason is about transitions. For example, as we come to consider the meaning or significance of some situation we face, or begin to ask in what sense is this action I am contemplating worthy of who I am, we will not necessarily come out of it the same person as before we started. In other words, by virtue of the fact that we are self-understanding persons, then the richness or maturity of our grasp of the moral sphere is not something we can reliably put to bed, as it were. The ability to read our immediate

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reality and act morally with regard to it may be challenged, such that current notions of the worthy course of action to take, may be shown to be faulty or inadequate to the task.

More generally, given the nature of practical argument, which in the case of self-understanding persons is by its nature about distinctly human significances, then the forms of reason used here need to be fashioned in such a way as to help us be open to a substantive grasp of the meanings in our world, and the significance of our actions in it.

Once again, the previous accounts are intended only to sketch some suggestions of what is involved in Taylor's notion of substantive reason. The discussion in later chapters will look more closely at his ideas. As the thesis argument develops, other notions regarding practical reason will also be introduced, notably those related to complexity and co-evolution. These various ideas regarding practical forms of argument will add to the thesis discussion when it comes to making sense of decisions about the development and use of technology in a planetary age. In order to close the current chapter then, and as a lead-in to discussions later in the thesis regarding technology and practical reason in a planetary age, the next Part D offers a few summary insights regarding technology and understanding that have emerged from the discussion in the first two chapters.

Part D: Technology and understanding

To state briefly, there is a tendency in Western culture to picture the technological world as consisting of tools or technical processes/systems. These contribute to a reservoir of neutral-like resources which humans can use to satisfy some need or want. Whatever else technology might be, it concerns the way people employ tools and technical processes for some productive or utilitarian purpose. In such a picture, technology is partly rooted in scientific representations of nature, and hence, in the crafting of devices and technical or industrial processes so as to meet human wants or needs. Technology would thereby serve to amplify and extend human powers through what Jerome Bruner calls "prosthetic devices".[404] The use of such devices would enable people to control, leverage and manipulate processes found in nature, as well as to craft novel ones according to our own circumstances and choices.[405] Here the material world is seen as a place of resources that humans can use as they choose in the building of a technological and industrial society. In this way of thinking, technology may reflect a somewhat machine-like image of the world. It could as well support in turn some related views concerning human skill, performance criteria, practical competencies and rational action. In general, such notions reflect a tendency to "define technology in relation to but distinct from the human organism".[406]

Along a different line of thinking, Bruner argues that the use of tools drove the evolution of the human central nervous system. As a result, and ultimately, the use of various outside devices are required in order to express our human powers.[407] Said differently, such ideas tend to "define technology in relation the human organism as symbiotic, co-constitutive, and define human and technology as one integrated functional system".[408] Both ways of picturing the human/technology relationship may also reflect some key naturalistic abstractions, notably those related to its ontology.

This picturing of technology is also arguably related to notions of explanation as treated in thesis Chapter One, as well as the discussion in this chapter with regard to understanding.[409] In the first instance, technology is made by people for people, and therefore can become part of a given constructed social context. As part of the context of people's lives, the way people understand technology, or otherwise come to develop and use it, may therefore have about it something of the nature of those constructed realities spoken of earlier. If so, then technology need not be thought of as something that exists in the same way as does the material world, apart from and neutral with respect to how humans live, think and act. In this manner of thinking, there would not be just one

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way to view or come to terms with what technology is about, or how people develop and use it as self-defining individuals. This is because, in terms of the discussion earlier in this chapter, people inhabit a world of multiply constructed realities. If so, then what technology is, is something that can shift and change as people's thinking about it changes. That is to say, as they take on different constructed realities a different consensus will be reached regarding technology. This is in some contrast to the idea of technology as a prosthetic device, as an artefact of implemented thought, or as means to accomplish some chosen economic end – views that are arguably related in some way to the conception of technology as a neutral resource, or as a tool that does for people what they have designed and intended it to do.

Such a view of technology could be developed as part of a postpositivist inquiry into how people live their lives. Since technology is part and parcel of a larger social context, it requires a different approach in order think about its development and use. In this point of view, technology is not a tool that amplifies or extends human powers, but is part of the context to those social constructions people devise as self-defining individuals. As such it could be accepted or rejected in different ways according to the various practices people adopt, and the consensus a group might reach regarding some aspect of its development or use.

Thinking along a still different line, the use of technology can have about it a distinct evaluative sense. In other words, its use speaks to us about the worthiness of our actions or of the significance of a particular form life. It makes up part of what we say, do, decide, organize, make or write, and so connects in some sense to the patterns of meaning and significance that go to make up our lives as self-understanding beings. In such a view, people's commitments in part move them to live and make choices in a particular way. The world they live in is grasped in part through the worthiness of those intentions, commitments and choices. But more than this, it is also partly constituted, not constructed, by those commitments, some of which are inescapable in nature. If so, then the social and technological world cannot be completely characterized as a place of neutral resources that can be manipulated and crafted for the sake of technology innovation and the satisfaction of people's needs and wants, as might be the case in a more mainstream account. Nor can it be regarded in its entirety as a social construction, the truths of which rely on the consensus reached by a group of self-defining subjects. It needs also to be grasped terms of what Taylor calls the significance feature.[410] In other words, we know and judge things in terms of their significance to us. This sense of significance is made possible by virtue of the fact that we are beings for whom the worthiness of our intents and actions is inescapably involved in our self-understanding, such that to fail to attend to them would be to show us up necessarily as a lesser creature.

So, for example, in an attempt to answer to the evaluative question: What, after all, is this innovation for?, we could not come to terms with the worth of our technology only, or even primarily, through the kinds of explanations found in a neutral and intersubjective stance, nor from the point of view of multiply constructed realties and the accounts of subjects. Needed as well, and perhaps more importantly so, is a picture of the significance things have for us as self-understanding persons. In such a picture, our sense of worthiness regarding some of our intentions and actions has about it an inescapable character, such that to fail to attend to those intentions and actions would cause us to fall into confusion regarding the form of life we aspire to, or the kind of society we desire to inhabit, and hence too the particular innovation we might seek to develop or use. Here then we have a different conception of what technology is about, linked necessarily to the significance of our form of life as self-understanding persons, and hence to the worthiness of our actions with regard to its development and use.

Furthermore and finally, the thesis argument in subsequent chapters will emphasize that we will not likely make sufficient sense of what technology is about apart from the recognition that we live in a planetary age, and with it a sense of unity in human relations. Or, to put it in the positive, gains can

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be made in our grasp of the decision we face about technology in a planetary by thinking in terms of the principle that mankind constitutes a single human race, with earth its common homeland

Part E: Chapter Summary

Chapters One and Two focused on patterns of thinking within the naturalistic stance. Both have attempted to answer the question: In what sense do background notions in explanation and understanding serve to cast doubt on the validity of practical moral argument? Attention was therefore placed on exploring a range of conceptions found in both the natural and human sciences that speak to the overall sceptical attitude towards practical argument that the chapter discussions presented as being part and parcel of the naturalistic stance.

More particularly, the discussion in Chapter One, highlighted some key naturalistic notions behind explanation. It explored five main topics: the epistemic imperative, full scientific mentality, machine-like image of the universe, intersubjective reason, and methodological interity. These five are among the main aspects of the naturalistic stance. Mainline views concerning practical reason and the development and use of technology are arguably indebted to them. In addition, the chapter repeatedly raised issues concerning Taylor's notion of foundational reason and the primacy of the epistemological, two ideas which play a key role in the sceptical attitude toward practical reason that is part and parcel of thinking from within the naturalistic stance.

The discussion in Chapter Two has attempted to explore some main characteristics in the naturalistic notion of understanding, first via Nussbaum's observation that the qualitative social sciences are something of a reaction to mainstream empirical research, but that as models of reason both take up respective positions of doubt when it comes to making evaluative judgements. Second, the account of Lincoln and Guba's conception of paradigms and their axiomatic approach to the qualitative social sciences had a two-fold aim in the chapter discussion, namely i) to develop a better contextual sense of the kind of reasoning that is partly characteristic of the qualitative social sciences, and by implication in the naturalistic conception of understanding, and ii) to gain some added insight into where it is such reasoning tends to take up a sceptical stance towards practical argument in the moral sphere. The intent here was not to enter the debate on the scientific status of the social sciences, but to explore the patterns of reason found therein and to see where and how it is such reasoning tends one to doubt the validity of practical argument. Third, the chapter discussion highlighted three background assumptions in the naturalistic stance that contribute to such doubt. In addition, Taylor's notion of substantive reason was introduced as a way of linking the general theme of the first two chapters with the remainder of the thesis argument. Finally a few brief notes regarding technology and understanding served to close out the chapter discussion, and which also served as a lead-in to the discussion in subsequent chapters regarding technology and practical reason in a planetary age.

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Chapter Three: Human agency, complexity and co-evolution

Introduction

Following from the discussion in thesis Chapters One and Two, the discussion in Chapter Three will attempt to highlight a set of ideas that arguably serve to expand on the usual range of naturalistic abstractions. These ideas will then be employed in subsequent thesis chapters to explore patterns of practical reason that can help make sense of the kinds of decisions we face in a planetary age, and notably those regarding the development and use of technology. More particularly, the third thesis chapter is organized around four main aims, namely: i) to begin to explore a pattern of reason based on the notion of human agency indebted to the ideas of Charles Taylor. The ideas to be discussed here employ a different set of underlying conceptions than those found in either explanation or understanding as treated in the two previous thesis chapters, ii) to point out some conditions under which scepticism about practical reason is therefore unwarranted, or better, is a non-issue, iii) to further expand the discussion on practical argument by looking at patterns of reason employed in complexity and co-evolution and iv) to use these ideas from complexity and co-evolution to highlight some initial links to an expanded notion of practical reason that can help make sense of the decisions that confront humankind in a planetary age.

The first two of these aims focus on questions regarding the nature of practical reason as such, but by using ideas that arguably have no direct relation to the abstractions of the naturalistic stance. The second two aims bring into the thesis discussion for the first time ideas from complexity and co-evolution. These four aims are interrelated. Perhaps the most important aspect is that they all involve a move away from thinking in terms of i) a universe that is silent on matters regarding human worth or significance, and ii) a strictly subjective view regarding the nature of values in the sense that they belong to self-defining subjects or otherwise exist only within the minds of individuals.[411]

Equally important, these four aims will contribute to formulating an expanded conception of practical reason. Such a conception will be use to explore in different terms the sceptical attitude towards moral argument that tends to accompany thinking from within the naturalistic standpoint. This expanded notion of practical reason does not reject mainstream ideas of explanation or understanding. The chapter discussion will however attempt to work out a set of ideas that can offer added perspectives on the relation between our capacity for knowing the world and our ability to judge the worthiness or significance of our actions within it. The thesis argument will also try to show how this conceptually enriched approach can add to resources for making sense of the decisions we face in an interdependent age. In general, the topics to be treated in Chapter Three will serve as stepping stones to ideas still to be discussed in thesis Chapters Four, Five and Six.

In order to work towards this the discussion in Chapter Three will direct its main attention to the ideas of Charles Taylor, Ilya Prigogine and Isabelle Stengers, Eric Jantsch, Edgar Morin, Basarab Nicolescu and Ervin Laszlo.[412] The chapter is divided into four main Parts. Part A, titled Interpretation and substantive reason, discusses a range of ideas from Charles Taylor. It is presented in three sections dealing with the naturalistic paradox in Western culture, how mechanism might be conceivable as part of the human sciences and some ideas relate to an expanded conception of explanation. Part B, titled Complexity, the arrow of time and co-evolution, looks mainly at some ideas from Ilya Prigogine and Isabelle Stengers, and Eric Jantsch. It too is presented in three sections dealing with an introduction to complexity, irreversible systems and co-evolution. Part C, titled Complex wholes, levels of reality and a systems view of man, discusses the ideas of Edgar Morin, Basarab Nicolescu, and Ervin Laszlo. Once again divided into three sections, the discussion

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in Part C will look at ideas related to the paradigm of complexity, levels of reality and the included middle, and a systems view of nature and of man. Part D is a brief chapter summary.

More particularly, part A turns to the ideas of Taylor as found in his How is Mechanism Conceivable? (1985), and Peaceful Co-existence in Psychology (1985).[413] Part B will discuss ideas found in Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Man's New Dialogue with Nature* (1984) and Erich Jantsch, *The Self-organizing Universe* (1980). Part C will turn to ideas found in Edgar Morin and Anne Brigitte Kern, *Homeland Earth* (1999), Basarab Nicolescu *Manifesto on Transdisciplinarity* (2002) and Ervin Laszlo, *The Systems View of the World* (1972).[414] The authors cited above in Parts B and C generally look to conceptions of evolution, the way knowledge of a complex world is organized, and how systems-based conceptions of the relation between man and the terrestrial world can influence social decisions and promote explorative reflections on human purpose and motivation. Some works from John Casti will be used in Part B specifically.[415] Other authors such as Margulus and Sagan (1997), Stewart (1999), Keller (2000) and Swilling (2003), though not used as part of the discussion, argue from more recent scientific evidence for a shift away from patterns of mechanical thinking towards an integrating view, including an organic or evolving sense of the interrelatedness of things.[416]

It is also worth emphasizing that Parts B and C in particular involve an exploration of "man's new dialogue with nature" based on relatively recent developments within the natural scientific tradition itself.[417] As such both of these Parts are written so as to a) introduce non-mechanical, time based images of an order in nature, b) help to reposition man's relation to it, c) use the patterns of reason that accompany such images in science to highlight a richer characterization of practical argument than is found in patterns based on the naturalistic stance, and d) employ these images and patterns in ways that can help think through questions concerning the development and use of technology in a planetary age. Point c) is of particular importance since it brings to the fore a method of analysis that is used throughout the thesis, namely, that by exploring patterns of reason used by the modern sciences added insight can be gained into patterns of practical argument, and *vice versa*. As Taylor repeatedly observes regarding these two patterns of reason, to become more clear about the one is to help make better sense of the other.[418]

While the argument in Chapter Three is designed to move thinking away from the image of an order of nature that makes no claim on humans as creatures of significance, as well as the notion that explanation consists in uncovering the underlying mechanisms of this order, this does not equate to a denial of modern science and its methods of reason. Nor is the chapter argument directed against a relative view of knowledge and the judgement of values *per se.* Across a certain set of experiences, the search for a mechanical explanation of underlying processes or hidden structures has proven to be successful, and certainly useful. In addition, even as we live in an evolving age which calls for a planet-wide perspective, there is a strong sense at work that our understanding of the world is based on the manner in which things exist in mutual relation to each other. However there may be a tendency to burden either a neutral view or strict relativism with more than they can conceptually bear.

The point to the discussion in Chapter Three is that other patterns of thinking can be used besides the generally dominant notion of reason indebted to naturalistic abstractions. These other patterns of thought arguably need not necessarily adopt a sceptical attitude towards the moral sphere of practical argument. If so, then, as Taylor puts it, other resources exist for reasoning about the various evaluative decisions people face in contemporary society, this notably for a world-embracing in view.[419] The argument in Chapter Three thus aims to introduce some of the main conceptual brush strokes that the thesis discussion will later use to trace a picture of practical reason that can help make sense of the decisions that face humankind in a planetary age.

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Part A: Interpretation and substantive reason

Section 1: A paradox in Western intellectual culture

Background beliefs to the paradox

The following discussion will bring back into view some ideas discussed in the first two thesis chapters. However, the points that follow are not a repetition. They instead set the stage for the next phase in the exploration of ideas taken up in this chapter.

Assumptions in the naturalistic stance concerning both a machine-like image of the order in nature and in the human world lead to what Whitehead calls a paradox in the West's intellectual tradition – one he describes as adding to an enfeeblement of reason.[420] The paradox can be introduced by looking at six beliefs that are part of this tradition.[421] The beliefs are listed in no particular order.

i) The world consists of extended, neutral objects on the one hand and thought or conscious mind on the other. In particular, and with regard to human purposes, hopes, desires and the like, the former makes no claim on the latter.

ii) The underlying pattern of reason in modern empirical science has become the primary model for reason in general – that it is procedural, following from foundations, based on external criteria of judgement, and delivers absolute-like conclusions.

(iii) Demonstrable knowledge claims derive from methods the underlying abstractions of which are formulated intersubjectively. (Or to put it in the converse, methods that don't follow from abstractions that are formulated intersubjectively will not deliver knowledge claims that can be substantiated. Such claims to knowledge would therefore possess little explanatory power.)

iv) Explanation consists of uncovering hidden structures and underlying mechanisms that constitute the basis for giving an account of phenomena, ideally in the form of the precise workings of their material antecedents only, and in accordance with explicit laws.

v) So far as the physical world is concerned, only individual entities exist. They do so in a specific place and time. In other words, that which is observable has a concrete existence only in relation to the existence of, and interaction between, particular individual entities.

vi) Likewise, only individuals have minds, and the minds of individuals only are the locus of ideas.

None of these beliefs holds universally in Western intellectual culture. The point here is that they serve to highlight an influential climate of thought, the influence of which is such that it can unreflectingly shape views of what constitutes a rational explanation or making a rational decision. While these beliefs probably relate more directly to abstractions formulated in an intersubjective sense, their range of influence extends well beyond this. The success of the modern scientific world view and this view's near complete alignment with the naturalistic stance has, however, led to what Whitehead calls a paradox in Western modes of thinking.

According to Whitehead the paradox has ruined modern philosophy. It has its home in the seventeenth century European revolution in natural science and philosophy.[422] Out of this revolution emerged a cosmology which holds that, on the one hand, there exists a natural order composed of energy and matter in ceaseless, purposeless motion. Motion is intelligible in terms of underlying mechanisms and hidden structures. In other words, we can make sense of it via a single more fundamental level of description. On the other hand there exists the conscious mind or

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intellect which acts as the host to reason and the locus of human hopes, aims commitments and the like. A crucial assumption at work in this twofold cosmology is that the one exists separately and independently of the other. Once this separate and independent existence is granted, then two chief questions arise: First, how can the mind or intellect come to know the extended neutral universe? Second, what is the nature of that conscious mind or aware intellect such that it can know itself?

A certain divergence of thought has grown up around these two questions and the variety of answers given. One notable source of this divergence is a long-standing division between the rationality of the scientific mind and the search for meaning in life. This shows itself in various forms, such as in the usual distinction between reason and emotion, or between primary and secondary qualities, or in the strict rule to avoid all anthropomorphic references in the conception, design and interpretation of scientific research. The deep disunity between science and religion is another example, the character of which serves to pitch two vast and influential systems of thought against one another. As a result of this general divergence, "man's dialogue with nature" has tended to formulate intersubjective methods that serve to explain in detail the workings of phenomena great and small, animate or inanimate, but necessarily separate from the presumption of any actual motive, aim or intent.[423] As Taylor has noted, in such a naturalistic scheme of thought the neutral universe offers no guidance to the decisions humans face as creatures of worth or purpose.[424] In other words, man's dialogue with nature does not ask questions of worth or purpose.

In very approximate terms, this turn of thought opens the door to the high regard given to the patterns of thought and reasoning used in the modern sciences. However, it has also thrown up a whole range of questions concerning the human capacity for reflecting on what earlier was also referred to as questions that concern "good/decent/acceptable forms of life".[425] Such reflections entertain the reality of a terrestrial life necessarily joined to a broader universe, but one which is essentially silent with respect to human ends. In other words, science delivers knowledge of an intersubjectively real world but leaves out human aims, intents, beliefs and the like. It is instead to the interior perceptions of individual subjects that questions of both a good life and right action are directed. Such ideas are arguably part of thinking from within the naturalistic standpoint, and from which a twofold perspective emerges, namely, that one has either intersubjective accounts based on the workings of a neutral universe, or the accounts of subjects based on the conscious content of individual minds. In the latter, according to Taylor, the tendency has arguably been to think of human ends in terms of the choices made by self-defining individuals.[426]

A brief outline of the paradox

The paradox in the naturalistic stance can be put in the following way. From the point of view of a neutral, or inanimate, universe, human purpose and motivation are not part of the fabric of things, as Taylor phrases it.[427] They may appear instead as surface features riding on sufficiently complex combinations of matter and energy, or constitute an emerging property of evolving material systems, or are perhaps faulty notions that rest on the ambiguities of ordinary language. Knowledge delivered by the modern sciences, however, provides a unusually trustworthy and accurate account of what can be observed.[428] In such a view modern physics and chemistry, as well as the theory of evolution, refute the notion of purpose in the working out of a inanimate universe. Deep down, in the classical world view of science purpose is an illusion. The idea simply does not fit into the modern scientific conception of things. Yet, as Taylor argues, people's actual experience of intent and purpose is real and moving. They form a centre to one's sense of life. They constitute key components in our conception of what it is to be a human person. Following Taylor, it simply cannot be the case that the entirety of the language of intent and purpose has been mistaken, that they are somehow a mirage. Yes, as Taylor's argument goes, some motives may well be based on unfounded judgements or false perceptions, but it cannot be the case that the entirety of our sense of purpose and intent is similarly unfounded and illusory.

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The paradox can otherwise be stated as follows. Claims based in intersubjective science hold that, ultimately, purpose and motivation are illusory, but, to borrow a phrase from Taylor, our most prescient accounts as subjects cannot but regard them as essential, real and moving. On the one hand, science is the heir to Western intellectual integrity and cannot be reasonably ignored by any thinking person. Yet as regards purpose, it is unthinkable to accept what science says. To do so is to render our lives unintelligible. To accept the one is to reject the other. Yet, according to Taylor, the modern identity is bound up with the both of them.[429]

Here the issue of human ends that stand at one pole of the paradox is conceived in part via the notion that, in his posture towards the workings of a neutral world, man is a self-defining subject. Question as to what constitutes the good life are to be reworked in terms of what we know about ourselves and our ends as individual, self-defining persons. According to Taylor, modern Western intellectual culture has come to regard the free individual subject as being central to its concept of a person.[430] As he also observes, the naturalist ontology gives full support to this concept.[431] In other words, part of the reason Western modernity accepts the naturalistic stance is that it fits completely with the central conception of what it is to be a freely acting self-defining individual. The paradox comes home because the stance that posits a neutral universe that makes no necessary claim on persons as agents is, according to Taylor, an expression of the desire of the free individual to transcend the limits of the world in which he lives.[432] For the sake of argument, such limits could be thought of as i) a deterministic world understood in terms of strict causal law as posited in the natural sciences, and ii) a common human world bound either by the working out of impersonal societal forces or by relations of power in various social structures that constrain choice or otherwise oblige people to comply.

Furthermore, and as suggested by the discussion in thesis Chapter Two, the focus on self-defining individuals creates its own relativity of ethical norms. Given that the neutral universe exists independently of individual human minds and the moral perceptions of people, then it becomes difficult to locate those external standards by which conclusive moral judgements can be made. In other words, the moral sphere is made up of the projection of subjects. If so, then it is a relatively short step to conclude that people simply "plumb for what feels or seems right" as Taylor puts it .[433]

If the argument is persuasive and enfeebling as regards practical reason in Western intellectual culture, then this is partly due to the acceptance of the naturalistic standpoint in so far as it posits a neutral universe set over and against the existence of individual minds. Contributing to this enfeeblement of practical argument is the naturalistic model of explanation, which is taken to constitute rational thinking in general.[434] Furthermore, the idea that secondary qualities are projections of subjects and are therefore not part of what makes up the actual extended world, carries over to the conception of the human moral or ethical world – they too become projections of subjects lacking substance in an objective sense.[435] In simple terms, given that deliberation in the moral sphere cannot measure up to the requirements of the naturalistic model of reason, then moral differences cannot be argued. When generalized, then a plurality of views prevails as the intellectually acceptable position to take.[436]

Finally, in terms of the discussion in thesis Chapter One the naturalistic model of explanation aims to give an account of the hidden structures and underlying mechanisms that make up observable phenomena. As was discussed in thesis Chapter Two, the mainstream social sciences have adopted a similar model of explanation, though fitted to their specific object of study. This is what makes them mainstream sciences. An alternative approach to social science based on understanding seeks to give an account of people's lives as they themselves make sense of it. Yet because both are indebted to the same naturalistic point of view, both struggle when it comes to questions of human intents and purpose, or, what Morin and Kern describe as our moral and spiritual potential.[437]

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More particularly, and according to the naturalistic conception of things being discussed here, explanation based on the study of an underlying mechanism struggles to give an adequate account of human intents, purpose and our various potentials, be they social, cultural, physic moral and spiritual.[438] This is because accounts based on a machine-like image of the order in nature tend to rely on a single level of description that is not adequate to the actual richness of human commitments. It may even be that machine-like inspired explanations of human commitments can sometimes end up explaining them away. Instead, the explanatory accounts we do give would need to be formulated in order to "save the phenomena", to borrow a phrase from Taylor.[439]

Meanwhile, and according to the same naturalistic conception, understanding based on the attempt to reconstruct actual social life treats such commitments as real and moving, but may tend portray them as the projections of self-defining subjects.[440] Here judgements to the worthiness of our commitments cannot be carried off, and this because first, rational debate requires the use of external criteria in order to decide between positions, and second, when it comes to judging matters of worth no such external criteria can be found. In this way of thinking then, to presume to pass judgements of worth on others is therefore to be regarded instead as a species of unwarranted judgement, as a desire to dominate them or as an expression of some form of wilful cultural superiority.[441] According to Taylor, these kinds of ideas have a certain appeal in modern intellectual culture.[442] What is noteworthy for the thesis argument however, is that thinking here with regard to understanding employs some of the same naturalistic assumptions about reason as are used to explain the underlying mechanism of things.

The next section looks further at some of the issues related to the mechanistic point of view in the human sciences. The point, however, is not to enter into the debate regarding the scientific status of their various methodologies, but to see how a different ontology than is found in naturalism can alter the conception of what it is to give an account of the underlying mechanism of things.

Section 2: "How is mechanism conceivable?"

Habits of thought in Western intellectual culture tend to separate explanatory accounts in science based on underlying mechanisms from question of what Taylor refers to as "good/decent/acceptable forms of life".[443] One possible cause for confusion here concerns certain conceptions of what is to be a self-defining subject, as well as what it is to act in a neutral or inanimate universe. The question: What do explanations in science have to do with humankind's spiritual potential?, therefore links back to the prior discussion in Section 1 on the paradox in Western intellectual culture. The point to the discussion in Section 2 then is to try to frame a set of ideas regarding what constitutes an explanation of things according to their underlying mechanism, but which does not at the same time explain away our most abiding sense of human commitments.

The paragraphs that follow will try to highlight some of Taylor's ideas found mainly in his How is Mechanism Conceivable? (1985), but also in Peaceful Co-existence in Psychology (1985).[444] Taylor's ideas arguably contribute to a reworked notion of mechanism, notably what this has to say regarding our conceptions of practical reason.[445] The discussion in Section 2 is divided into three sub-sections, namely: Mechanism, intersubjective accounts and certainty, Human agency and the expressive use of language and Features of an expanded explanatory account in the human sciences.

Mechanism, intersubjective accounts and certainty

Among the general points argued by Taylor in his How is Mechanism Conceivable? (1985), is that the classical model in explanation tends to side-step some key explanatory issues that properly belong in a broader conception of the human sciences and in social theorizing generally.[446] However, he also thinks that patterns of explanation based on the workings of some kind of inner

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mechanism or hidden structure need not be abandoned, only conceptualized in different terms. Such a reworked conceptualization of what is involved in giving a machine-like inspired account of human intents and commitments arguably opens the door to notions of practical reason that need not end in a thoroughgoing scepticism as regards the validity of its arguments, or towards the moral sphere generally.[447] Part of what Taylor tries to do here is to sketch the boundaries for such a reconceptualised model of explanation, thereby creating space for an approach to practical reason that avoids some of the sceptical pitfalls that accompany thinking from within the naturalistic standpoint, be it based on intersubjective accounts or on the accounts of subjects.

However, this task is not an easy one. First, the methods and procedures of the empirical sciences are rightly respected for the way they exemplify the notion of intellectual integrity in Western intellectual culture. However, given the widespread influence of naturalistic abstractions, and in particular "the primacy of the epistemological", it is difficult to convey in sufficiently clear terms what is involved in other patterns of reason without their appearing to be rivals, or simply confused.[448] In other words, the success of the classical model has led to the notion in the West that explanation is what mainstream science provides.[449] If so, then approaches that do not meet the rigours of its model are taken as failing to meet one or another essential requirement for an explanatory account. This is especially true for underlying mechanisms or hidden structures. If so, then alternative approaches that fail to meet the requirement for what constitutes explanation are placed on a back foot, so to say, in so far as their intellectual integrity is concerned.

Borrowing an idea from Taylor, and from the point of view of the classical model, doubt regarding the intellectual integrity of these alternative approaches turns on their inability to formulate their explanations in intersubjective terms, the assumption being that without such a formulation something like objective knowledge is impossible.[450] An additional presupposition in the classical point of view is that the ontology of the natural sciences is established fact. This certain belief in the existence of a neutral universe opens the door to a further criticism that could be levelled against alternative or rival explanatory accounts, at least from the classical standpoint. Namely, that to get off the ground they presuppose somewhere in their argument the rival but faulty ontology they seek to use.[451] Taylor seeks to avoid this debate. Instead, he hopes to clarify it by arguing that mechanism is conceivable, but not in its current form.[452]

What is needed in this regard is a notion of explanation that maintains the explanatory power of machine-like inspired accounts, but the ontology of which is expanded so as to include human intents and commitments. One issue here is that there are a range of questions regarding matters of worth which should be aspects of good social theorizing but which arguably tend to be passed over in the naturalistic standpoint. As a result, and in Taylor's terms, such matters of worth become invisible to it.[453] Said differently, scientific accounts assume that the explanation of phenomena is to be found in the underlying mechanisms and hidden structures that make them up. From this point of view, assumptions regarding the existence of some kind of underlying mechanism also provide for a degree of intersubjective certainty in our empirical knowledge of the social world. The sense of confidence in one's knowledge thereby achieved has also served to promote a wide-spread acceptance of the naturalistic stance in Western intellectual culture. However, the broad acceptance of this notion of explanation has tended also to exclude from consideration in the human sciences and from practical reasoning more generally a range of experiences regarding matters of worth, significance and human commitments. From the position being argued here there are good reasons for this, given that matters of worth and significance are properly regarded as the projection of subjects.[454] As such they fail by definition to meet the basic conditions for intersubjective knowledge. Here the term intersubjective is used in place of the more ambiguous term objective, as was discussed earlier in thesis Chapter One. From a classical point of view, human commitments are not part of the intersubjectively observable world. As such they are not the kinds of things about

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which explanations in science can be had. If so, then matters of worth and moral values generally tend to be excluded from explanatory accounts. Crucially then, the exclusion tends to rest on a certain set of notions regarding what it is to know the world.

Exploring these ideas further, Taylor suggests that the notion of explanation at work here is based on three aspects regarding knowledge and intersubjectivity.[455] First, knowledge is to be based on intersubjective accounts which provide agreement over what constitutes data that is beyond personal interpretation. Taylor calls this condition "brute data identifiable".[456] In like manner, Whitehead refers to "irreducible and stubborn fact".[457] In other words, data that are riddled with interpretation are data that cannot be checked against the test of nature or of a common human world. Such data cannot be counted on as being useful for research, partly in the sense that they cannot be used to infer in a reliable way what is going on in the phenomena being studied. There are two aspects at work here. Firstly, different researchers using the same data set might generate rival conclusions regarding the same phenomena. Secondly, no criteria can be found to decide the truth or falsehood of the rival statements made regarding the phenomena under study. From this point of view, to admit such interpretations would then create too great an area of uncertainty about what can be inferred from data. If divergent results arise, not only might they be judged differently by different observers, but also, due to the absence of any external criteria, we would be incapable of demonstrating which results to reject. Arguably, such a state of affairs would be intolerable, and particularly so in the case where the epistemic imperative is threatened.

Second, knowledge is possible because intersubjective accounts provide agreement on all operations with data as well as with deductions or calculations from established theory. This is done in such a way that the results of those operations, deductions and calculations are equally interpretation free. Hence, by using various inferences and deductions, researchers can reason out the underlying processes and hidden structures that the data reveals. In doing so they come to grasp and correctly apply those rules or correlations by which the underlying mechanisms or hidden structures are inferred from the evidence found in the data. In order to do this there must be clearly agreed upon procedures, deductions and the like that enable any scientist to check and verify his own work and that of others. Resulting from this, researchers can be reasonably sure that a theory of science accurately states what is and what is not the case regarding the functioning of those underlying process or hidden structure which the data points to. The qualifier that we are reasonably sure is added since science deals with various inductive inferences from experience, and not the certainty of logical deductions that are the hallmark of purely abstract systems of thought.[458]

According to Taylor, these two points characterize what he regards as a mechanistic epistemology that maps out through general law how an event is linked to its antecedents.[459] Even if the language of research is not explicitly mechanistic or mathematical, if it rests on these notions of intersubjective data then it carries a naturalistic indebtedness.[460]

Adding to this, the notion that knowledge rests on intersubjective agreement about what constitutes data, as well as what can be inferred from the data, points to a further condition in science that theories be refutable. Once again, these ideas are indebted to the abstractions of the naturalistic stance. If a statement about some phenomena has no way of being confirmed intersubjectively, then one cannot say if it truly or falsely refers to those phenomena. That is to say, one cannot tell if the statement speaks truly regarding the underlying process or hidden structure being studied. But if there is no way to establish if what is claimed about objects *properly* apply to them or not, then such claims would possess no explanatory power. In other words, they would have little or no use so far as concerns our ability to predict what will occur next, or why exactly something in the past happened in the way it did. In this regard then such claims do not faithfully reflect the epistemic imperative of science. They may contain highly imaginative and suggestive ideas, but in the end

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they do not necessarily say much about the actual observable world, at least so far as concerns our ability to make our way about in, or to predict, control or manipulate it.

Human agency

There is no question for Taylor that mechanism in its current naturalistic conception is inadequate for explaining our various commitments, judgements of worth and our experience in the moral sphere of life generally. He appears to use two strategies to look more closely at the conception and workings of explanation, and hence how these conceptions and workings can be expanded so as to include our most deeply felt human commitments. First, by analysing the founding ideas that makes mechanism possible he hopes to show up where its assumptions break down in the human sciences and in social theorizing generally. Second, by looking at the influence of the classical scientific world view on the sciences of man he hopes to show how the primacy of the epistemological has come to influence a wide range of intellectual endeavours, and not always for the better.[461]

Taylor goes to some length in How is Mechanism Conceivable (1985) to establish why it is that notions of who we are as self-understanding beings can form part of the human sciences, and to show up how the classical model of explanation based on naturalist principles tends to lose sight of them in some way.[462] This is notably so when it comes to intersubjective accounts and the accounts of subjects. More particularly, Taylor's notion of self-understanding concerns human agency and the expressive use of language – at least for the purposes of this discussion. He argues that if our accounts of worth and intent are conceptualized so to include the notion of human agency and the expressive use of language, then machine-like accounts could be expanded in such a way as to provide social theorizing with added dimensions of explanatory power. It is useful therefore to start this discussion by looking at some of what is involved in Taylor's ideas regarding agency and the expressive use of language, and from there where such ideas fit into an expanded procedural explanation so far as concerns the human sciences.

Briefly and oversimplifying, explanation based on intersubjective data come up short when faced with i) the nature of the link between intention and our actions, and which involve the higher emotions generally, and ii) ways of expressing those intentions, actions and emotions. The former arguably deals with what Taylor calls human agency, while the latter deals with what he terms the expressive use of language. The following introductory discussion is indebted to Taylor's ideas found in his What is Human Agency? (1985), and Language and Human Nature (1985).[463]

First, in the case of human agency Taylor suggests that for self-understanding beings there is a close link between intent and action such that to change the intention is to re-identify the act. This is because, according to Taylor, in many cases what an action *is* cannot be separated from the purposes, motives or intents of the agent. For self-understanding beings, the description of an action originates in persons as agents, and not as a result of applying a procedure for intersubjective knowledge regarding people's performances judged according to a set of criteria or performance indicators, as might follow form the naturalistic standpoint. For self-understanding beings it is not the case that actions can be observed independently from the intentions of those that perform them. Instead, an action is known by its intent. In other words, agency is not a function of a conscious mind that acts according to some procedure for knowing what to do or how to choose, assessed in terms of performance criteria or performance indicators. What might be called an action-description instead depends on the intention that gives rise to it, so to say. To grasp the intention differently, necessarily by the way people use language to express it, is to change what the action *is*.[464]

An important point to make here, one that will be repeated throughout the thesis discussion, is that this kind of ontological link between action and intention sets up a different matrix of ideas

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regarding practical reason, as well as the notion of what constitutes certainty in argument. When it comes to self-understanding beings, there is no intersubjective basis in classical terms that provide criteria for what Taylor calls brute data identification of our actions that are free of personal interpretation and hence true across all perspectives.[465] This is arguably one reason why the link between intention and agency is side-stepped in the classical model. But intersubjectivity is not the real issue here. Intersubjectivity comes out of the ontological assumption of a neutral universe together with the idea that reason is procedural in nature, and requires the use of external criteria.[466] This is where the primacy of the epistemological comes into the picture, and where questions about what an action is, is worked out in terms of how it is known intersubjectively. The key point here is that one is left with either intersubjective accounts or the accounts of subjects, both coming out of the same ontological assumption regarding a neutral universe and the individual conscious mind. Hence, and assuming that what an action is, is decided via the use of performance criteria or external standards of judgement, then in the absence of such criteria we are left with the notion that people's intents and their actions are pictured as merely being the projection of subjects.[467] But in the case of self-understanding beings, a different ontology obtains such that human agency is grasped substantially, to use Taylor's term, by the way it relates directly, and in part tacitly, to a person's understanding of their action as being constituted by the intention it both expresses and helps to realize.[468] Again, expanding on some of Taylor's ideas, to alter one's grasp of the intention is to change what the action *is*, and this ontological aspect of agency is side-stepped in the classical model of explanation in the sense that it tends not to make sense of things in these terms.[469]

The strength of the classical model rests in part on the widespread belief that it speaks truthfully about the workings of the natural and social worlds. In other words, research in the sciences generates true or truthful statements about their objects of study. As such it influences Western conceptions of what it is for an individual to act in those worlds. In such conceptions matters regarding practical choice are especially open to procedural methods and the use of independent criteria for making sense of people's actions. These may involve a variety of observable or measurable performances the likes of which are judged or assessed according to a set of performance indicators or standards. The quality or character of people's action is then decided by whether or not, or how well or poorly, it measures up to these indicators. In general then, the move here is one that tends to equate action with observable performances.

If so, then matters regarding people's view of worth, intent or commitment may be tagged as belonging to the world of personal motivation. In other words, in this point of view whatever reality such matters of worth may possess is properly regarded as the projection of subjects. Once again, the status of the classical model as regards its intellectual integrity makes this move acceptable to reason.[470] Taylor also argues that the move is acceptable to the contemporary Western mind because of the close link the classical model has woven with the naturalistic ideal of the modern free subject.[471] In other words, the self-defining individual is one who is free to make choices according to his own wants and likes. He can use whatever resources he has to develop the skills and talents that are needed to live according to his lights. Taylor makes the observation that naturalism is a paradoxical expression of the age-long desire of men to be free of the enigma of common experience, and so find the truth behind appearances.[472] This notion of freedom arguably refers to something like having the latitude to make choices in such a way as to build up or define a life of one's own making.

Here then, action, or the choosing to act, is at least in part a function of performance, utility and control in a world of resources which serve as means, or as extensions of our powers, to accomplish our own purposes. Action might then be thought through in terms of the kinds of performances the central nervous system has evolved to accomplish, always with the help of outside devices.[473]

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However, for self-understanding beings agency does not turn on making own choices in a world of ready resources. Instead, agency turns on its ties to purpose or intent, where, as a first approximation, to grasp the intent differently is to change what the action is. The point here is not to say that the naturalistic rendering of action is false *per se*, only that there exist some crucial aspects to agency which escape its focus. If so, then additional gains in knowledge can arguably be made when agency is also grasped in its self-understanding sense. Here a notion of agency expands the ontological ground for making sense of action when compared to that taken up in naturalism. These ideas lead to the second point for discussion here, namely, the expressive use of language.

The expressive use of language

The expressive use of language is closely tied to the notion of human agency, and, according to Taylor, is the second main explanatory term that tends to be truncated by mechanistic accounts.[474] Taylor's notion here is multiform, but as a first approximation language does not only name or designate things, it can also give expression to matters of worth or significance so as to make them real and present in our understanding, and this in a way that creates a added sense. In this regard, and as Taylor suggests, the expressive use of language can open the door to an expanded grasp of that which is of significance in our actions and decisions in the sense of realizing them in different terms, or coming to a more prescient understanding of what our commitments involve.[475]

In the case of agency, intentions partly make up what action is. If so, then the act of grasping or coming to realize the intent differently by altering the language used to express it would serve to transform the action. From the point of view of the naturalistic stance, the urgent question to raise here is: How do we really know what someone's intention is? From within this stance the answer is sought in reason that is procedural in some sense, and which calls for some kind of criteria for knowing or deciding. However, arguing from the idea that persons are not just self-defining individuals but are also self-understanding beings, then the question to raise here is not just how is it that we come to know the intent, but also what significance does it have for us.

Taylor argues that if we think in terms of who we are as self-understanding persons, then there are indeed ways for deciding what someone's intentions are, namely, those that come from what he calls common or shared discernment and community insight and meaning.[476] Persons do not use brute fact determinations and external criteria to know someone's intention. If there is a question about these then, according to Taylor:

> [An argument] is not won by pointing to irrecusable data; rather it comes to an end when one side communicates insight to the other, and hence come to use the term in the same way, to 'speak the language'. But one comes to grasp the language of the other the way we pick up our first language, not through unambiguous explanations, but through hearing it. Hearing the language brings to light what the language is about.[477]

Obviously, the point is not about learning how to speak a language. The context here is that by speaking the language or hearing it spoken Taylor is referring to the expressive use of language among people in so far as it helps brings to light what an intention is about. In other words, actions and their intentions are made present and real to people in the way a community uses language to speak about them and to sound out their meaning or significance.[478] In part then, meaning does not reside in the consciousness of one person but in the significance given to our experiences mediated by an expressive use of language within a community of self-understanding persons. This is a crucial step for Taylor, and arguably takes thinking far from the premises that surround notions regarding the self-defining subject. Language makes up part of what it is to be a community, and a community is where language is heard and spoken.[479] The point here is to emphasize that language, action, intention and community meanings are linked in what might be called a constitutive circle.

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For example, knowing that an act is worthy or not is in part made possible by the expressive use of language taken in its entirety, that is to say, as it is written, spoken, heard and understood in a community. If so, then the meaning of knowledge would carry a somewhat different connotation when compared to the usual objective sort as per the empirical human sciences. To write, speak and hear language in part provides for varying degrees of discernment, insight and a sense of significance among a community of persons, each of whom are self-understanding beings. With such discernment, insight and meaning also comes, at least in principal, an ability to see in our actions that which makes them significant or hollow, worthy or base. That is, we are better enabled to know and judge our actions for the way they speak to what is essential within the human person.

Language here then is not only a kind of tool by which actions and intentions can be named or designated, dissected and critiqued, and about which some kind of consensus might be reached. Although there is a place for this kind of designation, yet from the standpoint that persons are also self-understanding beings, then a notion of language as a tool to correctly designate what someone's intention are, or to reach some kind of consensus about them, is to misplace it ontologically as something exterior to what the intention is. Instead, the way language as a whole is used to express our intentions and actions enables us to better realise the significance they have for us as self-understanding beings. In other words, through the expressive use of language we come to realize or recognize our actions for what they are in a more vivid or searching sense, or are better able to judge their worthiness in so far as they possess or fail to possess a particular characteristic or trait. From this point of view then, to learn to use a language of intention, significance and worth in a more perspicuous sense is to also open the door to an expanded grasp of what our motives and actions are all about.

Given such a position then brute data criteria may well indeed overlook questions of communally constituted meaning.[480] For Taylor, such criteria either dismiss them in favour of procedural norms, or simply do not have the conceptual machinery to deal with them. As a result, the world of intention and meaning that is made present and real to us in ordinary language becomes suspect or invisible to classical accounts. According to Taylor the reality of such intention and meanings

> ... fall through the net of mainstream social science. They can find no place in its categories. For they are not simply a convergence of a set of subjective reactions, but part of a common world. What the ontology of mainstream social science lacks is a notion of meaning as not simply for an individual subject; of a subject who can be a 'we' as well as an 'I'. The exclusion of this possibility, of the communal, comes once again from the baleful influence of the epistemological tradition for which all knowledge has to be reconstructed from the impressions imprinted on the individual subject. But if we free ourselves from the hold of these prejudices this seems a wildly implausible view about the development of the human consciousness; we are aware of the world through a 'we' before we are through an 'I'. Hence we need the distinction between what is just shared in the sense that each of us has it in our individual worlds, and that which is had in the common world. But the very idea of something that is in the common world in contradistinction to what is in all the individual worlds is totally opaque to empiricist epistemology. Hence it finds no place in mainstream social science.[481]

Taylor also holds however that many criticisms levelled against the mainstream sciences and their epistemology is misplaced in that they tend to argue against mechanistic accounts *per se*.[482] Taylor's position is different. He argues that mechanism is conceivable. It has a place in the human sciences, with the proviso that its conceptual background be expanded in such a way as to include what he calls "systematic coordination".[483] Taylor presents his ideas in this regard in two steps.[484]

First, mainstream explanation in its current form is not viable since it fails to include the way agency, intention and community meaning are part of what it is to be a person. In other words, and according to Taylor, given that humans are self-understanding beings, then to lose sight of this intentional side of human existence is to offer accounts that do not explain phenomena but explains

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them away. In this regard Taylor uses the phase "save the phenomena" in order to convey what is not to be lost sight of in a compatible procedural explanation.[485] Given that human agency is real – that people cannot fully understand themselves and their community without taking on board some notion of agency and intention in its self-understanding sense – then not to admit it into in a conceptual net is to miss out on something essential.[486] In this regard mainstream explanatory accounts of human motivation and agency are unfinished. They have adopted an ontological view of man as an individual subject and devised procedural methods for study that pass by key aspects of the human world as constituted by the ontology inherent in humans as self-understanding beings.

Second, once the idea is accepted that brute data accounts alone cannot do the trick, the question then rests on what form of explanation, if any, is sufficient to treat the way people do in fact experience agency, intention, worth and the constitutive role of language. Given that such an explanation is possible, and Taylor thinks that it is, it cannot be carried out solely on the basis of existing views of what constitutes an explanatory account of things. Again, this is because the naturalistic stance does not simply fail to explain such things, but instead it tends to explain them away. In other words, the notion of what constitutes an explanation of things needs to be expanded so as to include such matters of worth, significance, agency and intention as have been under discussion here. Once the possibility for such mechanistic-inspired accounts is accepted then a central point to the reductive-inspired criticism would fall away. Taylor refers to this as the "requirement of compatibility".[487] Indeed, mechanistic accounts could then enhance our grasp of motivation, human agency and a language of intention.[488]

Three features of an expanded account in the human sciences

Taylor goes on to sketch some main hypothetical forms of what an expanded explanatory account would entail.[489] The points that follow are indebted to his treatment of the subject.

First, our notion of the subject would have to be enriched conceptually so as to overcome the bias in naturalism towards neutral accounts, that is, accounts which in effect claim that the world of human intention, being the projections of subjects, is not part of the universe in its intersubjective sense. Such a view passes by what this expanded explanatory position is intended to include.

Second, an expanded explanatory account would have to "save the phenomena".[490] If it offered explanations of underlying processes and hidden structures then these would have to capture the reality of intention and action in the way our best, most lucid use of ordinary language does – not as the projection of individuals but as lucid presentations of what is real about us as self-understanding persons. It cannot take the stance that such attributes are illusory. It would instead provide an account that does not explain them away, adding to the understanding of how it is we experience them the way we do. In other words, the ontology of naturalism stops short. From this viewpoint then, human agency is part of the "fabric of things", and an enriched account of process and structure would help grasp how it is that way.[491] If some account of underlying mechanisms turned out to counter our most lucid self-interpretations, that is, the best understanding we have of ourselves as self-understanding beings (not self-defining subjects), then that account would have to be reworked so as to save the phenomena, or be judged as lacking in reality.

Third, an expanded explanatory account would have to incorporate the way our use of ordinary language provides viable causal explanations at the level of purpose and intention. Current mechanistic schemes offer rival causal accounts in the sense that both cannot be true because contradictions arise at some point in the string of propositions that make up each respective account.[492] A conceptually enriched explanation of underlying mechanisms could not be a rival to ordinary language accounts, but instead provide supporting explanatory reasons why those ordinary accounts succeed. It might offer a set of correlated reasons regarding how it is the mechanical

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account which purports to describe the cause of x in terms of a, b and c, corresponds to ordinary language accounts that describe the cause of x*, in terms of a*, b*, and c*, where x and x* arguably refer to the same phenomena and where the respective causal statements do not contradict in some way.[493] The need to show that the respective explanations are not rivals rest in part with accounts based on underlying processes and hidden structures. This is because an enriched ontology sets the condition that what is given to us in our most lucid self-understandings is real. These are to be preserved, generally speaking, in any conceptually enriched explanation. Once again, such explanations are intended to save the phenomena, not explain them away.

As Taylor notes, no such account exists. The point is that those who would oppose a mechanical explanation of the workings of human behaviour typically reject mechanism outright. According to Taylor this need not be so. If key explanatory terms deriving from human agency and community language, which neurological inspired accounts side step due to current conceptions in mainstream explanation, can be brought into a conceptually enriched account, then there is no reason to reject mechanism outright. The debate would then centre on which, if any, explanation of process and structure best stands the test of a conceptually enriched science, namely, how well do they account for our most lucid interpretations of motivation, human agency and community meaning? Of course, no one need argue that mainstream science as a whole jump its conceptual track. There may in fact be a wide range of phenomena in the broad human sciences that are suited to its assumptions. The point Taylor emphasizes is that a mechanist account is too costly in terms of our most prescient self-understandings.[494] Said differently, the normal range of naturalistic abstraction is too narrow. A wider avenue of thought is needed for an expanded study of human agency.[495]

Section 3: An expanded conception of explanation

Introduction

So far two key ideas have been discussed which the classical model of explanation arguably tends to side-step, that is, (i) the intentional side of agency and (ii), the expressive use language as constitutive of community meaning. As argued above, certain aspects of these two ideas need to be included in an expanded conception of what it is to give a procedural, or machine-like inspired explanation in the human sciences. In other words, they are to become a part of what is explained. In this regard, five additional notions can be mentioned. Each of these notions revolves around the ontological link between human agency and language. They may therefore be thought of as riders to the first two key ideas. However, each has certain facets that could arguably be included in an expanded conception of what, according to Taylor, explanation in the human sciences involves. Besides notions (i) and (ii) above, the five additional ideas are: (iii) self-understanding and self-interpretation, (iv) procedural and substantive judgements, (v) consciousness and significance, (vi) strongly evaluated ends and qualitative contrasts, and (vii) reasoning about transitions.

Given that these seven notions speak to a richer ontology than is found in naturalism, then not only can they contribute to an expanded conception of mechanism, but they can also help sketch a different picture of practical reason. There are a number of ways in which these seven notions might work to bring this about. More specifically, they arguably help to: a) revisit the abstractions found in the naturalistic stance concerning the existence of a neutral universe, on the one hand, and on the other, that human purpose or values are projections of individual minds, b) rethink the notion that patterns of reason are to be based on either intersubjective accounts or the accounts of subjects, c) rework the notion of the self-defining individual in favour of a community of self-interpreting persons, d) set limits to notions of performance, utility, leverage and control that seem to dominate patterns of thought in the naturalistic stance and which arguably tend to obscure notions of agency and significance that are crucial to the way we judge our actions in the world, e) suggest how practical reason might deliver judgements of a substantive sort, and hence f) provide for possible

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views regarding questions of worth, and significance that avoid the general attitude of doubt towards moral argument, as tends to be the case in naturalistic thinking.

While all seven of these form a circle of ideas, only parts (iii) (iv) and (v) will be discussed in this Section. The remaining two deal explicitly with Taylor's analysis of practical reason, and will be reserved for the next chapter. The following is a brief outline of a group of ideas that work together in close mutual relation regarding the ontological link between human agency and language.

Self-understanding and self-interpretation

The first notion that points to the ontological link between human agency and language is that humans are self-interpreting creatures. Within the context of the thesis discussion, self-interpretation involves making sense of those judgements of worth, intent and inner significance that are central to who we are as persons and to the kind of society we inhabit, or would wish to inhabit. Taylor uses the phrase, significance feature, to refer to this notion.[496] There are two aspects that need to be highlighted here. First, the fact that we are capable of making sense of ourselves in this way is part of what it is to be a human creature.[497] In other words, understanding makes up part of who and what we are as persons. Such understanding can be said to be original in the sense that our capacity for it is not to be explained or accounted for in other terms. As Taylor writes, "There does not exist an adequate description of a human being in respect of his existence which does not incorporate his self-understanding".[498] The kinds of experiences we are capable of having as persons are conditioned by the fact that we are self-understanding beings. Ours then is to grasp its comings and goings, so to speak, to be aware of the kind of being we are in so far as we can make sense of ourselves as persons and particularly so when it comes to judging or discerning the significance and worth of our actions. These ideas serve a dual purpose: i) they help to expand the conceptual underpinnings regarding what constitutes explanation in the human sciences, and ii) they provide for a pattern of practical reason and reflection that serves to rethink the usual warrants for scepticism towards moral argument as are commonplace in Western intellectual culture.

Second the kind of self-interpretation we are capable of involves a sense of intention or purpose in so far as it makes up part of who and what we are. It comes with the warranty, so to speak. In other words, we cannot dissociate the world of intention from a conception of person-hood and the interpretation we give our actions, and still maintain a lucid grasp of who we are. From this point of view it would be faulty to think of our intents or purposes as being something we attend to in a representational consciousness given to us via the designative use of language, or through some form of foundational or instrumental argument, or in judgements made via external criteria and a set of performance indicators. At least, these are not the only ways of thinking about purpose. Knowledge of intention gained in this latter sense might instead be thought of as an add-on to what Taylor likes to call our most prescient self-understandings. More centrally then to the argument here is that the world of intention is already real and present to self-understanding beings. The task then is to interpret its many forms, meanings and significances. Included here is how we use language to grasp our intentions and what they say to us concerning the kind of person we are (or the society we inhabit), as well as what it is to judge or assess our actions in light of such understanding. John Thompson puts across the same idea in terms of what he calls symbolic forms:

> [T]he study of symbolic forms is fundamentally and inescapably a matter of understanding and interpretation. ... The subjects that make up the subject domain are, like social analysts themselves, subjects capable of understanding, of reflecting, and of acting on the basis of this understanding and reflection. [499]

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If so, then we will less likely make sense of ourselves fully and lucidly without also recognizing that part of what it means to be a person comes from the way we grasp who we are as agents. That is, as beings for whom one's actions cannot be made sense of apart from one's intentions.

It is worth noting here a distinction that can be made in the use of the terms self-interpretation and self-understanding, or what it means to be a self interpreting-person and a self-understanding being. The latter carries ontological connotations in that it can refer to our existence as creatures for whom understanding is part and parcel of who and what we are. In other words, we are beings partly constituted by self-understanding. The former can refer to our trying to grasp or make actual sense of ourselves and our actions as persons. To be a self-interpreting person is to be involved in trying to come to terms with the life we live and the social and terrestrial worlds we inhabit. Self-interpretation involves the attempt to make sense of ourselves as persons and agents, the society in which we live, and the larger world that surrounds us.

The reference to 'self' in self-understanding and self-interpretation is of course not a matter of paying attention to one's own interests and concerns. It is instead a way of referring the fact that we are aware of our own and other's existence, both of who we are and what we might become, and that we exist in a social world with other beings capable of a similar reflecting. As a species we can think about our own thinking, know our own and others' intentions, learn to experience the higher emotions and to reflect over them, be aware of and judge our actions, attend to a range of greater purposes beyond those that actuate the individual, and see ourselves and others as living, acting in and belonging to a larger world.

Such notions of what it is to be a self-interpreting person arguably lead to a different sense of theory and explanation. From within the naturalistic stance, the classical notion of theory is that it is about independent objects. Such objects exist separately from the mind that knows them. It stand apart from the theories the intellect formulates in order to explain them. Hence, in theoretical research using a general theory to study a specific case will not change that which is being studied. Neither will such a study alter the general theory.[500] Of course, there may come a time where what is observed does not fit what the theory says or predicts. Such cases may then serve as an opening to refine, extend, or completely revise the theory.

One way of demonstrating the latter idea is when a theory is used to make or craft some product or process according to human needs. Such products or processes partly serve to extend or amplify human powers, which in turn can be used either to extend the range of observable phenomena explained by the abstract theory, or to leverage forces in nature and the social world so as to build up an environment of one's own making or choosing. The better a theory the more effective will be the ability it gives to move about in the world the theory treats, or craft products that actually work according to human design.[501] This is arguably part of what is involved in the notion of explanatory power. Also, the sense here could be reversed: a better theory is precisely the one that enhances our ability to move about in the world according to our wants, or to craft products that work according to the way we design them. In any event, the underlying assumption here appears to be that once a theory is established, then the way it is used to explain something leaves unchanged that which is the object of explanation. This is because abstract theories are about independent phenomena, by which is meant that events, processes or objects exist separately from the ideas people have about them. Said differently, a given theory, T, is used to study a particular object or phenomena, P, leaving both T and P unaltered.

However, in the case of self-interpretation some aspects of what is real in the world are changed by the sense of worth or significance given in an interpretation of them. This is so because self-interpretation alters a person's or people's self-understanding. As self-understanding becomes more prescient, as old meanings dissolve and new ones emerge, something of who the person or society

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is will change in turn. In other words, to change how we understand ourselves is to exist differently than before, to be a different person or society in some sense, to occupy or possess a different state of person-hood or to assess some aspect of social life in different terms. With this would come as well an altered sense of significance, worth or urgency. Here social theories would not be about independent objects which leave unaltered both theory and object. It would instead involve instances where the social theory changes the practice being studied. Or, as Taylor notes, social theory is a form of social practice.[502]

As an example of how self-interpretation can alter its own object, someone might say, paraphrasing Taylor, "I now realize that what I was experiencing all along was not anger but my reaction to the stress of an uncertain situation. This realization has served to alter that emotion and how I make sense of it. I no longer identify it as anger. I now experience it differently, and view the situation in which it arises in a new light. I have changed the way I speak and act with regard to it, and can see how in the past I was led to behave badly due to what I now realize was a faulty grasp of the world".[503] Similar consequences follow for various kinds of social deliberations people might conduct between themselves or with others. This is somewhat unlike the accounts that might arise in mainstream explanation, where the task is to identify the kind of action being exhibited according to intersubjective agreement about what some behaviour signifies, and perhaps in accordance with set of specific performance indicators. As an aside, these kinds of ideas suggest the notion that social theory is kind social practice in a way that differs from explanatory accounts.[504]

By implication, as self-interpreting beings, humans come with an already present grasp of self and world. People understand themselves as having a particular character, they are engaged in specific tasks, are aware of certain intentions, and live among others who likewise speak, work, assist or hinder, befriend or threaten. When therefore a person's grasp of these aspects of life change, something of who that person is can also change. People are continuously involved in coming to terms with the explicit, and in gaining greater awareness of the significance of the tacit.[505] If to be a person is to be partly constituted by self-understanding, then to fail to grasp this aspect of our being is to be confused as a person and as an agent. Said differently, we are lucid in how we make sense of our world and ourselves in it if and only if we are lucid in the grasp we have of our intentions and actions as agents in that world.[506] Again, according to Taylor, descriptions of ourselves that do not take cognisance of this aspect of self-interpretation would fail to apprehend in greater or lesser ways an essential aspect of what it is to exist as a person. It is useful to note here is that this idea is unlike the relative or axiomatic accounts that arise in the species of understanding based on multiply constructed realities, as treated in Part B of thesis Chapter Two.

Taylor argues this is so because interpretation takes place in a world where meaning is communally or reciprocally given. This is in contrast to one that is contracted out, so to say, to a set of self-defining individuals each of whom exists as the locus of consciousness and value. Such a communally constituted world is composed of self-interpreting persons whose grasp of meaning is in part irreducibly linked to a shared language of meaning and expression. As previously quoted and according to Taylor, "... we are aware of the world through a 'we' before we are through an 'I'".[507] From such a viewpoint it is not possible to separate out the question of what is socially real from this kind of self-understanding, that is to say, from what the practices are that make up how people live their lives among others. In this regard, John Thompson in his *Ideology and Modern Culture* (1990) strikes a similar note, as indicated in the following passage:

> Human beings are part of history and not merely observers or spectators of it; historical traditions, and the complex clusters of meaning and value that are handed down from generation to generation, are partly constitutive of what human beings are.[508]

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An important point here is that such a view of interpretation steers clear of the thoroughgoing relativism that other accounts of understanding may tend to fall into, and this because the latter posits the self-defining individual in contradistinction to a universe of independent objects as the starting point for deliberation on the human person.

In this case understanding is incorrectly thought of as something an 'I' primarily does. However, in a point of view like Taylor's, even when alone a person is necessarily tied to a community of meaning as a partial precondition for him to reflect on or judge the significance or worth of his practices and actions. From this point of view, it is also faulty to think of self-interpretation as an act that is self-referring in the sense that it is driven out of self-interest. To be a self-interpreting creature is to be involved in making sense of the world in which people live and act, and where the meaning of which is not holed up in any one agent. Part of what makes up a person's (or a people's) most lucid self-understanding is the meaning that is given to the various social practices, historical traditions, religious beliefs and intellectual culture, among others, that makes up the world in which the person lives and in which he himself plays a part and can influence in turn. In other words, as social practice changes then so too might change a person's self-interpretation.[509] This is one case then in which it makes sense to argue that social theory is a species of social practice.[510] Crucially, this places evaluative judgements about the actions of agents as something that is part and parcel of what it is to be self-understanding creatures. In other words, questions of worth and purpose will arise because self-interpretation is closely linked to the significance of our practices for the way we live and the meanings they hold or portray.

Procedural and substantive judgements

The second notion that can help highlight the ontological link between human agency and language concerns the difference between procedural and substantive judgements. Taylor argues that in general human purpose and intent cannot be accounted for by observing peoples actions from a neutral stance to which is then assigned or ascribed some stimulus for that action, though there may be exceptions such as pain or fear.[511] In the case of self-understanding beings, a person's knowledge of action forms a different kind of awareness in which human worth or significance is already present and where the meaning of which need not be inferred from the information given in instrumental procedures, empirical methods, brute data observations, performance indicators or via some other intersubjective platform. Of course, our understanding of the moral sphere may be strengthened through these kinds of intersubjective platforms, but they cannot alone suffice. In this regard, and according to Taylor,

> [T]he attempt to separate out a language of neutral description, which combined with commitments or pro/con attitudes might recapture and make sense of our actual [moral] explanations, analysis, deliberation, etc., leads to failure and will always lead to failure.[512]

In this way of thinking there is no question of divorcing what a human being does from a language expressive of actual intent, significance, aspiration, misgiving, and the like. In other words, the most lucid self-understanding we have in terms of ordinary language descriptions speaks to us about who we are and what we do in such a way that neutral accounts *à la* the naturalistic stance cannot properly capture. There is something about our moral "explanations, analyses and deliberations" which escape the attention of a language of neutral descriptions, but which if ignored thereby would serve to miss something crucial in the kind of beings we are.[513] Taylor's main point here is that so far as the intentions of agents are concerned, the judgements available to self-understanding persons are substantive in nature, not procedural. This is another way of saying that ontologically speaking, action and intention are inseparable in the way persons are partly constituted by self-understanding, where to come to different terms regarding our most lucid self-interpretation is to change the kind of agent we know ourselves to be. Taylor argues that to be a

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person is not first to obtain to consciousness, to which can then be added some representative meaning or a system of values, as if someone had a map of the neutral world onto which can be drawn a topography of one's commitments and values, and off of which the bearings for one's actions can be read. In his view, this is impossible because of the peculiar quality of self-understanding as partly constitutive of human persons and their status as agents, that is, as beings of purpose and meaning who act with intent.[514] We cannot make adequate sense of who we are as persons by charting ourselves in neutral, representational terms, or via what Taylor calls the designative use of language.[515] It would however be consistent with Taylor's position to hold that some actions can be explained by correlating behaviour and intentions in an intersubjective study (e.g. fear, anxiety) but that this cannot be done across the entire range of human motivation.

In this regard, humans exist in a world of meaning and consequence, part of which is found in social practices, religious or spiritual significances, historical traditions and climates of thought that are already given. Part of what it is to be a self-understanding person is to be able to come to clearer terms with these sources of meaning and significance. This does not mean only to make better sense of them as givens, but also to discern between those aspects in them which are fulfilling or hollow, noble or base, profound or superficial, sympathetic or cruel hearted, enduring or transient, unifying or discordant, world embracing or confined to one's own self.[516] Taylor views such contrasting characterizations as playing an important role in the quality or depth of our self-interpretations, and especially so when it comes to matters of worth or significance.[517] From this point of view then, to think of action as something that can be intrinsically designated, or correlated to some objective neurological condition read as a motivation, as if action descriptions were objects among other objects in a field of neutral reference, is to misplace something of what it is to be a self-interpreting person. The tendency to do so turns in part on the notion that persons are viewed as self-defining subjects in a universe that makes no claim on us, and that they therefore choose courses of action based on a set of performance criteria in a world of neutral means and resources, this in accordance with their talents and faculties and in line with their own goals.[518]

Furthermore, given the influence of the naturalistic stance in Western intellectual culture, then it may be common to adopt a view that sees performance criteria or some form of demonstrable competence or skill as providing the more respectable account of rational or sensible action. Part of what makes up such a rational account in naturalistic-like explanations is that they seek to avoid personal bias and prejudicial judgements by adopting a neutral and value-free stance based on a view of what it is to know the world in intersubjective terms. In other words, the question: What is the world like? is answered according to the procedures by which we come to know it.[519] However, Taylor argues that some comparison here is needed with ordinary language expressions. Humans have been talking about themselves and their world for ages, and such talk is always, in part, purposeful, intentional and filled with meaning.[520] In other words, the intentional side of our being is not only described in terms of desire, aim, strivings, accomplishments and the like, but it also speaks to questions of what is worthy of us in our actions as persons, or of significance in the way we make sense of the moral and social forms or spheres of life, to paraphrase Taylor.[521] Said differently, we are beings whose form of life can give expression to what Edgar Morin and Anne Brigitte Kern in their *Homeland Earth* (1999) refer to as our "psychic spiritual ethical cultural or social" potential, or simply, the spiritual dimensions of life.[522] Here our ordinary language accounts can provide us with subtle and discriminating distinctions as to who and what we are as beings capable of experiencing these dimensions of life.

If so, then when our strivings, aims, aspirations and the like are made sufficiently clear and are related to each other in precise and subtle ways through the expressive use of language, then, according to Taylor, we have the beginnings of a causal account of action at the level of the everyday.[523] Such accounts can arguably be said to offer a substantive grasp of human intents and

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actions (that is, agency), at least to the extent they make sense of what is worthy of us as persons, or is of significance for a people, or speaks to a form of society that is judge worthy of inhabiting. Said differently we are looking at the way a people or society comes to realise or articulate mankind's social, ethical, cultural, psychic and spiritual potential in so far as it opens up avenues leading to forms of life that are more just and peaceful.[524]

In addition, the account is substantive in part because it is carried out at, or belongs to, the same level of reality as that which is being understood. In explanations based on the naturalistic standpoint the more substantial account is the one that goes beyond the observed in order to bring to light the underlying mechanism or hidden structure. From this point of view accounts that stop at the observable are only descriptive in nature, not explanatory. However in the case of accounts based on self-understanding, this notion of the observable versus the hidden does not apply in the usual mechanistic way. This is because when it comes to who we are as self-understanding beings one is already working at the level of inner meaning and hidden significance. In other words, inner meaning is the starting point to the whole act of interpretation, and so one does not need a procedure to be able to ask questions about the underlying nature of things. Here the entire dialogue can be conducted at a different level of reality, one in which the paradox spoken of earlier in this chapter need not necessarily arise.

Of course, explanatory accounts in ordinary language terms are no simple matter in that they involve subtle distinctions of inner worth or significance. Included here is a certain depth of insight into the practical and moral sphere, an intellectual culture, and a social, religious and historical tradition, the understanding of which are enhanced by an extensive reflection and consultation on the spiritual dimensions of life. Still, not more than this is required in such accounts but that they speak in meaningful ways to the worthiness of people's goals, aspirations, intents and desires. From this point of view our most lucid grasp of the ontological link between intention and actions are not procedural but substantive, and this is especially so when it comes to the questions: Are these actions worthy of who I am as a person? What significance do these actions have for the kind of the society we would truly wish to inhabit or bring about?

A crucial aspect here, and expanding on Taylor's ideas, is that a substantive grasp of the worthiness of some action or of the significance it has, outweighs the balance of procedural evidence (or determinations based on external performance criteria) in cases where the two accounts do not coincide.[525] This is because substantive accounts first provide a non-mechanical causal explanation of intent and action, that is, agency. Second, their explanations of human action already start off substantively at an underlying level of meaning. Third, they work from a richer ontology than is found in naturalism, that is, the ontology that obtains in the way intent and action are related for self-understanding beings. Simply said, the dialogue with nature that empirical social science achieves is in part a metaphorical one, whereas that which self-interpretation enters into is not metaphor but actual dialogue and hence substantive. If so, then the latter would likely trump the former in cases where the two dialogues diverge, depending, that is, on background considerations.

A point of further emphasis can be made. As already noted, Taylor holds that in matters of self-interpretation to alter the language by which the intention is described or expressed is to change what the action *is*. However, this is not simply a matter of rephrasing the intention by using words differently. Instead, the manner by which we give expression to our intentions is a central aspect in our coming to terms with the worthiness of the act or its significance to a specific form of life. From this point of view, offering an interpretation of, and hence giving expression to, some act according to its purpose, meaning or intent opens the door to substantive explanations of what actions are for self-understanding agents. In other words, the interpretation can open the door to added meaning or insight into conduct or decisions. Here a linguistic expression might trigger a novel insight or suggest some connection of ideas that was not previously noticed or sufficiently

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appreciated. Such transitions in meaning might serve to change the whole sense of an action's intent, and hence too then the reality of that action for self-interpreting beings. And once an agent has gone through a transition in the way he understands his intents or comprehends what they involve him in, then he is more likely to assess his actions in different terms. They will come to exist differently for him.[526] In a still different sense, once someone comes to realize in different terms the reality of what is going on around him, he will likely come to see and know himself and his intents differently in relation to them, and where the significance of what is going on around him could include the historical, cultural, economic, social, psychic, familial, ethical and spiritual domains. Crucially, however, the phrase going on around him is used here to point to something of the richness of life we are capable of experiencing, and for which single-term descriptors are inadequate, such as historical, cultural, economic, social, or psychic.

It is worth noting that this kind of transition in meaning can work in at least two ways. First, if someone (say, person A) comes to understand differently or more clearly the intention(s) behind another person's act (say, person B), then for A the actions of B have changed, even if the outward behaviour or performance of B has not. This is in part because the understanding we have of ourselves and others as agents starts at the level of inner meaning. In other words, different intents could be ascribed to the same outward behaviour, not in the sense that one is confused about them, although that might be true, but in the sense that in general we cannot set up a rule that says: When behaviour x is observed then we can read intent y. If intents exist at the level of inner meaning or what might be called a domain of spiritual significance, and if one wants to understand another's intent, then what is called for here is a prescient interpretation. For self-understanding creatures one could perhaps say that intent and act are subsumed under the same ontology, at least in the sense that what the intent is speaks directly to what the act is. If so, then forms of intersubjective knowledge, while useful, are still not fully sufficient to know the intent and hence the action. In this case interpretation is also required.

Second, if person A, in looking at himself and the effect his behaviour has both on others and on himself, comes to a different realization of what his actions really are about – that he now sees them as hollow or mistaken or as being nonsensical with what is worthy of life – then in his own understanding then two things could occur, among others: i) what his action *is* will be transformed (he thought it was action X but now he knows it to be action Y), and ii) his behaviour will change in the sense that he now sees both action X and Y as mistaken or unacceptable in some sense. In other words, what he has been doing or the way he has been behaving or conducting himself can no longer be aligned with the new understanding he has of who he is and the situation in which he finds himself. Since the inner meaning of things has changed, a door becomes open for him to alter what he says, thinks or feels. Said differently, it becomes possible to paint a different picture of what is worthy of himself as an agent, at least in that world within which his agency is lived and practiced. In other words, whatever agency is or howsoever it might be transformed, one can find in it crucial links to questions of worth and significance that were not present before.

Taking all this together, one could say then that the attempt to make interpretative sense of our actions, that is, to give a lucid account of them in terms of their inner worthiness or larger significance, requires a richer ontology than is found in naturalism. If so, then what is called for here are patterns of reason that work in a substantive sense in addition to a procedural one. If it is the case that persons are creatures of inner significance, then it makes no sense to offer causal accounts that explain away that significance, as is arguably the case with mainstream mechanistic-like explanations, as well as some accounts based on the self-defining individual, both of which adopt a sceptical view of practical reason and the moral sphere in general.

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Consciousness and significance

The final notion to be discussed in Chapter Three that points to the ontological link between human agency and language concerns Taylor's distinction between significance and consciousness.[527] According to the naturalistic ontology as discussed in thesis Chapter One, on the one hand we live in a universe which, according to Whitehead moves endlessly and meaninglessly. On the other hand, we have conscious intellect or mind the nature of which is to know the universe as well as to determine and assess human actions and their place in it.[528] The distinction between the neutral universe and the mind that is conscious of it is the starting point for the kind of dialogue with nature that science enters into. It is also central to the paradox in modern Western thought discussed earlier in Part A of this chapter. In other words, once this distinction is established then a key question becomes: How can the conscious mind come to know the extended universe, of which human society is a part? The second key question that arises here is: How can the conscious mind come to judge human actions?

One response to this first question is that since, in the naturalistic stance, the one is taken to exist separately from the other then the conscious mind needs to formulate for itself some kind of representation of the world that it can look over and consider.[529] If so, then to make sense of either physical nature or the common human world is to attain to clear and distinct ideas of how it functions, build up various conceptual schema concerning it and to use these ideas to build up various conceptual schema concerning what makes it up. As also discussed in Chapter One, this can be accomplished by formulating concepts that offer intersubjective accounts from a neutral stance, a value-free posture and procedural forms of reason.

Accompanying such a view is the idea that in so far as the world is represented to the conscious mind, it is coded through spoken and written language, visualizations and mappings, abstract symbols and patterns, and the like. Such a coding or representation helps make *Homo sapiens* particularly intelligent when it comes to acquiring skills, and the carrying out of various performances related to survival and adaptation. This kind of intelligence also includes a wide variety of intellectual tools related to prediction, control, calculation, leverage and manipulation, as well as the ability to plan and to act according to some strategy.[530] These plans and actions are perhaps most successful when based on the formation of clear-cut procedures and external performance criteria for measuring their success. The higher the degree of exercise of such "practical and theoretical intelligence", the more likely they are to increase our chances for survival, to improve the skill with which to move about in the world, for effecting own purposes in it, or to otherwise provide for gains in leverage over the forces of nature and society.[531] Part of what makes humans distinct then is an ability to consciously map out one's place in the world, to formulate rational decision procedures, to work out strategic plans, to survey and acquire the necessary learning and skills, and so accomplish whatever productive end might be desired – be it chosen by the individual, or the product of some instinct for survival, or deriving from the various needs, requirements, incentives and aspirations people face in modern society.[532]

However, from the point of view that persons are self-interpreting beings, at least as it is being argued here, then there are certain aspects of action and purpose or intent that are inseparable. If so, then it is not the case that, on the one hand, there is a set of abilities and performance capacities available to the human species, and on the other, some set of possible goal states achievable by an intelligent use of those abilities mediated by the CNS and the use of outside devices it requires to show itself, demonstrate what it can do and learn to do it better.[533] Or, at least such a division cannot give a complete accounting. When it comes to humans as self-interpreting beings the world does not neatly decompose into such divisions.

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Extending this line of thinking, matters regarding the higher emotions, intents and moral agency need not be thought of as the projection of subjects that are placed in contradistinction to the real world that makes up part of the furniture of things, as Taylor phrases it. Such a two-fold distinction is indebted at least in part to naturalistic abstractions, the latter of which would include the various human, social and material resources people use and exploit in order to realize or pursue our various purposes. From this point of view, emotions could perhaps be taken as a kind resource in the sense that they are something people can learn to use or control so as to leverage some advantage or employ as a means to bring about some desired outcome. However, from the point of view that persons are self-understanding beings, then how people think about higher emotions, intents and moral principles, or how they act in regard to them, are partly determined by the significance they have for us. One could perhaps also say that they are partly decided, known or constituted by our coming to grasp the significance they have for us. Thinking in terms of the significance things have for us as self-understanding creatures could serve to create an expanded sense of that which makes up the domain of higher emotions, intents and moral agency.

Continuing with these ideas, human awareness is of a reflexive or recursive sort, part of the reality of which is that we are self-interpreting beings for whom significance is a central feature. Such a reflexive awareness is not conveyed via some form of representation in the mind, of objects located in a perceptual field. Awareness here instead involves the grasp of the meaning things have, some of which are present in a more direct or more tacit sense to creatures for whom understanding is a constituent part of what it is to be a person.[534] Meaning is located in part in human motivation, practice and reflection in a world that is already understood in some sense (hence, tacitly so), but which is also open to the elucidation of new meaning. The distinction then for the human person who is partly constituted by self-understanding is that he or she be sensitive to the purpose and meaning human actions have, some of which are already given (that is, present, ready or at hand). If so, and borrowing an idea from Taylor, then the aim of reason changes from achieving own productive purposes in a world of neutral resources, "to being sensitive to, to being open to, to try to make greater interpretative sense of the peculiarly human significances".[535] In other words, the explanatory terms of reference originate with the notion of significance, not consciousness.[536]

The point being made here, however, is not to say that human experience cannot be described via a clear and distinct conscious representation, mapping or schema, but that to human persons things also have significance in an original sense. This of course need not imply that one can't be clear and distinct about that which is significant, nor that conscious representation has no place in giving an account of experience. In the negative one might speak of 'original' as not being derived from, or not being a derivative of, a set of procedures conceived in abstract, intersubjective terms as per the primacy of the epistemological. Intent, purpose, aims, goals and the like have significance to persons in such a way as to constitute another species of knowledge, in addition to those representations or mappings that are established via intersubjective procedures. In other words, things have significance substantively so and not only procedurally.

As Taylor might argue it, an interpretative understanding helps make sense of the significance our actions have. Interpretation is not a matter of grasping something that exists 'out there' independently of our ideas about it, but of bringing to light the significance that it has in the real world of communally constituted meaning. In such a view there is no completed or absolute portrayal or presentation (sometimes termed articulation) of human significance. What is true about us as agents is partly constituted by the understanding we have, such that as our understanding changes then so too is transformed what it is about our actions we are trying to understand. While there is no world out there that stands still, as it were, as we try to know it, neither is the world relative to our individual perceptions. The point then is to become more lucid about the significance things have for us as persons who "exist as a 'we' before an 'I' ".[537] The significance things have,

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shown up in forms of reasoning Taylor calls substantive, not procedural, exists neither as an objective part of a neutral world, nor as the projection of self-defining subjects; it exists in a common human world of mutual discernment, community insight and shared meaning.[538]

This is one reason why Taylor argues that an interpretation can be wrong. In other words, persons can be in error regarding what they understand. From the point of view of self-understanding beings, there exists a real common human world, a 'we' that exists before an 'I', which cannot be interpreted in any desired way. However, thinking in terms of intersubjective accounts and the accounts of subjects, for example, arguably tends to lose sight of this aspect of social reality. Here, and according to Taylor, the usual range of naturalistic abstractions has no concepts to handle this aspect of reality in so far as it assumes the social world is made up of individual subjects.[539]

Furthermore, and finally, since interpretation can effect change in the human world, then making gains in self-understanding is not a mere attempt at values clarification. We are looking for an articulate account that helps us realise the actual significance of our actions. An articulate view of ourselves and our world is one that enables us to grasp it in some coherent way. The use of the word, understanding, in this human sense is to point at that which comes into focus when we become more lucid about the significance our actions have. This coming into focus then serves to rework the notion of rationality, namely, according to Taylor, that it enable us to be open to, to make greater interpretative sense of peculiarly human significances.[540] Rationality in this substantive sense can bring to light what was only partly understood before, but which when reinterpreted can offer an expanded sense of the significance we ascribe to our actions, and in coming to realise something of the essential in who we are that had previously escaped attention.[541]

To summarize, the discussion in the previous pages considered three explanatory terms in an attempt to highlight the ontological link between human agency and language, namely: self-understanding and self-interpretation, procedural and substantive judgements, and significance and consciousness. Three additional explanatory terms, namely, the expressive use of language, patterns of reason linked to self-interpretation, and strong evaluation, will be discussed in Chapter Four. Following Taylor's view, the point behind highlighting these three aspects was, first, to suggest where it is current Western mainstream accounts indebted to the naturalistic stance, and particularly what Taylor calls the primacy of the epistemological, tend to explain phenomena away. The second point in highlighting these three aspects was to suggest what an enriched conceptual scheme would preserve in order to give an adequate explanation based on the idea of an underlying mechanism while upholding at the same time our most lucid self-interpretations.

The next two Parts witness a change of gears. Instead of treating ideas related to self-understanding they examine the notion of complexity and co-evolution, notably through some of the works of Ilya Prigogine, Isabelle Stengers, Eric Jantsch, Edgar Morin, Basarab Nicolescu, and Ervin Lazlo. This may admittedly seems too sudden a shift from the above discussion on agency. The two fields have different starting points: agency with its links to an interpretive human science and complexity and co-evolution coming out of contemporary developments in the natural sciences. At the beginning of the following discussion only a few converging points will arise between them. However, as ideas develop some important comparisons will eventually emerge. The connections found here will be used to aid the thesis argument when it comes to making sense of evaluative questions humankind faces in an evolving planetary age. More particularly, the contemporary age is obviously burdened by vast divisions of outlook, yet the mutual interconnections that link all peoples from across the globe call for a view that is world-embracing in its scope. It is furthermore an age that is moving towards a planet-wide level of organization based on a growing consciousness of the oneness of the entire human race. Some of the dynamics involved here can arguably be made sense of using notions related to the idea of complexity and co-evolution.

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Part B: Complexity, the arrow of time and co-evolution

Introduction

The next three sections in Part B will attempt to highlight a set of ideas from the works of Ilya Prigogine and Isabelle Stengers' *Order Out of Chaos: Man's New Dialogue With Nature* (1984) and Erich Jantsch's *The Self-organizing Universe* (1980).[542] Section 1 treats a few introductory features of complex systems. Section 2 looks specifically at a few central ideas regarding irreversible processes. Section 3 explores the notion of self-organizing systems and co-evolution.

The ideas to be discussed below will be used later in the thesis for the way they highlight certain patterns of reason found in contemporary developments within science itself that arguably work outside the usual, mechanistic abstractions. These patterns of reason will also be linked to a conception of practical argument and judgements of worth that arguably avoids the sceptical attitude that tends to accompany naturalistic thinking, and notably so in choices regarding the development and use of technology in a planetary age. Hence, the thesis will argue that some aspects in systems thinking can help make more clear what it is to reason practically, and by so doing avoid the kind of thoroughgoing doubt regarding the moral sphere of argument that was treated in thesis Chapters One and Two. Work done here will also help in forming a connecting point to the ideas of Taylor, to be treated in thesis Chapter Four. Just to be clear, Taylor would not regard his work as a part of systems thinking. However, his notion of self-interpretation, agency, and the expressive use of language does sketch a line that is not unlike one that fits the dynamics of co-evolution and self-organization as will be developed in this next section.

In order to get started, some standard notions about complex systems will be highlighted; this to set the stage for those ideas that will be a point of focus later in this chapter and subsequently in thesis Chapter Five. The aim here is not to give a technical treatment, but to provide a sense of those ideas that might speak in different terms when it comes to the usual range of naturalistic abstractions.

Section 1: Some background notions of complexity

The following account offers few outline notions regarding complexity. It will treat three ideas: i) integrable systems, ii) non-linear interactions and iii) sensitivity to initial conditions.[543] Such ideas are a small part of what is involved in the notion of complexity, and even here they are treated in an approximate sense only. No attempt is made in Section 1 to treat these notions in complex systems in a detailed way. The discussion below serves only to draw attention to a few ideas in systems thinking that contribute to the overall thesis argument.

Integrable systems. Theories of complex systems are arguably one response on the part of scientists to the realization that the classical model cannot explain all phenomena at the level of everyday experience. In other words, some phenomena at the scale of ordinary human perception cannot be explained in terms of the precise workings of underlying mechanisms and hidden structures that rigorously link observed events to their antecedents. For example, according to Prigogine and Stengers, thermodynamics was the first established theory to move out of a strictly Newtonian mode of thought, in that it incorporated into its basic structure some notion of a time-dependent process in physics.[544] According to Prigogine and Stengers, until that time physics proper studied systems that were time reversible.[545] In other words, the equations that are set up to model phenomena allow for time to run in either direction, so that calculations regarding the state of the system can look equally ahead or back in time by simply choosing any time value, t, for substitution into the equations. Indeed, many so called simple or integrable systems are considered to possess just this kind of time independent or reversible property. However, there is nothing simple about them. They consist of highly sophisticated analyses of nature that have served as an

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ideal for much of science to follow. The notion of an integrable system – that a solvable system of equations exists which can account for what is observed in phenomena – grew up around Newtonian mechanics and dynamics based on this reversible sense of time.

Thermodynamics however deals with systems that are comprised of an uncountably large number of components in which heat transfer is involved. The system is complicated in such a way that the trajectories of its individual components are too difficult to compute.[546] As a result the way such systems function can only be calculated on the basis of probability and statistics. Since individual trajectories are too complicated to figure out, thermodynamic systems do not exhibit the same kind of time-reversible trait that is characteristic of integrable systems. In other words, thermodynamic systems display an arrow of time in which the state of the system is differentiated between a previous (past) state, say at time t_1, and a subsequent (future) state, say at time t_3. According to Prigogine and Stengers, thermodynamic thinking viewed the arrow of time that arises in such complicated systems to be a matter of limits in scientific knowledge and skill.[547] In other words, the arrow of time is a consequence of the scientist's lack of sufficient knowledge and skill, not part of the fabric of things, to use Taylor's phrase. According to Prigogine and Stengers, the arrow of time that appears in systems is not a due a lack of knowledge but is a real attribute of the system.[548]

Even in classical accounts many simple systems cannot be calculated out so that prior and future states can be known from a given set of current measurements or initial conditions. The mathematics and the calculations are just too difficult to work out in practice. The point, though, is that scientists in the classical scheme believed that this could be done in principle if enough knowledge and skill were at hand.[549] It appears that many scales across the observable order in nature can be explained in this way. For example, contemporary cosmologists take this stance because they study the largest structures of the universe where mainly gravity is at work.[550] They therefore confidently look for those equations that enable them to describe the prior state of the universe at a given time and in terms of which subsequent states can be explained.

In simple dynamic systems, the equations of physics used in modelling are such that they can run through an indefinite period of time and not introduce any unexpected divergence between the state the equations predict the system should be in, and what observation of the system actually say. Perhaps more accurately, divergence does turn up but the assumption is that some factor has been left out of the model, such that it will therefore fail to represent actual events. In other words, divergence between model and the actual state of the system is the consequence of a lack of knowledge. In such cases the system is said to behave in a cyclical or closed way. In a lab or industrial situation, if any divergence does come about, inputs can be made so as to maintain control via negative feedback, eliminate the divergence, and generate predictable, stable outputs.[551] In naturally stable systems (i.e. those that cannot be isolated and studied in some experimental design), if the system undergoes a shock or perturbation then the forces operating on that system tend to return it to its original state or to one close to it. Of course, if the shock is great enough then just about any system could break down completely. Not surprisingly, scientists have tended to focus on such well behaved, stable, time-reversible, (hence mechanical) systems since they are obvious choices for explanation. Indeed, mainstream science historically could only study stable systems – its abstractions and the available mathematical techniques arguably made the workings of any other kind invisible to it.[552]

Non-linear interactions. Complex systems function differently than do their classical, integrable siblings. One key idea behind complexity is that the behaviour of some systems is such that, in principle, explanation is possible only in a probabilistic or statistical sense.[553] In other words, complex systems are those in which a given effect cannot be linked to its antecedents via a single chain of events. The effect is instead explained in terms of antecedents acting along multiple chains of events, not all of which are linear. In the complex case, the relation between event and

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antecedent involves non-linear interactions and positive feedback loops, the result of which being that it is impossible to know in advance what some future state of the system will be, even given a precisely known set of inputs (constraints or boundary conditions). While it may be possible to explain what happens after the fact, as in the laws of dynamics that account for the weather, the way things hang together in time related complex systems is such that they cannot be calculated out in full and in advance. In other words, complex systems involve non-linear interactions that cause the system to diverge over time from any predicted state. This occurs in such a way that the divergence cannot be precisely determined in advance.[554] The issue here is not lack of knowledge or skill, but deals with the nature of the system dynamics as such. Weather is a good case in point, especially since this is one area where scientists first began to recognize instability due to non-linear interactions and what are called positive feedback loops.[555] Systems that function like this are said to possess sensitivity to initial conditions. Such sensitivity is generally regarded as a central feature of complex systems.[556]

Sensitivity to initial conditions. The notion of sensitivity to initial conditions is used to describe what comes about when a minor change or fluctuation in one part of a system produces an unexpected, sometimes very large change elsewhere, or perhaps even one that washes through the system as a whole.[557] In other words, minor fluctuations cause the system to diverge in unforeseen ways from an existing or expected state. Divergence and sensitivity to initial conditions are probably among the more important ideas in complex systems. However, according to John Casti there are different ways of thinking about the idea of divergence that tend to be confused.[558]

In one sense divergence from an expected state can take place because measurement is not precise enough. For example, the precision of calculations needed to engineer the rates of reaction in nuclear explosions is of an extremely high degree. The trajectory of a cannon shell can fall outside an expected range if the initial calculations are off by a small percent. Alloy castings fail if the concentrations of component materials are incorrect to within parts per million. However, this notion of divergence is not related to sensitivity to initial conditions, since it also applies to determinable systems. In a second sense, in principle all measurement and observation contain intrinsic error. According to Jacob Bronowski, this is unavoidable for any science and as such is a general property of human knowledge or, as he writes: "One aim of the physical sciences has been to give an exact picture of the material world. One achievement of physics in the twentieth century has been to prove that that aim is unattainable".[559] If so, then it applies as well to our knowledge of complex systems, and especially so in light of the notion that such systems are partly characterized by their sensitivity to initial conditions. More specifically, no matter how carefully designed or refined the technique, and no matter how sophisticated the device, every observation or measurement will have an internal scatter or error.[560] This is why measurements must be repeated and an average of the scatter taken. The truth is somewhere in the range of the scatter, but can never be pinpointed exactly. According to Bronowski, this has been known at least since the work of Carl Gauss before 1795, and is one motivation for the use of probability and statistics in science. The internal scatter is given by the normal distribution for a set of observation or measurements, and is therefore a matter of probability.[561] As with the first example, this is not the kind of divergence that is specific to complex systems. Finally, there is the kind of divergence found in systems that are sensitive to initial conditions. These systems can fluctuate or produce outputs that are outside what is expected. Something unusual is happening that makes it impossible to know in advance what will happen next. Their dynamics are non-linear, and, according to Casti, models of the dynamics contain what are called "strange attractors".[562] Such systems can range across a wide spectrum of study, including the physical, chemical, mathematical, biological or social spheres.

With these distinctions in mind, it is worth noting three broad characteristics of systems that are sensitive to initial conditions.[563] First, complex systems tend to be instable. This means that in

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some cases a small change will move the system to a different state. In other words, a fluctuation may result in the system switching to a different and unexpected state which could not have been anticipated in advance.[564] Even systems that are dynamically stable across a wide range of conditions can be perturbed to become instable. So the point here is not about instability as such, but the range of the instability. Complex systems are sensitive to minor fluctuations, especially those systems which Prigogine and Stengers describe as being at far-from-equilibrium.[565]

Second, there may be clear and precisely stated equations, or mathematical models, that describe how the system functions, but this does not necessarily imply that the model can be used to calculate a future state from present conditions. In some cases the deterministic equations generate random outputs from any given initial values.[566] Casti calls this deterministic randomness, and according to him it basically puts an end to prediction for such systems.[567] However, explanation is still possible since one may be able to formulate a model that describes how the system functions, only that because the system is sensitive to initial conditions the model cannot be used to specify in detail what exactly is to happen next, as in weather prediction for example.

Finally, and again according to Casti, for many complex systems there is no way to calculate what is going to happen before it happens. Assuming a model exists that can be used to calculate future states, then for some states of the complex system there is no way to do this fast enough, i.e. before the event itself. In other words, "The system itself is its own fastest computer."[568] Casti describes such systems as being "computationally irreducible".[569] Obviously, such models perhaps have little value as predictors, but may be strong when it comes to explaining what has already happened.

The upshot of all this is that complex systems do not imply ignorance of that which makes them work the way they do.[570] Instead complexity means that, due to sensitivity to initial conditions it is not possible to know in advance exactly how a system is going to function over time. Eventually, complex systems will diverge from any predicted state no matter how exacting might be the system of equations that describes its workings or with what degree of accuracy and precision a set of initial conditions are known. On the other side it is worth noting here that the functioning of complex systems is not necessarily time related. Naturally complex systems may be time dependent, but according to Casti there are other kinds of systems that are calculationally complex without reference to the passing of time.[571]

Of course, classical notions of what scientific knowledge entails assumes that such knowledge be predictive in nature. This remains a powerful and effective mode of thinking. However, given complex systems that are sensitive to initial conditions, then there are perhaps other ways to picture or think about the future state of some systems. This opens the door to a possible, alternate notion of what an explanation involves, and hence to a different sense of what we want to know about the future or even what is possible to know about it. If so, then it may suggest an expanded way of thinking about what it is to know or explain something in the present tense, as it were.

In general, there is no contradiction between a system being complex, the ability to explain what makes it work, and that it possesses characteristics by which it can be classified, this despite not being able to predict in detail how it will or is likely to function in the future.

Summary characteristics of complexity

The characteristics of systems that are recognized as being complex arguably extend beyond the physical, chemical and biological or evolutionary sciences. Mark Swilling for one argues that work in complex systems may promote an epistemological revolution not only in the natural but in the social sciences as well.[572] Furthermore, Francis Heylighen, Paul Cilliers, and Carlos Gershenson, in their work Complexity and Philosophy (2006) note that "[T]he paradigm of complexity still needs

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to be fully assimilated by philosophy. This will throw a new light on old philosophical issues such as relativism, ethics and the role of the subject".[573]

Whether or not the paradigm of complexity can drive such an epistemological revolution is an open question. However, since "relativism, ethics and the role of the subject" as just quoted are main points of discussion in this thesis, it is worth closing this introductory Section 1 with the following summary points indebted to Paul Cilliers, *Modelling Complexity* (1998), and which have become something of a standard characterization of complex systems.[574] They are used here with an occasional addition or modification, partly thanks to Swilling.[575]

1. Complex systems comprise a large number of diverse elements that in themselves can be simple. Put another way, many seemingly simple elements or transactions can interact in ways that generate an extremely complex system. The whole becomes more than the sum of its parts.

2. There exist interactions between elements that are non-linear, that is, they involve some kind of positive feedback. This means they interact dynamically in richly textured patterns by exchanging energy or information. Even if only some of the elements interact with others, the effects are propagated throughout the systems. The results are non-linear because the dimensions of these effects cannot be predicted with certainty.

3. There are many direct and indirect feedback loops operating simultaneously all the time. This makes it impossible to identify a simple linear cause and effect relation. When multiple effects become multiple causes, it becomes impossible *a priori* that any one cause has greater explanatory weight than any other. This is why the specifics of context become so important.

4. Complex systems are open systems. This means they continually exchange energy or information with other systems located in the external environment. This continuous throughput of energy and information entering the system from external sources, which means that complex systems operate at conditions that can be described as 'far-from-equilibrium'. A system in equilibrium is dead without energy or information throughput. It is alive when throughputs are active, and because it is alive it is said to be far-from-equilibrium yet simultaneously remarkably stable.

5. Complex systems have a memory that is held by the system as a whole. No single aspect or element of the system has exclusive control or access to the memory. It is this distributed memory that makes it possible for complex systems to have a history, and which in turn influences the way the system will function over time.

6. The nature and functioning of the system is determined by the quality of the interactions between the elements, and not by the properties of any one of the elements. Because these interactions are dynamic, involve positive feedback, and are non-linear, the behaviour of the system cannot be predicted by reference to the nature of any of its elements. This is why outcomes that do result from these interactions are referred to as 'emergent properties' and the process of getting to these properties as 'emergence'. Although this disallows reductionism and deterministic forms of prediction, causality still exists but in this case as sets of probabilities with actual outcomes somewhat dependent on context.

7. Complex systems are inherently adaptive. They can organize and re-organize their internal structures and operations without the intervention of external forces. Hence, the use of the term self-organizing systems.

The discussion in the next section turns to ideas from by Prigogine and Stengers, notably their treatment of the way order can emerge in systems where one would normally expect to see only

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random or chaotic processes at work. Their ideas form an important link in the thesis argument between the first chapter's discussion of explanation from a more classical standpoint and what developments in contemporary science might say regarding patterns of practical reason that work outside the usual range of naturalist abstractions.

Section 2: Irreversible processes and the arrow of time

Section 2 briefly considers a few ideas regarding the functioning of physical and living systems in states that are described as being far-from-equilibrium. Ilya Prigogine and Isabelle Stengers explore the philosophical implications of these ideas in their book *Order out of Chaos: Man's New Dialogue with Nature* (1984), to which most of the following discussion is indebted.[576] More particularly, they argue that the functioning of some systems that are at far-from-equilibrium point to a change in conception regarding the way nature is to be questioned. They hold that such a change leads to different philosophical notions about the relation between man and the terrestrial and social worlds. In other words, the classical dialogue with nature is valid but incomplete. Relatively recent discoveries in science therefore suggest that there are forces at work in nature at the level of the everyday that cannot be explained in the usual mechanical terms, especially in the sense that they involve an actual arrow of time.[577] The importance of this for the thesis discussion is that it may also suggest other patterns of reason when it comes to matters of practical argument.

Prigogine and Stengers note that the way systems function in far-from-equilibrium states involve non-linear interactions. These exhibit unexpected changes due to their being sensitive to initial conditions, and lead to novel states of order.[578] Their notion of order out of chaos is a somewhat recent discovery and forms one of the central ideas in self-organization.

The appearance of such order out of chaos occurs in systems that are open, in the sense that an exchange of matter, energy and information can take place with a larger environment. The dynamics of this exchange is such that fluctuations can bring about wholly novel regimes of organization distinctly unlike what was observed before. Prigogine and Stengers describe these as dissipative structures.[579] They note that the formation of dissipative structures only occurs at states far-from-equilibrium, that is, high-energy states comprised of matter, energy and information exchanges with the environment where chaotic or random processes are normal. In such circumstances non-linear interactions and strong positive feedback come to dominate the description of the system.[580] In simple terms, self-organization refers to the fact that novel states of dynamic order emerge in systems that one would expect to be chaotic, due to the high energy, far-from-equilibrium, non-linear interactions that characterise them.

Taking a step back, in what might be called classical or linear systems the sequence of antecedents that give rise to some observable event can be mapped in precise detail. Retracing the sequence can help to model the event's antecedents in precise terms. If enough manipulative skill and instrumentality are at hand, the system can in principle be returned to a prior state. Simply said, linear systems are reversible over time. In the laws of science that describe them, time is an independent variable, meaning that in a system of equations one chooses a value for time t, from which the values of the other (dependent) variables in the equations are determined. Prigogine and Stengers emphasize that reversible systems are commonplace at the level of everyday experience. The established laws and abstractions of classical science can treat them with precision.[581] But they argue that there also exist thermodynamic and living processes in nature that show actual irreversibility. In other words, they show an actual an arrow of time. More particularly, there exits a wide class of thermodynamic systems whose states proceed in one time direction only. Not because we don't yet know how to reverse them, but that by their nature they cannot be reversed. Prigogine and Stengers argue that, though commonplace, irreversible thermodynamic processes are not classical in conception. They hold that the success of the classical, reversible and mechanical model

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in explaining the natural order that appears at the rough scale of the five human senses delayed the study of irreversible, thermodynamic processes that appear at the same scale of analysis.[582]

Here then the unpredictable and unexpected order arising in far-from-equilibrium conditions requires a different explanatory posture. Mainstream science focuses on some kind of time-reversible, deterministic account posed in terms of general rules or laws that apply with precision across a range of particular cases. The strong stance here is that, in principle, explanation is based on showing up – stating in explicit terms – the precise deterministic workings of an underlying process or hidden structure. But with the discovery that thermodynamics involves real irreversible processes there also exist particular cases that i) cannot be covered by general laws, i.e. those having a wide sphere of application, and ii) defy a classical causal account of phenomena. In other words, in complex systems the task of saying exactly how events are linked to their antecedents cannot be carried off using the terms of classical science. Spontaneity and novelty, in some sense unpredictable and unexpected, are factored into descriptions of nature and the evolution of life.

Such ideas lead to a set of characteristics that have become associated with the study of complexity based on non-linear interactions. In such a notion, linkages within the system are such that small shifts in one area can be amplified into unexpected changes at a local level, but which may also move the entire system to some new state of organization. An analysis of the parts of the system, or of its elementary constituents, would fail to reveal or suggest the sensitivity to change and response inherent in the processes at work within it. According to Prigogine and Stengers, for such systems the past is no necessary and sufficient indicator of present behaviour.[583] They use the term dissipative structure to refer to those systems that are self-organizing at far-from equilibrium conditions where one would normally expect simple chaos or random behaviour. New organization appears, generated by the way dissipative structures process matter, energy and information.

In closing this section, Prigogine and Stengers' discussion is wide ranging. Some of their broader observations are worth mentioning. From their point of view, an account of natural phenomena that claims to draw all phenomena within its explanatory domain, is not sufficient to account for all that may occur at the level of the everyday. They argue that irreversible processes imply that the emergence of order out of chaos is a part of the real physical world which no general theory can completely map out. As they write: "In contrast with close-to-equilibrium systems the behaviour of far-from-equilibrium systems becomes highly specific. There is no longer any universally law from which the overall behaviour of the system can be deduced".[584] They go on to make the interesting suggestion that since in physical systems "nonequilibrium is the source of order" then a new, non-classical conception of "active matter" is called for.[585]

Along a related theme, Prigogine and Stengers note that discoveries in thermodynamics and other areas point to "an unexpected intrinsic structure to reality", one which presumably counters the machine-like image of a single descriptive level.[586] In a similar way they make the point that, extending the lesson of complimentarity from quantum mechanics to other fields of knowledge, there is a "wealth of reality which overflows any single language any single logical structure. Each language can express only part of reality".[587]

Finally, referring to the evolutionary paradigm that emerges from their study of irreversible systems Prigogine and Stengers write as follows:

> The world of dynamics, be it classical or quantum, is a reversible world. It is therefore of great importance that the existence of an evolutionary paradigm can now be established in physics – not only at the level of macroscopic description but also on all levels. Of course, there are conditions: as we have seen, a minimum complexity is necessary. But the immense importance of irreversible processes shows that this requirement is satisfied for most systems of interest. Remarkably, the

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> perception of oriented time increases as the level of biological organization increases and probably reaches it culminating point in human consciousness.
>
> ...
>
> On the human level irreversibility is a more fundamental concept [than dynamics or entropy], which is for us inseparable from the meaning of our existence. Still it is essential that in this perspective we no longer see the internal feeling of irreversibility as a subjective impression that alienates us from the outside world, but as marking our participation in a world dominated by an evolutionary paradigm.[588]

The above comments suggest a possible connection to some of Taylor's ideas. There appears to be an analogy between the functioning of systems at far-from-equilibrium states and the way self-interpretation, human agency, and language connect in ways that could arguably be termed non-linear. While the language of Taylor and that of irreversible systems differ widely, at certain levels some of their central aspects may tend to coincide.

Section 3: Co-evolution

The ideas of Eric Jantsch arguably provide a useful introductory link between ideas about irreversible processes, the notion of self-organization, and the characteristics of living, co-evolving systems. He offers what he calls a new paradigm of evolution, or co-evolution. Jantsch's ideas are useful for the thesis argument in that he uses some key notions of co-evolution to explore values and evaluative social questions, some of which can be applied to decisions about technology in a planetary age. The brief account that follows is indebted to some of Jantsch's ideas as found in *The Self-organizing Universe* (1980).[589] More of his ideas will be discussed in Chapter Five.

Before starting it is also worth noting that many of Jantsch's notions are exploratory in nature. It is likely the case that some details in his work have been supplanted by more recent developments.[590] His efforts however appear to be an early attempt at creating a picture of mankind's socio-cultural life based on an emerging picture of evolution, and in this regard his ideas are still worth looking at as a part of the thesis discussion. Thus, for the purposes of this thesis his ideas will be used to help lay the ground for a more in-depth examination of evaluative social questions and patterns of practical reason when it comes to making sense of decision about the development and use of technology in an evolving planetary age. These ideas will be visited again in Chapters Five and Six. Finally, no attempt is made in Section 3 to give a detailed treatment of Jantsch's ideas. Those that are discussed are only outline sketches, the intent of which to give a general sense of what he thinks are the main notions involved in self-organization and co-evolution.

Confirming and transcending processes

Jantsch adopts Prigogine and Stengers technical notion that self-organization emerges spontaneously from the non-linear interactions that partly comprise some physical systems at far-from equilibrium conditions. In other words, organization emerges from what according to classical conceptions is a state of undecipherable randomness or chaos. As such Jantsch's focus is on process and patterns that arise out of extremely complex interactions in dynamic matter-energy and information exchange processes. He defines self-organization as "a set of coherent, evolving, interactive processes which temporarily manifest in globally stable structures that have nothing to do with the equilibrium and solidity of technological structures".[591] The notion that self-organizing systems "have nothing to do with the equilibrium and solidity of technological structures" arguably serves to emphasize that self-organization is a way of picturing things in dynamic and evolving terms, instead of using the image of mechanical equilibrium or static states. This is particularly so for those co-evolving processes that give rise to life, or to the living world. For example, Jantsch describes organic systems as being first, self-regulating and second, self-transcending in such a way

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that life and the environment to which life is rooted both co-evolve. The picture presented here is one of organic patterns, not time reversible mechanical components.

Self-organization in physical systems, according to Jantsch, arises from interactions that take place both within the system and with a larger environment.[592] The emphasis here for Jantsch is not on individual parts as such, but on relationships that come from a dynamic interaction between them. In addition, notions of organic patterns, non-linear interaction, positive feedback and sensitivity to initial conditions imply that no single sequential chain of antecedent and event is sufficient to explain what is going on. In other words, the interplay of forces in self-organizing systems is such that a single predictive chain of antecedents cannot account for all that is observed. However, this is not to suggest that links between antecedent and event cannot be found, only that the relation between them is non-linear. This point is worth making in contrast to the ideas from Lincoln and Guba, as discussed in Chapter Two Part B, where they seem to suggest that in cases where some kind of mutual shaping takes place, then it is impossible to say what is cause and what is effect.[593]

Furthermore, analysing the workings of a self-organizing system by breaking it into its component parts will dismantle what one wants to study. Of course, in a sense every system in nature arises or comes about from the interplay of forces at work. For many of these systems, breaking them into their component parts is the ticket for a successful explanation. The term, self-organizing, however is reserved for those systems that exist at far-from equilibrium conditions and which would ordinarily be chaotic or display random behaviour, but which instead exhibit some kind of dynamic organization. Arguably, then, to explain such systems one would need to study them on the go, as it were, not necessarily because one is unable to dismantle them, but as an aspect of those essential conditions for what Prigogine and Stengers' refer to as a new dialogue with nature.[594]

In any event, for Jantsch the notion of individual components is not an entirely accurate way of picturing self-organization. In self-organization the whole system displays ordered properties, or a process structure, that emerge from multiple local interactions and sub-processes. Those same local interactions and sub-processes depend as well on the structure of the system as a whole. One could perhaps speak here of a co-emergence of properties. In living things, for example, it is the relatively long-lived, highly energetic, specific interactions within and among cells that create identifiable structure. Here one sees structure in the organism as a whole as well as in its distinct organs, but where neither can exist and function apart from the other.

Jantsch goes on to argue that continuous self-renewal or autopoesis, as well as fluctuation and the occasional emergence of novel states of order are part of the processes involved in the evolution of living things.[595] On a point of interest it is worth noting here a similar comment from Whitehead based on a broader philosophic principle who writes: "There are two principles inherent in the very nature of things, recurring in some particular embodiments whatever field we explore – the spirit of change, and the spirit of conservation. There can be nothing real without both".[596] Self-renewal is a restoring or maintaining interaction that copies or reproduces.[597] It is a process by which the order that emerges in self-organization tends to continue – perhaps a kind of stratified stability, to use a term from Jacob Bronowski.[598] In Prigogine and Stengers' idea of dissipative structures, novel order in chemical reactions arises spontaneously out of high energy and matter interactions.[599]

Jantsch argues that in environments that can supply continuous matter and energy interaction at far-from-equilibrium conditions, the self-organized system tends to become stable or to settle down into forms of relatively long-lived patterns that respond to changes in such a way as to keep the self-organization going. That is to say, one chief characteristic of self-organizing systems is that we tend to see in them an increase in the range of conditions over which their organization can be maintained or renewed. As Jantsch writes, they "manifest in globally stable structures" that ensure organization is renewed continuously.[600] Self-renewing structures serve to provide living systems

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with a recognisable pattern or form that may appear static but which are constantly being regenerated. According to Jantsch, as co-evolution proceeds this process of self-renewal is mirrored in long standing organic process patterns that serve as a kind of platform for later levels of self-organization.[601] Jantsch also speaks of self-renewal in terms of the interactive and co-operative nature of self-organization. However, he also argues that recurring phases of confirmation are sometimes punctuated by novelty.

Novelty, or self-transcendence as Jantsch calls it, refers to interactions that take dynamic systems beyond their current form of organization.[602] Self-transcendence is possible in systems at far-from-equilibrium. Due to sensitivity to initial conditions, fluctuations can occur that spread through either localized aspects of the system or across the system as a whole. As a result, new states of organization can emerge in the way energy, matter and information are processed. In one sense then relatively stable, self-renewing processes serve as the platform for self-transcendence. An existing system is moved from a relatively stable pattern to a state of flux which in time settles down into a novel pattern that regularly dissipates energy, matter and information through the entire structure.

More specifically, dissipative structures refers to stable forms of organization that arise in systems at far-from-equilibrium states. In such states the system dissipates energy within itself in such a way that organization instead of chaos appears, and is maintained.[603] Self-renewal then refers to what takes place in relatively long-lived stable structures. They are continually being renewed, even though classic science says they should become chaotic. In other words, we are talking about patterns of energy and matter distribution, or dissipative structures to use Prigogine and Stengers phrase, the organization of which is being renewed through a continuous interaction with the environment over time.[604] In other words, self-organisation involves in part recurring renewal and transcendence which together make up a "set of coherent, evolving, interactive processes" that partly characterize what Jantsch calls co-evolution.[605]

Before moving on to a discussion of co-evolution, a side note about Jantsch's use of terms is in order. Self-renewal and self-transcendence are no doubt something of a carryover from the more established term, self-organization. However, and as was discussed earlier, self-organization does not mean that physical systems on their own simply become organized. It means that in systems where, according to classical ideas, random or chaotic processes should obtain, organization occurs instead. Such organization however does not happen by itself, but via the operation of a set of different forces and interactions with the environment compared to the usual deterministic sort. Ideas such as non-linear dynamics, positive feedback, irreversible process and dissipative structures are an attempt to pin down what some of these non-classical interactions involve. In a similar way, physical systems that undergo self-renewal or self-transcendence do not simply do so on their own. For example, self-renewal, or autopoesis, is the process whereby, once a stable dissipative structure has emerged, its process pattern comes to be sustained, or renewed, over time even if it undergoes changes in its high energy interactions with the environment. Similarly, self-transcendence is a more philosophical term which Jantsch uses to refer to the process whereby, due to some fluctuation in the high energy interactions with the environment, a stable dissipative structure is reorganized, bringing about a second or next generation dynamic pattern, the specific organization of which being partly influenced by the process structures from which it has come. Of course, once you get to living and especially human systems, then in the attempt to apply ideas such as self-renewal or self-transcendence as if they had no significance to those experiencing them, could not be carried off. Here then the sense given to the notion of self in self-renewal or self-transcendence would take on added meaning given the fact that we are dealing with human persons.

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Co-evolution

Jantsch links his ideas about self-organization to what he calls co-evolution. The following is a simplified presentation of a few of Jantsch's broader ideas regarding co-evolution. The presentation is brief and will deal with only a few of its more general features. The aim is to help set the stage for the development of ideas in thesis Chapters Five and Six, where some implications for making sense of the decision that face humankind in a planetary age will be explored.

The broad context for Jantsch's ideas is in what he refers to as the co-evolution of the micro-scale universe and the macro-scale universe.[606] In simple terms, the universe at differing scales evolves in such a way so that what has come about in the one has influenced and makes possible what has come about in the other. One case in point would be the evolution of the 92 naturally occurring elements, the atoms of which are involved in the make-up of in the observable universe. The physics by which the elements are built up is known with precision. It is a process that takes place in the centres of stars.[607] One co-evolving aspect involved here concerns the fact that different stars age in different ways, which is collectively shown up in the process called stellar evolution. This however cannot generally take place apart from the way stars first form in a given galaxy, which also form and evolve. Hence, the way elements (micro-scale) are built up in stars (macro-scale) determines in part the way stars collectively evolve (macro-scale). Yet stars are first created out of hydrogen gas (micro-scale), the process of which determines the type of star that forms (macro-scale) and hence the specific paths by which elements will build up in its core (micro-scale).

While Jantsch refers to micro and macro scale systems, there are a vast range of systems one could mention, each occupying different scales, and each arguably involved in some as aspect of co-evolution with other systems. Examples of systems at such differing scales might include interactions at the level of elementary particles, the chemistry of atoms and molecules, organic crystals and macromolecules, irreversible processes at the level of the everyday, the evolution life and our planetary ecology, geologic structures and inorganic crystals, the development of Earth's atmosphere oceans and biosphere, the Earth's solar system and other planetary systems, the Milky Way and neighbouring galaxies, and the development of the innumerable galaxies and other objects that make up the cosmos and much of its known structure.

Jantsch furthermore does not limit his notion of co-evolution to those found in the physical universe. For him both the living world and mankind's socio-cultural life are especially rich in co-evolving processes that make up part of their dynamics. When it comes to living systems, for example, both their subsystems (micro-scale) and the larger living whole (macro-scale) interact and influence each other in ways that helps to create further conditions for both to evolve.[608] The two or more systems are aspects of but one dynamic terrestrial process, both bringing out life together by evolving together. A classic example here is the way oxygen, once toxic to the earth's first forms of microbial life, has gradually come to be one of the main constituents of the earth's atmosphere, and which as it did over time served to further influenced the evolution of that microbial life.[609] A classic example of this is the interrelation between entire ecologies and the different species of plants and animals that live in it and make it up. Intimately linked to these as well are the specific climate and geology which form the first conditions for the given ecology to be established and to mature. Another especially significant example of this general notion of co-evolution is the relation between organs and organism in the human body (or any mammalian species). Cleary, the body as a whole is composed of individual organs, and yet the entire organism is more than the sum of these. Neither would exit without the other, being part and whole together, and in this sense the entire organism has evolved in conjunction with the evolution of its distinct but intimately related parts. As regards the co-evolution of mankind's socio-cultural life, this will be a topic of extended discussion in thesis Chapter Five.

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Jantsch does not discount the established view of evolution at the genetic or molecular level where chance events, or mutations, lead to alterations in forms of life that, because they fit their environment, are more likely to survive or reproduce. He also admits that evolution by natural selection is a key mechanism in accounting for the way species alter over time. His point here is not to deny that major aspects of evolution proceed in these ways, but that a gain in understanding comes from bringing on board ideas of self-organization and co-evolution. In this systems view, irreversible processes at far-from-equilibrium states are real factors in evolution, where small fluctuations can be the source of entirely new organization. It is not the case that the origin and alteration of species arises strictly out of multiple random events that produce a plethora of options, only a few of which survive the competitive test of natural selection in a harsh environment. In addition, the environment itself is open to evolution, and both it and the species that make it up evolve together, or co-evolve.[610] Furthermore, Jantsch's picture of co-evolution implies that, while competition and natural selection do occur, part of making sense of evolution also involves bringing on board notions of mutual interaction in the form of co-operation among species.

For Jantsch then the notion of co-evolution implies that some notion of symbiosis or interconnectedness between species and environment are also at work besides the competitive survival of the fittest individuals who inhabit a threatening environment. Competition is part of the interaction. However, co-evolution also includes interconnecting wholes that work together to create the conditions for both species and environment to evolve together in some cooperative sense. Jantsch pictures this as a stream along which evolution flows, in which case one could either stand by and watch, go along with, or be a part of.[611] Some of these interactions work to restore and maintain life at the level of the individual organism, their collective as species, or across an entire ecology. Others serve to create new possibilities for organisation to emerge. Jantsch for instance discusses evolution at the metabolic, genetic and neural levels. For example, Fritjof Capra writes that: "The multileveled structure of living organisms is a visible manifestation of the underlying processes of self organization".[612] These structures would be, for example, cells, tissues, organs, organ systems, organism, and systems of organisms.[613] Such levels come about via the organized dynamics at work in all living systems.

Multileveled processes

In complex systems each part functions as a whole and, at a large enough scale, each whole is the part of another.[614] In addition, non-linear feedback can create antecedent-effect relations that cannot be understood in terms of the notion of reversible time and linear cause. This arguably is one aspect to Prigogine and Stengers' notion of order out of chaos.[615] Furthermore, given the range of such cause-effect relations it is unlikely that there is only one main mode of depicting what the system is, or is like, what its distinguishing features are, and how it functions. The following passage from Prigogine and Stengers, though written in the context of how it is possible to know what is going on at the quantum level of physical reality, also speaks to the ideas being discussed here. They write:

> The physicist has to choose his language ... No single theoretical language articulates the variable to which a well-defined value can be attributed can exhaust the physical content of a system. Various possible languages and points of view about the system may be complimentary. They deal with the same realty, but it is impossible to reduce them to one single description.[616]

It may also be that multiple system interact, in which case multiple modes of depiction might be required not as an expedient but out of necessity. If so, then a conception of explanation would be called for that can describe multiple levels of organization in such a way as to make possible gains in understanding how these systems work and interact. This may be especially so for the many interacting levels that contribute to mankind's socio-cultural life. Each layer of organization, so to say, could arguably be taken on its own, and hence as a point of study. At the same time each is

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also seen as part of a larger whole with which it and other sister levels mutually interact. A more satisfactory explanation then might take into account the entire course of co-evolution which the system has traversed, meanwhile looking for coherent connections with other levels of organization within the system itself. There may also be link here to Thompson's ideas on history.[617]

Thinking in terms of the overall course, or history, of a system's co-evolution is apt here, especially since organization is always in the making and where we can anticipate that new ordering principles will emerge over time. The same would hold for the history of interactions between multiple systems. If so, then one could say that thinking about co-evolution can be both past-regarding and future-regarding. In other words, it is past-regarding because the current state of a system and the principles of organization it exhibits depend in part on the prior stages through which it has passed. This idea suggests the principle that complex systems exhibit some kind of memory.[618] It is future-regarding in the sense that evolution speaks to us in fairly urgent tones regarding the continuity of life, and where new socio-cultural forms are potentially emerging. It is worth noting here that Jantsch views these time-linked features of co-evolution as being closely connected to the human capacity for self-reflection – a capacity that makes it possible both to recognize and to describe or express those co-evolving temporal features of our own selves and our society, as well as the terrestrial world and the broader universe which have brought us to where we are.

For Jantsch the emergence of our various human capacities can be explained in part by general principles of co-evolution and the multileveled universe in which they occur. His conception of a multileveled reality includes such technical notions as complementarity, communication and the development of structure, complexity and meta-evolution, and the way expanses of time and space become bound in an active present.[619] In different terms, Jantsch argues that what he calls the genetic, metabolic, and neural forms of communication which evolved in different forms of life served as lead-ins to the emergence of our capacity as a species for self-reflection.[620] However, the appearance of our capacity for self-reflection has served to turn the principles biological evolution on their head, so to say.[621] Jantsch argues that the capacity for self-reflection creates the possibility for socio-cultural evolution, and that this form of evolution now takes precedence in human living and communicating over the usual biological pathways and mechanisms.

More specifically, man's ability to reflect on the past, to anticipate the future, and to bring both into an active, significant present creates the possibility for evolution to proceed along a distinctly different set of ordering principles. In other words, human evolution has become primarily socio-cultural, based on the human capacity for self-reflection, a part of which features the ability to know ourselves as beings capable of moral deliberation and the ability to judge our actions as agents belonging to meaningful socio-cultural past, present and future. In this context, Jantsch often uses the word self-reflexion. In addition, it is not just a matter of the passing of time but also the specific society and societal conditions that give us a sense of place in which we make sense of past present and future. Here our capacity for self-reflection enables us to visualize different times and places that are not a part of the world in which we currently live and which would, if we let it, preoccupy our attention to the detriment of a more inclusive or world-embracing point of view.

After-the-fact processes

One way to express these kinds of ideas might be to say that of all of forms of life, the most inclusive to evolve so far is found in the human species, and specifically so via our capacity for self-reflection, a capacity which goes hand in hand with our socio-cultural forms of life. In the words of one text, human self-consciousness is the arrowhead of evolution.[622] Here Jantsch in particular holds that, in looking back over the micro-scale and macro-scale processes in the universe, one could say that they have co-evolved in such a way as to bring about the human capacity for self-reflection.[623] Such ideas are also reflected in the contemporary search by some

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astronomers for intelligent life elsewhere in the universe.[624] In other words, the universe is too big a place for something like consciousness or intelligence not to have evolved elsewhere, the assumption being that i) evolution is not a strictly Earth-bound process but can take place wherever certain planetary condition are met, and ii) if intelligent beings have evolved on one planet then there is no reason to think they could not have evolved on another planet, or perhaps on many others. Said simply, the universe is a kind of place where beings will evolve who can be aware of that universe and of themselves living in it. If so, then it makes sense from a position like Jantsch's to try to understand the processes out of which have emerge our capacity for self-reflection.

In this regard, it is central to Jantsch's thinking about these processes where he writes that: "Evolution is the history of an unfolding complexity, not the history of random processes."[625] Given this, he goes on to argue that when we look back over these micro-scale and macro-scale aspects of "evolution as a total phenomena" then a kind of after-the-fact trend or purpose, so to say, appears to be unfolding.[626] For Jantsch this sense of unfolding process occurs when we look back over the course of evolution as a whole and across broad scales of awareness. That is to say, awareness at the level of the micro-scale and the macro-scale. Here we are using our capacity for self-reflection to try to understand where that capacity for self-reflection has come from. This then becomes part of a picture of what Jantsch calls man-in-universe.[627] So far as the thesis argument is concerned, it may make more sense to say that it is not so much a notion of after-the-fact trend that emerges, but a sense of the larger significance such co-evolving processes have in our attempt to understand something of ourselves and the universe in which we live.

In any event, Jantsch makes mention of three such after-the-fact processes, or significances as they will also be called here, namely:[628] i) the evolution of living things resulting in a greater degree of individuality and subtlety in functioning or behaviour, or what Jantsch refers to as the intensification of life, ii) evolutionary processes that cause a greater diversity of forms and functioning of life to come about, and iii) an increase in the number and kinds of linkages or interconnections between organisms (sub-systems), ecologies (systems of life), and between those ecologies and the broader terrestrial environment (supra-systems).[629] Extending Jantsch's ideas, these after-the-fact trends or significances may provide some added insight into the relationship between mankind's evolutionary past, our life in the present, and what might be called a future-in-waiting.[630] These linkages also tie in with the notion of an arrow of time, as discussed in Part B, Section 1 of this chapter. In this regard, one would not find evidence of such purpose in the mechanism of genetic, or molecular, evolution or in the operation of natural selection. One needs instead to look across an extraordinary range of scales and an expanse of time and place to see these processes and something of the significance they might hold for us. Here one might say that the sense we make of the universe and the sense we make of who we are, together co-evolve.[631]

Exploring some of these ideas further, and in the first instance, we see increasing differences among different species as regards their form and behaviour, and notably so in the way the individuals of that species are able to cope with their environment. In simple terms, not all creatures of one species look alike or behave the same way. In biology a distinction is made between a phylogeny and ontogeny. In other words, within the current evolutionary period various species have emerged the individuals of which, generally speaking, interact with their environment across a wide range of levels or degrees of freedom. Eventually, a point is reached where in the human species, our interaction with the environment is such that it makes sense to speak not just of differences in the behaviour among individuals but of their *individuality*, and with this the intensity with which they can experience or engage with the world around them. That is to say, with differing degrees of intelligence and sense of significance. For humans then, individuality is at an evolutionary high-water mark, and this is arguably in direct proportion to our capacities for knowing the world and judging the worthiness of our actions across multiple levels of reality.

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In addition, there is also a sense here that in each individual organism can be found intricate traces or imprints of the entire evolutionary process via which the species to which it belongs has emerged. These traces or imprints are perhaps not so much leftovers from a vanished past period in its evolution, as they are part and parcel of what the species now is. In other words and looking back, each emerging form in the evolution of a species is built on the prior one. If so, then the most recent is in part made possible by virtue of a multitude of prior evolutionary forms and functioning, each building on the one before. For example, Jantsch sometimes refers to the reptilian brain, the mammalian brain and the human brain as showing up different phases of an entire evolutionary process. In other words, in the human brain we find structures beneath the cerebral cortex that are holdovers from reptilian and mammalian forms.[632]

In the case of *Homo sapiens*, a species has emerged with the capacity to reflect on life in the present, particularly via the ability to know the past and to anticipate or prefigure the future. Jantsch coins the term, self-reflexion, to refer our capacity to reflect back over the entire process by which both our species and our own selves have come to be, and from this find ourselves obliged to make decisions about, and take responsibility for, what to do next. If so, and as regards judgements of worth and significance, then one might speak not only of life in the present, but also of a life that is to be intentionally well-lived. In other words, life no longer flows according to the usual evolutionary rules out of which our powers of self-reflection have emerged. The capacity for self-reflection speaks to the emergence of new ordering principles where evolution is now given expression via significant action. Said differently, in human evolution we no longer see only significance after-the-fact but also significance before-the-fact. For the thesis discussion as a whole, the distinction is arguably a crucial one in the sense that in the attempt, for example, to understand who we are as agents we cannot turn to the usual rules by which biological evolution has proceeded. While the great weight of evolutionary evidence in our metabolic, genetic, and neural selves, so to speak, cannot be ignored, yet neither can it offer the kind of insight needed by beings capable of self-reflection, whose evolutionary guise has now become the socio-cultural, and where the spiritual dimensions of life are among the determining factors in our decisions as agents.

Another useful point to make here is that the present is what it is by virtue of it being in part future-regarding. This is in addition to the fact that memory and history partly make the present possible. A useful analogy may be found in the way language and community meaning are linked, such that the expressive use of language calls up the entirety of language in order to make sense of, or offer an interpretation of, what it is we do as creatures of worth or significance. Such matters of meaning, worth and significance are not just momentary but, first, are given expression by language that has grown in subtlety and richness over long stretches of time, second, take place in an intricate socio-cultural context, but which third, is by definition the root of some new expression in the future

To sum up, human evolution has become primarily socio-cultural. Our socio-cultural life is in part a reflection of who we are as self-understanding creatures. That is to say, to be able to use language in ways so as to become more alert to mankind's potential, to better realize the place of values or what can be called spiritual principles in the emergence of a co-evolving socio-cultural world, and to demonstrate more mature levels of responsibility for the quality of life in that world. These ideas connect back to the first main thesis question concerning our capacity for knowing the world and for judging the merit of our actions within it. With the emergence of a socio-cultural world also comes our capacity for moral deliberation and choice, the ability to investigate the reality of our present life, to understand the past that has helped make it, and to imagine or anticipate its links to a future-in-waiting. Each of these is carried in part by the human species' relative autonomy from the demands of the immediate environment, both in the sense that man by nature is not a highly instinctual creature and that his form of life is such that he has the capacity to reflect on more than just matters related to his immediate survival. In a practical sense, humanity as a whole is involved

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in learning how to consider not only the consequences of its own immediate actions, which can be measured across a planetary scale, but also those decisions that help to write its collective future-in-waiting. In such considerations a language of moral and ethical deliberation, and hence, obligation, can help to give expression to multiple levels of awareness in an age which requires us to think in terms of the oneness and wholeness of the entire human race. In addition, mankind's productive capacity which both supports and is driven by a growing population of some seven billion people, can now influence those broader co-evolving systems that make up the living Earth's natural environment. Responsibility for a socio-cultural future is thereby also linked to a planetary ecology.

Thinking about a future-in-waiting based on our capacity for moral deliberation and ethical choice will be one starting point for the discussion in Chapter Five. In general, this will be applied to patterns of reason about the development and use of technology in an age where people are gradually coming to see themselves as inhabitants of a common planetary home. These ideas will appear again when dealing with the social institutions people create, or what Morin calls the knowledge of organization and the organization of knowledge, to be treated in Chapter Six.

Part C: Complex organization, levels of reality and a systems view of man

Introduction

The discussion in the following pages attempts to highlight a set of ideas from the works of Edgar Morin, Ilyia Nicolescu and Ervin Laszlo. The discussion is divided into three sections. Section 1 will consider some of Edgar Morin's ideas in his article From the Concept of System to the Paradigm of Complexity (1992), in regard to what he calls complex organization, as well as some ideas from Edgar Morin and Anne Brigitte Kern *Homeland Earth: A Manifesto for the New Millennium* (1999).[633] Section 2 explores some of the ideas of Basarab Nicolescu, *Manifesto of Transdiciplinarity* (2002).[634] The topics to be treated include Nicolescu's notion of multidimensional complexity, levels of reality, and the logic of the included middle. The discussion in Section 3 is based on the ideas of Ervin Laszlo, *The Systems View of the World* (1972).[635] Laszlo holds that advances in science are opening up the prospects for a new world view based on systems thinking. His ideas offer an approach to the study of both nature and man.

The ideas of Morin, Nicolescu and Laszlo to be highlighted here will help contribute to the overall work in thesis Chapters Five and Six, notably in the discussion on ideas that can contribute to a grasp of what it is to reason practically. Once again, a key point here is to consider how contemporary developments in science can contribute to notions of practical reason and evaluative questions that move outside the assumptions of the naturalistic stance, as well as to the implications that can be drawn from these developments when it comes to thinking about the development and use of technology in a planetary age.

Section 1: The paradigm of complex organization

Edgar Morin in his article From the Concept of System to the Paradigm of Complexity (1992), argues that classical systems thinking is influenced by what he calls the principle of holism, namely, that the characteristics of a system are to be regarded as an indivisible whole that transcends any of its parts.[636] However, Morin takes the position that this principle is itself open to the same criticism that tends to be directed against reductive explanation. Holism too, for Morin, is a kind of reduction of phenomena so as to be amenable to a single level of explanation (namely, the whole or totality) even as traditional reductionism places the burden of explanation at the level of elementary components, underlying mechanisms and hidden structure. For example, three particles

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– protons, neutrons and electrons – can account for matter, or that the complexity of speech can be explained by a set of ideas that guide the combination of phonemes and words.[637] In this regard Morin refers to the paradigm of simplification, or the paradigm of disjunction/simplification.[638]

Furthermore, and according to Morin, there is an influential tradition that regards systems thinking as an approach to the analysis of phenomena. In other words, the analysis of systems is typically regarded as a technique that can be used to gain greater insight into how things function. This leads Morin to one of his main points of departure from the classical systems stance, where he holds that we can instead think of systems as a generic or generative concept. For example, he argues that gains in knowledge can be had if the notion of 'system' replaces the notion of 'object', where a thing or object is that which possesses some kind of form and substance, decomposable into primary elements, each occupying a specific space and time and subject to the laws of nature. In other words, Morin argues that the concept of system takes on a richer ontology than is found in the classical ontology of the object. For example, he suggests that we are dealing with "a complex reality that is rooted both in physical as well as psycho-cultural organization". [639] Put differently, the point is not to come up with a systems-based explanatory theory that "covers everything from atoms, stars and molecules, to cells, artefacts and society".[640] The task instead is to regard these things as being complex in nature, or at least in part. If reality is complex in some of its dimensions, then so too should be the terms by which one might grasp something of the nature of those dimensions. From this point of view, thinking in complex terms is not just a technique in terms of which one can study phenomena. It constitutes an analogue for understanding that which makes up phenomena at a complex level of reality.

Morin also makes the point that by taking complex organization as a paradigm, that is, by positing what he calls the organization/system dimension of reality as a principle, then being, existence and life take on a quality that cannot be grasped solely via the paradigm of simplification, or be made adequate sense of by thinking in terms of the paradigm of disjunction.[641] Morin is emphatic that both the paradigm of simplification and the paradigm of disjunction have a place in our being able to explain or understand our world. However, there are some aspects of reality for which thinking in terms of these paradigms is not particularly well suited. In other words, there are some cases where to adopt them is to miss something of that which, according to Morin, makes being, existence or life real and present, at least to the extent that they possess a dimension to their reality that is by nature complex in organization. At the same time Morin seeks to avoid the notion that complex organization, or the organization/system dimension of reality, is either something physical as if it were an object out there that must be represented to the intellect, or is a mental category, a heuristic, an ideal model, or a pragmatic intellectual device that is used to control, manipulate, leverage, or model phenomena. To think of complexity in this way is to choose between opposing poles in a dual conception of things, and so assumes the paradigm of simplification/reduction as part of an attempt to explain the dimensions of things that are complex in nature.[642]

In addition, the paradigm of complexity refers to the way things are organized, not their static order or structure, where the former implies ways of thinking that involve diverse terms often linked by some kind of complementarity. Thinking in particular in terms of human social systems and our systems of knowledge, and in speaking of what he calls the organization/system dimension of social reality, Morin refers to complex organization as a "continually generative and regenerative activity at all levels based on computation, strategic planning, communication and dialogue".[643] He furthermore holds that: "Only at the paradigmatic level – where the true extent of a systems potential complexity can be revealed – will the idea of system be able to open out onto a new complex organization of thought and [social] action".[644] From this standpoint, by thinking of complex organization or the organization/system dimension of reality as generative concept, then new or unfamiliar patterns of reasoning about the social world may come into view.

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Here Morin argues that an over emphasis or undue reliance on the paradigms of disjunction and simplification contributed to a misplaced sense of what is real in phenomena – in other words, that which constituted the proper object of study in science.[645] According to him, this tended to reduce complex phenomena to the working of component or separable parts. By doing so, according to Morin, reasoning in science lost sight of the way in which every phenomena has "an organization, a being, and an existence" peculiar to itself.[646] This tended to make thinking particularly unsuited to the study of living things and social systems. For Morin then, the organization/system dimension of reality should appear not only in theories of the material universe, but so too in what he terms its biological, anthroposocial and noological realms.[647] In this regard, in the work *Homeland Earth* (1999), Edgar Morin and Anne Brigitte Kern note that:

> Recognition of the complexity of reality – of our human, social, and historical reality – is no simple matter. The paradigm of disjunction/reduction, which controls most of our modes of thinking, separates the different aspects of reality from one another and isolates objects or phenomena from their environments. It is incapable of integrating the transformative potential of time and thus remains closed to the possible. This is why all knowledge of reality that is not animated and controlled by the paradigm of complexity is bound to be mutilated and, in this sense, to be lacking in realism.[648]

It is probably too much to claim, as Morin and Kern do, that *all* knowledge of reality that is not related to the paradigm of complexity is mutilated in some sense. First, and as noted above, Morin accepts that there are some aspects of reality the knowledge of which can be obtained by the paradigms of disjunction and simplification. Second, Morin himself goes on to argue that adopting the paradigm of complexity does not guarantor that realism, only that more needs to be added to the paradigms of disjunction and simplification if we want to avoid faulty conclusions when dealing with those aspect of realty that are complex. In this regard Morin and Kern write that:

> [T]he paradigm of complexity, which assists us in recognizing the complexity of realities, does not provide certainty. On the contrary, it helps us reveal not only the uncertainties inherent in the very structures of our knowledge, but also the black holes of uncertainty in the realities of the present. Reality is not clearly visible in the facts. Ideas and theories do not reflect reality – they translate it, and in a manner that can be mistaken.[649]

It is useful at this point to highlight some differences between Morin's notion of paradigm and the conception employed by Lincoln and Guba as was discussed in the previous chapter.[650] According to Lincoln and Guba, paradigms are independent systems of ideas that cannot be reconciled, this in main part due to the way they proceed from differing world views and modes of reason. In other words, each paradigm is based on differing set of foundational beliefs from which and in terms of which people's thinking and reasoning proceeds. In Lincoln and Guba's conception, it not possible to translate the basic terms of reference used in one paradigm into the basic terms of reference used in another. In other words, they cannot be employed to understand the same aspect of reality because each will see reality in radically different ways. Hence, for example and as discussed in Part B of thesis Chapter Two, Lincoln and Guba refer to three distinct paradigm eras. Furthermore, implied in their formulation of the paradigm for postpositivist inquiry is a consensus notion of truth – that true statements are those that are regarded to be so by consensus – based on the nature of the human world as being composed of multiply constructed realities.

Morin's thinking about paradigms and the nature of reality is noticeably different. In the first case, he does not adopt an axiomatic approach, and so does not necessarily regard paradigms as constituting incommensurable world views. Instead, he recognizes a place for both the paradigm of simplification and disjunction along with the paradigm of complexity. While thinking in complex terms may be different from thinking in terms of simplification or disjunction, the task is not to divide the world into different independent realities, but to try to come to terms with different

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aspects of the world in which we live and where gains can be made in understanding by using the multiple modes of thought available to us.

It is also worth noting that Lincoln and Guba's idea that human world is made up of multiple constructed realities does not equate well with what Morin and Kern refer to in the citation given above as "recognizing the complexity of realities" and where "theories do not reflect reality – they translate it, and in a manner that can be mistaken".[651] Here the notion that ideas or theories can translate realty and perhaps mistakenly so arguably does not fit with Lincoln and Guba's notion of multiple constructed realties. For example, their emphasis is not on the nature of reality, but on multiple constructions of reality. Furthermore, Morin and Kern in the former citation given above speak of the "recognition of the complexity of reality", "different aspects of reality" and "knowledge of reality".[652] Each of these phrases serves to suggest that Morin and Kern's conception is unlike Lincoln and Guba's notion of multiple constructed realties.

Continuing then, the idea of organization is central for Morin. In very imprecise terms, Morin's notion of organization is an active one in that phenomena show what he calls co-productive, recursive, and interdependent characteristics.[653] He furthermore takes the terms 'organization', 'system', and 'interaction' to be indissoluble in the sense that they are linked by a kind of mutual implication, or what he calls an active loop.[654] Reflecting some ideas from Prigogine and Stengers as well as Jantsch, Morin holds that at the physical and biological levels, organization, or more precisely the link between organization, system and interaction, "includes the supply, storage, distribution and control of energy, as well as its expenditure and dissipation through work".[655] He first links this to the building up of ordered processes through auto-organization, or what was earlier called self-organization. Second, the same processes are intimately joined to the breaking down of organization, and hence re-organization. Growth and decay are thus unavoidable aspects in his notion of organization, a feature he describes as auto-re-organization.[656] Third, organization, be it in terms of either growth or decay, everywhere involves exchanges with the environment. Since the environment is a kind of macro-organization or ecosystem, Morin describes organization as auto-eco-re-organization.[657] As already noted, he places organization at a higher paradigmatic level in the sense that we can't get at it by thinking in terms of order or structure alone. Instead, the dynamic aspect of system-organization-interaction is an irreducible explanatory principle.

> Complexity cannot be simplified – that is the moral of the system paradigm. It is complex because it forces us to unite ideas which are mutually exclusive within the framework of the principle of simplification/reduction. It is complex because it establishes mutual implication – and therefore necessary conjunction – between notions which that [sic] classically disjunct.[658]

Morin often describes patterns of reason about organization-system-interaction as a recursive process between, for example, concepts such as one and many, order and disorder, unity and diversity, infrastructure and superstructure, the generative and the phenomenal.[659] In this sense the word complementarity was used earlier. One point to make here is that the classical disjunction between terms serves to block perception and conceptualization regarding the way things otherwise hang together, or to what was earlier described as that which makes being, existence, and life more real and present. In other words, there is a realness to some phenomena that is better grasped in the way they are complex, instead of only in the way they form a simple whole, or only in the way they are made up of component parts.

One point to emphasize here is that the notion of complex systems is closely related to the idea of self-organization, as suggested earlier by Morin's use of the term auto-eco-re-organization.[660] More especially, Morin highlights the recursive relation between whole and the parts as being particularly important in the way a system is self-organizing. For the sake of argument, and following Morin, the part-whole concept involves notions such as one and many, order and

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disorder, unity and diversity, infrastructure and superstructure, the generative and the phenomenal, autopoesis and transcendence. He also draws important ontological links to these ideas, in that, as was the case of the paradigm of complex systems, self-organization is also "productive of being and existence".[661] In other words, understanding a system at far-from-equilibrium conditions in terms of its self-organization (say, living systems, our planetary ecology and human society) calls for patterns of reason more open to the sense in which we can speak of, give expression to, or recognize something of that system's concrete existence.

Morin's ideas of complexity and the patterns of reason characteristic of system/organization thinking can be brought to bear on a planetary perspective. For Morin this is especially needed in a time of whole-earth crises that in their complexity can be seen to both threaten and foster a human future.[662] The ideas discussed above will therefore be taken up again in the thesis discussion, notably in Chapters Five and Six, where matters regarding judgements of worth and decisions for technology in a planetary age will come to the fore.

Section 2: Levels of reality and the included middle

The ideas treated by Basarab Nicolescu in his *Manifesto of Transdisciplinarity* (2002), come in part from the author's experiences as a 20th century physicist, particularly the way in which concepts in quantum mechanics build on but go beyond those employed in classical science.[663] More particularly, in his *Manifesto* Nicolescu argues that in the contemporary age thinking and research in science needs to move beyond the classical disciplinary fields of knowledge, and that recent scientific developments can help achieve this. Indeed, part of his argument for transcending normal disciplinary knowledge is that existing methods of specialist knowledge creation are an inadequate basis for understanding the contemporary world. He argues that disciplinary knowledge by its nature is not designed to study the complex realities of the contemporary world, and with it an understanding of the kind of societal life that might speak to the fulfilment of our human potential in a planetary age. For Nicolescu these latter two points speak to the goals of what he calls transdiciplinary research, and he argues that, while specialist knowledge remains invaluable, such goals cannot be formulated in strictly disciplinary terms. The following paragraphs offer a brief summary of some of Nicolescu's main ideas in this regard.

First, Nicolescu holds that the founding, classical notions in modern science, though driving a host of noteworthy discoveries within Western intellectual culture, have reached the limit of their explanatory power.[664] This is because recent developments in science itself have given rise to conceptions that expand man's dialogue with nature in ways never imagined by classical scientists. According to Nicolescu these classical notions include the existence of universal laws of a mathematical nature, that these laws can be discovered by scientific experiment, that these experiments can be replicated across time and location without loss of generality, that all physical events proceed along a continuum of space or simple location, that all physical phenomena are made of a continuous chain of cause and effect, that causality is local causality only (not formal or final), that the laws of physics are deterministic, and that in principle all phenomena – physical, biological, social – can be explained in terms of their material antecedents only.[665]

Due in part to the success of the modern sciences, Nicolescu argues that, over time, the West's intellectual tradition has taken on board a set of ancillary ideas regarding the relation between man and the natural or terrestrial world which, according to Nicolescu, ultimately contributed to social excesses and misconceptions regarding human nature. In summary point form, these ancillary ideas include i) the notion that the physical universe can be explained in classically material terms, ii) that economic, historical and social laws can be found, the functioning of which are analogous to laws of nature, iii) due to the way these laws have been formulated women have been condemned to play minor roles in social organization, iv) history can be made objective and thus become subject to the

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implementation of deterministic social laws, hence, v) the experiment of history can be restarted by social revolution, that is, by a radical starting over in the application of these social laws, vi) once restarted, or once initial conditions are known, future social states can be predicted with certitude, and that vii) in many cases attempts to impose these initial conditions have been done in the name of a conception of what constitutes the social good and political truth which quickly turned into their opposites. In addition and furthermore, viii) knowledge is assumed to be based on scientific methods and is therefore objective, ix) all other claims to knowledge are subjective by default, x) the reality of the life of the subject has therefore been subordinated to the reality of the objective, and that, as a result, xi) humans became the object of the experiments of ideologues, who adopted a strict and at times a radically materialistic view of life and human nature that wrought havoc on people's lives and on the societies in which they live.[666]

Overall then, for Nicolescu classical scientific world views as well as the ancillary ideas taken on by Western intellectual culture are inadequate to the choices facing a contemporary humanity. This is perhaps especially true for an age that is characterized by a sense of the oneness and wholeness of human relations, and where mankind's most pressings challenges possess a planetary dimension wherein self-sufficiency is no longer possible. Nicolescu argues that three key factors are involved in creating patterns of thinking that are more in line with the needs of such a global world, namely: *multidimensional complexity*, *levels of reality*, and *the logic of the included middle*.[667]

Multidimensional complexity: Nicolescu argues that twentieth century research has seen an explosion in disciplinary knowledge, or what he calls the disciplinary big bang.[668] He holds that much of this is the result of applying generally accepted methods of research to ever more specialist or focussed fields of learning, each taking up a disjoint set of phenomena as their distinct object of study. So far as knowledge is concerned, this has led to a state of affairs that has served to weaken not only the belief in the unity of knowledge, but even the ability to conceive what might constitute such a unity. The result for Nicolescu is a thoroughgoing pluralism in learning, innumerable discourses or a multitude of stories.[669] In this regard, and for example, Nicolescu writes that:

> In the course of the twentieth century, complexity – frightful, terrifying, obscene, fascinating, and invasive – has established itself everywhere as a challenge not only to our existence itself, but also to its very meaning. Meaning seems to get absorbed as if by white blood cells of complexity in all areas of knowledge
>
> This complexity is nourished by the disciplinary research boom, which, in turn, leads to the accelerating proliferation of disciplines
>
> Classical binary logic confers its patent on either a scientific or nonscientific discipline. Thanks to its rigid norms of truth, a discipline can pretend to entirely contain all knowledge within its own field. If the discipline in question is considered as fundamental, as a touchstone for all other disciplines, its scope is thereby enlarged so that it appears to encompass all human knowledge. In the classical viewpoint, the disciplines as a whole were conceptualized as a pyramid, the base of which was physics. Complexity literally pulverized this pyramid, provoking a veritable disciplinary big bang.[670]

However, he does point to one central reason for the explosion of disciplinary knowledge, namely:

> [T]he fundamental cause is perhaps easy to discern: the disciplinary big bang is the response to the demands of a technoscience without brakes, without values, without any other end than utilitarianism.[671]

At the same time Nicolescu holds that this disciplinary big bang

> ... has led to an unprecedented understanding of the knowledge of the exterior universe, as well as contributing a new impetus to the establishment of a new world viewpoint.[672]

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For him a 'multidimensional complexity' is found in all spheres of human activity and learning, be it from the hard and soft sciences, to the arts, and across the entire range of social life.[673] For Nicolescu this sets up a deep seated problematique created by a complex world having but one guiding light, namely, the logic of utilitarianism.[674] The multidimensional complexity of contemporary knowledge, then, for Nicolescu, while at times providing unique insights into the workings of the universe, creates what he calls a paroxysm of social knowledge. In large part this is because the deeper, harmonizing aspects of complex knowledge are misconstrued by the unreflecting use of what is for him an inadequate utilitarian logic – a logic born of "the demands of a techno-science without brakes, without values".[675] The resulting confusion regarding what our world is like, what it is to know it, and how to act in it in ways that advance human, social and individual life serves, according to him, to drive thinking towards a transdisciplinary approach.

Levels of reality: For Nicolescu, scientific knowledge was founded on the idea that there is a single level of reality. He argues that, thanks to discoveries in quantum physics where matter and energy are discontinuous and discrete, science no longer accepts the main premise of a single level of reality.[676] He argues, for example, that the belief in some kind of fundamental continuity in nature needs to be modified. The same is true for classical notions of cause (or local causality), and with it the case for a strict determinism. Such notions are no longer adequate to the kind of knowledge called for in a contemporary and complex age. The notion of levels of reality leads Nicolescu to characterize Reality (a term he always capitalizes) as "that which resists our experiences, representations, descriptions, images, or mathematical formulations".[677] He argues that:

> [T]wo levels of Reality are different if, while passing from one to the other, there is a break in the laws and a break in the fundamental concepts (such as, for example, causality, or between what is reversible time and what is irreversible, or between what constitutes the simple and what constitutes the complex.)[678]

That the quantum and macro worlds both coexist and cannot be collapsed into one another is for Nicolescu a sure sign that there are at least two levels of reality in the universe. According to him, traditional disciplinary knowledge is incapable of coming to terms with such a multidimensional and multi-referential notion of reality, one which he believes is not only found in science but applies as well throughout the whole human and social spheres of experience, or what he describes variously as personal lives and social lives, or the interior and exterior aspects of our reality.[679]

The included middle: Nicolescu's third pole of transdisciplinarity is based on the different forms of reasoning needed to handle a multidimensional and multi-referential world. Classical scientific conceptions such as wave and particle, continuity and discontinuity, time reversibility and irreversibility tend to be formulated as mutually exclusive contradictories e.g. if something is not a wave then it is a corpuscle. Instead, Jantsch would probably recognize these as comprising a complementarity. Morin would describe them as being recursive. However, quantum mechanics produced multiple pairs of mutual concepts that, while making sense in terms of the reasoning and conceptions of quantum mechanics are contradictory according to thinking in terms of classical logic.[680] More particularly, Nicolescu argues that three axioms lie at the heart of classical logic:[681]

1. The identity axiom:	A is A
2. The axiom of non-contradiction:	A and non-A cannot hold at the same time or in the same way.
3. The axiom of the excluded middle:	No statement, T, exists which asserts A and non-A at the same time or in the same way .

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Axioms two and three are crucial for Nicolescu. According to him, if one assumes that there is only one level of reality, then axiom three collapses into axiom two, and classical logic holds. Indeed, classical logic need not even make the distinction between axiom two and three. If, however, there is at least a second level to Reality (reality 1 and reality 2, say), then in principle it is possible to find a third term, T, that holds in reality 2, and which in reality 1 posits a contradiction, that is, it asserts A and non-A at the same time or in the same way. From the point of view of reality 1 a contradiction obtains. However in reality 2 no contradiction occurs because T does not operate at the same level as does A and non-A.

So, for example, quantum mechanical entities behave like a wave and like a particle, but are in fact neither waves nor particles – they are a term T entity having a different kind of reality (in reality 2), but which appear as both particle and wave when observed from the point of view of classical science (in reality 1). Of course, when observed from the point of view of reality 1, a reality 2 entity makes no sense in that our measurements of it throw up all sorts of contradictory results. It is important to note that measurement of phenomena in reality 1 is obviously designed around the concepts and techniques of measurement that work at that level. So, when we observe (measure) matter-energy interactions we know that we will not get a result that asserts both A and non-A. If everything takes place at the level of classical measurement that is exactly what happens. But according to Nicolescu this was precisely the problem with observations of the quantum world – they made no sense because they threw up contradictions that classical concepts could not resolve.[682] In other words, techniques of measurement for observing level 1 reality were used to observe events at the level of reality 2, and which therefore gave contradictory readings. Nicolescu therefore argues that physicists had to postulate the existence of quantum entities that made sense of the measurements they were getting and which at that level of reality did not posit contradictions within themselves, but which looked mutually contradictory as of classical entities.[683]

Furthermore, according to Nicolescu there is no necessary dialectic between different levels of reality (say, between reality 1 and reality 2 entities). In other words, A, T, and non-A can exist at the same moment in time.[684] There need be no transformation or translation of one into the other. In addition, A and non-A are not opposites, they are contradictories. As such the logic of the included middle is not an attempt to get around the axiom of non-contradiction.[685] This comes into play if there are different levels of reality and if contradictions in thinking at one level can be resolved by viewing things from another. This is one reason why Nicolescu thinks the "logic of the included middle is perhaps the privileged logic of complexity; privileged in the sense that it allows us to cross the different areas of knowledge in a coherent way".[686] In other words, part of the problem with complexity (in so far as we are confused by it) is that we view it from a single level of reality. Given that the idea of levels of realty makes sense, and as regards those things that are complex in their reality, should our thinking meet with contradictions then it would be prudent to first look for non-contradictory explanations at level 2, so to say, before passing judgment that a given conception of things contains contradictory statements.

Of particular interest for the thesis discussion is the notion of inner being and outer knowledge as constituting two levels of reality in the human world, as well as the harmony that might be established between them. From Nicolescu's point of view such harmony would serve as a counter to i) a rampant techno-science that is wholly directed by utilitarian ends, ii) a deepening rupture between quantitative knowledge and an impoverished inner identity and iii) an unprecedented growth in and use of specialist knowledge which at the same time helps create vast social disparities among nations and between peoples.[687] According to Nicolescu success here would help provide a renewed sense of the unity of knowledge and less discordant ways of acting in the world. Chapter Five and Six will pick up on some of these ideas. However, the aim there will not be to carry out a program of transdiciplinary research. More particularly, the work in Chapter Six with

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respect to Nicolescu's ideas will be to see how the notion of levels of reality and the logic of the included middle might help make better sense of evaluative issues that arise in decisions made regarding the development and use of technology in a planetary era. This is particularly so in an age the focus of which is still directed on achieving various productive purposes, to borrow a phrase from Taylor, but whose aspirations for unity require a expanded grasp of human knowledge and judgement than is possible in the case of thinking in terms of utilitarian ends.

Section 3: A systems view of nature and of man

In his work, *The Systems View of the World* (1972), Ervin Laszlo holds that "A new world view is taking shape in the minds of advanced scientific thinkers the world over, and this view is our best hope of understanding and controlling the processes that affect the lives of us all."[688] For Laszlo this "best hope of understanding" is a systems view of both nature and man.[689]

In one sense Laszlo adopts an emphatically scientific stance. For example he writes that:

> If we want to understand the world around us, whether because we want to change it, preserve it, or just have the satisfaction of knowing it, we could very likely not do better, and could do a lot worse, than to turn to the contemporary sciences for elucidation.[690]

However, Laszlo's thinking on systems is not an attempt to do science, but "to elucidate an underlying world view which directs the attention of the scientists".[691] He argues that such a world view constitutes a kind of natural philosophy and that, therefore, a particularly viable natural philosophy for the contemporary sciences can be found in a systems view of the world, or what he also calls organized complexity.[692] His attempt to highlight some guiding ideas for thinking about such a world view focuses on two main aspects, namely, i) a systems view of nature, and ii) a systems view of man. As with Nicolescu, Laszlo argues that specialization has led to an explosion in scientific and technological knowledge, but that this knowledge is closed off in isolated bubbles. This isolation of knowledge extends beyond the sciences to include the arts and the humanities. The result is a kind of atomism in thinking based on fragmentation or piecemeal analysis and hence incoherence in the exercise of both our capacity for knowledge as well our choices for action – a set of excesses that a systems view can arguably help to moderate.[693]

One response to these excesses is to carry out what Laszlo calls a simplification, namely, to put things together into categories according to integrated wholes. He argues however that such a simplification is not correctly seen as some kind of reductionism.[694] In this regard Laszlo writes:

> In the history of Western science, atomistic and holistic ways of thinking have altered. Early scientific thinking was holistic but speculative; the modern scientific temper reacted by being empirical but atomistic. Neither is free from error, the former because it replaces factual history with faith and insight, and the latter because it sacrifices coherence at the altar of facticity. We witness today another shift in the ways of thinking: the shift towards rigorous but holistic theories. This means thinking in terms of facts and events in the context of wholes, forming integrated sets with their own properties and relationships. Looking at the world in terms of such sets and integrated relations constitutes the systems view. It is the present and next choice over atomism, mechanism, and uncoordinated specialization.[695]

Whitehead would perhaps describe this as setting down a group of concepts adequate to make sense of phenomena in their broad generality.[696] The analysis of things according to the characteristics they display as integrated wholes is what Laszlo refers to as the science of organized complexity.[697] Such a choice tries to look not only for system-wide characteristics but for those characteristics that emerge at different system levels (or sub-systems), all the while avoiding the image of a "mechanistic aggregate of parts".[698]

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Picking up on what is perhaps for him the central theme of systems thinking, Laszlo argues that the organization of things cannot be grasped only at the level of isolated parts. In other words, the characteristics of complex wholes cannot be reduced to the characteristics of its components, at least not in the usual mechanical sense.[699] By the characteristics of complex wholes is meant that there exists a set of relationships that are conserved in a system of organized complexity, even though the material components of that system may be constantly replaced. The task then is not to study the components of the system but to make sense of the relationships that are conserved or maintained in it, and which give the system its characteristics as an integrated whole.[700] In this sense then, physical laws that govern the behaviour of mechanical parts are wholly inadequate for describing the behaviour of complex wholes. If so, then it is impossible to explain the workings of a living organism, for example, in terms of the laws of physics and chemistry. Such an oversimplifying reduction cannot be carried out. Laszlo emphasizes however that describing things in systems terms is also a simplification, but one carried out at a different level of analysis than the mechanical laws of physics and chemistry. In this regard, systems thinking too will fail to describe the complete richness of a complex organization in its particular form and relations. However, Laszlo holds that the notion of levels of reality correspond to modes of organization of a system, and therefore a philosophy of organized complexity (or a systems view) can help make this notion of levels of reality more clear. It is interesting to note in this regard that instead of using the usual terms inorganic, organic and social as working categories for the study of modes of organization (or levels of reality), Laszlo uses the terms suborganic, organic and supraorganic.[701]

As a side point, if one wants to understand the workings of atoms and molecules then the laws of physics are just the prescription needed. If however the aim is to grasp the chief characteristics of living things, then, given that such characteristics are emergent properties of complex systems, a systems view is required. Such a view will never provide a complete analysis of its object of study. Its advantage however is that it is conceptualized at the same level of reality at which the phenomena under study exists and functions. In quite simple terms, it is the right tool for the job.

More particularly, and according to Laszlo, in a systems view gains in understanding can be made if we think of "facts and events in the context of wholes, forming integrated sets with their own properties and relationships" – a perspective which he holds makes for looking at nature and man in a different way.[702] In this way of thinking, a systems approach, or a philosophy of organized complexity, involves looking for invariances in those processes that make up organized wholes, or what Laszlo calls invariances of organization. For him it is these invariances which contribute most to a systems-based world view.[703] Instead of assuming that things consist of components that, when analyzed, can reveal the essential underlying structure in nature, a systems view assumes that what we see in phenomena are patterns that derive from their organizational invariances. Laszlo argues that such invariances, once identified, will not describe everything about the phenomena, only that the generalizations those invariances provide will be formulated at the same level of reality as the phenomena themselves. In other words, for example, a systems view will not abstract from one's person as a living being, and so describe him in nonliving terms. What systems thinking may do is to place the living being of a person in a more general context or as having characteristics that belong to more general systems. Thus for example, in describing man Laszlo suggests that "We are natural systems first, living things second, human beings third, members of a society and culture fourth, and particular individuals fifth."[704]

Concerning his notion of natural systems, or the systems view of nature, Laszlo argues that there are four organizational invariances every natural system will exhibit, namely i) they are wholes with irreducible properties, ii) they maintain themselves in a changing environment, iii) they create themselves in response to the challenge of the environment, and iv) they are coordinating interfaces in nature's hierarchy.[705] One key point to these characterizations is that they allow systems thinkers

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to recapture a deep notion of nature, which classical concepts in science have tended to filter out and remove from scientific discourse. The following passage encapsulates Laszlo's overall vision:

> In sum, nature, in the systems view, is a sphere of complex and delicate organization. Systems communicate with systems and jointly form supersystems. Strands of order traverse the emerging hierarchy and take increasingly definite shape. Common characteristics are manifest in different forms on each of the many levels, with properties ranged in a continuous but irreducible sequence from level to level. The systems view of nature is one of harmony and dynamic balance. Progress is triggered from below without determination from above, and is thus both definite and open-ended. To be "with it" one must adapt, and that means moving along. There is freedom in choosing one's paths of progress, yet this freedom is bounded by the limits of compatibility with the dynamic structure of the whole.[706]

Laszlo goes on to describe what he calls a systems view of man. In doing so he places the notion 'man' within natural systems. The main implication here for the thesis argument is that the study of man cannot be done in isolation from a vast range of systems with which the human species interacts and out of which emerge part of what it is that makes us distinctly human. Laszlo writes:

> Man is one module in the hierarchical structure that arose on earth as a result of nature's penchant for building up in one place what it takes down in others. In multiple levels, each with its own variant of the general systems-characteristics which reflect the nature of the self-constructive segment of the world, systems interact with systems and collaboratively form supersystems. Man is part of a majestic cathedral of great complexity of detail, yet of sweeping simplicity and order in overall design. All parts express the character of the whole, yet all parts are not the same. This is the systems concept of nature, and it is a precondition for coming to know man.[707]

It is worth noting that Laszlo's writes of 'the self-constructive segment of the world', or what in Section 2 in this Chapter was referred to as self-organization. Within this great complexity of detail, capacities have emerged that apparently are unique to *Homo sapiens*, such as abstract thinking, language, the higher emotions, and the expression and embodiment of these in a vast range of instruments for communication and action such as written and spoken words, music and works of art, our devices and implements, and a host of images, signs and symbols. However, Laszlo does not think that these capacities are somehow intended in any evolutionary sense, and in this respect he does not regard them as suggesting some kind of higher evolutionary progress.[708]

However, Laszlo argues that a distinction exists between two types of consciousness. The first is the kind of consciousness that all sentient creatures have, in that via the instrumentality of their central nervous system they feel pain, use their senses to perceive an outer world, get hungry, look for food and so on. In Taylor's terms they might be regarded as agents within their specific spheres of existence. There is some kind of inner life going on here made possible by a sufficiently complex central nervous system.[709] Laszlo refers to this first type of consciousness as subjectivity.[710]

According to Laszlo, the second type of consciousness is unique to humans in so far as natural entities are concerned, and involves our being aware that we are aware of things, or being conscious that we are conscious, or knowing that we know.[711] In other words, to the extent that self-awareness is distinctly human then it is not a universal property of natural systems. What makes self-consciousness different from subjectivity is the way it frees a subject from the concrete present. According to Laszlo, "subjectivity is the slave of actuality: it registers actual events when they take place".[712] Self-consciousness on the other hand allows one to monitor and evaluate the actual, and create what he calls ideal entities in our imagination or via abstractions that are not tied to one place or time.[713] This for Laszlo is the key selective advantage self-consciousness gives to man so far as his evolution as a species is concerned.

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What is much harder to explain via normal biological evolution is the rise of the multitude of human cultures. Indeed, Laszlo claims that in terms of ancient evolutionary processes one cannot give an adequate account of the diversity of culture and mankind's inner life. In the first instance, so the argument might go, these are based on our capacity for knowledge and judgement as human beings who by their nature possess the power of self-conscious reflection (or who are self-understanding beings, to use Taylor's conception). As with Jantsch, the point here is that once the capacity for self-reflection evolved it took over the direction of human evolution. In a sense then, biological evolution served to create a new form of evolution which could look back and make sense of its own evolutionary path, and therefore act in ways not previously possible in normal evolutionary terms. In this regard Laszlo notes that:

> Man's evolutionary history determined that he become a cultural creature. It did not determine, on the other hand, what *kind* of culture he would have. Hence, our problem today is not whether to have a culture; it is what kind of culture to have ... the self-maintaining biological species was transformed into a culture sensitive to knowledge, beauty, faith, morality. We could hardly call this a mistake.[714]

There is arguably an analogy here to the idea that part of what it is to be human is to be constituted by self-understanding. In other words, the question is not are we self-understanding beings, but concerns instead the kinds of self-interpretations we are capable of and which ones we give expression to. The question of what kind of culture to have or to give expression to, in that it is not determined beforehand, in part rests on the distinction that Nicolescu made between inner life and outer knowledge, or action, as discussed in the previous Section 2. In other words, the quality of inner life a people achieve is intimately and mutually linked to the choices they make, the actions they pursue, and crucially, what they understand of the significance surrounding those choices and actions – or what makes up good and acceptable forms of life, to paraphrase Taylor.[715]

In pursuing this subject further, Laszlo deals with the same question when he asks: "[W]hat is it that ultimately determines the nature of a culture?".[716] According to him, it is the values a people use to guide their actions:

> There are many factors in a culture which accelerate or brake societal processes. Tool using capacity is one such factor, one which in our culture developed into the vast resources of contemporary technology. Mores, customs, and laws regulating human interactions and the exchange of goods are further factors. The speed and range of our inter-personal communication is still another. But over and above these, there is one set of factors which exercises determining influence, for it is this set which influences the persistence, growth, or decay of any particular kind of technology, law or communication. This is the set of values prevalent in a society. Cultures are, in the final analysis, values-guided systems.[717]

Picking up on the lattermost point that as a system, cultures are value-guided, Laszlo goes on to distinguish between descriptive and normative values. A few closing comments on this topic are worthwhile here in order to highlight the link this general theme will have to the thesis discussion in later chapters.

Human life involves a range of values, and, as self-understanding beings these can be described, grasped, characterized, categorized, transformed, realized, altered or even replaced. Laszlo calls these the descriptive, or what might also be termed situated values.[718] Given this, then upon a careful, searching, reflective examination he also argues that some values will likely be uncovered that speak more clearly or more profoundly to a good and acceptable form of life (as Taylor writes), or to a greater realization of our human potential, or to a society in which justice is thereby more fully practiced and preserved. Laszlo calls these postulated or normative values. Such values can perhaps be thought of as regulative signposts in that they help us make sense of what to do, as it were, with such values as we have at hand and employ, known either by description (having already

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been described in some way) or realized by introspection.[719] Said differently, the latter are chosen for their unusual ability to act as principles of moral judgement, and without which the linkages between the broader set of descriptive values could not be made sense of. In other words, we would likely not be able to make proper sense of them as a system of values.

Or yet again, and in a different sense, our most prescient self-understandings based on strong evaluation makes it possible to discern in different ways and at times arguably more clearly that which constitutes a good and acceptable form of life. These normative ideas might be sought out from amongst other values as being those which give maximal guidance to the choices people make. As with all values they aid in pointing out that which is more or less worthy of our speech, sense and action. More than this, however, they as well better enable us to be more open to, be able to be transformed by, the distinctly human significances, but here conceived in terms of the way an attempt to understand the richness of those connections that make up systems as a whole serves to bring about a sense of meaning and significance that is distinctly human-regarding.[720] In other words, as with Taylor's strongly evaluated ends, Laszlo's notion of postulated norms would lead to gains in discerning how well or poorly we are living our lives as persons, or the extent to which our society is hitting or missing the mark, as it were. Here Taylor in particular argues that where we ignore those inescapable commitments discerned in what he calls strongly evaluated terms, then we could not but regard ourselves as lesser beings for it.[721]

For Laszlo, the description and search for values takes place with reference to individual fulfilment in a flexible and dynamic social system.[722] According to him:

> Here is the crux of the problem of our times. We are faced with the following variables: increasing communication – hence determination – on the macro level of sociocultural systems, great differentiation among individual aptitudes and potentials, and the value of individual human fulfilment. Our humanistic goal is to enhance individual fulfilment in an increasingly deterministic multilevel society composed of greatly differentiated individuals.[723]

Personal human fulfilment is a key component in contemporary Western culture, and plays a part in the language of individual rights that is currently an influential part of current thinking about morals.[724] Laszlo too is deeply indebted to this humanistic tradition. With this note in mind, he goes on to argue that certain types of system-wide values need to be sought out and rediscovered, as is illustrated by the following two quotations:

> The Western world tends to offer the values of affluence as the panacea for all social ills. These values are now superannuated. In their place we must propose positive, humanistic values. Humanistic values, discovered in the systems perspective of man and nature, are not arbitrary goals but natural norms, encoded in every system. But they are overlaid by diverse cultural value objectives and hence, in times of urgency, they need to be consciously rediscovered.[725]

> The supreme challenge of our age is to specify and learn to respect, the objective norms of existence within the complex and delicately balanced hierarchic that is both in us and around us. For there is no other way to make sure that we achieve a culture that is viable and humanistic.[726]

It is worth noting that Laszlo's reference to the challenge of our age as being one of learning to specify and respect the objective norms of existence, is perhaps not unlike Taylor's notion of practical reason noted above in that that it directs us to a being open to, to a being able to be influenced by our grasp of that which is significant in our human reality. Furthermore, Laszlo's notion of objective values serves as a reminder that he is writing from within the perspective of the contemporary natural sciences and that, so far as a natural philosophy is concerned, such norms are part of that furniture of things, to borrow a phrase from Taylor.

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A further point to be made here is that Laszlo regards the norms that guide human cultures as being embedded in a generalized systems view of nature and man. In other words, our understanding of human cultures and the values that guide them can be derived from a generalized systems view. In this systems view however, everything that man is, is ultimately dependent on those natural evolutionary processes that precondition all living things on earth. Of course such a view is not surprising from an expressly scientific stance such as Laszlo's. It is worth noting that this view is in contrast to ideas such as Taylor's who sees man first as a self-interpreting being, a quality without which he could not be able to make sense of himself as a creature that, through evolution, is able to be self-conscious. In other words one first makes use of the powers of a self-conscious being to be able to make sense of where that power might have come from. The discussion in thesis Chapter Four will speak to the way we can maintain a mechanical explanation of man so long as we do not explain away our most prescient grasp of that which makes us who we are as a values-guided being.

From within another context and written some years later, Laszlo argues in a similar vein. More particularly, his notion of objective norm is now phrased in terms of the balance between unity and diversity in both natural and human systems. Laszlo writes:

> If systems, whether natural or human, are to survive and develop, their interactions must be harmonized. If and when they are, a new level of order emerges. In nature, this is the cellular level for molecules, the organic level for cells, and the social and ecological level for organisms. In the human world the next level of order is the global. Unity on the global level need not diminish diversity on national, sub-national and regional levels. On the contrary, national local and regional diversity is an enduring precondition for a global level integration.
>
> If humanity is to regain the balance necessary for social, economic and human development, it must enter a phase aimed at the unity within diversity that results from successful integration. Current calls for world peace, for a new world order, and for economic justice already reflect and express this need.[727]

In a passage presented to an international peace conference, Laszlo writes:

> Humanity therefore I believe is in urgent need of an alternative to the secular, purely market-oriented ethic of industrial society. This alternative is not reasonably sought either in the Marxist ethic of world communism, or in a fundamentalist religious ethic that claims that there is only one path to salvation and to justice and all others must be condemned. The reasonable and the promising alternative is a planetary ethic that is meaningful for all cultures in the global community, both the religious and secular. This ethic cannot be articulated and enforced 'from above' by any authority – it must win the heart of the people and it must diffuse in society 'from below'.[728]

A final point worth noting here is that, at least from the thesis perspective, it is not that unity within diversity results from successful integration, but the other way around, namely, that with the acceptance of unity in diversity on a global scale as a first principle for human society, then the ground is set for efforts towards successful integration. This is because as self-conscious or self-understanding beings, significance or purpose exists before the fact. Furthermore, human societies are not only natural systems that can respond to the various dynamics at work in and around them. The form and quality of our societies is also written by the actions of beings who can see into, plan for and anticipate their future – in other words, by beings who can reason practically in terms of the worthiness of their actions and the significance of a given form of life. From this point of view the question of values that balance out our choices technology in a planetary society thereby becomes a main problem for practical reason. This theme will be taken up again in Chapter Six.

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Part D: Chapter Summary

Given the purpose of the thesis, this chapter was devoted to a discussion of ideas articulated in the works of Taylor on the one hand, and Prigogine and Stengers, Jantsch, Morin, Nicolescu and Laszlo on the other. The former works out of a hermeneutical tradition, while the latter group stand within the ongoing tradition of modern contemporary empirical science. The point has not been to compare traditions, but to introduce a set of ideas that can arguably take thinking some way toward patterns of practical reason that do not rely on the naturalistic stance, notably its ontological assumptions, foundational reasoning, and the primacy of the epistemological. The end point is to find some notions that can better handle evaluative issues in general, and the development and use of technology in particular, without falling into an enfeebling skepticism about practical argument that is characteristic of thinking in terms of the naturalistic stance.

The next chapter will look more closely at the ideas of Taylor, notably his notion of the ad-hominem form of practical reason. More specifically, thesis Chapter Four will pick up on the ideas discussed in Part A of this Chapter that first highlighted the ontological link between intent and action. It will attempt to develop a set of ideas based on the works of Charles Taylor regarding practical reason that, because they work outside the usual naturalistic assumptions, approach the moral sphere of argument in such a way as to avoid giving an unnecessarily early warrant to scepticism. In the same breadth, it will use this picture of practical reason to explore what Taylor refers to as good or acceptable forms of life. These ideas will then be put to use in thesis Chapter Six which will discuss some of what is involved in the attempt to make sense of the worth or significance of our decisions for technology in a planetary age.

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Chapter Four: Qualitative contrasts, strong evaluation and reasoning about transitions

Introduction

Chapter Four will attempt to explore patterns of practical reason using the notions of qualitative contrasts, strong evaluation and reasoning about transitions. The background work to these ideas was discussed in the first part of Chapter Three which highlighted some ideas from Charles Taylor, especially those regarding human agency and the expressive use of language. The discussion in the current chapter will again focus on the work of Taylor. It will offer a further set of ideas that arguably expand notions of practical reason that are indebted to the naturalistic stance, and thereby offer a reading of the moral sphere of argument that need not land thinking about matters of worth and significance in a thoroughgoing scepticism. Patterns of practical reason developed here will then be employed in the thesis discussion regarding decisions about the development and use of technology in a planetary age, to be treated in thesis Chapters Five and Six.

As was noted in thesis Chapter Three, Taylor's ideas can serve to amend some well established, classical notions concerning mechanistic explanation, and by implication what it means to give an account of human actions. This was the main aim in Part A of thesis Chapter Three. His approach favours a set of notions that help to incorporate what might be called a more connected or interpretive notion of human agency than what obtains in the mainstream or classical case based on the notion of intersubjective accounts as was discussed in Part D of Chapter One. Taylor's ideas regarding practical reason, which the thesis discussion has described as involving a being open to, an ability to be influenced by, distinctly human significances, form a cornerstone to the way he develops many of his other ideas.[729] Of particular note here is the way he seeks to counter the primacy of the epistemological in favour of what he calls knowledge of a substantive sort, and, by implication, the sceptical stance towards evaluative judgments that tend to accompany notions of explanation and understanding as treated earlier in thesis Chapters One and Two. His formulation arguably provides an avenue for capturing some of the rich, particular character of ethical reasoning while avoiding a thoroughgoing relativism, a rampant pluralism or a flat scepticism.

This being said, the discussion in Chapter Four is divided into five main Parts. More specifically, the discussion in Part A looks at ideas related to significance and common human meaning. It deals with topics such as the designative use of language, common human meaning and inescapable commitment, as well as strong evaluation and a different ontology than is found in naturalism. The discussion in Part B looks at Taylor's notion of the expressive use of language. It looks at ideas such as language and matters of worth, reflexive awareness, human agency, certainty in reasoning and the self-understanding person. The work in Part C looks at some ideas concerning interpretation and reasoning about transitions, and deals with the notion of apodictic reason and criteria for argument, the special status of moral claims, and how these link to our notions of action and intention. Part D deals with the nature of qualitative contrasts and strongly evaluated goals, and includes such topics as *ad hominem* reason and qualitative contrasts, forms of meaning, certainty and strong evaluation, and judgements of worth. The focus of the discussion in Part E is on the *ad hominem* form of practical argument, and covers matters such as reasoning about transitions, the nature of special pleas, practical reason and historical change in science, the arrow of time in practical reason, and differing cultural values. Part E is a brief chapter summary.

The reader might recall that the discussion in thesis Chapter Three, Part A, Section 3 dealt with seven notions involved in an expanded explanatory account in the human sciences, each of them being related in one way or another to the ontological link between intent and action. The first five

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of were discussed in Chapter Three, namely, the intentional side of agency, the expressive use of language, self-interpretation and self-understanding, procedural and substantive judgements and consciousness and significance. The remaining two, strong evaluation and reasoning about transitions, will be discussed in the pages that follow, notably but not exclusively in parts D and E. However, it is worth noting that the discussion in Chapter Four will continue to explore the ontological link between human agency and intent, first begun in the previous chapter. Indeed, many aspects of the discussion from Part A of Chapter Three will be revisited here, but in a much expanded form. Furthermore, the ideas developed in Chapter Four will be used again in the discussion of technology in a planetary age in both Chapters Five and Six

Finally, the discussion in Chapter Four will serve overall to:[730] a) revisit the abstractions found in the naturalistic stance concerning the existence of a neutral universe on the one hand and the subjective status of purpose or value on the other, b) rethink the notion that patterns of reason are based on either intersubjective accounts or the accounts of subjects, c) rework the idea of the self-defining individual in favour of a community of self-understanding and self-interpreting persons, d) set limits to notions of performance, utility, leverage and control that tend to dominate patterns of thought in the naturalistic stance and which tend to obscure the place of human agency and human significance, e) suggest an alternative to practical reason as regards explanation and understanding that can arguably deliver judgements of a substantive sort, and hence f) explore possible alternative views regarding questions of worth, significance or acceptable forms of life that avoid the generally sceptical attitude towards moral argument as tends to emerge in naturalistic thinking.[731]

In broader terms, the aim of the discussion in Chapter Four is to map out some basic ideas at work in practical reason which can move away from naturalist abstractions that either regard intersubjective accounts as the basis for generating objective results, or which view the procedures involved in understanding as issuing from the accounts of self-defining subjects. From the point of view being argued for here, an over reliance in Western intellectual culture on either intersubjective accounts or the accounts of subjects in the way one frames practical argument is one reason why conclusions in the moral sphere tend to be viewed with suspicion. The five main parts taken up in this chapter are intended then to help make more clear those specific conditions under which practical reason need not be coloured by a thoroughgoing attitude of doubt. According to Taylor this sceptical attitude can be avoided in cases where practical reason aims at what he calls a substantive grasp of the moral sphere of argument, as opposed to a procedural one. Possible gains in knowledge here could in turn help to rethink a host of evaluative issues that arise in making sense of decisions regarding the development and use of technology in an age characterized by the conscious realization of humanity's essential oneness.

In pursuit of such possible gains, the chapter discussion will begin by looking further into what is involved in Taylor's notion of significance, the topic of Part A.

Part A: Significance and common human meaning

Introduction

In simplified terms, explanation involves the use of clear and distinct ideas which can be designated or named. The meaning of these names would then be the perceived object or abstraction the name refers to.[732] Furthermore, explanation also employs the use of a clear-cut syntax and procedural reasoning.[733] Here ideas are assembled or are otherwise built up into an intellectual representation of the observable world, and where such representations could be in the form of theories, schema or models. More particularly, the clear and distinct use of syntax, often mathematical in nature, functions as a kind of intellectual tool with which one can manipulate ideas, construct schemes of thought, or build mental models to represent in the mind a host of observable phenomena and

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processes found in the world of nature or in our social world. Included here as well in the notion of syntax as intellectual tool are various conceptual systems, theories, or mathematical simulations. In addition, the precise use of syntax serves to keep ideas in distinct order and provide for a complex chain of reasoning. In this way any given explanation can be inspected and corrected as part of a public process of verifying every link in the chain. Writing along similar lines, W. H. Calvin notes that "Language is the most defining feature of human intelligence: without syntax – the orderly arrangements of verbal ideas – we would be little more clever than a chimpanzee."[734] Such a designative use of language, to borrow a phrase from Taylor, is also one of the chief means behind forming explicit, procedural representations of the world so that control, leverage, manipulation, fabrication, and planning of thought or action is possible.[735]

The above conception of explanation speaks to our powers of abstraction and the designative use of language as something that is distinctly human. Yet from Taylor's point of view the exercise of these powers need not be limited to the formulation of abstract, representative schema and the ability to construct complex chains of reason, conceive plans, make procedural decisions, and carry out actions with the intent to manipulate, control or exert leverage over the natural and social worlds. For Taylor such powers also involve how people assess their sensitivity to goals that are peculiarly human, and which are tied up with the way our *experiences* have significance in what he calls an original sense.[736] In other words human life is filled with intentional and meaningful acts the character of which cannot be inferred from a neutral standpoint. Thinking in terms of Taylor's ideas, the concept of a person includes intents, purposes and goals that possess a distinct and real significance, and which do not rely on an intersubjective procedure for them to be known, recognized or experienced.[737] Neither do they exist as an aspect of someone's idiosyncratic perception or be thought of as belonging in the world of the self-defining individual. In other words, they have a reality in experience that is tied neither to intersubjective accounts nor to the accounts of individual subjects. From Taylor's point of view, they are real for us by virtue of our growing up with them in a world of common human meaning, intent and action.[738] From this stance humans are born into a world of what he sometimes calls experiential meaning, already present and understood in a particular way – lived and acted upon in part according to the historical, social or cultural conditions that obtain up to that time and in that place. (The term often used with reference to art, namely, meaning-space, could be used here.) Such meaning-space is the first reality with which humans are presented from birth, and as such is part of the furniture of things to use Taylor's phrase, at least so far as concerns who and what humans are as beings whose nature is to understand their world and its significance. This is arguably part of what Taylor refers to when he writes: "We are aware of the world through a 'we' before we are through an 'I'."[739]

In various writings Taylor also argues that this world of common human meaning, intents, and purpose makes it possible for humans to have a substantive grasp of that which is significant to us, and not only a procedural one.[740] Taylor's use of the term, substantive, is complicated but part of his usage arguably points to the idea that things have significance for us by virtue of our being creatures whose world begins with, or is otherwise rooted in acts of understanding. We are creatures a part of whose nature is to experience our world, understand it, and find significance in it. This is available without having first to turn to procedures or employ tests against set criteria in order to decode which acts are significant and which are not in what is otherwise a neutral universe. As quoted earlier, and regarding the designative use of language and its links to the ontology of a neutral universe, Taylor argues that "... the attempt to separate out a language of neutral description, which combined with commitments or pro/con attitudes might recapture and make sense of our actual explanations, analysis, or deliberations leads to failure and will always lead to failure".[741] Instead, and again according to Taylor, such language would be part of explaining away the significance things have for our lives as persons and agents.[742]

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Elaborating some on Taylor's point, designation helps to give an account of what is out there, as it were, through a conscious representation via some procedure that can be used to validate or confirm the correctness of the description given to some phenomena, occurrence, event, action, situation, experiment, circumstance, and the like. As one of the pillars of what it is to give an explanatory account of things, the designative use of language has arguably become an influential mode of thought in Western intellectual culture. Its influence is also tied to a tendency in Western experience to portray the mind and the extended world in abstract, separable terms.[743] This can arguably lead to ways of thinking that tend to separate notions of responsibility for human action from the way we think about strategic planning, control, leverage, manipulation, and the like. Such divisions are perhaps one hallmark of instrumental reason, and, from a view like Taylor's, help form a set of ideas where something like the space of common human meanings would have no referent. The experience of human significance in the manner Taylor presents it would tend then to be lost or misplaced in such knowledge structures that aim for control, leverage or manipulation. More generally, naturalistic reason as discussed here would tend to restrict the investigation of things to either a) an intersubjective procedure, or b) the experiences of individual subjects. The existence of a substantive grasp of meaning would then be doubly suspect since it would fail to have a clear referent in either restriction a) or b).

On the one hand then, and from the point of view of explanation as treated in thesis Chapter One, the rich and particular connections found in a world of common human meaning (or meaning-space) are truncated to what can be represented, designated or otherwise named via a rigorous syntax. Behind this is the working idea that the act of representing, designating or naming is pre-eminently a conscious one, and more specifically the act of individual conscious minds, and that it takes place in a world that exists separately from those that might know it. On the other hand, and from the point of view of understanding as treated in Chapter Two, to focus on the notion that persons are self-defining individuals or that the human world is made of multiply constructed realities would tend to filter out, as it were, the sense that there is a space of shared meaning and significance in the world of community practice and language. The failure then to be conscious of a space of common human meaning that can be grasped in some substantive sense would tend to leave us with, from the naturalistic point of view, behaviour that can be explained either in procedural and intersubjective terms, or as something understood as being part and parcel of a world of multiply constructed realties rooted in the individual subject, as was discussed in Part B of thesis Chapter Two.

A clarification of terms

Before entering further into the discussion, a caveat is in order. Under the same topic Taylor refers to common human meaning and intersubjective meaning. Both speak to the human social reality as is constituted by self-understanding beings. Some clarification is needed here since much of the discussion in thesis Chapters One and Two dealt with intersubjective accounts. But this term is generally unrelated to the way Taylor employs the notion of intersubjective meaning, and so it needs to be made clear the sense in which the term intersubjective will be used in this chapter.

To begin with, Taylor makes the point that in many instances one will not be able to find a social reality "which can be discovered in each society and which might exist quite independently of the vocabulary of that society, or indeed of any vocabulary, as the heavens would exist whether men theorized about them or not".[744] Instead, Taylor makes the point that "[T]he realities here are practices; and these cannot be indentified in abstraction from the language we use to describe them, or invoke them, or carry them out".[745] He furthermore notes that "The language is constitutive of the realty, is essential to its being the kind of realty it is. To separate the two and distinguish them as we quite rightly distinguish the heavens from our theories about them is to forever miss the

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point".[746] The fact that social reality is partly constituted by our practices is what gives to practical reason its particular importance, notably in the attempt to grasp the significance of our actions.

Taylor then goes on to make a distinction between common human meaning and inter-subjective meaning, both being related to the way in which language is partly constitutive of our social practices, and vice versa. The distinction is subtle and is hard to get at, and any kind of full treatment is beyond the effort here to clarify the use of terms. Regarding inter-subjective meanings, Taylor notes the following:

> Inter-subjective meanings, ways of experiencing action in a society which are expressed in the language and descriptions constitutive of institutions and practices, do not fit the categorical grind of mainstream political science. This allows only for an inter-subjective reality which is brute data identifiable. But social practices and institutions which are partly constituted by certain ways of talking about them are not so identifiable. We have to understand the language, the underlying meanings, which constitute them.[747]

Concerning common meaning, Taylor makes the following point:

> In a society with a strong web of inter-subjective meanings, there can be a more or less powerful set of common meanings. By these I mean notions of what is significant, which are not just shared in the sense that everyone has them, but are also common in the sense of being in the common reference world.[748]

Taylor uses the example of the survival of a national identity, since such identity is "not just shared, and not just known to be shared, but its being a common aspiration is one of the common reference points of all debate, communication, and all public life in the society".[749] Taylor summarizes the distinction he is making in the following way:

> Common meanings are the basis of community. Inter-subjective meanings give people a common language to talk about social reality and a common understanding of certain norms, but only with common meanings does this common reference world contain significant common actions, celebrations, and feelings. These are objects in the world that everybody shares. This is what makes community.[750]

Having said all this, much of the thesis argument thus far has referred to inter-subjective accounts, as opposed to the accounts of subjects. This distinction will again come up in the thesis Chapters Five and Six. In order to avoid confusion in the use of terms the following discussion will drop the use of the term inter-subjective meaning as Taylor employs it, and use instead the term community meaning, or the phrase shared community meaning, in order to refer to the idea that the way we use language and the significance of our social practices cannot be grasped apart from one another.

Consciousness and significance

For Taylor the crux here is not really the question of consciousness, but that humans are creatures of significance. In other words, persons are beings for whom the significance things have cannot be derived from explicit procedures based on external criteria, the designated use of language, from either intersubjective accounts or the accounts of subjects as adjudged from the point of view that the individual mind is the locus of consciousness and that humans are self-defining subjects.[751] In general Taylor argues that some of our experiences based on who we are as self-understanding beings will take precedence over either procedural, intersubjective explanations or accounts based on the experiences of self-defining individuals. While it is proper or normal that some descriptions of everyday or normal experience will be discarded based on these kinds of explanations, still, for other experiences some of the logic of self-understanding will take precedence.

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The point being made here is not that the naturalistic account of things is wrong. The methods, logic and results of science have immense value. But any theory rich enough to make sense of human aims, purpose and aspirations (that is, the spiritual dimensions of life) should also be able to give an account of a people's most lucid understanding of the intents by which they act – not perhaps the minor details but minimally the central categories by which people understand themselves and their actions as agents whose intents are real and moving. Or, as Taylor sometimes phrases it, that as a self-interpreting person things matter to us from a non-observer relative standpoint.[752] These and the fact that human life is in part social and meaning communal are to be preserved, not explained away, in a mechanistic theory. From this stance, and following Taylor, some of the everyday experiences people have cannot be dismissed as wrong *per se*, and particularly so when dealing with matters of higher worth or significance.[753] To do so would be to dismiss or misplace something essential about who we are as beings for whom self-understanding is original. In other words, we would show ourselves up as beings inescapably less than all that we are or might become.[754] Although this was discussed at some length in Chapter Three, it is worth looking further into the idea that there are aspects of self-understanding which should not be lost to an explanatory account. One way to do this is to draw out some comparisons with ideas from the quantitative and qualitative social sciences, as was discussed in the first two thesis chapters.

According to the discussion in Chapter One mainstream social science formulates its ideas so as to conduct valid research, without which it could not make clear and distinct conclusions about observable social phenomena. Within the limitations of research in the social domain these conclusions are taken as constituting knowledge of the social world. In other words, given the circumstances that obtain in the social world, they are the best possible approximations to the truth.[755] According to Taylor, however, there is a tendency in mainstream social scientific theorizing to regard its results as valid in a way other approaches do not match. In other words, and from the point of view of the naturalistic stance, high confidence in its intersubjective procedures is warranted. As a result, and paraphrasing Kahane as quoted in Chapter One, it is simply foolish to deny or turn aside from that which is established by the natural and social sciences.[756] This kind of thinking however may lead to the erroneous idea that what cannot be netted by the concepts and methods of the natural and social sciences is to be placed in the category subjective or idiosyncratic experience. Taylor would instead argue that there is a relatively wide range of experience based on common, or shared community meaning that slips through the methodological net of mainstream social research.[757] These would be experiences that are neither understood as the projection of subjects, nor knowable in an intersubjective sense. Taylor argues that, as regards shared common, or community meaning, there is something in their mode of existence that is substantively real, only that it cannot be got to via the naturalistic abstractions current in either the explanatory procedures of mainstream social research or in research that aims to portray the experiences of individuals as they themselves make sense of them. According to Taylor:[758]

> These [common meanings] fall through the net of mainstream social science. They can find no place in its categories. For they are not simply a convergence of a set of subjective reactions, but part of a common world. What the ontology of mainstream social science lacks is a notion of meaning as not simply for an individual subject; of a subject who can be a 'we' as well as an 'I'. The exclusion of this possibility, of the communal, comes once again from the baleful influence of the epistemological tradition for which all knowledge has to be reconstructed from the impressions imprinted on the individual subject. But if we free ourselves from the hold of these prejudices this seems a wildly implausible view about the development of the human consciousness; we are aware of the world through a 'we' before we are through an 'I'. Hence we need the distinction between what is just shared in the sense that each of us has it in our individual worlds, and that which is had in the common world. But the very idea of something that is in the common world in contradistinction to what is in all the individual worlds is totally opaque to empiricist epistemology. Hence it finds no place in mainstream social science.[759]

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It is worth noting that, in so far as the thesis argument is concerned, some of these experiences of the communal involve matters of original significance, the implication being that to discard them would be to court confusion about ourselves as self-understanding persons.

Taylor furthermore argues that some goals, meanings, purposes and the like carry the status of inescapable commitment, such that to cease attending to them is to deny something of what we are, or is to necessarily fall into confusion about the significance of our most central actions or intentions. Simply said, such goals and purposes involve what Taylor points to by his term strong evaluation. He describes this aspect of the human person as the significance feature.[760] According to him goals such as these are to be clearly distinguished from the various human wants and desires that come or go, or various pro/con attitudes, where their transience implies nothing essential regarding what it is to be a person. He uses the term weak-evaluation to refer to these kinds of desires or attitudes.[761]

An important point to make here is that goals, intents and the like can be spoken of in at least two senses. First, they may belong to the *reality of community meanings* as described in the quote immediately above. Second, they may be *real in a person's life and experiences* in so far as they are significant or meaningful in a strongly evaluated sense. In other words, they mean something that cannot be ignored. By the words 'they mean something' is not intended that they are memorable, like an unforgettable journey, but that they have been incorporated into the person's grasp of that which constitutes a life that is not lived in vain. It is at least worth noting that what is important here is that the person regards it as so constituting such a life, not that he or she is everywhere successful in living it out. The above two senses are mutually related. As such there may be cases where it is hard to distinguish one from the other. For example, the reality of community meaning in part makes it possible for a person to judge his or her actions in the first place according the significance they have in a strongly evaluated sense, while a person's grasp of a life well lived may have unique or profound insights that can add richness to community meaning.

The naturalist reduction

The above ideas regarding significance speak to the discussion in Part A of Chapter Three which dealt with Taylor's article How is Mechanism Conceivable? (1985).[762] In looking at the difference between men and machines Taylor writes:

> [T]he crucial difference between men and machines is not consciousness, but rather the significance feature. In other words, when we say that the significance feature is essential to our self-understanding as agents, we are not saying that it is inseparable from our representations in an inner medium, whose deliverances are as dispensable to an explanation of behaviour as our perceptions of the sun in the sky are to account of the solar system. We are rather saying that once we understand ourselves as agents, rather than, say as physical objects on all fours with others, including inanimate ones, we understand ourselves as beings of whom the significance feature is an essential character, as beings such that it is essential to what has to be explained, if we want to explain their behaviour.[763]

Elsewhere Taylor also argues that:

> The assumption underlying this dismissive attitude must be that the significance feature is a misleading surface appearance, like the movement of the sun or perhaps a purely phenomenal one, like phenomenal colour or felt heat, to be set aside in any rigorous characterization of the events to be explained. But this is, of course, mad. There is all the difference in the world between a creature with and one without the significance feature. Once we look to feelings, emotions, or actions which are defined in terms of them, or of moral categories, aesthetic categories, and so on, like 'saving one's honour' or 'telling the truth', we run out of machine analogies to be bemused by.[764]

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Following Taylor, there is no need to doubt that some of the findings in the natural and mainstream human sciences point to situations where our understanding of the everyday is mistaken – where our experiences as expressed in ordinary language terms are erroneous, and must defer to what science tells us. This is arguably part of what Neils Bohr referred to in his description of modern science as involving "the gradual removal of prejudices".[765] In a supporting sense, John Thompson argues that gains in knowledge can be made in an interpretive science when done in conjunction with "a range of explanatory or 'objectifying' methods" that help ground our readings of reality.[766]

However, and referring to ideas discussed in Parts A and E of thesis Chapter One, the success of the epistemic imperative and the goal of methodological integrity seem at times to support the added conclusion that ordinary language accounts have no explanatory force; that the project of science, if systematically and doggedly pursued, will provide a satisfactory procedural account of knowable phenomena, including human behaviour. In this line of thinking then there is no conflict between mechanical accounts and those based on significance, that is to say those that use ordinary language because ordinary language accounts can in principle be reworked at a more fundamental level of explanatory cause.[767] But in Taylor's thinking this is an extravagant position to take, and is really only defensible once the abstractions of modern science are incorrectly taken for palpable fact.[768] Ordinary language descriptions may be wrong some of the time, he argues, but it is absurd to believe that all such language is and has always been mistaken.[769]

Regarding the notion that it is ordinary language descriptions that are mistaken, Taylor speaks of the "naturalist reduction", referring to the idea that the neutral universe says nothing to us about right action, with the result that the standards used to judge human actions are to be regarded as the projection of individual subjects.[770] Employing the notion of strong evaluation, Taylor writes as follows regarding opposition to the intolerant use of the naturalist reduction according to which ordinary language accounts are suspect in some sense:[771]

> The opposition to this naturalist reduction has come from a philosophical stance that might be called "phenomenological". By this I mean a focus on our actual practices of moral deliberation, debate, understanding. The attempt is to show, in one way or another, that the vocabularies we need to explain human thought, action, and feeling, or to explicate, analyse, and justify ourselves or each other, or to deliberate on what to do, all inescapably rely on strong evaluation. Or to put it negatively, that the attempt to separate out a language of neutral description, which combined with commitments or pro/con attitudes might recapture and make sense of our actual explanations, analyses, or deliberations leads to failure and will always lead to failure.[772]

In other words, some things are significant to persons in such a way that neutral accounts or explanations based on a designative use of language simply cannot get to them. It is also worth adding that the term strong evaluation is used here to suggest that a moral goal is not just something to which we happen to be committed, but that "It must have a stronger status, that we see it as demanding, requiring or calling for its commitment". Taylor refers to this as inescapable commitment.[773]

Taylor goes on to make the following point regarding the pattern of practical reason we use to make sense of the significance things have for us, in that it:

> [T]ries to show us that in all lucidity we cannot understand ourselves or each other, cannot make sense of our lives or determine what to do, without accepting a richer ontology than naturalism allows, without thinking in terms of strong evaluation".[774]

With these ideas regarding significance in place, the stage is set to discuss the remaining topics in Chapter Four, namely, the expressive use of language, interpretation and reasoning about transitions, the nature of qualitative contrasts and strongly evaluated goals, and the *ad hominem* form of practical argument.

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Part B: The expressive use of language

Introduction

The following treatment regarding what Taylor calls the expressive use of language looks at the way language gives expression to our goals, intentions and actions in so far as humans are self-understanding beings. Such beings have the capacity for self-interpretation and live in a world partly constituted by a community of meaning. In a view such as Taylor's, the notion of the self-interpreting person and a community of meaning work together to form a mutually interacting, dynamic whole which is part and parcel of our various decisions and practices, be they of the community or of the person. Language is used to give expression to the meaning and significance found in these practices. More than this however, the expressive use of language serves to make real and present what is meaningful in our world and actions, to be able to see their significance in other terms, and to make gains in the realization of that which is worthy of us as persons or within our community life. In coming to grasp the ways of the world in different terms, we therefore also come to see ourselves differently and more presciently, transform how we regard or judge our actions and therefore alter what we say, decide and do. In other words, the expressive use of language can at times serve to alter our practices both as individuals and as a society.

The following paragraphs attempt to explore some of these aspects of Taylor's notion of the expressive use of language. Since much preliminary work regarding this was done in Chapter Three, the account here does not involve much testing of the waters, so to say, but instead jumps straight away into the main points of the discussion. It is worth noting that Part B is a summary and at times an extension of some of Taylor's ideas regarding language and meaning. However, his work here is extensive and so the paragraphs that follow are only an attempt to condense in a brief discussion what is in fact often an extended argument on Taylor's part. The language used therefore is intended to give a general direction to the theme and not to analyse ideas exhaustively. More depth is reserved for later in the chapter discussion.

Expressions of worth

As discussed in Part A, and as also discussed in Chapter One, naturalistic abstractions tend to regard language as a tool that, through a well oiled syntax, serves to designate the observable world or the world of intellectual realities in such a way as to render them clear and distinct to the conscious mind. The term used for this was representation. Furthermore, that something can be designated and represented is in part a prerequisite for it to have an objective status. That is to say, once designated and represented it can become an object of study via intersubjective procedures. If so, then that which cannot be rendered in intersubjective terms joins the candidature for what might be called subjective projection, say, by virtue of the fact that it is neither an aspect of the observable world nor an abstraction that is intersubjectively available. From this point of view it may be entirely convincing for the one who experiences it, but none other need necessarily agree to or be moved by it on that account. Objectivity requires that we learn how to distinguish the phenomenally or abstractly real in an intersubjective sense from idiosyncratic perceptions. In other words the test for something to be objectively real is that it be available to, and can stand the test of, intersubjective procedures. Objective reality would then be that to which all valid intersubjective procedures give assent.[775]

However, Taylor holds that the expressive use of language, not its designative sense, is required to give reality to significance, that is, to increase our awareness of, to make us more open to, to enable us to respond more fully to matters of meaning, purpose, intents and the like. Elaborating on some of what is implied here, and in the first instance, that which is of significance in our lives, has a tacit dimension in meaning-space. There will be no first starting point or a final stating of the full

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significance things have for us as self-understanding beings or as self-interpreting persons. Humans are creatures of intents, purposes, hopes or aims that are partly constituted by the understanding we have of them. As we come to be more clear in our grasp of what they involve, then so too is transformed the way we give expression to the meaning or significance they have for us as persons or moral agents. In a similar sense, the domain of actions that have meaning and significance for us (meaning space) does not stand in its place, so to speak, as we come to know them. In the domain of meaning-space the point instead is that we make gains in what we know about the significance or worth an action has according to the way we use language to express its motives or intents. Yet as we thereby make sense of our actions we can also be open to altering them. We come to see them in a different light, we grasp their moral implications differently. A point of view (and the practises that accompany it) to which we previously gave assent, is now clearly seen as lacking in force or substance. In general and from this stance, the significance of our actions is never fully articulated, because fields of meaning change as we articulate the significance our world and actions have for us, which in turn opens new doors of knowledge and judgement, which then call for further reflection or investigation. In this respect knowledge of ourselves and our world is not spoken fully formed, but grows with enquiry. It is also in this respect that reason involves a being open to the significance things have for us, at least, and from a more critical stance, if we are to avoid a skeletal grasp of ourselves, our world and our actions as self-understanding creatures.

In contrast, from the point of view of procedural reason the world of neutral objects exists independently of the language used to describe it. This enables the methods of science to ground knowledge of phenomena using brute data, that is, in observations that carry the minimum possible interpretive content. In this sense, then, language does not have an expressive dimension, or If so, then one having nil effect. It would instead be built up so as to translate the way the world behaves or functions (as given in observation) into well defined or precisely formulated terms that offer a rigorous or otherwise adequate mental mapping of that behaviour or functioning, hence providing a greater or lesser degree of explanatory power. Accompanying the success of this model of reason is, arguably, a tendency to regard explanatory power as a kind of litmus test for what might be thought of as a worthwhile theory. In other words, the question here would be: Of what value is a theory that offers no explanatory power?

More particularly, research in the natural sciences aims to establish valid inferences about the way the physical world functions. [776] Obviously, this is different from asking: In what sense does the physical world exist? In broad terms, it is via logical deductions and empirical inferences that scientists are able say something about its workings. In other words, what will be said about phenomena (and so too then the language used) depends on the procedures employed to know them. The human intellect has thus found a way of asking questions of nature that give an intelligible response. This is the chief dialogue scientists enter into, and makes modern science the kind of activity it is. Such questioning leads to what are now well establish theories that serve as the stepping stone to further observation and prediction. These in turn go to make up the kinds of explanatory accounts that are the hallmark of sound reason in empirical research. The sciences of man attempt the same kind of dialogue, except that in the social sphere certain limitations are placed on research that differs from its natural scientific counterpart. The point being made here, however, is that the notion of significance under discussion has no part to play in either dialogue. This is because the idea of significance is not part of observable phenomena on which good scientific research reclines, be it of the natural world or of human society. And once again, given that the model of reason used in the modern sciences sets the benchmark for intellectual integrity, then in Western intellectual culture attempts to make sense of significance on its own terms tends to face at the outset a certain weight of suspicion as regards its intellectual credentials.

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Returning to the argument regarding the expressive use of language, according to Taylor, however, the significance that actions or practices have for self-understanding creatures exists in a world of community discernment or shared insight. Such discernment or insight is made present and real to us through an expressive use of language. He argues that to sidestep this sense of shared discernment in trying to make sense of our actions and to employ instead the mainstream conceptual assumptions used in the dialogue of modern social science is to miss something of the essential nature of that common world. It is to view it as being comprised of a set of self-defining subjects, and not as one constituted in part by a community of self-understanding persons. From a stance such as Taylor's, then, some of what makes up our human powers involves being open to the meaning and purpose that is part of social or community practice. In simple terms we have the power to find them out and make clearer sense of them. Where, however, to make clearer sense of them implies something like grasping the nature of our being-in-the-world, and how it is our communally given practices can be said to exist and have meaning for us.

In this regard, Taylor argues that a kind of reflexive awareness goes hand in hand with our being open to, or being able to give expression to, the meanings that exist in and are shared by a community of practice.[777] Taking this idea further, being open to such meaning goes hand in hand with a species of awareness that is not only of ourselves, but also of our actions in the world among others. Being so aware is part of what it is to grasp in a substantive sense the significance of our intents and actions (or the significance things have for us, to put it another way). Here one might speak of a reflexive use of language in so far as it helps to uncover or articulate – to express in terms of worth, intent, desire or purpose – both our self-understanding as well as the universe of common meaning and community action.[778] Language in this sense is not a tool. It is partly constitutive of that universe. It gives it substance, so to say. It is in language, not through it, that we find the reality in what is significant about ourselves and our actions.[779] Reflexive awareness then is not something that goes on 'in here', meaning found 'out there', with language a correspondence between the two. Neither is language a function that links or assigns syntax to its proper object for the sake of representation. If to be human is to be partly constituted by self-understanding, then to become more articulate about our motives, intents or purposes is to change something about who we are as agents. The implication here is that our most prescient knowledge of meaning-filled practice is intimately tied to what we actually are or can become, which is an ontology other than that posited in the natural sciences. Taylor's own use of the term expression can perhaps be thought of as referring to this characteristic way language makes real the range of meanings available to us, the way we can be open to it, the manner by which our practices and our world can be changed by it and how we might go about judging the worth of what we say or do in strongly evaluated terms.

From such a standpoint then it perhaps makes sense to argue that the task for practical reason is "to be more open to, to make greater interpretative sense of the peculiarly human significances".[780] By implication, and elaborating further, if the fruit of practical reflection is a more clear or prescient grasp of that which is worthy of or significant to us judged in strongly evaluated terms, then a best effort is put into crafting our linguistic expressions so as to bring these significances to light and give them a distinct reality. It is worth noting here that such ideas are related to what might be called the ontology of significance, in that there is an ontological link between our intents and what our actions are. In a related sense, as we come to grasp our intentions in different terms we serve as well to change who we are as agents. The turn of phrase used, the depth of art in the way words are chosen here then forms deep links to the ontology of significance. In other words, the deeper-current meanings with which matters of significance are expressed in language, including those actions judged to be worthy of us, can not only give our motives or intents greater effect in our actions, but it can also serve to constitute them. That is to say, to make them what they are.

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Here then motives or intents can be changed by the way language is used to reveal that which is of genuine significance in our forms of life, hence involving Taylor's notion of inescapable commitment.[781] If so, then the effect of coming to recognize the worthiness of something not previously regarded as such could work to revise our sense of right action. These ideas point to a link between i) notions of what is worthy or significant, ii) thinking in terms of strongly evaluated ends, and iii) applying those principles that direct our deliberations or consultations as regards which actions to take. Such is particularly the case when it comes to making sense of decisions about the use development and use of technology in a planetary age, to be discussed later in thesis Chapters Five and Six.

Two aspects contained in the above ideas need further treatment, namely, first that language in its expressive sense cannot be used in a piecemeal fashion, and second, that the sense of significance we have about ourselves and our world resides in part in a community of self-understanding persons. These two aspects are discussed further in the following paragraphs.

Language as a whole

Taylor argues that the whole of language is involved in the way humans make sense of their various intentions or actions, be it of the individual or of the community.[782] It is as well the use of the whole of language which makes those intentions present and real to us as agents. A circle of interpretation, transformation, and reinterpretation is involved here. An alternative phrasing here might be expression, awareness and re-expression, or practice, learning and reflection. To clarify some, the full significance of some action can never be made fully explicit because the significance it has for us can change as we come to understand its intentions better, or differently. To use an example from Taylor, what an adult once viewed as being shameful or embarrassing, namely, to play with children, can no longer be carried off when he comes to see such play as a being involved in their care and growth. The accompanying sense of shame is transformed as the practice comes to be understood in different terms. Adult care and nurturing is a worthy intention. The behaviour *per se* is unchanged but it is no longer play, and so the feeling of shame falls away to be replaced by a sense of responsibility or even obligation – an adult partaking in children's play thereafter becomes a commendable act.

More generally, while the meaning something has for us can be made more lucid, it cannot be compartmentalized from other relations of meaning. The entire field of meaning relations, partly shown in community practices and their artefacts, are called upon when making sense of a particular aspect of that practice. In a similar way, the whole of language is called upon when we try to express in words the significance a particular action or judgement has for an individual person (or, more generally, an object of interpretation). Said in reverse, a particular awareness or realization of who we are or what we do calls up to duty the entirety of language in the way it is expressed.[783] If so, then a specific style or tone of language can serve to express a noteworthy way of being or acting in the world, and thereby give it added substance. Yet to do this is not a matter of employing a few isolated words or sentences, but rests on the ability to use the entirety of language in some fluent sense.[784] Obviously, by 'the entirety of language' is not meant every word and all possible sentences, but that there is a deep cohesion in language such that when one aspect is called up to service, as it were, the whole of the language goes with it.

This idea suggests close links to the way social theory is a kind of social practice, and particularly so regarding certain notions of complex knowledge and self-organizing systems to be treated in Chapters Five and Six. As it also turns out, the manner by which notions regarding complex knowledge and self-organizing systems link together as a whole is not dissimilar to the above discussion of meaning and expression in so far as they are mutually related. The kind of thinking involved in one is analogous to patterns of thought that emerge in the other.

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In addition, and so far as concerns human intents, motives or judgements, the notion of a certain fact that stands beyond further investigation is an import from procedural reasoning from within the naturalistic stance, as well as the ontology it assumes, and is used here with equivocation. In a manner of speaking, language is used to understand ourselves and our actions, while the way we understand ourselves and our actions partly determines the manner by which we use language. This is not cyclic reasoning but is instead a kind of mutual referencing, and is one reason why the notion of meaning and significance is hard to get at. It is a different kind of dialogue than occurs in the empirical sciences. From a procedural stance, 'man's dialogue with nature' seeks to identify the meaning something has by linking it back to an observation that can stand outside interpretation, or what Whitehead refers to as irreducible and stubborn fact.[785] In a community of persons however one's sense of the world is made real in ordinary language, and which is a kind of given. In other words, we are born into a world with meaning already given and at work. Some of these meanings arguably involve matters of practical reason, and hence deep questions regarding what or who we are, or why we act the way we do.[786] In other words, in such a view it is impossible to think in terms of those actions and intents that are worthy of us as persons without also thinking about that which constitutes a good and acceptable form of life, to paraphrase Taylor.[787]

A community of self-understanding persons

Connected to this sense of practical reason is the notion that the expressive use of language does not rest only with an individual person, but also resides in a community of self-understanding persons and which furthermore links to Taylor's notion that social theory can also be thought of as a kind of social practice.[788] The notion of self-understanding here includes the way language is constituted by a community and the manner by which a community is constituted by language – that persons exists as a 'we' before any one exists as an 'I', to use Taylor's phrase.[789] In this sense it would be a mistake to refer to the idea of self-understanding persons and community meaning through the use of terms that need to be bolted together, as it were. As a further point of clarification, the point here is not to talk about the psychology of persons who are trying to understand themselves or their world. The point here is to grasp what it is to be a creature for whom understanding is original and given, and how the world exists for beings so constituted. In this regard the ownership of meaning, so to say, is not contracted out to self-defining subjects.[790] Individuals are not the only determiners of what is significant, important, worthy, or desirable. Judgements of worth, or questions about what actions are worthy of being carried out, exist in a form of mutual relation with the quality and depth of expression available to those who speak a language, who hear it spoken, and who respond. Significance is present to a linguistic 'we' before it is present to a linguistic 'I', but once present it is shown up in both human practice as well as in the thoughts and intents of individual agents.[791]

According to Taylor this is partly why an interpretation can be wrong.[792] In other words, people cannot understand themselves or interpret community meaning-space in any chosen way; it is possible to be mistaken about self and world. If so, such a view places the argument outside the usual distinction between objective truths and the relative opinions of subjects, or, as was said earlier, between intersubjective accounts and the accounts of subjects. The expressive use of language is central to this position, at least in Taylor's way of thinking, and sets up a mainframe distinction between what might be called an interpretative dialogue compared to a dialogue based on irreducible fact, rational reconstruction, and the designative use of language. The reverse side to this rational reconstruction is usually thought of as subjective opinion, but here both together can be placed in distinction to the kind of interpretive dialogue presently under discussion.

From an argument based on the expressive use of language, human goals, aspirations, intents, emotions, and purposes are real and moving. Humans possess a greater or lesser grasp of these. Gains in lucidity are possible and serve to change a person's self-understanding. More specifically,

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such gains in lucidity may come about in part by the efforts we make to understand our world and ourselves. It is something we *do* as self-interpreting creatures. The fruit of such gains in lucidity is a different quality of understanding we come to possess and which in part makes us who and what we *are*. The later is a main point in who we are as self-understanding beings. Yet such gains are not a matter of simply choosing for oneself some interpretation according to own desires. An error in self-understanding is not a matter of using wrong words to describe one's condition or world. Knowledge here is not necessarily a function of internal self-consistency, nor does it flow from personal tastes, whims, or desires. Taylor argues that there are goals or ends that make an inescapable claim on a person such that to cease attending to them leads to necessary confusion about one's self and world. In other words, they land us in ignorance about our deepest or most urgent sense of who we are. Such goals centre on the distinction Taylor makes between strong and weak evaluation, and is based on the idea that moral desires have this unique status.

To continue, there are certain motives or intents that require commitment to them if we are not to fail our capacity for moral judgement or worthy action in some substantive sense. Taylor repeatedly emphasizes that what he calls strongly evaluated goals involve the question of inescapable commitments, and as such have a unique status which is central to our being the kind of agent we are as self understanding persons.[793] If there are intentions that are real and moving, whose compromise, ignorance or denial imply a life that is inferior in some substantive way, then the procedural norms of the naturalistic dialogue based on external criteria would arguably not apply. From this standpoint to treat such intents as if they are no different from a host of other likes or dislikes would tend to lead to a confused grasp of that which is morally worthy or commendable, as well as to a lesser ability to make qualitative distinctions with regard to dignity, honour, compassion and the like.[794]

From within this general point of view the empirical social sciences entertain a host of abstractions that cannot make full sense of human experience because its concepts and procedures fail to recognize a world of meaning-giving practice available to humans in an original sense, and communally so. Instead, to explain our intents and actions as moral creatures is to give an account of them based on such notions as strong evaluation and inescapable commitment, neither of which can be made sense of apart from the way the language we use to express them resides in a community of self-understanding persons.[795] Such accounts lead to gains in understanding who and what we are, and make up part of what is meant by practical reason, an aspect which the thesis discussion has variously characterized as a being open to, a being able to be influenced by, the significances that surround us as self-understanding creatures.

Part C: Reason and self-interpretation

Part C looks at some implications for reason in what might be called an interpretative dialogue such as Taylor argues for. Discussions later in the chapter will expand some of these concepts and introduce additional ideas that help fill in the pattern of practical reason being sketched here. These will then be used in the next two chapters as the discussion turns to questions about the significance of our decisions as regards the development and use of technology in a planetary age.

Two ontological avenues

From the point of view of a disengaged study, one function of foundational, or apodictic reason to use Taylor's term, is to render one able to make own choices in a world of neutral resources. Disengagement from the world as provided by a neutral universe offers the self-defining subject (as opposed to a self-interpreting person) a platform to stand outside the enigma of experience. Here then is a way of reasoning things past their appearances to a point of established knowledge and fact, and if not absolutely so then clearly and evidently enough for the kinds of practical choices

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people make. Taylor argues that apodictic reason serves to uncover the foundational ideas behind an argument or position. It separates the various inferences to be drawn from the basic premises hidden behind the intricate set of ideas that go to make up some stance or theory – a stance perhaps at first only indistinctly mapped out. The task of reason then is to make fully explicit all important avenues of thought, implication, and background ideas making up a position, and so uncover the essentials of the argument.[796] It is at the level of basic ideas, exposed in a full and responsible analysis that debates about the validity of contending arguments are to be held.[797] In this point of view, personal or private attitudes and beliefs cannot be part of what it is to adjudicate rival knowledge claims. In a world that is studied from a stance free of bias, the test of nature and the common human world secures the logic of propositions open to intersubjective judgement through a clear and distinct analysis of both the reasoning process and the facts of the case.

Taylor attempts to offer a different characterization of reason, at least for this discussion as it involves the status of persons as agents. Some of these will be noted in the paragraphs immediately below. They carry as well a variety of implications for patterns of practical reflection which will be highlighted as the chapter discussion continues.

In the first place, and as is also the case for notions of understanding treated in thesis Chapter Two, the metaphor of an exterior platform from which experience can be surveyed in a disengaged stance tends to fall apart when dealing with matters of significance. Some of what makes up our world can be studied and known in this way, but, according to this line of thinking, to claim universal applicability for the disengaged stance is to "explain away", as Taylor puts it, some key aspects of the world constituted by self-understanding.[798] The argument in part is that persons possess intentions that are real and moving. Part of what makes them so is that we experience them in a particular way. Actions and social practices both give expression to them and are sites wherein intentions find their home, so to speak. This is in part a consequence of the fact that language both gives expression to and helps makes real and present some of our meaningful experiences. Of course, it also works the other way. In other words, our experiences enrich our use of language.[799] Taylor furthermore holds that some of what is significant to humans is present in an original sense, as opposed to their being made known via procedures for making valid deductions or factual claims. Matters of significance are thus closely tied to the way language makes the meaning of things to become real and present before us.

However, it appears that for Taylor some aspects of man's intentional life court a special claim on us, such that to misplace them is to forego something crucial to us as agents.[800] To forego them would be to render ourselves a lesser being, at least in so far as the quality of one's intentions and motives are essential to the kind of beings we are. However, the effort to gain a lucid grasp of that which is worthy of us as persons or as agents can never be concluded in full. One reason for this is that there are no external criteria in terms of which rival positions are to be judged in absolute terms, one being the superior. In other words, the sense that a fully concluded account is what one aims for when it comes to matters of worth or significance is a holdover from the naturalistic stance. Accounts that could arguably offer gains in our knowledge of significance turn instead on the study of purpose, intent and meaning for agents who by their nature are self-understanding beings. Such gains in knowledge occur from positions that already assume much and are only partially open to explicit analysis. Said differently, in our efforts to know what is worthy of choice in our world one cannot but start from some neighbourhood in meaning-space. From within this way of thinking, then, one outcome of reason involves the articulation of fields of meaning-giving ideas or meaningful practices so that a more coherent grasp of them is made possible. It involves gains in what is an already meaningful stance – not absolute-like demonstrations of what is and is not the case and where all rival claims but one are to be eliminated, as tends to be so in the apodictic case. The point is to come to gains in knowledge in what we already understand of those

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social practices and actions that are in some sense worthy of us as persons. If so, then to gain knowledge means in part to gain a richer grasp of that which is worthy of us a persons, or of a commendable form of life, or of the kind of society we aspire to inhabit. As agents humans belong in a world whose meanings are already at hand. Given this then the kind of reason that will make further sense of that social world will also link to the way humans are self-understanding beings. Simply said, there are cases where the logic that comes with our being self-understanding creatures will trump that which accompanies the view that man is a self-defining subject.

This is one reason why it is inappropriate to expect to arrive at this kind of interpretive knowledge, to coin a phrase, when using the model of reason that comes with foundational thinking. If one posits external criteria as the basis for rational judgement and the making of valid inferences then, according to Taylor, reason proceeds in such a way that certainty in argument is to be sought. In other words, once external criteria are set out as the basis for judging between rival positions, then the nature of the reasoning process is such that certainty is the end game. This is part of what is implied in foundational thinking, where notions that seek certainty in argument turn on deep assumptions in Western intellectual culture, namely, that i) criteria are required in order to judge between rival positions, ii) judgement between positions requires that they be fully and explicitly spelled out, and iii) the chosen criteria are in fact sufficient to carry out such judgement.[801] If so, then in the absence of criteria to judge between explicit positions, one is left with subjective opinion or idiosyncratic perception – what Taylor refers to as the projection of subjects.[802]

Working in the background here is the notion of the self-defining individual. The term in part calls up the idea that individual minds are not only the locus of consciousness and the determiner of value (hence self-defining) but that they exist independently of a universe that, according to Whitehead, moves endlessly, meaninglessly in and of itself.[803] Once individual minds are postulated in this way, the question becomes: How do we go about attaining conscious knowledge of the world? The answer that emerges in the naturalistic stance is that knowledge in part comes about from reasoned argument between minds via intersubjective criteria and clearly laid out procedures that all can accept. In this regard, there might be a consensus based on social need or political persuasion, or via the exercise of power, but this would not be what reasoned agreement refers to here. One important notion here is that in matters of ethical debate, there being no good rational arguments, then the fact that people agree on an ethical norm, principle or some good or worthy course of action is a happy coincidence or a matter of consensus. As Taylor puts it, that "[M]oral positions can't be argued, that moral differences can't be arbitrated by reason, that when it comes to moral values, we all just ultimately have to plump for the ones which feel best to us".[804] Such a view is perhaps somewhat characteristic of thinking from within the naturalistic stance. From this point of view, what remains in the absence of intersubjective accounts are personal fancy, private feelings or idiosyncratic states of mind, that is to say, the accounts of subjects.

Looking at this further, and in the case of modern empirical science, the assumption that there is a neutral world means that the specific set of external criteria called for in a rational investigation depends on the characteristics or nature of that which is being studied. More generally, the extended world places its own conditions on our efforts to know it. In the thinking of Nicolescu, reality is that which resists our thinking about it. To quote Nicolescu: "By Reality...we intend first of all to designate that which resists our experiences, representations, descriptions, images or mathematical formulae".[805] Presumably then, to the extent that realty resists our attempts to understand it then we are obliged to find ways of entering into a dialogue of questions with it. This then may at least be one of the underlying currents to the litmus tests of modern scientific method – to ground knowledge of our world on what Taylor calls brute data and certifiable procedures, and which are perhaps akin to Whitehead's notion of irreducible and stubborn fact.[806]

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Intersubjective procedures then are partly designed around the discovery, uncovering, or modelling of such facts as concern the natural and social worlds, and not their invention. Thinking here can lead to the conclusion that whatever is not thereby part of the real world can be regarded as the projections of subjects.[807] In other words, the mind instead imposes its own conditions on that which we perceive. Because of the kind of ontology implied in the naturalistic stance, namely that there is an extended world and conscious minds, then what does not belong to one properly belongs to the other. Notions of explanation and understanding, at least as they were argued for in the first two thesis chapters, arguably tend towards some such scheme of ideas. Explanation takes the road that aims at intersubjective accounts based on irreducible fact. In other words, in principle knowledge claims are grounded on experience or observations that derive from phenomena in such a way that personal interpretation is excluded.[808] These, however, tend to bypass human desires and hopes. Understanding then turns to the study of the projections of subjects in order to capture something of human daily lived experience. But then we are faced with a vast set of differing desires and hopes between which, in principle, there is no standard for comparison. To claim one as the superior is a species of cultural imperialism or some other assertion based on limited perception.

However, given that the notion of significance derives from the ontological link between action and intention, then the notion of seeking certainty in argument does not follow. In the case of self-understanding beings, certainty is not what practical reason requires. Neither then does a lack of certainty imply a realm of subjective opinion, nor that we are dealing with the (mere) projection of subjects. Questions about what is significant to persons who are partly constituted by self-understanding cannot be answered by reference to an extended world or to the projection of subjects. Matters of significance are aligned to social practice where the sense being made of that which is worthy in what we do or who we are can change that self same practice. Practical reason is called on to do different duty because the ontology is different. What an action *is* can change depending on the intention or aim of action, that is, in the way we use language to express our intents, purposes and the like. If so, then in such a case questions of practical reflection, a system of values or spiritual principle can enter the picture. In other words, to exclude them would be to lose sight of what one is talking about.

Practical reason in the domain of self-interpreting persons speaks to how we actually go about making sense of that which is worthy or significant to us as agents. To avoid being no more than a mere projection of one's own ideas or beliefs, interpretation as social research turns to a methodological framework for guidance in making decisions. This point is more in line with questions about the scientific status of such hermeneutical research, that is, the justification for what one claims to know or has discovered as derived from the methods used in interpretation. As has been repeated throughout the thesis discussion, the scientific status of such social research is not of concern here. Still, it is worth looking briefly at one such framework of ideas from John Thompson, *Ideology and Modern Culture* (1999) in what he calls depth hermeneutics, this in order to at least suggest how it is such reasoning arguably escapes the label of being mere personal opinion. However, it is also worth noting that Thompson's is an attempt to move to a balanced stance regarding hermeneutical method as an aspect of critical social research on the one hand and the ontology behind understanding on the other.[809]

Depth hermeneutics

Thompson's view of reason revolves around cultural analysis, which he defines as:

> [T]he study of symbolic forms – that is meaningful actions, objects, and expressions of various kinds – in relation to the historically specific and socially structured contexts and processes within which, and by means of which, these symbolic forms are produced, transmitted and received.[810]

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He holds that humans necessarily live in an already understood and interpreted social world, or *doxa*, which an interpretive science seeks to uncover and make further sense of. This in turn serves to transform *doxa*, hence calling for further interpretation:

> [*T*]*he object of our investigation is itself a pre-interpreted domain*. The social-historical world is not just an object domain which is there to be observed; it is also a *subject domain* which is made up, in part, of subjects who, in the routine course of their everyday lives, are constantly involved in understanding themselves and others, and in interpreting the actions utterances and events which take place around them.[811]

Such a world is both a domain of objects as well as a domain of self-interpreting persons. Continuing, he adds that:

> [T]he subjects that make up the subject-object domain are, like social analysts themselves, subjects capable of understanding, of reflecting, and of acting on the basis of this understanding and reflection.[812]

The kind of reflection Thompson refers to is what Taylor and Jantsch sometimes call reflexive awareness. Thompson notes that, thanks to the work of Heidegger, we can regard the process of understanding as that which is

> ... the fundamental characteristic of human beings as such: understanding is something we, *qua* human beings, already do all the time anyway, and the more specialized procedures of interpretation employed by social analysts take for granted and build upon the pre-established bases of everyday understanding.[813]

It is because understanding is fundamental that Taylor can describe humans as creatures of original significance. Thompson notes as well the following which further brings out his notion of cultural analysis via the study of symbolic forms:

> There is a further and related aspect in which hermeneutics retains its relevance today: it reminds us that the subjects who in part make up the social world are always embedded in historical traditions. Human beings are part of history, and not merely observers or spectators of it; historical traditions, and the complex clusters of meaning and value which are handed down from generation to generation, are partly constitutive of what human beings are. This point has been forcefully made by Gadamer, whose conception of understanding as a fusion of historical horizons, as a creative production of meaning which implicitly draws on the resources of traditions, helped to emphasize the fact that human beings are always part of broader social-historical contexts and that the process of understanding is always more than an isolated encounter between minds.[814]

In Taylor's terms, part of what it is to be a self-understanding person is to be involved in community meaning and common discernment together with various meaningful social practices – that humans exist as a 'we' before existing as an 'I'.[815]

The following quote from Hans-Georg Gadamer's *Philosophical Hermeneutics* (1976), appears to emphasize a similar notion:

> Philosophical hermeneutics takes as its task the opening up of the hermeneutical dimension in its full scope, showing its fundamental significance for our entire understanding of the world and thus for all the various forms in which this understanding manifests itself: from inter human communication to manipulation of society; from personal experience by the individual in society to the way in which he encounters society; and from the tradition as it is built of religion and law, art and philosophy to the revolutionary consciousness that unhinges the tradition through emancipatory reflection.[816]

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There appears to be good agreement between these ideas and the way both Morin and Jantsch develop their notion of complex systems and co-evolution in a socio-cultural world. Such links will be explored in the next chapter. It is worth noting that some of these links involve deep seated ideas regarding the significance of mankind's life, which in the contemporary age is given expression via the growth in awareness and in a maturing mentality that can look upon the oneness of human race as being something of the essential to the dimensions of that life.

At any rate, Thompson goes on to argue that a social-historical world is the unavoidable starting point for social analysis, such that the notion of certainty used in natural science does not apply when dealing with the social-cultural world and its symbolic forms. Once again, this is so because as some aspect of that world is made more clear via an interpretative study, then reflexive awareness allows that this very interpretation affect and transform the symbolic forms that are the object of investigation. Said differently, what is meaningful to persons can change as language is used to express and realize some aspect of that world. To understand some aspect of the world is in part to make it real and present in a way that was not seen before, or in a way that carries with it some kind of creative act. 'Rational explanation' in this sense then is an obtaining to a more coherent account of human practice. It leads to gains in understanding, and rests on an ability to be as coherent as one can be about the field of meaning being expressed or interpreted.

For example, an interpretation of some object or field of objects in meaning-space brings to light some new realization. Language has been used in such a way so that something about the world is seen in a different light; an unexpected connection has been made across boundaries that alter one's understanding. How well has it been expressed? To what extent does it cohere with previous articulations in similar fields of meaning? What implications can be drawn from the new meanings adumbrated in it? How do these affect neighbouring fields? What collaborative insights does it offer? Can we find meaning relations in these neighbouring fields that link with the first and help illuminate it further? In what ways do they allow us to mark out transitions between positions that we can see as gains in understanding? Crucially, in what ways might human practice be affected? What are the consequences of this? Can they be regarded as a gain in the human capacity to be open to, to be able to be influenced by the sphere of significance available to us as self-interpreting beings? How might such a change in practice lead to further reinterpretations? Do they hold out some promise for a more illuminating understanding, a more clairvoyant practice, one more expressive of the meaning various forms of life take on?

Such are the general sorts of questions that might be asked in reasoning – an attempt to argue out, analyze or discuss some one or another proposed interpretation of self and world. The questions of course are not those that would be posed in an empirical study in the human sciences, but this is because the objects analyzable in terms of instrumental reason are unlike those posited in a framework of ideas based on persons as self-understanding creatures.

Part of the point being made here is that what is often termed the 'ontological turn' in hermeneutics – that it involves reflection on the constitutive role understanding has in the coming to terms with the kind of being we are – also has a methodological side that serves to produce and guide actual social analysis. And of course, such social analysis can help illuminate in turn something of the ontological link between action and intent that is part and parcel of our existence as self-understanding beings.

Reason and the methodology of interpretation

Thompson calls his methodological approach a depth hermeneutic framework, the idea being that the process of giving lucid interpretive accounts of some social practice are also "mediated by a range of explanatory or objectifying methods if it is to have value as social analysis".[817] In other

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words, philosophical hermeneutics deals with questions of understanding that surround humans as self-interpreting beings *per se*. Methodological hermeneutics uses patterns of reasoning to work out an approach to social analysis that provides for gains in understanding specific social contexts. Taylor's notion of an enhanced explanatory account that saves the phenomena is in line with this, although his approach to social analysis is clearly different from Thompson's.

Thompson has this in general to say about such a framework:

> Hence, 'explanation' and 'interpretation' should not be regarded, as they sometimes are, as mutually exclusive or radically antithetical terms; rather they may be treated as complementary moments in a comprehensive interpretive theory, as mutually supportive steps along 'a unique hermeneutical arc'.[818]

Taylor specifies three characteristics that a science of hermeneutics would satisfy in that "... men and their actions are amenable to an explanation of a hermeneutical kind".[819] According to Taylor, "We need, first, an object or a field of objects about which we can speak in terms of coherence or its absence, of making sense or nonsense. Second, we need to be able to make a distinction, even if only a relative one, between the sense or coherence made and its embodiment in a particular field of carriers or signifiers ... a distinction must be possible between meaning and expression". The third condition is that meaning and expression is for or by a subject. There must be a "notion of a subject for whom these meanings are".[820] Elsewhere, Taylor notes these conditions as "...first, that we can speak of its (what is being interpreted) sense or coherence; and second, that this sense can be expressed in another form so that we can speak of the interpretation as giving a clearer expression to what is only implicit in the explicandum. The third condition, that this sense be for a subject".[821]

Thompson approaches an interpretive study from the point of view of cultural analysis involving the study of symbolic forms in structured social contexts. More particularly, he argues that symbolic forms possess five main characteristics.[822] First, they are intentional: "Symbolic forms are expressions of a subject and for a subject." Second, they are conventional: "The production, construction or employment of symbolic forms, as well as the interpretation of symbolic forms by the subjects who receive them, are processes that typically involve the application of rules, codes or conventions." Third, they have a structural dimension: "Symbolic forms are constructions that display an articulated structure." Fourth, they possess a referential aspect: "Symbolic forms are constructions which typically represent something, refer to something, or say something about something." Finally, they always occur in context: "Symbolic forms are always embedded in specific social-historical contexts and processes within which and by means of which they are produced, transmitted and received". The first four involve the sense or significance of symbolic forms – that they convey meaning in some possibly confused or ambiguous way which an interpretation can help to clear up. For Thompson, the last deals with the manner in which symbolic forms may help create and sustain asymmetrical relations of power in socially structured contexts, and as such carry with them an ideological dimension.[823]

In general then, symbolic forms are the focus of interpretation, the meaning of which, in Taylor's terms, "must be describable in terms of sense and nonsense, coherence and its absence, and must admit of a distinction between meaning and its expression".[824] In this regard, symbolic forms are the signifiers that carry the sense or coherence being expressed. In other words it is through symbolic forms that a distinction can be made between the meaning being conveyed and the manner in which meaning is signified. Furthermore, the fact that symbolic forms are always found in specific social and historical contexts goes hand in hand with the idea that they are intentional. In other words, they are produced, transmitted and received by subjects for subjects. Thompson goes on to apply his ideas to the critical analysis of meaning and power – the ways in which symbolic forms can create and sustain asymmetrical relations of power in structured social contexts

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This is not the place for a detailed analysis of his ideas on method. However a few comments are in order. This is because later on the thesis discussion will consider certain aspects of technology, or technology artefacts, which might be regarded as symbolic in form. As such the ideas being sketched here will provide useful background to the work of later chapters.

Thompson aim here is to uncover something of the way symbolic forms create and sustain relations of power in structured social contexts. It is worth at least mentioning the ways in which strategies of construction of symbolic forms serve an ideological purpose – "meaning in the service of power", as Thompson describes it. He notes five modes of operation of such potentially ideological constructions, namely, legitimization, dissimulation, unification, fragmentation, and reification.[825] While no symbolic form would necessarily display all five aspects, Thompson's analysis itself provides a language of qualitative contrasts for realizing the various ways symbolic forms may possess an ideological turn. He also emphasizes that no symbolic form is of itself ideological. Such a conclusion would depend on how "the symbolic from constructed by this strategy is used and understood in particular circumstances".[826]

To anticipate slightly, certain aspects of the way technology is produced and received may be ideological in this sense. In other words, the way technology is used and developed may serve to create and sustain relations of power. No doubt technology arises within structured social contexts, and in part goes to make them up. It also carries or signifies a wide range of meaning, especially regarding social transformation and the assimilation or rejection of values associated with technology and social change. Such questions will be raised in the discussion in Chapter Six as part of exploring evaluative issues that arise in the development and use of technology. While no attempt will be made there to determine if a specific instance of the development or use of technology serves an ideological purpose (such a task is well beyond the bounds and aims of this work), it will be well worth exploring some of the kinds of questions the issue raises.

On the whole, Thompson's is a framework for reasoning. His ideas everywhere point to a founding notion in hermeneutics, that symbolic forms are made by people for people – that they say something to someone. That this takes place, for Thompson, in structured social and historical contexts implies that they are open to interpretation. In other words, they convey various meaning to us that cannot be read directly. Meaning for Thompson is a process based on the analysis of social and historical contexts, and requires that we interpret them via a range of explanatory methods so as to make of the effort something more than an exercise in personal opinion.

Part D: Qualitative contrasts and strong evaluation

Introduction

One central aspect of practical reason that Taylor emphasizes is his notion of qualitative contrasts and strong evaluation. The discussion in Part D picks up on this emphasis. The treatment of qualitative contrasts and strong evaluation that follows will also serve as a lead-in to the discussion concerning Taylor's conception of what he calls *ad hominem* reason, and which is the focus of the final topic in Part E. It is worth emphasising at the beginning however that the argument in Part D does not treat the scientific status of social research, nor the research methods used in the hermeneutical sciences. The discussion in Part D focuses instead on uncovering some chief characteristics of practical reason as well as judgements of worth or significance that arguably rely neither on intersubjective accounts, nor on the accounts of subjects.

To begin, in order to link together the notions of qualitative contrasts and strong evaluation it is useful to look briefly at some introductory ideas from Taylor concerning what it is about the human sciences that, according to him, gives them a hermeneutical dimension and hence makes them the

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particular kind of dialogue they happen to be. More particularly, the discussion below will take matters related to meaning and interpretation and attempt to connect them to a language of qualitative contrasts. The paragraphs that follow will attempt to give partial a summary of Taylor's answer to this question. They therefore rely heavily on his own wording and argument structure as found in his work Interpretation and the Sciences of Man (1995) as well as in his Neutrality in Political Science (1995).[827]

As a first approximation, interpretation is an attempt to make more clear, or to make greater sense of, the understanding one has of one's self, others, or of some meaningful object of study. In the context of the thesis discussion, self-interpretation concerns the way we seek to comprehend the significance, worth or worthiness of our intents and actions, and is therefore closely aligned with practical reason. For the human sciences this object might be a text, text-analogue or some other symbolic form the meaning of which is present in a confused or confusing way. Interpretation aims to bring to light an underlying coherence or sense to it (or confirm that, indeed, the confusion is real). Taylor describes these as "confusingly interrelated forms of meaning", or "meaning confusedly present" in a text or text analogue.[828] He furthermore notes three additional conditions to such interrelated forms of meaning:[829] First, there must be an object or a field of objects about which we can "speak of coherence or its absence, about its sense or nonsense".[830]. Second, we must be able to make a distinction between "the sense or coherence made and its embodiment in carriers or signifiers".[831] This is so because when it comes to interpretation we need to make the claim: there is meaning being conveyed by this carrier (say, a text, spoken words, or some act), but it is done so in a confused way. The task then is to express the meaning differently, to rephrase it, so to speak, and to do so in a more clear sense so as to thereby remove some of what was previously only confusedly conveyed or presented. Third, there is a subject for whom these meanings are intended, directly or otherwise. In other words, and oversimplifying, meaning or significance is present by virtue of the fact that one speaks, writes or acts in ways so that others can listen, read or see.

"Now, why should anyone think", to quote Taylor, "that men and their actions involve confused or cloudy expressions of meaning which a successful interpretation would help make more clear?".[832] In answer to this, the fact that actions have meaning for persons makes them inescapably hermeneutical, at least to the extent that finding meaning in what one says or does is part of the way a person understands himself. If so, then to be a person partly implies that we live unavoidably in the space of meaningful relations, and that something of what makes us who we are is to live in and through such meaning-giving relations in ourselves, with others, through the common social sphere and in our terrestrial world. If so, then it is not a mistake to inquire into the meaning things have and in terms of which a person can come to say that a situation makes sense or not, or that he can understand his own self or the life of others.

In this regard, Taylor holds that the meaning things have, as such, also has three dimensions.[833] i) "Meaning is for a subject."[834] Meaning does not occur in the abstract as if in an isolation ward. It has reality for a subject or for many subjects. If we really are self-understanding beings, then finding meaning in life involves human subjects *per se* by virtue of what it is to be who and what we are. ii) "Meaning is of something."[835] We can distinguish between a situation, action or artefact and its meaning. So, we might enquire: "What is the meaning of this action?" or "What does it mean when people behave in that way?" Something that is meaningful might also involve an event we can see, describe, talk about or experience and which has some kind of importance or significance for us. And, obviously, it may be that more than one event has a similar meaning, and of course that any given event has different meanings. For example, one might say "The talk delivered last night was filled with meaning for the audience." In another sense John Hatcher, for instance, argues that physical reality has a metaphorical nature, in which case what might be called natural objects also fall into the set of things that have meaning in the sense being discussed here.[836]

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iii) "Things only have meaning in a field", or space. In other words, the meaning something has makes sense in relation to other things that also have meaning.[837] Hence, the phrase meaning-space.

The idea that things only have meaning in a field implies a) there is no such thing as an isolated meaningful situation, act, event or artefact, and b) changes in other meanings to which a given situation etc. is related, can change the meaning or significance of the given situation. This is where the similarity to linguistic meaning comes in – that the meaning of words cannot be known or conveyed except in relation to the meanings of other words. However, Taylor refers to experiential meaning, in contrast to linguistic meaning, in order to speak of the meaning things have for subjects.[838] Experience changes the boundaries and byways of these relations, and in this sense new concepts are built up that enable us to make finer distinctions in experiential meaning. Crucially, as new distinctions are built up, we thereby also open the door to new relations of meaning which we could not have previously recognized, known about or made sense of.

To elaborate some, situations, circumstances, events, objects and the like have meaning or significance for a subject. This is because the experience one has of them calls up a whole field of relations with which the experience is joined. There is no getting out of the circle of significance that is implied here. As an example, and following Taylor, we experience a feeling – suppose we call it shame. A term like 'shame' refers us to a certain kind of situation (a shameful or humiliating one) as well as to a certain kind of response (to want to hide or cover oneself). It is part of the experiential meaning of shame that it be related to a situation and a reaction. But how do we recognize the situation and reaction as having something to do with shame or the shameful? Taylor argues we understanding it as the kind of situation it is because it is related to other situations and ideas in contrast to which (in qualitative contrast to which) we are able to distinguish it or mark it out as possessing characteristics x, y and z, instead of characteristics r, s and t. It makes sense for us because of the relation it has with other situations that already make sense. The terms we use, the concepts we employ, the situations we face and the reactions we experience possess meaning partly because they are connected to other terms, concepts situations, and reactions we are familiar with and which, because they set up a variety of qualitative contrasts that mark them out in particular ways, enable us to distinguish this particular case as having the meaningful characteristics it does, in distinction to that other case which does not possess it, or possesses it in a different way.

Continuing, people use language to express and make real the meaning things have be they situations actions or visible artefacts. With a more varied experience, a more mature judgement, a higher sense of what is important, we develop finer distinctions, a greater fluency of words, phrases and sentence forms, a more elegant turn of phrase that captures a heightened or more insightful subtlety of meaning. In other words we learn to acquire an ever growing language of qualitative contrasts. The qualitative contrasts we thereby come up with over time enable us to express in richer terms the meanings available to human experience, and, as our command of these qualitative contrast increases, ever more meanings become present to us in the actions, situations, events or artefacts we face or encounter. More importantly, not only do we come to express things in richer terms, but the quality of our experience expands and grows. A wider range of higher emotions becomes open to us. We can come to judge them with an increasing depth of meaning and significance in the way we live or act, and which gives to our life a quality or sense previously unknown or unrecognized. In more abstract terms then, the meaning of the whole gives meaning to the part which in turn helps reshape the meaning of the whole.[839]

This movement in a circle of meaningful relations is what a subject does among other subjects. It is worth noting that the image of meaning is perhaps better described by the spiral, not the circle, since as we gain meaning – as we learn to make reference to other qualitative contrasts of greater or lesser distinction – we will not repeatedly return to the same meanings, as in a closed circle, but

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spiral away from a first reference to new ground. It is this spiralling away that arguably contributes to new realizations that can change our understanding, which can mark out transitions, and which can convince us that we have made gains in our capacity to know or to judge – either that we see in greater detail the connections involved, or that a wider range of connections can be seen.

Certainty

Such ideas connect to the question of certainty. How can we know for sure the terms we employ to grasp the experiential meaning of something actually holds for the situation we face or the response we experience? Might we be wrong about the meaning our qualitative contrasts provide? According to Taylor, philosophically and historically there are three ways of handling questions of certainty.[840] Taking the hermeneutical circle as a reference point, Taylor argues that we can: i) Stay within the circle and accept that certainty is not what interpretation gives us. To the extent that meaning always works in relation to other meanings, then uncertainty of one form or another is part and parcel of the way humans make sense of things (or the way things make sense to humans). It is important to note that this is not to say that everything is uncertain, or that everything is uncertain in the same way. Some meanings have very persuasive justifications, or at least Taylor agues so in the case of what he calls strongly evaluated goals. ii) Seek and attain a level of understanding that is so complete or an insight that is so clear as to be absolute and hence beyond question or doubt. According to Taylor this is Hegel's position.[841] iii) Break out of the circle by anchoring perception or experience to a world of fact absent of any interpretive content – or what Taylor calls brute data identifiable – and from there build up arguments about what is known that have recourse to determinations not based on someone's particular point of view but on what can be demonstrated intersubjectively via a well marked out procedure.

It goes without saying that matters of interpretation are often faulted for their lack of certainty. This in part derives from the way some approaches to understanding squarely place themselves in the 'subjectivist' camp. In other words, they take up the counterfoil to intersubjective accounts – namely, the accounts of individual subjects (more specifically, self-defining subjects). Such is likely the case with Lincoln and Guba's approach discussed in Chapter Two. Such a view arguably tends towards a fairly strong relativism or even perhaps a flat pluralism. Since, from this point of view, there are no external standards that can be used to judge the actions of self-defining subjects, then there is no option but to take the subject's beliefs as they stand and to try to build up as rich a narrative of them as is possible. Beyond this no judgements will be or can be made as to the truth of what a subject believes, the worth of his action, or the correctness of his choices. A similar argument holds in cross-cultural judgements, if a culture is self-defining in an analogous sense.

The criticism regarding a lack of certainty in interpretive accounts – that they are not intersubjective and are therefore idiosyncratic in nature – also comes from the assumption that what certainty is, is what intersubjective accounts deliver. But this in part assumes the world exists and works in certain ways. Part of the point being made by Taylor is that not all that the world is can be netted by intersubjective accounts as developed out of a naturalistic stance. In the case of self-understanding beings a different ontology is at work. It is inappropriate then to use conceptions of certainty developed for a neutral universe and apply them to a world made of self-understanding beings. In such a circumstance the conditions for certainty would fail to be met – indeed, could not be met – with a consequent faulty accusation of 'subjectivity'. However, the kind of hermeneutical treatment taken up in this thesis, while not 'subjective' in the sense of not being intersubjective, is still tightly linked to the notion of interpretation as involving 'epistemic gain', to use a phrase from Taylor. Such a process inherently allows for more than one account, and this for good reasons. There is an ocean of linguistic expression that can bring to realization some aspect of human practice, and hence also change it. Not all that can be said can be said at one sitting. Each new

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realization of the meaning an action, situation or artefact has serves to change the field of meaning-relations with which it is connected. "Before, I could not make sense of my situation. Now I see it clearly. The way that I acted was certainly incorrect. I would not now make the same choice" is perhaps typical of the kind of realizations that can change one's field of meaning. Some of these changes remain bound within a specific family of realizations. Others may wash through an entire class of meaning relations and so alter the whole of its meaning-space.

From a stance such as Taylor's, there is no final account of what is worthy for us as humans, or of that which properly constitutes a good and acceptable form of life. The effort is a life-long one. We can learn that some of our accounts were clearly faulty or mistaken, or that our choices are more realistic if a previously unrecognized factor is taken on, or that we will improve our grasp of the situation if we start thinking of it in terms of position *R* or *S* with less emphasis on standpoint *T*.

With an ever more subtle command of qualitative contrasts we gain in expressive power (not explanatory power), and in turn, the ability to bring to light a different grasp of that which is of significance but where this different grasp is recorded as a gain in knowledge. Indeed, for self-interpreting persons such expressive power serves to create a new sense of reality either in our choices, our changed practices, or in the range of ideas, higher emotions or spiritual principles we can not only experience but bring to bear on attempts to make added sense of our world. For intersubjective accounts this may be unsatisfactory, but from the point of view of persons as self-understanding beings, the language of qualitative contrasts is a starting point to the whole process.

Strong and weak evaluation

The next discussion links qualitative contrasts and strong evaluation. As noted earlier, it plays a key part in the thesis discussion regarding practical reason. These ideas will be considered again in Chapter Six when issues on the development and use of technology take centre stage. For now the paragraphs below aim to set up some main ideas. The discussion in this section is indebted to Taylor's work What is Human Agency (1985).[842] Many of the following paragraphs closely follows the argument developed by Taylor, and the terminology adopted here is liberally taken from Taylor's own usage.

Agents are creatures capable of desiring or intending in some way. Human agents possess the power to evaluate own desires – to stand back, to reflect on them, and recognize some as doable, attractive, compatible, unifying, worthy, course, or lacking in dignity or spiritual distinction. Taylor refers to this power to evaluate own desires as a mode of human agency, and is part of a more general capacity for self-evaluation.[843] He argues at length that this capacity or power is part of what constitutes us as persons.

Taylor notes two forms of evaluation of desires which in turn speak to two forms of agency.[844] The first concerns the manner in which people simply weigh an action or outcome – that some course of action is more opportune or expedient, or that we choose between outcome A and B so as to fit with some momentary constraint P, or that we select the one that is most attractive to us on the day. Such choices are often judged according to their degree of importance. Which one is most satisfying? Which is least difficult? Which gives the most return? Or simply: Which one do I want the most? These differ by degree. They can be weighed according to some favoured or disliked, pleasant or distasteful outcome which we choose depending on what we want to or expect to get from it.

The second concerns a qualitative evaluation of desires.[845] Here Taylor holds that some desires can be appraised using terms like higher/lower, virtuous/vicious, profound/superficial, noble/base, substantive/hollow. To evaluate desires described in this way cannot involve only a weighing of the outcomes, as described in the paragraph above. There is something more involved here – a

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distinction that speaks to underlying motives and how these make sense of or measure up to what it is to be a person, or that link with what kind of society we aspire to create or write for ourselves and come to inhabit. Such desires are judged as holding out qualitatively different categories of action – there is something different between a noble and base action, or between that which is substantive and that which is hollow – something a matter of degrees will not bridge or overcome. In other words, these desires occupy a world of human intents that operate beyond degrees of difference, as in a question like: "Which do I want most, to play tennis or to go to the movies?" Accidental outcomes or fortuitous desires of this latter sort say nothing about who or what it is to be the person I am, or what kind of society we long to inhabit. Except perhaps in the minimal descriptive sense that someone happens to like both tennis and movies, for instance.

Taylor uses the term contingent, or sometimes circumstantial, to describe the first form of evaluation, in that it involves the weighing of contingent outcomes – that today one set of outcomes takes centre stage, tomorrow a different set is in play.[846] "Yesterday I wanted to ride my bike, today I choose to go swimming." Among different contingent or accidental outcomes the choice of one over the other involves no contradiction (except that one cannot ride a bike and swim at the same time) or need not imply a choice that speaks to fundamental aspirations. It is the second form of agency based on what Taylor calls non-contingent desires, that qualifies us as beings for whom matters of worth, purpose, right, significance or spiritual principle are central. In other words, they speak directly, more searchingly, more intimately or with greater pain and sense of consequence to the kind of life being lived – that it is disjointed or unified, constrained or open, estranged or familiar, small minded or generous, greedy or selfless, hollow or fulfilling. The first contingent or accidental case concerns outcomes and results that can be measured in terms of time, effort, satisfaction or success. The favoured option is acted out not because of the worthiness or otherwise of some underlying motive. Here the simple desirability of an outcome is the basis of choice.[847]

Even here in the accidental case there may be different *kinds* of outcomes that determine what action is taken, although the judgement is not made on the basis of the worthiness of the outcome. Different possible outcomes present themselves in the course of normal unreflected activity, and while these outcomes may differ in kind – "I choose the quiet of an evening alone in a comfortable chair with a great book instead of a busy social gathering with friends at the cultural centre" – the choice is not made at the level of their worth or significance but simply with the question: "What kind of evening do I want to have?" These sort of choices or outcomes may not differ by degree – they can display a difference in kind (quiet time at home, gregarious performance) – but the difference is of the sort that does not require one to reflect on a mode of life or agency. In other words they do not call up questions about what kind of person am I or what sort of society is this, but simply, what do I want to do, what preferences suit us most.

In the first instance then we have outcomes that differ by degree only or which differ in kind but do not call up a set of qualitative distinctions that speak to the worthiness of the outcome being contemplated. Taylor calls this judgement of outcomes weak evaluation, and the goals or outcomes they involve weakly evaluated ends.[848] In other words, they are qualified by outcomes that do not speak directly to the worthiness of the action involved or some form of life. They can change and shift over time without any deep qualification of the life one lives. In this case they might be called transient outcomes. In Taylor's terms, a "simple weigher of alternatives" is someone who acts at this level of choice, whose thinking life follows some kind of measure or calculation of his actions in terms preference, inclination, likes or dislikes.[849] The implication here is that all of us are simple weighers of alternatives at one time or another, and this takes place in forms of daily living that do not bring up searching questions as regards the quality of life being lived.[850]

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Taylor goes on to make a further distinction, namely, that weakly evaluated goals concern both outcomes as well as desires.[851] The initial observation that part of what it is to be a person is to possess the power to reflect on our desires and evaluate them, while most properly directed towards qualitative distinctions of worth or value, also comes into play with weakly evaluated ends. Such ends involve not just decisions regarding the object or outcome of some action, but also include desires themselves. Taylor uses the example of the debate one enters into about eating chocolate or staying on a diet, both of which are weakly evaluated ends or outcomes. As regards motives or intent the question Which desire is preferable? (or Which desire do I desire?) can be asked here. "I want to be free of my love of watching B-grade movies" is one type of response (which is a case of desiring to be free of a desire one actually possesses). "I wish I had the discipline to go on a diet" is another (which is a case of wanting to have a desire one does not possess). These questions and responses do not turn on worth or on admirable (or wretched) traits, and hence fall into the category of weak evaluation. That is to say, in the end they are circumstantial or contingent, accidental or transient, unlike a statement such as: "I wish I could bolster my life in a habit of truth.". Furthermore, and as noted above, desires may also be described qualitatively, that is, the kinds of intents we might choose to pursue may differ in qualitative terms, but be based on matters of preference, satisfaction, fancy and the like. On this account they are also weakly evaluated desires.

In general, Taylor adopts the view that weakly evaluated outcomes and desires possess an unusually strong backing in modern Western culture.[852] Perhaps there is a tendency to see weak evaluation as constituting evaluation *per se*. In other words, what is here termed weak evaluation is something that includes all forms of choice. In such a case, and as Taylor notes, clear distinctions are not made between different forms of evaluation of outcomes or desires, with the result that, from this point of view, each of us in effect acts like a simple weigher of alternatives.[853] If so, then one possible explanation for this is that the notion of qualitative contrasts that rest on distinctions of worth or significance tend to be discounted where instrumental reason is taken as the proper model for determining or calculating practical outcomes. Here stock is placed on calculations of utility, means-ends and cost-benefit analyses, the maximization of efficiency, and theories about rational actors. These would then tend to discount any investment in qualitative distinctions that focus on the worthiness of intents and motives in strongly evaluated terms.

The position seems to be that such arguments from higher motives and the notion of inescapable commitment simply fail to deliver results. Practical choice rests on our actual preferences, where these are best regarded as measurable in some sense and hence open to a calculation of outcomes. The point is to improve our practice or the actual delivery of results, not endless philosophical debate that more often than not turns on some slight nuance of meaning and which only delays practical, directed, useful effort. What is required of action is that it be based on real, measurable results. Obviously, there is good sense in this, and the point of the argument here is not to belittle such reasoning, only to point out that there are other patterns of practical reason available the fruits of which provide for added insight into who we are as agents.

In any event, in cases where the calculation of outcomes as if on a scale is central to the choice being made, then it may be that some notion of weak evaluation is at work. Thinking about our choices as agents mainly in terms of calculation, or the weighing of outcomes (no matter how complicated) is, according to Taylor, one aspect of a strongly utilitarian undercurrent of ideas that washes through much of modern Western intellectual culture.[854] In this regard, Taylor thinks that the emphasis placed on utility is at times off the mark, and this arguably in two broad senses. First, that qualitative distinctions are discounted because they are not properly understood. Second, that even in theories of utility some determinations of outcomes do not involve calculation of different desires, but only that one desire or group of desires is preferred over another in the weakly evaluated sense being discussed here.[855]

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Of course, the issue here is not calculation as such. In other words, and for example, in times of heavy rains and damaging floods let us be glad that careful calculations are made as to the numbers of people affected, the logistics behind the efficient delivery of first aid and food parcels, setting up rescue stations and temporary housing, taking measures against the spread of disease and the like. It is not just emergency situations intended here, but the daily running and servicing of the needs of society without which terrible consequence would follow.

However, and expanding on Taylor's ideas, to fail to grasp the nature of strongly evaluated goals – those intents, motives or purposes in terms of which we understand something essential about ourselves – is not only to miss or to misconstrue a central aspect of what it is to reason practically, it also cuts short, as it were, the links that exist between our capacities for knowing the world on the one hand and, on the other, judging or discerning the moral worth of our actions in it. For example, qualitative contrasts can give expression to underlying motives and intents in such a way as to post gains in knowledge of ourselves or our social world, yet it is also in terms of such contrasts that our desires are judged or our actions assessed. We could say we have described these emotions or intents, but perhaps the term, described, is not the best choice of word. The intended meaning here is that they are what they are by virtue of our grasp of their significance in strongly evaluated terms.

This kind judging or assessing can be a deeply reflective process that turns on the distinction between strongly evaluated desires or goals, and those which we weigh in weakly evaluated terms, but here remembering that weakly evaluated desires can also be expressed using qualitative contrasts. Once again, the distinction between strongly and weakly evaluated desires turns on the idea that persons are creatures for whom things have significance or worth in an original sense, that this comes with who and what we are as self-understanding beings, and that to cease attending to certain intents or desires as part of the effort to understand who and what we are is to be shown up necessarily as a lesser being.[856] When translated into action, so to speak, persons who understand their desires in terms of worth, not preference, will have a different sense of agency or what it is to be an agent, and so the goals they pursue or the aspirations that characterize their actions may be of a different species, so to say. In terms of goals or aspirations that arguably point in the direction of inescapable commitment, one might, for example speak of a devotion to liberation from oppression, of a lifelong obligation to the education of children, or the development of an inner spiritual discipline based on compassion, integrity, trustworthiness and the like, or the pursuit of relations among people and forms of society that give expression to the consciousness of the oneness and wholeness of the entire human race. In brief, the qualitative contrasts used to express the rich meaning-space within which inescapable commitment makes sense and is known are also employed in the way we judge ourselves as agents.

The point of the above analysis based on Taylor's ideas is to show that differentiating between the two types of evaluation of desire or motive rests on i) the notion of qualitative contrasts, and ii) that these contrasts call upon distinctions as to worth, merit, significance, virtue, spiritual principle and the like. In other words, the difference between weak and strong evaluation (or between intents that are evaluated in weak or strongly evaluated terms) is concerned with whether or not desires are distinguishable as to their worthiness understood in terms of inescapable commitment.[857] If so, then the two types of evaluation of desire arguably speak to two forms of agency, in the sense that we will tend to make sense of our actions in different terms. Said differently, we might act according to our contingent preferences, attitudes, inclinations and so on, or we might act according to a substantive grasp of worth, significance, dignity and the like. The next subsection looks further at this latter notion of agency as it relates to strong evaluation.

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Human agency

The notion of significance, discussed earlier, comes to the fore in Taylor's account of human agency. According to Taylor:

> [H]uman and animal agents are beings for whom the question arises of what significance things have for them. I am using the term 'significance' here as a general term of art to designate what provides our non-observer-relative answers to such questions as: What is he doing? What is she feeling? What do they want?
>
> Ascribing action in the strong sense to some being is treating that being as a subject of significance. The full-blooded action-description gives us the action as purposed by the agent. We define the action by the significance it had for the agent (albeit sometimes unconsciously), and this is not just one of many descriptions from different observer's standpoint, but is intrinsic to the action *qua* action. So we can only attribute action to beings we see as subjects of significance, beings for whom things can have significance in a non-observer-relative way.
>
> We have to add this last rider, because there is of course, another, weaker sense in which we can speak of things having significance for inanimate beings: something can be dangerous for my car, or good for my typewriter. But these significances are only predicable in the light of extrinsic, observer-relative or user-relative purposes. By contrast, the significance we attribute to agents in our language of action and desire are their own. It is just this principle feature of agents that we can speak about the meanings things have for them in this non-observer-relative way, that, in other words, things *matter* for them.
>
> Let us call this essential feature of agents the 'significance feature'.[858]

Taylor's emphasis in this passage is on language that gives expression to a fuller sense of human agency, and where such language might bring about a sense of our motivations and outcomes seen in light of the kinds of inescapable commitments that are urged upon us. He suggests that, for an important class of actions, an incomplete sense of their significance will emerge if we judge outcomes as distinct from the worthiness of intents. In part this is because of the role language plays in giving expression to the reality of action, or, as it has been described in this thesis discussion, to change the description of the intents or motives of our action is to change what the action *is*. This is the nub of Taylor's comment in the quote immediately above that: "We define the action by the significance it had for the agent" and that "this is not just one of many descriptions from different observer's standpoint, but is intrinsic to the action *qua* action"[859] Of course, it is not some mere or simple change intended here, but involves what might be called a perspicacious change. Employing an expressive use of language in this way might go something like the following: "I now recognize that my reason for acting the way I did was actually based on feelings of envy and not honour. I no longer see myself as having acted in a way worthy of who I am. Mine was an envious act, not an honourable one". Here the observer-relative behaviour has not changed, but what the action *is*, so far as concerns the intent of the agent who carried it out and who is responsible for it, has been altered irreversibly. This is because things can matter to agents in ways that are non-observer-relative, to use Taylor's phrase as quoted immediately above.[860] If so, then an explanation of human action in a singularly intersubjective or naturalist sense, as Taylor might put it, is likely to miss out on some key aspects of what it is to be an agent. In other words, and as repeatedly mentioned in the thesis discussion, to grasp the space of meaningful action requires a "richer ontology than naturalism allows".[861]

Elsewhere, Taylor goes on to specify two sets of ideas for sifting through our judgements of desires.[862] He argues that these conditions can be used to determine if our desires are distinguishable as to worth, and hence are a matter of strong or weak reflection. It is important to note again that Taylor's distinction between weak and strong evaluation is not a question of desires

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differing in quantitative or qualitative terms. It also does not rest on deciding if desires are matters of simple fancy, preference, attractiveness and the like or if we are involved in a conscious evaluation of desires *per se*. For Taylor the distinction rest on whether or not desires are distinguished as to their worth or significance judged in terms of inescapable commitment. In other words, if by failing to attend to some matter of worth or significance we show up ourselves necessarily as a lesser being, then we are dealing here with judgements that involve inescapable commitment. According to Taylor, this determination rests on two interlocking conditions.[863] The first of these conditions is divided into two parts, 1a and 1b:

1a. In the first case, for something to be a weakly evaluated end it is sufficient that it be desired in terms of preference, attractiveness, simple choice and the like. For example, I desire to play tennis or to go to the movies, or spend the evening home so to enjoy my favourite ice cream. These are desires for which the question "In what sense are these a good or not?" does not actually arise. Either the debate about good or right action is suspended, or the given desire held without calling up any significant reflection as to its status. In accordance with the discussion in the previous section, Taylor thus calls this kind of want a weakly evaluated desire, and its intended result a weakly evaluated outcome.

1b. In the case of strong evaluation the desire one is open to the use of an evaluative term such as good, worthy or significant (or base, ignoble, hollow). The nature of the desire or intent is such that it opens the question of its worthiness to a reflective evaluation. In other words, the desire calls for a reflective evaluation of that which constitutes it or in which it consists – is the intent base, ignoble, trivial, superficial, unworthy, high minded, noble, substantive. Following the above terminology, the goal or object of such intents are called a strongly evaluated outcome.

It is worth noting that from this point of view relativism in the moral sphere rests in part on the failure to make a distinction between strong and weakly evaluated desires. From a perspective that supports relativism, judgements as to desires or practices that are bad/good, or hollow/substantive cannot be made since there are no rational criteria, cross culturally, to choose between these terms. In other words, relativism tends to do away with the entire set of contrasts as to worth. If so, then any agreement between people or cultures as to what is a worthy or unworthy desire or practice turns out to be mere coincidence between world views that, so far as criteria of judgement go, otherwise pass each other in the night, so to say.[864]

The second of these interlocking conditions is again divided into two parts, 2a and 2b:[865]

2a) In the case of weak evaluation, if one's desired option is put aside, it is done so only because of a contingent incompatibility with a more desirable option.[866] This corresponds with having to make a choice between alternatives simply because both cannot be done at that time. Because one is more attractive or interesting, and since both (or many) cannot be done at the same time, then one (or some) can be ignored or passed over. This afternoon I want to attend a community social. I also desire to spend the afternoon working in my vegetable garden. I will not be able to do both, but the choice of one over the other is simply a matter of circumstance or preference. Tomorrow I might desire to tend to my tomato patch, and this would imply nothing about the status of my desire for socializing. Obviously, on the same afternoon doing one precludes doing the other, but for this contingency there is little else between them except the way they are ranked as to preference fancy, attractiveness, interest, position on a list, time available and the like.

2b) In the case of strong evaluation Taylor argues that contingent incompatibility need not be part of the choice, and this for two reasons: i) the question of incompatibility may not even arise, and ii) if an incompatibility does arise, it will not be a contingent one.[867] Taylor uses the example of a cowardly act – the desire to run away in the face of danger that threatens some good or person. (It is

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of course not a cowardly act *per se* to run from danger.) I am tempted to avoid the danger, but I stop myself. Why? Taylor holds that it not because this would make some other desired act impossible (hence incompatible, like riding a bike and swimming at the same time). Yes, if we literally mean fleeing on foot then no other desired act would be possible while we are running away. But we can avoid danger in a way that permits of a whole range of other desired actions that have nothing to do with being cowardly, and which are not incompatible with it. So the issue here is not about choice based in an incompatibility. Taylor instead argues that one refrains because the cowardly act is base – it is unworthy of the kind of being I am or aspire to become and this desire, to be worthy of my responsibility as a caring person, keeps me from fleeing and so I stand up to the test. Of course, I may fail the test. The good I seek to defend may still suffer, or a fellow human may still be injured. But this will not alter the quality of courage I sought to display. I choose to stand because to do otherwise would show me up to be a lesser person. The skill I display says nothing as such about the character of the motive and hence the kind of action it is.

Taylor goes on to argue that a notion of incompatibility can be brought in to the idea of strong evaluation, but that this would involve a non-contingent incompatibility.[868] Here we engage in close examination of what it is a person or society values most dearly such that to give it away, or impair it, or wrongly employ it, or exchange it implies being a lesser person or a society in compromise. In particular, the notion here is that a mode of life or quality of desire judged according to worth or significance cannot but be jeopardized by giving way to a lesser impulse. If I aspire toward courageous action, then my aspiration or desire would be compromised by giving into the urge to flee from danger to some good or other person.[869] Here the incompatibility is between an aspiration in one direction and the motive for a course of action in another. As noted at the top of the paragraph, this incompatibility is not contingent, where contingent means that circumstances in the here and now make it impossible to do both things. Instead, one cannot flee from danger to some good or person, and still hold to being courageous. This is because to be courageous is not to successfully fight off the danger, but involves standing against a lesser impulse.[870] One could add here the phrase 'no matter what the circumstance', but this would be to miss the point slightly. This is because, as Taylor argues, the mode of courageous life one aspires to consists in part in withstanding the urge to flee. If I want the one then I must not do the other. The desire to be courageous and the urge to flee are incompatible non-contingently. Part of what constitutes the one is what the other negates.

Taylor asks if this not just a trick of language in the way terms are used?[871] He responds in the negative, and argues that this is where a language of qualitative contrasts that turns on the worthiness or significance of our desires can show up some of the main points in our most deeply felt sense of self. Indeed, a faulty language of qualitative contrasts would hinder our ability to recognize strongly evaluated goals or desires in terms of original significance, and so miss the point of the non-contingent character of the deliberation.

The above discussion leads to some further ideas that will be highlighted in the next subsection regarding how we characterize our motivations, the meaning things have for us or for our society, as well as which reading of self or society is correct.

Evaluative distinctions

According to Taylor, strong evaluation is aligned to non-contingent incompatible desires in part because of the way we use a language of evaluative distinctions to make sense of these desires – that we come to describe them as noble/base, integrating/fragmenting, courageous/cowardly, clairvoyant/blind, to use Taylor's examples.[872] For the following discussion such distinctions depend on what will be called a language of qualitative contrasts.

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As noted in the previous subsection, it is not incidental that there should be incompatibility of a non-contingent kind in cases of strong evaluation.[873] Strong evaluation 'deploys' (to use Taylor's term) a language of evaluative distinctions.[874] In such a language different desires are described as noble or base, integrating or fragmenting, courageous or cowardly, clairvoyant or blind and so on.[875] But this means that they are characterized using contrasting terms. The concepts presented in the above pairings can be better understood when put in relation to the other that contrasts it. In other words, the use of language in this way provides for gains in knowledge. Regarding this notion of contrasts Taylor writes: "Something is a contrasting description if it is essential to the identity of one of the alternatives that it not be the other."[876] For example, Taylor argues that the word 'now' has sense when put in contrast with other terms like later, tomorrow, yesterday or, earlier. Taylor calls these several other terms the contrastive background.[877] Crucial for him is that this contrast need not be with one term only but can be with several terms. As Taylor writes:

> And of course with evaluative terms, as with colour terms, the contrast may not be with one other, but with several. And indeed, refining an evaluative vocabulary by introducing new terms would alter the sense of the existing terms.[878]

In this way then the attempt to fine tune the meaning of an existing evaluative term by introducing new terms – which is the same as building up a language of qualitative contrasts, or be likened to filling in some neighbourhood in meaning-space – can help to enrich the set of meaning relations and so change (by refining) the sense of the existing term. The richer the contrastive background, the more refined or rigorous might become the grasp of the desire or end we seek to know.

Generally then, the attempt to think in terms of strong evaluation can benefit from the use of contrasting alternatives that permit us to express the character of some desire more fully. This in turn is an example of the way in which the expressive use of language serves to alter meaning-space – that what an action *is*, is changed as we come to use language to describe the motivations that accompany it with greater subtlety or restraint, at least from the point of view of non-observer relative agents. We perhaps learn to picture the desire with increased rigour or refinement, or that we come to see it as being intimately connected with an aspect of worth or significance that we previously were not aware of (say, some matter of right or good or spiritual principle), or which we had only approached in a tangential way, or which we previously regarded as being inconsequential.

One point of clarification here concerns what might be called alternative desires.[879] For example, "I look forward to an evening at the community centre." stands independently from "I want to mix compost for my vegetable garden". These weakly evaluated desires are alternative desires. The fine point to clarify here is that in trying to understand in what sense these desires are alternatives one need not bother with the notion that they are contrastive terms. This is because the condition for contrastive terms, that it be "essential to the identity of one of the alternatives that it not be the other" does not apply here to two or more alternative desires.[880] In other words, there is no need to contrast desire A with desire B in order to refine or make more rigorous our grasp of either A or B. Besides, even if alternative desires of a weakly evaluative sort were also incompatible and hence open to the use of contrastive terms, they would only be so in a provisional or circumstantial sense.

Continuing with this point of clarification, alternative desires of a strongly evaluated sort can also be described without contrasts. For example, we can understand the kind of desire involved in wanting to save one's life without any reference to, say, the desire to save one's honour. In other words, there are circumstances where it is not essential to the one that it not be the other. One complication here is that, according to Taylor, there are also circumstances where the choice between saving one's life vs. honour might arise, but that the choice is not of one's own making. Here Taylor uses the case of the sergeant ordering conscripted troops into the battlefield. The

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choice here for the conscript to 'save my life' or 'stay and fight' is not his own, and so the contrastive issue of courage/cowardice *per se* may not arise. In other words, courage is found in the choice to resist the urge to flee, to stand and fight the danger to some good or other person, because, as was said earlier, to do so is worthy of the kind of person I aspire to be, or the kind of society we seek to inhabit. But in the case of the conscript, it may be that he would rather avoid the battlefield entirely and instead be back at home tending his vegetable garden. The fight simply isn't his. For his case, the question would have to be raised if there is any real dishonour in fleeing to save one's life (though there may be court marshal and imprisonment in the offing for dereliction of duty).

Perhaps here the choice to obey the sergeant and so jump onto the battlefield or disobey (and be shot by the sergeant or be put in prison for disobedience) does not so much concern death vs dishonour, but which outcome does the conscript fear the least – possible imprisonment (or death) at his sergeant's hand, versus the probabilities of survival on the battlefield – both of which are forced on him by circumstances which he should liked to have avoided in the first place. Suppose though one is a committed soldier, ready to display all honour on the field in which one's sense of life's worth is invested. Such a soldier does not need the sergeant to oblige him to fight in this way. This battle is his battle. His honour and the good name of his company are at stake. And so, unlike the conscript, for the committed soldier the contrast is essential. If he flees he *will be* dishonoured; He will have compromised himself terribly. Both of these cases help point out in their own way the non-contingent aspects of the contrastive terms life vs. honour or death vs. dishonour – that it is essential to what honour is that one willingly resists the urge to avoid danger that threatens some good or the life of another person (of course, not every good or other person). It is worth noting that this kind of discussion is itself an example of practical reflection – that by building up both a language of, as well as a language about qualitative contrasts, we can reflect more substantively on the worthiness of desires and contemplated actions.

To sum up, when it comes to strong evaluation, that is, actions that call up questions regarding the worthiness or significance of their accompanying motives, then we are required to speak in terms of inescapable commitment. In this regard Taylor writes that:

> [W]here we deploy a language of evaluative distinction, the rejected desire is not so rejected because of some mere contingent or circumstantial conflict with another goal ... The conflict is deeper; it is not contingent ...When we come to the desirability (or undesirability) characterizations in virtue of which one alternative is rejected, the alternatives in strong evaluation must be contrastively described.[881]

The ideas discussed thus far therefore lead to the following characterization of strong evaluation: *Desires (or goals) that call for non-contingent contrastive descriptions to make sense of them are desires (or goals) that involve strong evaluation.*

The next three subsections highlight some implications of the above characterization of strong evaluation in so far as it concerns notions of certainty and error, modes of being, and practical reason. These subsections will close the discussion in Part D. More particularly, the last subsection on practical reason will set out a few preliminary ideas that will be explored more fully in Part E.

Errors of evaluation

Taylor goes on to argue that if we come to use a language of evaluative distinctions in strongly evaluated terms – what might be called a of science of qualitative contrasts – then we can come to grasp ourselves and our society differently.[882] In his terms, when people deploy such language they are no longer contingent weighers of alternatives, but instead are strong evaluators.[883] He also argues that in a sense they are different people because, as human agents, the language used to give expression to action also serves to realize (or to make real) the quality of those actions – the way

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underlying motives are described changes what the action is, and hence in the end the agent too.[884] The world of meaning relations is different under the conditions for strong evaluation. Meaning-space is altered, it portrays a different reality when an expressive use of language uses strongly evaluative qualitative distinctions based on worth or significance. Taylor also makes the point that this kind of language opens up the possibility for a deeper level reflection.[885]

For example, the way our use of technology is characterized in weakly evaluative terms such as utility and control, cost and benefit, maximization of productivity, capacity for expansion, is unlike that used in strong evaluation. The reality of our choices for technology when expressed in strongly evaluative terms would arguably be different than when characterized in terms separated from distinctions of worth or significance. Such distinctions based on worth provide forms of practical reflection that articulate reasons why some alternatives are significant or more worthy than others. Otherwise, we are asking questions about productive capacity, distribution, consumption and the like. Of course, from this point of view if a person or a community did not have a language of qualitative contrasts with which to make adequate distinctions as to worth or significance, then a choice about how someone uses technology or the debate in a community regarding its development and use may tend to take place at the level of the 'contingent weighing of alternatives'. Obviously, the physical thing or process that makes technology so noticeable is not the point here, but how we regard the technology we develop and use, what this says about the kind of person or society we are, what sort of human powers our technology extends or amplifies, what ends or aspirations move us in our choices regarding the use of those powers, and what do these ends or aspirations say about our conception of a good or acceptable life or the form of society we seek to create. Such distinctions may begin to point us in the direction of different levels of reality, to think in Nicolescu's terms

As suggested earlier, Taylor is critical of theories of utility, which, according to him, would do away with a language of qualitative contrasts and hence strongly evaluated motives (with the proviso that not all qualitative contrasts involve strongly evaluated goals). Of course, utility and control have much to recommend them. Part of the so-called good life enjoyed by some is made possible by the material well-being such control offers. However, for Taylor the general tendency in modern intellectual culture has been to rely on notions of utility that speak to issues in instrumental terms at least, and perhaps in weakly evaluated ones as well. One way to think of the term, instrumental, is via the idea that the human central nervous system, or CNS, has evolved in such a way as to require outside devices to express itself. That is to say, what might be called human powers are an extension of what the CNS is capable of showing up via the use of outside devices. Such instruments either extend or amplify these human powers.[886] In addition, the tendency for questions concerning utility to be approached without much consideration for what has here been called strong evaluation goes back to the discussion in thesis Chapters One and Two and the distinction between self-defining individuals and self-understanding persons.

The above points open the door to a debate on which is more illuminating or truer to reality. Is it our actions judged on their quantity of satisfaction, or is it on the quality of motive that accompanies them? Do we see ourselves as weighers or evaluators? Do we regard our desires as matters of preference, say based on their attraction or repulsion, or do we assay them in terms of their inner worthiness or significance? Taylor labels this kind of debate as a "conflict of self-interpretations", and argues that the interpretation-type someone adopts, to coin a term, will partly shape the meanings that will be recognized, the meaning things will have, and the kinds of choices that will be made.[887] If so, then it makes sense to ask which interpretation is more valid, or more faithful to reality, since, clearly, the reality we face in life is not wholly generated out of one's individual perception of things.

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According to Taylor, to be in error here would not be a simple case of using a term incorrectly, or wrongly describing what is going on. To quote Taylor: "This is a question about what our motivation really is, how we should truly characterize the meaning things have for us."[888] To be in error in this sense is to somehow distort meaning-space, to give it a sense our best self-interpretations do not support, to pursue a form of life that is hurtful. For Taylor, part of the reason for introducing the distinction between strong and weak evaluation is to contrast the different kind of self-interpretation each tends to involve. Again in his terms: "In examining this it will, I think, become overwhelmingly plausible that we are not beings whose only authentic evaluations are non-qualitative as the utilitarian tradition suggests."[889] *There is perhaps no more important aspect to practical reason than that it speaks to the qualitative contrasts we use to understand in strongly evaluative terms the motives that accompany our actions.* The point here is that when it comes to practical reason, thinking based on likes and dislikes, trends, fancies etc. misidentify or simply pass over those distinctions as to the worth or significance of our motives and which make up part of our existence as self-interpreting beings. Simply said, they make up part of who and what we are. Furthermore, if the argument about an expressive use of language has merit, then by thinking of practical reason as debate on the satisfaction of needs, productive capacity, self-expression and the like will tend distort the significance of those motives that most deeply move us. Thinking in terms of what Taylor calls quantity of satisfaction will thus tend to pass over the ways in which, as agents and self-understanding beings, some of what the world *is* is altered by the way we both give expression to it and judge it in strongly evaluative terms.[890] (In other words, they involve distinctions of worth or significance rooted in a language of qualitative contrasts.)

Summarizing then, the language of weak evaluation can be linked to the calculation of consequences in a utilitarian sense, together with a choice of outcomes that are judged to be satisfying, attractive or advantageous in some way. In so far as these involve the simple weighing of alternative outcomes and desires Taylor views it as a kind of entry level reflection – a minimum necessary level of thinking beyond the immediate that is required of persons who are aware of their power to reflect, evaluate and will. According to Taylor, such reflection stops at the relatively simple grasp that one alternative is the more agreeable, appealing, profitable and the like. The choices involved here centres on wants, likes and preferences. While at times useful, none of this entry level analysis is posed in terms of worth, meaning, significance or spiritual principle. That the analysis done here fails to consider the worth or significance of desires in terms of inescapable commitment is what qualifies it as entry level reflection. The effort one puts into to such reflection does not to attempt to grasp which alternative is more worthy than another. The attempt to attribute worth is left largely inarticulate. The focus instead is on enunciating the various productive possibilities our choices provide for or offer us.[891] In general, to articulate here involves a stepping back from the situation (hence qualifying as reflection), calculating outcomes, and assigning preference to one set of desires or outcomes over a host of others based on a given set of criteria.

Regarding strong evaluation, a language of qualitative contrasts helps bring to light those actions and intents that can be judged worthy of who are and what we aspire to be. The expressive use of language employed here uses such contrastive terms as noble/base, integrating/fragmenting, courageous/cowardly or clairvoyant/blind, to borrow from Taylor.[892] Thinking in terms of strongly evaluated goals is thus a matter of being open to such things as higher emotions or spiritual principle understood in terms of intent, motive, purpose or aim. The phrase 'being open to' is used here because the knowledge we have of, say, the higher emotions, does not come primarily from our intuiting them in experience but by using a language (or science) of qualitative contrasts to give them a rich and particular form or meaning. Similarly, judging goals in strongly evaluative terms speaks to actions that are worthy or significant to persons for whom the capacity to understand is original. It is thus not a question of the classical division between basing reasons for our actions on either some form of rule-based morality or via one's moral intuition.[893] Through a language of

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qualitative contrasts such judgements help give expression not only to a quality of life or a way of acting, but also make more real and moving those intentions that speak directly to who we are as persons. This is also where a 'richer ontology than naturalism allows' comes to the fore.[894]

More particularly, strong evaluation speaks to the way moral goals have a special claim on us such that to cease attending to them would lead to confusion, uncertainty, doubt or indecision and where, furthermore, to weigh those goals in terms of wants, likes or preference would be to misconstrue what it is to be a moral agent. The word 'expression' used a few lines above refers to the articulation of actions and intents using non-contingent contrastive description terms. When applied to such actions and intents as deal with matters of worth or significance, they also thereby speak to the quality or mode of one's life and society. In other words, strong evaluation concerns actions and intents that in some sense look to matters of dignity, honour, trust, integrity and the like, and in ways that speak to the significance such matters have for our lives and social practices. *Crucially, such contrastive distinctions not only help us to become more articulate about our most deeply held motives or aspirations, they also enable us to experience a richer set of motives or aspirations to be articulate about.*

Modes of being

The above views are obviously underpinned by Taylor's notion of an expressive use of language which partly enables us both to convey meaning and to realize the significance of our actions in the world in which we live as self-understanding beings. For Taylor then, to be able to express our experiences in richly contrastive terms rooted in distinctions of worth or significance is to open up the possibility for different kinds of experiences. We are thereby presented with a language of interpretation that can help bring to light a range of meaningful practices. The following conversation, for example, points to some of the ideas at work here: "There was a time when I could not see how it was possible to compete with my fellows yet still hold them in respect. I eventually realized, however, that competition concerns the way I choose to use my skills and capacities on the field, and that I can defeat others or be defeated by them without experiencing contempt for their status or feeling disdain for mine. I did not grasp this before, and so my behaviour towards my competitors has changed, as has my whole approach of what it is to compete. I now regard it as an opportunity to refine my skills and to obtain a certain maturity of presence on the field. The way I now think and behave not only enables me to play the game better and more consistently, but it helps to make it a better game to play."

Extending Taylor's ideas, the language of strong evaluation helps to show up what is centremost regarding the worth of something, say, as in the question 'Is my motive here substantive or hollow?' The language of strong evaluation can also serve to create a rich contrastive background to the intent or outcome one is trying to make sense of. Such a contrastive background may well help to supply a certain depth of meaning to a given social practice, or offer greater insight into a situation one is facing, or open the door to a leap in thought that joins one set of ideas to another in an unexpected and illuminating way. An important point to emphasize again at this juncture is that the language of strong evaluation is part and parcel of Taylor's notion of practical reason. For Taylor practical reason consist in being open to, to be able to be influenced by the distinctly human grasp of what is significant or worthy of us as moral creatures.[895] One way to be influenced or transformed by them, is for these human significances to find expression via a language of qualitative contrasts. If so, then among these qualitative contrasts the best fitted to spotlight our distinctly human significances are those given in terms of strongly evaluated intentions and outcomes. That is, intentions and outcomes understood in terms of inescapable commitment.

In this regard then practical reflection does not rest on some conflict of desires that is contingent or circumstantial but concerns a language of contrasts that shows up inescapable commitment. As

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noted earlier in the discussion, if given two contrasting desires then the one consists in not being the other. There is something necessarily different between the two, where the 'something' in which this difference consists is both put across and made real or present to us through a language of non-contingent qualitative contrasts based on distinctions of worth or significance. Taylor also emphasizes that such language is not exclusively ethical in character, but involves a wide range of human experience that can be conveyed and realized via a language of richly contrastive terms.[896] We come to characterize some desires, motivations, goals, inclinations, aspirations and the like as more worthy than others. They are nobler, more integrated, more substantive, and this because they speak to the form or quality of life one wishes to sustain. To deploy a language of strong evaluation that in some sense speaks to inescapable commitment is to characterize desires such that to reject or misplace them is to show ourselves as incomplete or compromised as a subject or society – that in not attending to a particular trait, attribute, ability, perception and the like we sacrifice something that is worthy about who and what we are. We necessarily become lesser in stature, capacity, insight or character for our choice.

In contrast, the kind of language put to use in weak evaluation concerns different end results (or what Taylor calls consummations) that are defined by *de facto* desires. In other words, the worthiness of the desire *per se* is not opened to reflection. It can be but it isn't. Thinking about what to do or which action to take would instead focus primarily on the desirability of the end result, decided in terms of satisfaction, attractiveness, preference or interest and the like. This pattern of practical reason in so far as it revolves around matters of preference, the weighing of costs and benefits or various likes and dislikes is arguably commonplace, and was earlier described as a kind of entry-level reflection. In this sense, strong evaluation calls for a category of reflection about one's self and world that is possible only from a different level, or what Taylor calls mode of being:

> To characterize one desire or inclination as worthier, or nobler, or more integrated, etc. than others is to speak of it in terms of the kind of quality of life which it expresses and sustains ... Motivations and desires do not count only for the attractiveness of the consummations they offer, but also count by virtue of the kinds of life and kind of subject these desires properly belong to ... To be a strong evaluator is thus to see desires in an additional dimension.[897]

It is at least worth suggesting that, from this point of view, the kind of reflection that accompanies the simple weighing of alternatives makes it less likely that we will recognize important evaluative distinctions.[898] Said differently, if someone reached a point where he always thinks in terms of the simple weighing of alternatives, then in time an entire sphere of evaluative distinctions may become opaque and lost to experience. Given that some evaluative questions cannot be decided, let alone raised, on the basis of preferences, costs and benefits, likes and dislikes and so on, then to be opaque in this way is arguably to be cut off from a host of central questions regarding the worth and significance of our actions. Furthermore, and crucially, questions regarding the worth and significance of our actions may well in turn speak, at least in part, to the heart of our capacity as beings who can know and judge.

Once we take possession of a language of non-contingent qualitative distinctions then the question can arise: How do we argue practically about our intents and actions? In other words, how do we use this language to make sense of intents that involve inescapable commitment? Taylor places this query in the context of what he calls a conflict of self-interpretations as well as "which is more valid, more faithful to reality".[899] Taylor elsewhere speaks of "the truer, more authentic, more illusion-free interpretation".[900] In other words, which mode of being is the truer or more authentic to a given situation? One could choose between the simple weigher of alternatives or the strong evaluator, but here, in answer to the question, these are not categories as such as if to say that a person is exclusively one or the other. From the standpoint being presented here, such issues tend to turn on questions regarding the action or form of society that is worthy of who we are. In other

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words, two questions can be asked: Are my intentions or actions worthy of the kind of being I am or aspire to become? What form of society do we wish to strive for, and are these the kinds of actions that will help to bring it about? Taylor puts it in slightly different terms, in that by seeing things in terms of a struggle between self-interpretations depth is added to practical reflection. Taylor writes:

> But this additional dimension can be said to add depth, because now we are reflecting about our desires in terms of the kinds of being we are in having them or carrying them out. Whereas a reflection about what we feel like more, which is all a simple weigher can do in assessing motivations, keeps us as it were at the periphery; a reflection on the kind of beings we are takes us to the centre of our existence as agents. Strong evaluation is not just a condition of articulacy about preferences, but also about the quality of life, the kind of beings we are or want to be. It is in this sense deeper.[901]

There is another side distinction here that is worth noting. It occurs between the kind of reflection first prompted by the question: Are my intentions worthy of the kind of being I am or aspire to become?, which was posed in the paragraph above, and second by Taylor's comment just cited on strong evaluation: "But this additional dimension can be said to add depth, because now we are reflecting about our desires in terms of the kinds of being we are in having them or carrying them out."[902] While both reflections consider our intentions and actions understood in strongly evaluated terms, the focus of the second is arguably on the quality of our self-interpretation. In other words, we use a language of qualitative contrasts in an effort to better understand or be more clear about our actual motives or intents, and hence and in turn, to make gains in knowing who we are.

The gist of the first, however, starts with the knowledge of who we are and what we are about, or what we aspire to become. The reflection thereby called up aims to understand better those intents and actions which, if carried out, will more faithfully express and sustain who and what we are, or which are worthy of our potential. Reflection here may help point out those actions that will take us one step nearer to the realization of our vision, or perhaps broaden our understanding of those intents and actions that will help nurture its fuller fruition. The second reflection is an attempt to picture motives and actions in the context of a life currently being lived, the interpretation of which could bring to light aspects of their (that is, our motives and actions) worth or significance, and therefore in what sense can we say that this form of life is or is not a good and acceptable one. In contrast, the first reflection speaks to an acceptable form of life not yet being lived but judged to be worthy of bringing about, or to a current one already so judged but which still needs to be nurtured.

The self-interpretation involved in the first reflection therefore looks to those intents and actions, understood in terms of their worth or significance, but which give direction towards a future-in-waiting. It provides for a better understanding of those distinctly human significances that are worthy of our being open to, or to our being able to be transformed by them, so that we might in future better aspire to a form of life that we recognize now as being a good and acceptable one. To be sure, these two reflections are not an example of what Taylor calls a struggle of self-interpretations, since they do not face off each other on the question: Which is truer to reality? However, although the thesis discussion here concerns both kinds of reflections, the gist of the first is more directly related to the broader thesis aim, namely, under what conditions might we be able to say a given decision constitutes an advance or decline in human social well being? This is particularly so when it comes to the principles of life in a planetary age, the chief characteristic being the recognition of the oneness and wholeness of the entire human race.

Returning to the main point of discussion, Taylor holds that a mode of deeper reflection is different in kind to the way people reflect about the pros and cons, the advantages and disadvantages, the costs and benefits, or the productivity and inefficiency of their various efforts, be they technological and otherwise.[903] While this latter kind of weakly evaluated reflection may be common in Western

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intellectual culture, Taylor views it as occupying the margins of the debate on important issues that direct us "to the centre of our existence as agents".[904] If so, then a deeper, strongly evaluated mode of reflection would make it possible to think about human agency in ways that weakly evaluated reflection alone might miss. From this viewpoint, a strongly evaluated reflection can picture our intents, the decisions we make or the actions we take in such terms as their being higher/lower, noble/base, or substantive/hollow. That is to say, between non-contingent contrastive qualifications of motives or outcomes. A possibly useful observation, or reminder, to make here is that this kind of picturing of our own intents, decisions and actions is something we can do by virtue of the fact that we are self-understanding creatures, and, as a result, possess a certain greater or lesser capacity for self-interpretation.

As a result of this deeper mode of reflection we might come to see our intents or actions in terms of their being, for example, purposeful or idle, dignified or wretched, fulfilling or shallow. But then we can expect to meet and to have to deal with divergent views, depending on the character, depth or openness of the reflection. Diverging views here might concern matters such as the quality of one's own life and that of others, or the kind of society we wish to inhabit, and thereby involve us in what Taylor calls a struggle of self-interpretations, as mentioned earlier. For example, to pose to oneself such a question as 'What do I believe?' or 'How ought I to act?' is to hold out the prospects of a possibly painful reflection over a life that may or may not be free of false conception, misdirected purpose or harmful acts. In another sense, to ask a question such as 'How can we create a just society for our children?' might in turn prompt a searching inquiry into the shortcomings of our past decisions, the manner by which choices are now being made, and the vision we have for an acceptable form of societal life that is still being written. Arguably, one central aspect to the notion of practical reason being developed here is that it provides a way to think about or handle these kinds of substantive questions in different terms when compared to a weighing of alternatives, as is perhaps more likely so in the case of utility or instrumental thinking. Instead of looking at an analysis of costs and benefits, say, we engage as well in an effort to resolve differing self-interpretations. The pattern of reason to take up and use here is not that based on an explicit analysis of foundational premises, as might be the case in naturalistic thinking, but looks instead "to the centre of our existence as agents" in the hopes of making gains in our knowledge of the practical and/or moral sphere. Instead of arguing for the validity of one position over the other, seen as its rival, a pattern of depth reflection to use Taylor's terms might try instead to find "shared dispositions towards good and right".[905] This is perhaps one reason why Taylor remarks that "Resolving this issue [a struggle of self-interpretations] is restoring commensurability"[906] Said differently, the human world is not just nonsense, and so the sense we can make of it is partly a matter of removing incongruity and restoring some measure of proportion to our understanding.

As an aside, one central task of thesis Chapter Six will be to try to take these ideas about possible conflicts of interpretation and the question of which is truer to reality, and see what they say about the development and use of technology in an planetary age, understood in terms of the consciousness and oneness of the entire human race. As already noted, deliberation about technology perhaps most typically revolves around utility, especially where the conception of technology is that it amplifies and extends human powers. Joined to this is a very successful deployment of instrumental thinking, especially in the arena of control and manipulation. As noted in earlier thesis chapters, this all links in a deep sense to the naturalistic stance. Such links tend to call up modes of reflection about the use of technology that resonate well with what Taylor calls weak evaluation, such as the calculation of means, the analysis of cost and benefit, maximization of efficiency and productive outcomes, external performance criteria and the like. In contrast, and as will be discussed later in Chapter Six, strong evaluation and a language of qualitative contrasts could offer an approach to questions about the development and use of technology that expand thinking about technology beyond matters of efficiency and performance.

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On a final note, the pattern of practical reason under the spotlight here is arguably a broad one, and can entertain questions such as: What can be done to make our contemporary institutions more adequate to the needs of the age? Do our collective actions fit those of a responsible global society? How deeply have our past decisions contributed to the societal problems we now face, and can we say that our motives here are what they ought to have been? The aim to this kind of reflection is to consider our actions in ways that can help keep our sights fixed on matters of worth or significance, or at least not lose sight of them, and thereby offer added dimensions of meaning to what we know. *In practical reason the point to asking 'Who are we?' or 'Why do we do the things we do?' is not just to get a practical response, but to set the stage for a richer kind of response, namely, one posed in terms of worth or significance.* This is perhaps one implication of Taylor's notion that practical reason involves a being open to distinctly human significances. As will be argued in Chapters Five and Six, the setting of that stage involves the coming to terms with our evolving planetary era and how we respond in it to the consciousness of the oneness of the human race.

In order to bring the discussion in Part D to a close, the next and final subsection will highlight a few additional, summary ideas regarding practical reason. These will form a lead-in to a more detailed discussion in Part E concerning the *ad hominem* form of practical argument.

Practical reason

Practical reason attempts to answer the question 'Which decisions do we choose with regard to our actions?' or simply, 'What is the correct course of action to take?' Such arguments may at times include matters of moral judgement, even though the subject of the debate, investigation or question may not be a singularly moral one. As noted in thesis Chapters One and Two, the naturalistic stance requires of rational debate generally that it i) work an argument down to its explicit, foundational premises, and ii) employ external criteria in order to adjudicate between rival positions. Taylor argues that a third condition, what he calls a critical morality, usually attaches itself to the notion of practical argument in particular, at least from the point of view of the naturalist stance.[907] This is the condition that, in order for the truth to be found, moral argument must work a thinking being free from all prior beliefs and various faulty perceptions or biases. The point here is that, paraphrasing Taylor, only in a full and complete accounting of our moral assumptions can the correct principle or course of action be determined. However, if it is the case that all three of these conditions are part of the naturalistic stance, and once we recognize that other patterns of reason are possible, then these assumed conditions for a rational debate need not necessarily all hold. Such is the case, Taylor might argue, with a notion of practical reason as involving a being open to, a being able to be influenced by that which is of significance to us as self-understanding creatures.

Following Taylor, reasoning in these terms would include arguments about transitions from one stance to another.[908] It would engage people in an attempt to resolve a struggle of self-interpretations. It would use a language of qualitative contrasts in an effort to answer questions about right action that to go to "the centre of our existence as agents".[909] This pattern of reason is, however and for example, in contradistinction to the idea that moral debate must uncover the fundamental assumptions in a position so as to judge the validity of its argument. A language of qualitative contrast would instead provide for a more clear reading of a situation, and would start with what a person already believes. According to Taylor this pattern of practical reason works on the premise that those who might defend rival positions already accept at some level a host of shared notions concerning good and right. The point then, according to him, is not to defend some set of first premises, but to look for those shared but hidden or tacit notions that are found in differing but not necessarily unrelated moral viewpoints.[910]

Thinking in terms of the naturalistic stance, such a pattern of reason may appear halting or vague, perhaps even a kind of 'mumbo jumbo' of words that, when one tries to get clear about it, just

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doesn't make sense. It is admittedly hard to gainsay the clarity of thought that is characteristic of the Cartesian intellect. Yet even if there are cases where the latter point is granted, a bad attempt at language says nothing about the kind of gains in knowledge that can be had in principle through a language of qualitative contrasts combined with the distinction between strong and weak evaluation. Furthermore, it is not the point in the use of such language to provide indisputable evidence for the adjudication of fully explicit, rival positions. If this is the complaint then certainly the evaluative judgements based on qualitative contrasts and distinctions of worth will not deliver. But is this not the point under consideration? We are asking what gains in knowledge can our moral deliberations give us? According to Taylor, the sceptical view that there are no good arguments to be found in the moral sphere comes in part from models of practical reason based on the naturalist reduction – for example, that differences cannot be resolved between rival positions in the absence of external criteria.[911] Moral arguments will fail to deliver because the standards set for rational debate as per the naturalistic stance cannot be met. And hence a sceptical attitude seems to follow.

The point here, however, is that patterns of practical reason that speak to our nature as self-understanding beings occupy a different category. These patterns are not indebted to assumptions of the naturalistic stance. If so, then the conditions the stance sets for rational debate fall away. For example, and first, a language of qualitative contrasts can be used to help form judgements about the worth or significance of our intents or actions, expressed in terms of strong evaluation. Second, questions of original significance are not resolvable by their nature into fully explicit cases which can then be analyzed according to external criteria. As Taylor notes, a different ontology is called up here where things matter to persons in an original or substantive sense, and not by virtue of our inhabiting a neutral universe distinct from the minds that know it. In other words, it matters if one is thinking in terms of a self-understanding person or a self-defining individual. The different ontology calls for a different reading of practical reason, notably one that, following Taylor, involves a grasp of what he refers to as the peculiarly human ends or significances.[912]

Commenting further, and as was also discussed earlier in Part B of this chapter, our ways of acting, speaking or writing gives expression to a form of life and practice. Various interpretations of these ways can act upon our moral self-understanding, thereby transforming it and possibly changing that self same form of life and practice. This is so because the language used to express human actions can alter the intention descriptions of the action, and, as argued in Part B above, to change the intention descriptions of an action is to change what the action *is* from a "non-observer relative" position, as Taylor sometimes phrases it.[913] This is part of that "richer ontology than naturalism allows", as described earlier.[914] From this point of view practical reflection need not be limited to the assumption that answering ethical questions involves uncovering valid conclusions among rival positions by appeal to irreducible fact and judgements that are intersubjectively given – as perhaps tends to be done in more instrumental or procedural patterns of reason. In an attempt to come to terms with a moral problem, practical reflection can also offer a more coherent or prescient account of it, one in which errors of judgement or gains in knowledge can be marked out through a language of qualitative contrasts and distinctions as to worth. This kind of thinking can take us but one step further along the path, and is not intended to give an absolute-like insight or conclusion.[915] This in part follows for Taylor's from his three-fold conception regarding certainty about the world, namely, absolute insight, brute fact determinations, or interpretation from a given stance.[916]

Thinking in terms of qualitative contrasts is one example of a kind of reflection that does not rely on a naturalistic rendering of fact. In addition, practical reason based on a language of qualitative contrasts is not designed to merely depict or describe the range of human experience, however insightful, as was discussed in Chapter Two. What the language of qualitative contrasts combined with the notion of strong evaluation can arguably do is provide a way of showing up that which is significant in our situations, actions and intents, and from there help make evaluative distinctions as

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to their worth or significance. It involves possible conflicting interpretations of self that require a more in-depth uncovering of what distinctly human significances entail. These also call into play a repeated rendering of what it is to reason via an evolving language of qualitative contrasts. It as well provides for reasoning about transitions between views, where these need not call upon external criteria so as to judge their validity. In another sense, this pattern of practical reason helps open the way to a possible fruitful response to questions about the worth of our actions – an epistemic gain, as Taylor calls it. In addition, and perhaps more than this, it opens the door to a different sort of response – one that can make substantive sense of our decisions, and not just in terms of the primacy of the epistemological. Finally, it can provide a way of thinking about human agency that connects notions of meaning and purpose to the ontology of human persons, in other words, that humans are self-understanding beings and not only self-defining individuals. Here then reason offers an expanded notion of the unity that exists between our capacity to know the world and our ability to judge or discern the significance of our actions within it. In sum, such patterns of reason involve a richer ontology than naturalism allows.[917] In so doing the language of qualitative contrasts combined with the notion of strong evaluation can help to rethink those naturalistic assumptions which tend to place human meaning and intention in a separate category over and against the existence of a neutral universe or the natural order wherein reason offers either intersubjective accounts, or failing which, the accounts of subjects.

In the case of technology, one familiar way of thinking about its development and use involves exploiting natural resources and man-made tools for productive gain. Included here might be choices for research, production and distribution of technology goods and services based on some principle of efficiency. Questions of best use of resources could perhaps then be conceived of in terms of utility, cost-benefit analysis, and how to maximize or optimize outputs.[918] In addition, the procedures or analyses used to make informed, rational choices also link to the various ways in which material resources are used as well as the manner by which tools are developed in order to exploit a global market. It is perhaps not uncommon in this way of thinking to regard both resources and tools as being neutral with respect to human choices. In other words, we use and make them as we will.

If so, then thinking in these terms could be partly indebted to the idea that humans are self-defining individuals, and as such are free to make own choices according to own ends in what is essentially a world filled with a vast range of means and material to use as one might please. As was discussed in thesis Chapter One, this view of the human subject can be linked to the naturalistic stance, notably via the existence of an universe that stands independently of the conscious minds that might know it. If so, then in the process of deciding how to act in a universe of resources, some end would be identified or mapped out by the self-defining individual. Reflection and analysis would then involve something like finding the best choice of means and manufacturing according to the opportunities available, and in line with various constraints. This kind of reflection and analysis would be done in order to reach some outcome or satisfy some need that is related to those ends.

A language of qualitative contrasts would arguably serve to expand this kind of thinking about technology. Not only would a language of strong evaluation embody a different pattern of reason – that one be more open to, to have greater interpretive sense for, to be able to be altered by what is significant to us as moral creatures – but that by putting to use a range of terms related to worth or significance, thinking is lead away from an over reliance on questions of utility and performance-based outcomes. In Nicolescu's terms, we would be inhabiting a different level of reality. Thinking here might instead move towards reasoning about motivations, not as preferences, likes or dislikes (the simple weighting of alternatives), but in substantive terms regarding the worth or significance of our choices and actions. That is to say, in terms of their inescapable commitment.

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Furthermore, a language of qualitative contrasts can provide both for a broader range and a more nuanced set of intention-descriptions, and so provide for a richer grasp of what is at stake in particular ethical or moral issues. The central question here is, arguably: How am I to act with regard to others? This question can be translated into language about the development and use of technology: In what way will this use of technology alter the way people act with regard to one another? It is fairly obvious that in this discussion, answers to such questions cannot but also call up a whole range of questions about the kind of society we inhabit, and the sort of person we are, or become as we do so. For example, it is not sufficient to analyze the question on the basis of a set of given ethical norms, the only question then being: What policy for action do the norms specify in this case? Instead, answers to these sorts of questions also turn on the way a language of qualitative contrasts can provide a vocabulary to i)) analyse more clearly a range of moral choices because one can distinguish a wider range of moral nuance, ii) be better able to act with greater insight since one possess a deeper grasp of the good and with it the consequences of different actions, iii) to be better able to make sense of a practical situation someone else faces, or which arises in choices about the use of technology others are facing, and so understand it better than would otherwise be the case, iv) to be better able to understand what another person is experiencing in some moral or ethical problem, or the kinds of issues that affect others in their social choices, to be able to see or grasp problems as others experience it, and so be open to a greater range of interpretations of what it was that moved that person or group to act in that way, or which brought about some social choice, say in the use of technology, and v) to move toward a perspective from which both the origins and ends of some issue can at least be more clearly or sensitively marked out. And, of course, the possibility for this kind of practical reflection can be transferred to other kinds of meaning-space, this on the principle that a language of qualitative contrasts is not exclusively about moral contrasts but can also be aesthetic in character or concern matters in education, various social analyses and the like.

The next and final Part E looks in some detail at the *ad hominem* pattern of practical argument as developed by Taylor. A study of the *ad hominem* form of practical reason will be of use to the discussion in Chapters Five and Six in that it will a) help make further distinctions as to what is involved in practical reflection, and b) provide some specific forms of practical reasoning that could be adopted to questions about the development and use of technology in a planetary age.

Part E: The *ad hominem* form of practical reason

Introduction

In a variety of his writings Charles Taylor makes the point that contemporary Western views of practical reason are sculpted by what he calls "the weight of moral scepticism".[919] He similarly discusses what response is available to such scepticism from a position based on the distinction between strong and weak evaluation.[920] Taylor argues that the present-day sceptical attitude towards practical reason in Western intellectual culture reflects a tendency to figure out the question of what something is, by giving priority to questions regarding how it is known, or what he calls the primacy of the epistemological.[921] There is arguably a close link between this trend and the naturalistic stance, especially the ontology implicit in the natural scientific world view.

Particularly influential here is the conception of a natural order that is taken to be silent as regards the moral choices humans make. The resulting emphasis on what Taylor calls apodictic patterns of reason gives credence to a widely sceptical stance towards ethical argument in modern Western thought. In other words, the moral sphere being what it is, no good arguments are to be found there.[922] In addition, as Taylor notes, the very fact of moral diversity in the contemporary world gives credence to this view. Yet in Taylor's perspective reason is wrongly confined if thinking is conducted in foundational or apodictic terms only. Other patterns are available, notably those based

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on the use of qualitative contrasts and strong evaluation. The argument here then is that these patterns, or what Taylor calls the *ad hominem* form of reason, need not land thinking in a thoroughgoing attitude of doubt towards practical reason.

The discussion that follows is one attempt to analyse the *ad hominem* form of argument as presented in Taylor's work Explanation and Practical Reason (1995).[923] It will try to recount how Taylor thinks it is possible to reason practically without taking on the kinds of sceptical stances highlighted above and discussed in earlier chapters. A variety of ideas from Taylor's own presentation will be discussed in this section. While a number of the topics treated here were mentioned in earlier chapters, the point is not to repeat ground already covered but to build up a more detailed account of a specific form of reason so as to better highlight what is involved in thinking outside the assumptions of the naturalistic stance. Finally, some of the more detailed aspects to be treated here will appear again in Chapters Five and Six in regard to the sense that can be made of decisions about the development and use of technology in a planetary age, the chief characteristic of which is the consciousness of the oneness of the human race.

The case of special pleas

According to Taylor the naturalistic stance carries an implicit notion of what it is to argue rationally, where showing someone they are wrong means presenting facts or principles they must per force accept in the end, and which are sufficient to show that all competing positions are false (i.e. that they are faulty in some way).[924] If, as Taylor puts it, someone is "unconfusedly and undividedly" convinced of his position, then counter-argument must proceed by digging down to basic premises and showing at that level how it is that his argument is faulty.[925] However, if no resolution is found at that level then, truly, the tools of reason alone will fail to move the parties beyond their respective positions.

In the case of practical moral argument however, Taylor tries to show that there are limits to what people can claim without confusion.[926] Special pleading, as he calls it, must be brought in for someone to argue beyond these limits.[927] In such a situation both sides may in fact accept various moral principles or share similar ethical goals, although these may be unspoken or be otherwise hard to get at.[928] Differences arise then by appeal to exceptions or unusual conditions in the effort to apply moral principles to selected cases. Given such a situation, the task for practical reason is not to disprove a clearly stated and opposed foundational belief (which Taylor accepts cannot be done), but to show up an error in the appeal to exceptions to principles the parties in fact accept, deep down as it were. Taylor's idea here is that in some cases differing positions already share some fundamental ideas about good and right. If no, then practical reasoning is truly of no use. But then some form of *ad hominem* argument may be able to show up these special pleas. Taylor writes:

> [P]ractical reasoning starts off on the basis that my opponent already shares at least some of the fundamental dispositions toward good and right which guide me. The error comes from confusion, unclarity, or unwillingness to accept some of what he cannot lucidly repudiate; and reasoning aims to show up this error. Changing someone's moral view by reasoning is always at the same time increasing his self-clarity and self-understanding.[929]

It is worth noting that the last point made by Taylor in the quote is arguably a reference to the idea that reason involves a being open to distinctly human significances in such a way as to be able to be transformed by them.

An aside is in order here. The condition that differing positions already share some fundamental ideas about good and right is obviously an important one. In a more abstract sense, if this condition does not obtain then it makes logical sense to conclude that practical reason has little or nothing to

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offer. In other words, scepticism towards the moral sphere of argument would be justified. But the abstract sense need not always apply. If we think in terms of Lincoln and Guba's axiomatic approach, as discussed in thesis Chapter Two, then we may never meet the condition that differing positions already share some fundamental ideas about good and right, and this because they come from two completely different paradigmatic world views, the likes of which may even vary on what it is to reason about things. It is perhaps because of this kind of thinking in paradigmatic terms that Nussbaum and Sen make the comment that, as regards the attitude of doubt towards practical argument, we are not dealing here with reason but with the effort of one party to dominate the other, or with some form of cultural imperialism. In other words, reasoning turns out to be little more than the application of power.

And yet we need to question the point that two paradigmatic world views that differ fundamentally on ideas about good and right are therefore rivals and at odds in the moral sphere, or are perhaps like strangers that simply pass each other in the night. Two brief points can be made in this regard. First, we need to see if there really are cases where differences of culture or world view actually exist in this paradigmatic way, and this in two senses: a) Does the paradigmatic way of thinking really apply to the world in which we live?, and b) What are the actual cases or situations that lead us to conclude that between two positions there really are no shared fundamental ideas regarding good or right? Second, and even if the first case holds such that there do not exist between world views shared ideas regarding good and right, still, cultures and world views change over time. They are not static entities, but have an organic character. They are evolving not only within themselves but also in their contact with other cultures or world views, and especially so in a planetary age.

If so, then what is for now, say, two world views having no shared ideas about good and right may instead be only a temporary state of affairs. In time the respective conceptions of the world and our actions in it they offer will have changed. And who can say that, in their own place and time, there will not have evolved between them some notions regarding good and right that they share alike? Besides, if the notion of practical reason being argued for here has merit, namely, that it involves a being open to those human significances that have a special claim on us, then instead of accepting that cultures are rivals or otherwise pass by each other like strangers in the night, we would be on the active lookout for some form of illumination, a chance to converse or consult, perhaps through the experience of shared adversity so that the time may be shortened before there emerges the recognition of like ideas in the moral sphere. Finally then, the emergence of shared fundamental ideas regarding good and right need not be restricted to a pair of world views taken as rivals or strangers, but involve multiple cases and indeed in time the planet as a whole.

Returning to the main argument, in comparison the apodictic model of practical reason is an application of what Taylor considers to be the model of explanation *per se*, namely, the kind of reasoning used by the modern sciences. In the apodictic form of reason, arguments are carried out as explicitly as possible, positions are analyzed down to the level of their foundations, and external criteria are used for the adjudication of rival claims. Taylor holds that some of what constitutes modern moral scepticism rides on these largely unexamined assumptions about reason, but which in the end turn out to be elements of the naturalistic stance. In other words, the belief that they comprise explanation *per se* needs further examination.

In this regard, Taylor highlights four underlying aspects to the West's climate of contemporary moral scepticism. The four are reviewed succinctly below. First, the notion of strong evaluation and the special nature of moral goals tend to be overlooked or dismissed. Taylor links this directly to what he calls the primacy of the epistemological and what he describes as "the tremendous hold of epistemology over modern culture".[930] For example, in the apodictic model strict procedures for valid reasoning are needed in order to reach true conclusions. Taylor argues that this model can easily be identified with reason itself.

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> As a result, modern reason tends to be identified procedurally (not substantively, as is the case with strong evaluation), and the steps for 'foundational thinking' are easily seen as central to the procedural model. From the foundationalist perspective, only the apodictic mode of reasoning is satisfactory.[931]

Of course, it is dismissed due to the assumption that explanation is what the apodictic model of reason delivers; that other models that do not follow its norms are therefore faulty in some sense. However, the apodictic model sets impossible standards for practical reasoning to meet. Not only are explicit and foundational arguments hard to come by in practical reason, but in many cases one cannot find external criteria that all involved in the argument can accept. Taylor accepts that a person who is "unconfusedly and undividedly convinced of his position" cannot be moved from it by arguing down to basic premises.[932] The differences ride on these very foundational beliefs. According to Taylor, under such circumstances practical reason is of no avail.[933]

Second, the model of explanation employed in the West is reinforced by developments in the modern natural and social sciences.[934] This calls for an universe without intrinsic worth, and therefore no natural goals or commitments that make a claim on human agents. With regard to our choices as ethical beings, the universe is silent. All such choices reside in human subjects, or in individual minds. However, with the wide-spread acceptance in the West that the universe is silent with respect to moral intentions, then the model of explanation used in modern science has tended to be accepted as the model of reasoning *per se*. If it is the case that the universe is neutral (that for instance, the notion of strong evaluation has no referent in the reality of things), then there is arguably no better model to base reasoning on than one based on natural fact. Furthermore, if we are to reason practically then we must also reason according to the facts given in experience, as confirmed by and in line with modern scientific models. Part of this means that people will tend to work out the question of what something is in terms of how it is known, implying that primary emphasis is placed on the procedural norms of reasoning.[935]

Third, the world view of modern natural science does away with the classical conception of the universe as the instantiation of Forms, that is, the notion that there is a part of the world that exists in a teleological sense. By this is meant that, according to Taylor, we grasp its nature "in terms of the place of things in a meaningful order".[936] Forms defined not only the standard according to which things were to be judged, but also that which constituted knowledge. The neutral universe posited in modern science eroded this form of knowing and judging. Of course, positions argued from a naturalistic stance cannot ignore the fact that humans act and make choices according to some kind of standard. But Taylor argues that in the absence of a notion of Forms the thinking of the day construed such standards as the projection of individual subjects, and hence not part of the "fabric of things".[937] Such projections of individuals tend then to reflect the way subjects react to things or display their likes or dislikes, their attraction or repulsion.

Crucially then, and from this point of view, moral beliefs too become projections or pro-con attitudes. In other words, people's individual moral experience and choices say nothing about what is a good or acceptable form of life. Individual subjects simply believe what "seems or feels right" – their positions reflect mere projections or pro/con attitudes that derive from psychological states or various happenstances of history and culture.[938] Obviously, however, what people happen to agree on does nothing to show that this point of conformity is more right than any other. That there is agreement is only a coincidence, and to argue otherwise is to commit the "naturalistic fallacy".[939] In other words, from the fact that people believe something one cannot necessarily conclude that they are inescapably committed to it.[940]

It needs to be mentioned at this point, to interrupt the discussion slightly, that Taylor places the counter arguments to this reduction of moral beliefs to a projection of subjects in a broad philosophical stance that he calls phenomenological.[941] He argues that the special nature of moral

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goals, which the reduction tends to erase from view, is best seen by focusing on our actual practices of moral deliberation and understanding – practices which Taylor terms the *ad hominem* mode of reason. According to him, *ad hominem* reason:

> [T]ries to show that in all lucidity we cannot understand ourselves, or each other, cannot make sense of our lives or determine what to do, without accepting a richer ontology than naturalism allows, without thinking in terms of strong evaluation. This might be thought to beg the question, establishing the validity of a mode of argument through a use of it. But the presumption behind this objection ought to be challenged: what in fact ought to trump the ontology implicit in our best attempts to understand or explain ourselves? Should the epistemology derived from natural science be allowed to do so, so that its metaphysical bias in favour of a neutral universe overrules our most lucid self-understandings in strongly evaluated terms? But does this not beg the crucial question, namely, whether and to what extent human life is to be explained in terms modelled on natural science? And what better way to answer this question than by seeing what the explanations actually wash?[942]

Perhaps the key point here is that, given an understanding of who and what we are, then what considerations can be brought to bear that could convince us that what is true in the ontology of a neutral universe requires us to forfeit that understanding?

Fourth, an additional point highlighted by Taylor is that the use of foundationalist reason in moral debate is designed to set thinking free from a limited or insular perspective on things.[943] This derives in part from the world view of natural science that calls for us to detach ourselves from a peculiarly human perspective in order to know what the world is like, or at least to be able to say how it functions. Adapting this to practical argument, moral reflection must serve to break us free as much as possible from our own limited outlook. According to Taylor such a "critical morality" requires or calls for radical change in the way people have been trained to react to or think about circumstances.[944] From this stance the *ad hominem* model is suspect since it starts with what an opponent already accepts and this opens the door to being accused of conservatism in morals.[945]

In general, Taylor ties together three notions that he thinks inclines Western intellectual culture towards moral scepticism: 1) naturalism or the naturalist reduction as developed in tandem with the world view of natural science, which posits a neutral universe and hence a view of moral sentiment as being the projection of subjects, 2) the attractiveness of foundational reasoning *per se*, which sets impossible standards for moral argument, and 3) the need to perform a radical criticism of morals and which calls into question *ad hominem* forms of argument.[946]

All of three of these notions according to him pass over the distinction between strong and weak evaluation – that the nature of moral goals as involving inescapable commitment carries a special status for persons as agents. As was discussed earlier in the chapter the special status of moral goals derives from the ontological link between intention and action. From an equally broad perspective, the failure to make the distinction between strong and weak evaluation is also due to the primary view of knowledge, namely, "the tendency to think out the question of what something *is* in terms of how it is *known*".[947]

As a point of final emphasis before moving on to the next subsection, a deep assumption at work behind the generally sceptical attitude towards moral argument is the idea that rational argument *as such* requires external criteria in order to judge between rival arguments. In other words, criteria are required because it is only through some externally defined standard that differing theories can be weighted independently. In Taylor's view people tend to adopt this view unreflectingly – that whatever else an argument may be, external criteria are required for its adjudication – and this suggest to him "the real hold of the epistemological" in Western habits of thought.

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Three examples of arguments about transitions

Taylor turns to the history of change in the natural sciences to illustrate both the assumption that reason by its nature calls for external criteria and that the *ad hominem* pattern of thinking has something to offer practical argument in ways that do not call for the use of such criteria.
In particular, Taylor argues that in effect, the acceptance of the apodictic model of reason and its assumption that external criteria are required to judge between positions can lead to the conclusion that the history of modern science proceeds non-rationally.[948] In other words, science moves from one independent paradigm to another, or what Taylor refers to as "closed explicit systems".[949] The concepts that characterize explanation in one paradigm do not translate to another, and, in addition, neither does the model of what constitutes the test of truth in scientific argument. There are no external criteria here capable of deciding between independent paradigms. In this perspective (ironically), we all think from within some kind of world-view, and these, famously, have crucial non-translatable conceptions of and conditions for validity in argument.[950] Where this occurs, historical change in science may be explained not as a rational activity but as one based on power, wealth, authority, status, prejudice, political influence and the like. Since not every instance of change is rationally motivated, then some of these factors may indeed have a part to play.

Here then the apodictic model of reason and its assumption that rationality requires external criteria is what needs to be explored more carefully before concluding that historical transformations in science are understood as being non-rational. Taylor writes:

> The blind acceptance of a foundationalist, apodictic model of reasoning is perhaps as damaging here as in ethics. Calling to mind how inadequate the model is here can help to weaken its hold on us in general, and allow us to see what is truly peculiar to practical reason.[951]

Elsewhere he notes that:

> Perhaps, then, those ultimate breakpoints we speak of as scientific revolutions share some logical features with moral disputes. They both are rendered irrational and seemingly inarbitrable by an influential but erroneous model of foundationalist reasoning. To understand what reason can do in both contexts, we have to see the arguments as being about transitions. And as the second case makes plain, we have to see it as making an appeal to our implicit understanding of our form of life.[952]

Instead of assuming that external standards are required in order to judge rationally between contending theories, positions or even paradigms, what may also be decisive is that "... we are able to show that the *passage* from one to the other represents a gain in understanding".[953] The point is not think of theories as disjoint options. To do so is to focus attention prematurely on the characteristics each has separate from the other and which therefore calls for adjudication via independent criteria. Once again, the problem here is that both positions must accept and answer to adjudication via the same independent criteria, and, as noted repeatedly in Chapter Two, from within the naturalistic stance there are no such criteria.[954] For Taylor, though, the task instead is to "give a convincing narrative account of the passage from one to the other, as an advance in knowledge, a step from a less good to a better understanding of the phenomena".[955]

> The *ad hominem* mode of argument works on the notion that we can sometimes arbitrate between positions by portraying transitions as gains or losses, even where what we normally understand as decision through criteria – qua externally defined standards – is impossible.[956]

Taylor discusses transitions in science in some detail, and thereafter provides three examples of the *ad hominem* form of argument that move progressively away from the apodictic model. He develops these three examples using the history of science as context, this in part to show that the *ad hominem* mode of reasoning is not just about ethical deliberation, but can also show how ideas

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from the development of science can help highlight the sphere of practical argument. All three examples rely on the notion that debate can benefit by thinking in terms of transitions, instead of clearly defined and defended first principles. Taylor's presentation here is extensive and so only the key ideas will be highlighted in the following paragraphs.

Example one

In his first example, Taylor looks at the role comparative judgments play in transitions that take place in science. Comparative judgements are not only about how two or more rival positions in science measure up to facts or standards, but how the one can give and account of why it is the other is struggling to measure up to the facts. In the former instance the one position is judged to be superior to the other because it can account for phenomena which the other cannot. In this case, Taylor argues, the comparative judgement position A is the superior to B derives from a judgement about their performance against external criteria, where such judgements are made via an appeal to "facts, observations, protocols, or perhaps by standards to be applied to explanations of facts – such as elegance or simplicity".[957] A scientific position that does not measure up to the facts, or which cannot offer a mechanism for what is claimed to be the case, must retire from serious consideration.

Concerning the case where the one position can give an account of why it is the other is struggling to measure up to the facts Taylor writes:

> What may convince us that a given transition from X to Y is a gain is not only or even so much how X and Y deal with the facts, but how they deal with each other. It may be that from the standpoint of Y, not just the phenomena in dispute, but also the history of X, and the particular pattern of anomalies, difficulties, makeshifts, and breakdowns, can be greatly illuminated. In adopting Y, we make better sense not just of the world, but of our trying to explain the world, part of which has played out in terms of X.[958]
>
> ...
>
> The superiority is registered here not simply in terms of their respective 'scores' in playing 'the facts', but also by the ability of each to make sense of itself and the other explaining the facts.[959]

To illustrate his view Taylor looks at the classic example of transformation in thought that Galileo's ideas brought about. As Taylor puts it, not only does Galileo's theory of inertia make better sense of the motion of objects, but it enables us to see more clearly where it is the older, rival theory had difficulties that it itself could not fully resolve.[960]

Central to Taylor's point is that an inappropriate view of rational argument may arise if the set of ideas taken on by two or more differing positions are taken to be closed and disjoint.[961] By analogy with basic set theory, to be closed here means that when the various conceptions, procedures, calculations, demonstrations and established facts that make up a position are used to investigate some new phenomena then the conceptions, procedures, calculations, demonstrations or facts generated thereby will remain part and parcel of that same position. (In other words, normal science). For two positions to be disjoint would mean that the conceptions, procedures, calculations, and demonstrations that belong to one position are unlike the conceptions, procedures, calculations, and demonstrations that make up the other.

But other cases cannot be thought of in the same way – as in the example of the challenge Galileo's ideas about the motion of natural objects posed to the Aristotelian thinkers of his day. Supposing we take their positions to be closed and disjoint, then indeed it becomes difficult to see how an Aristotelian thinker could change his spots, so to speak, as the result of a rational debate. From this point of view one could argue against making rational sense of change taking place here, because the Galilean and Aristotelian views not only work from differing scientific premises regarding the natural world, but each has its own criteria or test of what passes as valid science. The two operate

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out of different world views, and their respective arguments simply pass each other in the night. In this view, and as Taylor notes, "Galileo and his successors, we might say, turned towards an utterly different paradigm of explanation".[962] Once granted – that positions really do differ even over the logic by which arguments are to be judged – then it is hard to give good reasons why the ideas of Galileo replaced Aristotelian science. In such a case change is more like a radical jump or abrupt shift for which no reasonable arguments can be found because there are, by definition, no external criteria to adjudicate between rival closed disjoint axiomatic-like systems. If so, then it is hard not to be sceptical about rational change in the history of science. Or, by implication, of our ability to perform a critique of cultural beliefs, or about what constitutes an ethical use of technology.

Example two

Taylor argues it is a mistake to stop here and think that this notion about transitions being irrational explains the way the science over time has changed. In part this is because such views

> [D]o not go further and demand of each that it give an account of the existence of the other: that is, not just explain the world, but explain how this other, rival (and presumably erroneous) way of explaining the world could arise.[963]

His argument, and the second example of *ad hominem* reasoning, is that what are mistaken for irrational jumps may turn out to be rational transitions, because there are ideas or principles that both sides do accept, though implicitly so, and hence lie unrecognized in the background of the argument. They might then play a minor, tangential or seemingly non-influential role in the position being argued for. Taylor holds that pre-Galilean science put its stock in a grasp of the Forms as the way to comprehend the nature of things, and upon which a universal body of knowledge could be grounded. It was impossible to believe that the everyday, varying, rough, inchoate world could ever deliver universal truths. At best it could be studied to bring about certain changes via a manipulative understanding, but this kind of understanding could never in principle amount to knowledge. In other words the 'pre-Galileans' did recognize a place for a manipulative gasp of things, and discounted it as not holding any possibility of delivering knowledge. So, argues Taylor, when "Galileo and his successors" did in fact succeed in building up a very substantial body of knowledge centred on manipulative power, "you just cannot pretend any longer that manipulation and control are not relevant criteria of scientific success".[964] According to Taylor,

> [W]hat the earlier science cannot explain is the very success of the later *on the latter's own terms* ... Pre-Galilean science died of its inability to explain or assimilate the actual success of post-Galilean science, where there was no corresponding symmetrical problem.[965]

Here then the failure to argue about transitions and rely on a mode of thinking that focuses on closed axiomatic systems gives scepticism a hold it need not necessarily have. As Taylor notes,

> [W]e can see a rational path from one to the other, but only because in virtue of what the pre-Galilean already accepts he cannot but recognize the significance of Galilean science's massive leap forward.[966]

Part of this leap forward, that is, that it constitutes a gain in knowledge, can be seen in the way it increases our capacity for acting in the world. Referring to a kind of pre-understanding "as we originally have prior to explication or scientific discovery" Taylor argues that:

> One of the directions of increasing knowledge of which we are capable consists in making this pre-understanding explicit, and then in extending our grasp of the connections which underlie our ability to deal with the world the way we do. Knowledge of this kind is intrinsically linked with increased ability to effect our purposes, with the acquisition of potential recipes for more effective practice. In some cases it is virtually impossible to extend such knowledge without making new recipes available; and an extension of our practical capacities is therefore a reliable criterion of increasing knowledge.[967]

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These ideas arguably point out one possible way to make sense of decisions regarding technology that will be the focus of the discussion in thesis Chapter Six, and where Taylor's notion of *ad hominem* reason will be used to examine some ideas regarding decisions for technology.

In any event, it is useful to state that Taylor's focus is not in an attempt to put forth a theory of rationally motivated change in science, however useful such ideas may be to his overall argument. His aim is to point out alternatives to a sceptical attitude towards practical reason that tends to accompany the foundationalist mode of thinking, both of which he thinks has had a wide-ranging influence in Western intellectual culture. As Taylor states:

> I have been arguing that the canonical, foundationalist notion of arbitrating disputes through criteria generates scepticism about reason, which disappears once we see that we are often arguing about transitions. And we have seen that this scepticism affects some of the more important transitions in science just as much as it does the disputes of morality, and for the same reason, namely, the seeming lack of common criteria.[968]

Regarding further the links between transitions in science and a sceptical attitude towards moral debate Taylor writes:

> But then is not the predicament of reason here coming to look analogous to the description I offered above of moral disputes? The task is not to convince someone who is undividedly and unconfusedly attached to one first principle that he ought to shift to an entirely different one. So described it is impossible; rather, we are always trying to show that, granted what our interlocutor already accepts, he cannot but attribute to the acts or policies in dispute the significance we are urging on him.[969]
> ...
> Perhaps, then, those ultimate breakpoints we speak of as 'scientific revolutions' share some logical features with moral disputes. They are both rendered irrational and seemingly inarbitrable by an influential but erroneous model of foundationalist reasoning. To understand what reason can do in both contexts, we have to see the arguments as being about transitions. And, as the second case makes plain, we have to see it as appealing to our implicit understanding of our form of life.[970]

Having said all this, and arguing the point that reasoning about transitions in science can also say much about how to conduct moral argument, Taylor does admit that some cultures may be too dissimilar for any kind of argument about transitions to work, and this because such arguments turn on the availability of some common beliefs that may be present but which are well hidden in the background or which are otherwise discounted, but still be part of a form of life about which people can have something to say. Without any common beliefs whatsoever, however tacit, arguments about transitions too cannot get off the ground.

Example three

Taylor's final example of *ad hominem* reasoning moves on a third rail, so to speak. Instead of turning on the way anomalies are explained by one position which another cannot, or by the asymmetrical ability of one position to explain why the other faced the problems it did, or by the way some tacit common belief is uncovered in order to effect a transition, the last form of argument is a gain in understanding by moving directly from one position to another. The conclusion presents itself unavoidably as what it is: an undoubted gain in understanding over a prior position which is now grasped as having been erroneous in some way. In Taylor's terms, a step from one position to another "is shown to be a gain directly, because it can plausibly be described as mediated by some error-reducing move".[971]

For example, Taylor describes the case of a son who once believed that he had been cheated out of his rights as the eldest – that he did not receive the required respect or what was due to him by virtue of this position in the family.[972] He felt resentful and was full of aggression towards his

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siblings and parents. But now he does not think this way and his attitude has changed. He clearly sees that his earlier behaviour was wrong, and that he had mistakenly judged what it is to be the eldest. Far from demanding respect and expecting certain benefits, the eldest's role is not this at all, but has more to do with helping to ensure the rights of all in the family are attended to. In Taylor's terms, he has gone through an error-reducing move, where, having made the transition from one stance to another, the new position is clearly grasped as a gain over what was held before, and where the prior position is one that cannot be returned to once the new stance has taken root.

According to Taylor, this third mode can be said to reverse the direction of argument. The foundationalist form can only show that the transition from X to Y is a gain in knowledge by showing that, say, X is false and Y is true, or X has probability n and Y has probability 2n.

> But consider the possibility that we might identify the transition directly as the overcoming of an error. Say we know it consisted in the removing of a contradiction, or the overcoming of a confusion, or the recognition of a hitherto ignored relevant factor. In this case the order of justifying argument would be reversed. Instead of concluding that Y is a gain over X because of the superior performance of Y, we would be confident of the superior performance of Y because we know that Y was a gain over X.[973]

Taylor also uses the term ameliorating transition to refer to the way we know directly that Y is a gain over X, and hence, that Y will perform better. We do not need to wait to be shown that Y has this characteristic – that because of our experience with it over time it actually does a better job at making sense of things or enables us to perform better on some task, and has therefore convinced us that it is a gain in knowledge. He argues that, far from being a suspect, the kind of reasoning that says "I know that Y is a gain over X, and so Y will perform better", is commonplace.

> This is, I believe, the commonest form of practical reasoning in our lives, where we propose to our interlocutors transitions mediated by such error reducing moves – the identification of a contradiction, the dissipation of a confusion, or rescuing from (usually motivated) neglect a consideration whose significance they cannot contest. But this is a form of argument where the appeal to criteria, or even the differential performance of rival views in relation to some decisive consideration, is quite beside the point. The transition is justified by the very nature of the move which effects it.[974]

Continuing, Taylor holds that

> [A] great deal of moral argument involves the articulation of the implicit, and this extends the range of the *ad hominem* argument far beyond the easy cases where the opponent offers us purchase in one of his explicit premises.[975]

By focusing on transitions then, practical argument opens more avenues to rational debate than is possible if one assumes reasoning proceeds from explicit, closed disjoint positions. And this derives from two central considerations.

First, foundational arguments are constructed in such a way that not only is position Y shown to be superior to X, but that it is superior to any other position currently at hand. In other words, the claim Y makes for being superior is an absolute-like one. All other possibilities are to be eliminated so that the one left standing must be the truth. For *ad hominem* arguments however, no such claim is made, only that Y is better than X, or Y is a gain in knowledge over X, or Y provides for a more effective practice than does X. As Taylor notes:

> The argument is thus specifically addressed to the holders of X. Its message is: whatever else turns out to be true, you can improve your epistemic position by moving from X to Y; this step is a gain. But nothing need follow from this for holders of a third or independent position. Above all there is no

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> claim to the effect that Y is the ultimate resting point of inquiry. The transition claim here is perfectly compatible with a further one which in turn supersedes Y.[976]

The crux here is that practical reason can improve one's epistemic position, that the result is a gain in knowledge or a kind of differential in understanding. This follows from Taylor's position that the point of reasoning is to become more open to, to make greater interpretive sense of, our peculiarly human motivations.[977]

Second, *ad hominem* arguments assume that positions are not made fully explicit. There are ideas, considerations, possibilities and the like that can come to the fore in unexpected ways and show up where it is or how it is the move from X to Y is a gain. *Hence, practical reason in this sense carries with it an arrow of time.* This is partly implied in the notion that for persons as agents and as self-interpreting beings, the way we express the meaning or significance of our practices serves to change those very practices. If so, then there is no final or completed account of the way the world exists for persons as agents. In such cases, *ad hominem* arguments can help uncover something that was not recognized before but, having now been brought to light, plays a significant role in showing how a move to Y is a (possibly unexpected) gain that someone can no longer miss or repudiate. *In other words, the gains in knowledge provided by practical reason can evolve.* Indeed, the move here is of the sort that what is now known or understood is accepted as such – the notion that a position being argued for need to be proven or repudiated falls away. Taylor does not speak of knowledge or understanding as something that evolves, still his summary of the *ad hominem* forms of argument suggests three ways in which an arrow of time accompanies practical reason:

> [T]hese arguments all make their case by bringing to light something the interlocutor cannot repudiate. Either they [the *ad hominem* pattern of argument] make better sense of inner difficulties than the interlocutor can (case 1); or they present a development which he cannot explain on the interlocutor's own terms (case 2); or they show that the transition to Y comes about through a move which is intrinsically described as error-reducing (case 3).[978]

There may be situations, say in the case of differences across cultures, where some disputes cannot be bridged by reasoning about transitions. These may simply involve too wide a gap in conception and practice. However, this need not be assumed at the beginning. Indeed, since reason here proceeds by giving expression to some hitherto unexplored but present form of life-practice, then there is no knowing for sure and in advance what the argument may uncover. Linked to this is the notion that, even as with Taylor's example of the revolution in science, positions regarding moral cultural or technological transitions will not be settled all at once in a single interchange, but develop over time and have a history such that altered practices may urge or force positions to stand up, as it were, and take notice of that which was not recognized before. *Crucially, and again, this introduces an arrow of time into practical reflection of a cross-cultural sort.*

Arguments that seek to bridge cultural gaps could also revolve around the exploration of differing cosmologies, and their ontological and epistemological background. This, of course, makes such arguments difficult to get at, and is another reason why apodictic models are less adequate. The alternative *ad hominem* arguments are tacit and subtle, and require one to be open to those terms of significance by which people make deep sense of their lives and practices. The aim here, however, is not to depict another people's form of life, but to look for shared or sharable points of contact in the moral sphere, and especially so in a planetary age.

In the case of wide cultural differences the fact that one is unable to reason via arguments about transitions need not be a permanent state. Over time cultural beliefs and practices change and this makes possible the refashioning of a person's experience of the world through a different language of qualitative contrasts. These may in turn provide a point where transitional arguments can begin.

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In general, an assumption of scepticism regarding both historical change in scientific and moral transition is unwarranted, and is due to the influence of a particular apodictic model of reason which is widely mistaken to stand for reason *per se*. One implication of this is that the apodictic model, or at least some of its main traits, are taken to be universally true of reason in general. With this belief comes the assumption that external criteria must be used in order to judge between two or more explicit positions. When planted into practical reasoning, the same assumption serves as the roots of doubt regarding moral judgement. The doubt however is premature and arises in part from a failure to make the distinction between strong and weak evaluation, which in turns derives from the assumption that humans as agents occupy the same neutral-object universe as is posited in the world view of natural science. In Taylor's terms, practical reason has more going for it than is supposed. Scepticism need not be assumed when arguing about transitions.

Part E: Chapter summary

Chapter Four attempted to put forth a set of ideas that favour a notion of practical reflection which works outside the naturalistic stance. Five main topics were covered: i) significance and strongly evaluated ends, ii) the expressive use of language, iii) interpretative reason, iv) the nature of qualitative contrasts, and v) the *ad hominem* form of practical reasoning. The treatment of each relied heavily on the works of Taylor. To work outside the naturalistic stance is to work against the assumption that, as regards moral reasoning, there are no good arguments to be found there. In general, the ideas in this chapter are intended to provide the basis for a set of notions to be developed in Chapter Six that need to be brought on board when trying to think through what it is to reason practically over difficult evaluative question regarding the development and use of technology in a planetary age.

The next chapter will also explore patterns of practical reason, but these will be approached using contemporary developments within science itself. In other words, developments in science are also moving away from the most obvious assumptions in the naturalistic stance. A "new dialogue with nature", to borrow from Prigogine and Stengers, is being developed that arguably works outside the thoroughgoing mechanical conceptions of a neutral universe.[979] In particular, organic and relational images are on the rise, notably here the ideas of co-evolution and complex systems respectively. These in turn have very distinct implications for the way we think about the organization of knowledge, what is involved in making decisions, and what can be said about the workings of society. All of these serve to change our conceptions of technology and what it is to reason about its development and use in a planetary age. They call on us to think of our mutual interdependence in the organization of the planet, in how we regard one another as members of a single human race.

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Chapter Five: Complexity, co-evolution and technology values

Introduction

The discussion in Chapter Five will attempt to explore questions about practical reason through a set of ideas that have grown up out of developments in the contemporary natural sciences. The chapter discussion will build on some of the preliminary notions from the second half of thesis Chapter Three, but more, will attempt to place the notion of practical reason, consultation and decisions about the development and use of technology in the context of the social transformations that are now taking place on a planetary scale. These transformations are partly complex and co-evolving in nature. The chapter discussion is explorative in tone. It will centre on ideas deriving from the study of complexity and co-evolution first begun in thesis Chapter Three, the intent being to develop some further notions that can serve to characterize evolving technology values, or what can otherwise be referred to as the significance of technology in a planetary age.

In order to do this a group of broad-based texts will be used to help explore a set of ideas that are relevant to the thesis plan. Ideas from Prigogine and Stengers, Laszlo, Nicolescu, Morin and Kern, and Jantsch, as first discussed in thesis Chapter Three, stand central in the discussion that follows. However, the writings of Jantsch and Morin and Kern will be used as the framework of the chapter narrative into which ideas from other authors will be incorporated.

One key aim of the chapter narrative is to sketch a circle of ideas joining patterns of practical reason and consultation to an evolving planetary dynamic shown up, for example, in the growing interdependence of the world's nations and peoples. Such interdependence is taken to express something of the spirit of the age, one which all of the above authors accept in some sense. The discussion will regard this planetary dynamic and the growing sense of significance that drives its conscious expression as a proper context within which practical reflection and consultation about the development and use of technology can take place. In other words, it is a set of ideas within which the significance of technology for a planetary age can be discussed in a fruitful way.

Working in the background to this aim, and as argued in earlier chapters, is the notion that patterns of reason in modern science, together with a range of abstractions indebted to the naturalist standpoint, have influenced Western views about what constitutes rational thought in general, resulting in what Taylor calls the primacy of the epistemological. These patterns and abstractions are changing. There is, arguably, a broad recognition that a shift in scientific thinking has occurred, and that there now exist well established theories which are non-classical in important respects, among these being the theory of relativity, quantum mechanics, and irreversible processes. As a result, a thoroughgoing scientific materialism need no longer remain the commanding story in so far as our theorizing is concerned. An image of organic unity has taken up some of its place, especially as regards conceptions of the institutional and community life of mankind, but also in matters related to what the thesis discussion in earlier chapters has referred to as humankind's social, ethical, cultural, psychic and spiritual potential.[980]

From this latter point of view, the central questions to address here are threefold. First, what implications might contemporary developments in scientific thinking towards a more organic image of knowledge have for our notions of explanation and understanding? Second, what does such an image say about the links between our capacity for knowing the world, and for discerning the worth, dignity or significance of our actions within it? Third, in a planetary age what patterns of practical reason are called for in the attempt to better grasp those community and institutional dimensions of mankind's social life that impact in particular on the evaluative decisions people make regarding the development and use of technology? The chapter discussion will attempt to

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take these in principle questions and explore what some answers might say about the significance of technology from a community or institutional perspective, even as the discussion in Chapter Four tended at times to focus on the significance of the individual human agent.

Finally, the various notions of complexity and co-evolution to be discussed in the chapter are linked as well to an ontological position, that is, a conception as to what constitutes reality, or levels of reality, which is other than the naturalistic ontology linked to classical science. An important part of the discussion in Chapter Five is to try to pick out how this non-classical ontology is variously presented in the more recent developments in science, and to highlight some of the implications it might have for practical reason and the making of evaluative judgements in a planetary age.

Chapter Five is divided into three main parts, the first two consisting of two sections each. Part A, Section 1 will look further into notions from Erich Jantsch regarding self-organizing systems, the dynamics of co-evolution as such, and socio-cultural evolution in particular. The discussion throughout is explorative in nature and is linked to the fact that humans are creatures capable of self-reflection. Section 2 of Part A explores additional ideas regarding ethics and consultation in an evolutionary context, and extends these to a broader social dynamic that arguably has relevance for questions about the development and use of technology in a planetary age, notably with regard to the consciousness of the oneness and wholeness of human relations. Part B, Section 1 looks at ideas from Edgar Morin that concern complex organization as an abstract concept, as well as the parts-whole relation in general. Section 2 of Part B treats ethical ideas regarding social organization and the evolution of global interdependence as an application of the more general treatment of ideas in Section 1. These are then linked to questions about the dynamics of technology in a complex, global world. Part C provides a brief chapter summary.

In general, the chapter narrative proceeds along two broad avenues. First, commentary on the ideas of the authors concerned; second, an exploration beyond their ideas to questions that concern the thesis argument. These two avenues are intertwined in such a way that the exploration relevant to the thesis argument is developed as part and parcel of the commentary on each author's ideas. As has been the case throughout the thesis discussion, ideas treated in previous chapters are brought back into focus here, not as repetition but as part of the attempt to gain added insight into their implication for the themes being explored.

A note about sources is needed. The chapter contains quotations from a range of authors. Among these are Jantsch, Morin and Kern, Bronowski, Toynbee and Whitehead, as well as institutional texts from The Universal House of Justice and the Baha'i International Community – an NGO having observer status at the United Nations. As noted in the Introduction to this thesis, these texts have been chosen for the insights they offer to the study of its three main research questions. The inclusion of texts from a faith-based organization is therefore not an attempt to advance any particular religious point of view, but to provide added depth of analysis to the chapter discussion.

Part A: Further ideas regarding co-evolution

Section 1: Co-evolution and self-reflection

The following pages in Section I are an attempt to highlight and expand on some key ideas from Eric Jantsch's work *The Self-Organizing Universe* (1980), based on the concepts of self-organization, socio-cultural evolution and self-reflecting mind as treated in Chapter Three of this thesis.[981] The ideas that follow will be presented along four interconnecting threads.

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The first of these, Social-cultural evolution, practical reason and consultation, offers a brief review of some main ideas from Chapter Three, followed by a discussion of the links between our capacity to make sense of our decisions and the evolution of society in a planetary age. Included here is the notion of strong and weak evaluation, how our capacity for self-reflection enables us to look back into the past, anticipate the future and so make gains in judging or discerning what is significant in the present, as well as the links this has to practical reason and consultation in a slowly maturing planetary age. The second thread, Co-evolution and mankind's socio-cultural life, looks at the distinction between significance before and after the fact, the ways in which the socio-cultural world is partly open to a future-in-waiting, as well as the responsibility mankind has for such a future. Of particular interest here is the notion that values occupy the high-end of mankind's experience in a co-evolving society. The third thread, Time and socio-cultural change, begins with the distinction between terrestrial and socio-cultural time. The discussion goes on to explore the emergence over time of new principles of organization in society. Such ideas make up part of what it is to think in evolutionary terms. This third thread in particular will be joined to notions of practical reason, consultation and evaluative judgements seen from the point of view of time understood in a socio-cultural sense. The fourth and last thread, Cultural guiding images, will highlight the way guiding images that span many human life-times might offer gains in understanding our socio-cultural life.

Socio-cultural evolution

In order to begin the discussion in Section 1 a brief reminder of some ideas treated in Chapter Three is in order. The appearance of *Homo sapiens* as a species marks a point where evolution opened up along a unique avenue, namely, the socio-cultural. Socio-cultural evolution is in part driven by our powers of self-reflection, and with it the capacity for knowing, judging, consulting and planning outside of the urgent demands of immediate experience. Included here is a range of productive capacities, creative expression, and forward thinking or outward-looking action that accompanies such self-reflection. More particularly, this power of self-reflection is part and parcel of what is involved in our ability to look back into the past, to recognize the progenitors of the present, and to anticipate, consult over, and make decisions regarding a future still in the making. Such ideas suggest that we are dealing with processes that involve organic growth in some respect.

As also noted in Chapter Three, a form of significance after-the-fact can be seen in the overall co-evolution of the life. Three such areas of significance were discussed in Part Two of Chapter Three, namely: the appearance of greater individuality, increased diversity, and their emerging interconnectedness.[982] A corollary to these was that organisms display differing orders of autonomy from the demands of the immediate environment. However, the appearance of *Homo sapiens* as a self-conscious species turned the order of evolution on its head, so to speak. In other words, looking back at its earlier phases, the significance of evolution could only be seen after the fact, whereas now the significance of mankind's socio-cultural life is in part a function of knowing and judging before the fact. As a result, the species 'man' has become partly responsible for the writing of his own future.[983] With this comes the responsibility for individuals, communities and the institutions of society to try to recognize and discern, to be open to the significance of, and to act with an aware concern for the problems and requirements of the age in which they live. In other words, our powers of self-reflection are mirrored in the close link that exists between our capacity to know the world and to judge or discern the significance of our intents and actions in it. What is particularly noteworthy here is the way in which we have created technologies that serve to heighten our powers of reflection, and hence to know our world better, but which also serve to amplify the consequences of our actions in that world. At times such consequences are arguably for the better. At other times they serve to threaten that very world which is our responsibility to help create.

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In regard to these lattermost ideas, and expanding on the links between the evolution of society and the place of technology in a planetary age, people's decisions and actions work to continuously refashion their society. By doing so they also serve to help create a set of successive tests and difficulties to be met and overcome.[984] In this sense there is no complete autonomy from the demands of an environment of one's own making, so to say. If so, then the decisions and actions that work to fashion a society also partly determine the kind of difficulties or moral challenges its people will face. For example, and in simplistic terms, a technological society faces challenges thrown up by a particular conception of what its technology is and does, as well as the way in which that conception drives its aspiration and choices; where economic growth is its focus, such a society would perhaps have to deal with conflict created by its people's chief aspiration for accumulation and wealth versus limits on resources and the consequences of the way it exploits them; a society focussed on bringing about equity and justice, say through removing racial prejudice or promoting the equality of men and women, would perhaps face the challenge of understanding the spiritual principles involved and putting them into action.

The focus here is not on what people in a society perceive their challenges to be, based on how they understand their world. Instead decision and action help make society. Taylor's point about strong and weak evaluation is useful here. A society largely fashioned by decisions conceived in weakly evaluated terms will be different from one where decisions understood in terms of strong evaluation come to the fore. On the whole, one might say that a people's take on autonomy, the kind of society they work to create and a language of moral obligation tend to go hand in hand. Said differently, decisions that help make and remake society may well be joined to one or another sense of moral significance. If so, then the attempt to come to terms with the requirements of society, a part of which concerns the decisions people make regarding the development and use of technology within it, will be met with its own unique set of challenges and obligations. Part of these challenges and obligations arguably include efforts to expand on a language of qualitative contrasts and consultation in the moral sphere, and so make gains in coming to terms with the anxious and pressing decisions of the age.

Developing this latter point further, and picking up on some ideas from thesis Chapter Four, our powers of self-reflection can be developed and expressed in a host of ways, be it with reference to ourselves as persons, to the life in our community or with regard to the institutions of society. Among these powers of self-reflection one could include the manner by which we come to grasp the significance of our actions in strongly evaluated terms. With this capacity for self-reflection also comes the entire sphere of moral awareness and obligation that falls to us concerning the ways we are to act towards others or otherwise regard them. That is, what we say and do is in answer to the question: What is it to treat others as beings of worth or dignity? One point repeatedly emphasized in thesis Chapter Four is that the whole issue of what makes our actions moral cannot be separated from our intents, and especially so in matters of inescapable commitment. Of course, possessing the capacity to understand and be open to what is significant, or to discern what is a substantive or hollow course of action to pursue is one thing; learning how to express these matters in action is quite another. This is one place where a mature consultation comes to the fore.

A possibly useful idea to bring in at this point is that consultation can provide a framework for uncovering or helping to realize added dimension of depth, or perhaps even levels of reality, when it comes to understanding matters of worth or significance. It can, as it were, help to prepare the way for such realizations – for a being open to the distinctly human significances. In this sense, a observation made earlier in the previous chapter comes to the fore, namely, that in the case of consultation, "the point to asking 'Who are we?' or 'Why do we do the things we do?' is not just to get a practical response, but to set the stage for a richer kind of response, namely, one posed in terms of worth or significance."[985]

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For example, in a co-evolving socio-cultural world, the decisions people make and the action they take help create in part the conditions for fostering humanity's further evolution. One might say their actions help to promote it or to hold it back.[986] In a mature form, and so far as this thesis discussion is concerned, such decisions derive in part from the quality of consultation a community and their institutions are able to achieve. In other words, the effort to discern what is significant to our form of life, or to recognize which course of action to pursue or avoid, is potentially more fruitful when carried out through the process of consultation. A certain quality of understanding or self-articulation can result from taking counsel together.[987] Here knowledge is not confined to an individual's conception of things; our understanding acquires a level of maturity and effect through forms of community reflection and consultation that no one person's ideas, experiences or efforts can match. From this point of view, consultation and patterns of practical reason go hand in hand.

To rephrase slightly, our capacity for self reflection involves the ability to look back into the past, to anticipate the future, and to bring into focus that which is of significance in the present, all of which speak to the fact that human evolution is now socio-cultural. From a strictly terrestrial view point, one would consider those co-evolving or self-organizing processes that developed along both micro- and macro-scale branches in the physical universe, and out of which terrestrial life has emerged. Regarding the evolution of society, one might consider those social and historical conditions from which a society has come, the perspectives and assumptions they have influenced in contemporary life, as well as the various conceptions that now obtain regarding a future-in-waiting, all of which speak to the effort to come to terms with problems of the age in which we live.

More particularly, and in the case of our contemporary world, the evolution of society is directly tied to a maturing planetary perspective. In this regard it is worth noting Arnold Toynbee's view that the maturity of a civilization depends upon the quality of self-articulation its peoples achieve.[988] If so, then a maturing planetary perspective would arguably be part and parcel of such self-articulation, and would partly involve efforts to discern that which is of greater and lesser significance to human life in it. Such efforts might include, for example, the development within a society of a mature and open, a compassionate but detached consultation that would attend to the problems of the age in which its peoples live. The emergence of a more mature understanding and outlook, or self-articulation, might similarly include finding notions of development that go beyond purely economic incentives, employing a language of qualitative contrasts in the attempt to give expression to a range of moral obligations that accompany life in a planetary age, and what might be involved in adopting principles of cooperative association instead of those based on struggle and conflict as the basis for social action on a planet-wide scale.

The sense given to the notion of development in the above comments is not what is perhaps typically meant by progress, as in the accumulation over time of resources and skills that are needed to run a society and to provide for the needs of its peoples. Development in society is also shown in a maturity of understanding that comes from the quality of consultation its peoples achieve. As an aside, it is worth noting that such maturity of understanding as is gained through consultation would then become one of the central characteristics of practical reason, and notably so when we reflect on the challenges and requirements of a planetary age.

Humankind's socio-cultural life

In order to develop further some of the topics discussed above, it is useful to examine a few general ideas about co-evolution that relate to mankind's socio-cultural life.

From the point of view presented in thesis Chapter Three, the universe has evolved to a point where beings exist who can reflect on both the nature of that universe as well as on their own selves, the purpose of their lives and its significance, and the worth of their actions. Mankind can visualize

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evolutionary processes across time and space, reflect on them, make efforts to realise what is of significance in who we are and what we strive to be as socio-cultural creatures, and so make decisions with a mind to a future-in-waiting. If so, then such a universe can no longer be viewed solely as a machine in the classical sense within which matter and energy move "endlessly, meaninglessly", to again use a phrase from Whitehead.[989] In other words, we are involved with "a richer ontology than naturalism allows".[990] Of equal importance here is the notion that the emergence of our capacity for self-reflection, and the fact that we are beings for whom significance is present in an original sense, locates the reality of man outside the usual operations of material antecedents in terms of which explanations of the inanimate universe have usually been put.

Given this, then our capacity to know the world, to discern what is significant about it and to judge the quality of our actions within it, is such that a socio-cultural future is partly open. In other words, it is a future-in-waiting. If so, then humankind individually and collectively is placed in a position of responsibility for furthering the quality and character of that future-in-waiting. For example, Laszlo argues that co-evolution produces a rich hierarchy of partially autonomous yet interacting levels.[991] In this point of view man's socio-cultural life is open to a variety of interactions and forms of communication.[992] More generally, these interactions and forms of communication possess rich links among themselves, and provide for multiple avenues along which human actions might proceed. Some everyday examples of this might include knowledge systems such as science agriculture and technology, medicine and health practices, law, the arts and religion, and cultural traditions, together with forms of organization such as corporations, nation states, regional or continental organizations, international bodies, and various citizen associations and groups.

Furthermore, such links and avenues could arguably include a dynamic that is multi-levelled, or which works at different levels of reality à la Nicolescu, and perhaps be based in part on principles that operate at the level of self-reflection or self-understanding, and the socio-cultural.[993] This is one area where one of the notions discussed in thesis Chapter Three comes to the fore again, namely, that whereas prior to evolution having become socio-cultural we can find in its processes a kind of significance after-the-fact, but that now, given that human social and cultural evolution is driven by man's nature as a self-understanding being, then the intent and significance of our actions are matters of knowledge, judgement and decision before-the-fact. It is worth noting that this idea also calls up the ontological link between intent and action found in the discussion in Chapter Four.

In a related sense, Laszlo argues that in a systems view the notion of reality actually refers to modes of organization in a system, and where these might be termed higher or lower according to the extent of their interactions.[994] Laszlo then argues that the unique determiner of culture is its values, the nature of which operates at the highest interacting level in any system dealing with man's self-conscious life, and with it the sense of significance we can have about ourselves and the world we experience around us.[995]

Arguably so, part of the reason for these authors' emphasis on values is their awareness that many decisions in contemporary life tend to be restricted to or bound by the value placed on progress through material development and economic growth. Innovation, for example, is highly sought after in technology and in related techniques of economic production and distribution. The word, innovation, is perhaps used to suggest a creative and open response to the economic necessities for material advantage and the exploitation of various resources. There is also an accompanying sense here that in the individual but especially institutional decisions people make, the abstract, socio-economic principles related to progress are to be preserved or maintained.[996]

One point worth making here is that in the 20th century a range of ideologies based on a set of socio-economic principles came to occupy people's individual and collective lives. However, some of these were such that as a result, human life and well-being were sacrificed for the sake of the

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preservation of that particular ideology's set of socio-economic principles.[997] Other examples of the preservation of values against change might include an attitude to never investigate one's inherited beliefs, or to follow the urge to power that might come with unfettered political authority, or a being locked onto a given guiding cultural image or conception about the nature of reality, even if that conception has proven to be harmful.

Regarding such conceptions of reality, authors such as Morin and Kern, Laszlo, Nicolescu and Jantsch each explore ways of thinking differently about the socio-economic values so that we need not risk sacrificing human life for their preservation's sake.[998] Not surprisingly then, their thinking shows a tendency to picture what might be called the higher emotions as being central to deciding the significance of our lives as socio-cultural beings. Furthermore, the same authors not only place a high premium on the way we reason about values, but also that the way we think about them needs to be open to transformation in order to learn to live in an evolving, planetary age.

These kinds of ideas raise the question: What are the forms of practical reason that might foster an openness to the significances of an evolving society? Although the thesis will argue for a different answer than what Jantsch offers, it is worth looking at such questions from a set of ideas that could be described as time and socio-cultural change.

Time and socio-cultural change

Three preliminary points can be made at the start of this sub-section. First, whenever we are talking about evolution we are also talking about the passing of time, and hence history. If so, then the various characteristic and aspects of evolution discussed below also deal in some sense with the nature of time and the ways in which we can speak of its passing. Second, the discussion that follows actually looks at two species of time, so to say, namely terrestrial time which is linked to the ancient, co-evolving processes out of which life on the earth has emerged, and socio-cultural time, which comes about by virtue of the fact that human are self-reflecting or self-understanding beings. Third, in the context of this sub-section, to speak of significance is also to be saying something about time, in some cases terrestrial and in other socio-cultural. In the latter case however, the significance we find in our forms of life are closely linked to the notion that consultation is part and parcel of practical reason, the decisions we make as agents, as well as our capacity for knowing the world and judging the worthiness of our actions in it. With this notion of consultation also comes the ability to discern more clearly over time the significance of what we know and of the actions we take. The general point here is that the following paragraphs attempt to explore the ways in which these preliminary points are related, and that by so doing one can begin to build up a richer vocabulary for discussing time and socio-cultural change.

In terms of the discussion from thesis Chapter Three regarding the emergence of terrestrial life, the tendency to see in co-evolving processes a rich hierarchy of interacting levels can also produce a relatively tight-knit coupling between these levels. Jantsch calls such systems metastable.[999] In other words, in metastable systems fluctuations that would otherwise give rise to novel states of organization are kept in check. A similar situation might occur in social systems. Such a tight coupling is perhaps seen, for example, in the way modern telecommunication systems maintain a highly complex set of global production and distribution systems that would not otherwise be possible. The coupling this creates among diverse national economies establishes a system that is metastable. Arguably, in order to keep this crucial lower-level metabolic system going, marketplace demands, or notions of leverage and utility, may tend to dominate thinking at the level of values.

One implication here is that such a tight coupling might extend the phase of confirmation, delay the onset of a new organizing regime, and hence postpone the demise of an existing one.[1000] In general, a tighter coupling between levels, hierarchies, or subsystems creates a stronger damping action in

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the system as a whole. Jantsch also appears to argue that without some kind of damping effect the evolution of life could not get going.[1001] In addition, time is needed to create relatively stable process structures that can act as a platform for the emergence of new levels of organization in living systems.[1002] Yet, presumably, not every aspect of a system can remain stable indefinitely.[1003] This may suggest that the more prolonged the damping of the fluctuation, and the deeper the phase of confirmation, the more rich and varied will be the dynamics that emerge over time. In the case of human society, this may also suggest that values or cultural guiding images could grow or mature through similar patterns of confirmation and novelty, maintenance and revision, or, what is basically the same, through the disintegration and integration of our societal life and it institutions, and in the case of the life of the individual, through adversity and growth.

Jantsch appears to argue that thinking in evolutionary terms – that is to say, thinking in terms of the proper use of our self-reflecting powers as a species that has ascended from but is part of the earth's terrestrial environment – means to engage wholeheartedly with the present moment. He seems at times to also link this notion of a wholehearted engagement to accepting and encouraging a thoroughgoing pluralism of ideas in society, that a free and open dynamic in evolution is its own best determiner of outcomes.[1004] Elsewhere he comments that, in an evolutionary spirit, "[T]he reality of the human world becomes dissolved into many realities".[1005] It is perhaps worth here noting a similar use of terms by Lincoln and Guba, as was discussed in Part B of thesis Chapter Two, where they talk of multiple constructed realities.[1006]

The thesis argument here, however, aims to avoid the idea that the human world is composed of a large set of undifferentiated (i.e. dissolved) and autonomous human realities. Instead, the notion of evolutionary thinking is perhaps more properly characterized as a being open to, a being able to recognize that which is significant in the present, and which is worthy of engagement in so far as it also speaks to a future-in-waiting.[1007] In other words, such recognition would in part rely on patterns of practical reason and consultation that can help us to listen to a certain depth of knowledge of the past – those that "avoid the embittering traditions of history" – to a prescient anticipation of the future – the best one's knowledge and judgement can offer – and to be open to possible gains in discerning what is significant and hence worthy of our attention in the present.[1008] Surprisingly, these ideas can be linked to all three main research questions for this thesis.

Picking up on ideas from Prigogine and Stengers concerning what they refer to as order through fluctuation, fluctuations produce what might be called a bifurcation in development pathways wherein new forms of organization can emerge.[1009] According to Prigogine and Stengers, the detailed organization that emerges in a new dynamic regime cannot be known or worked out in advance.[1010] Presumably, however, once they have happened we can find explanations as to what is it that brought them about.[1011] They make a similar point by arguing that unexpected novelty is intrinsic to systems operating at far-from-equilibrium conditions, a condition which in its ramifications calls for a new dialogue with nature. In this regard, and for example, they put forth the concept of active matter to replace the notion of inert or inanimate matter.[1012] Furthermore, systems like this serve to create an actual arrow of time, in other words, an arrow of time that is not a function of one's ignorance of the system, but one which is a real attribute of the dynamics that constitute it.[1013]

Thinking in terms of an arrow of time, arguably then, the passing of evolutionary time is taking terrestrial life somewhere – we can see it in the development pathways marked out by the emergence of new states of order, but which are not predictable in detail and in advance of the next fluctuation. Of course these pathways cannot be seen in the constituents of the system. They are instead emergent properties of a dynamic system. However, the same need not be said for the passing of socio-cultural time, since, as emphasized earlier, socio-cultural evolution turns the first principle of terrestrial evolution on it head, namely, that instead of being able to discern

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significance only after the fact, *Homo sapiens* also exist in a world of significance before the fact. If so, then as beings capable of self-reflection we are at least partly responsible for helping to realize a significant future-in-waiting.

Furthermore, the idea suggested above that a system can be kept stable long past the time when fluctuations would have otherwise triggered the emergence of a different set of ordering principles, suggests that when such transformations do come about they may in some sense be thoroughgoing. That is to say, the system as a whole would be involved such that, to adopt an idea from Whitehead, it could bring to ruin the civilization in which it appears.[1014] As Whitehead writes in *Symbolism: Its Meaning and Effect* (1927):

> It is the first step in sociological wisdom, to recognize that the major advances in civilization are processes which all but wreck the societies in which they occur: – like unto an arrow in the hand of a child.[1015]

In the same passage, and prefiguring the discussion in the next subsection, Whitehead notes that:

> The art of free society consists first in the maintenance of the symbolic code; and secondly in fearlessness of revision, to secure that the code serves those purposes which satisfy an enlightened reason. Those societies which cannot combine reverence to their symbols with freedom of revision, must ultimately decay either from anarchy, or from the slow atrophy of a life stifled by useless shadows.[1016]

However, given that self-reflection speaks to a different evolutionary dynamic, then humans can anticipate possible fluctuations, and hence possible futures. If so, then, in principle, actions may be able to mitigate some of their effects. It is worth noting that the in principle clause added here is no minor one, since the fact that we might be able to discern the significance of a possible future does not imply that we will in fact act so as to mitigate or promote it. Of course, all prior evolutionary dynamics go to make up the emergence of life on a living Earth, and we ignore at some peril the after-the-fact significance we find in them. At the same time, and from the perspective of human persons, the appearance of a universe in which self-understanding beings exist is not merely an encore to the four billion years of microbial evolution and the eventual development of higher plant and animal life. This is another way of saying that lessons from biology or ecology are invaluable, but will only go so far in our effort to reason about forms of socio-cultural life in a planetary age.

As part of the same argument, socio-cultural evolution works along multiple levels, say, for example, at the level of the individual, the community and the institutions of society.[1017] One possibly useful idea here is that the character and pace of our actions partly qualifies our experience of time and its passing. From this point of view, the experience of the passing of time in social evolution refers in part to a future-in-waiting, the writing of which is everyone's present responsibility, be it individual, communal or institutional. The experience of time and its passing would also then be linked to a certain depth of evaluative judgement, a certain maturity of understanding, that comes from consulting on those actions which are significant or worthy of our attention in the present. Part of this might involve insight into the way societies grow or mature through our decisions and actions, and if not in their specifics then in the broader sense of worth or significance. Such ideas arguably call for an expanded image or picture of the passing of time.

Cultural guiding images

The following discussion appears in three parts. First, it will consider the notion of cultural guiding images in general, Jantsch's ideas about man-in-the universe, the links this has to Toynbee's notions of consciousness, will and the divided self. As one expression of these ideas, the second part will explore the usually conflicted relation between science and religion in the West, and

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consider some transitions in the conception of both science and religion that can arguably help open the door to a different kind of dialogue between them in a planetary age. Third, it will look at a few general ideas regarding cultural guiding images and development.

However, the purpose of this sub-section is not to discuss religion as such. The first main thesis questions asks: What is the nature of the unity that exists between our capacity to know the world, and our ability to judge or discern the significance of our actions within it? The thesis discussion has approached this question from a variety of perspectives, such as distinctly human significances, good decent or acceptable forms of life, man's new dialogue with nature and our psychic, spiritual, ethical, cultural, or social potential. Here the approach to this question centres on the notion of man-in-the-universe, views regarding consciousness, will and the divided self, and Jantsch's view that cultural guiding images are partly expressed via humankind's faculty for religious belief. In the West, such matters have tended to decay into a conflict between science and religion, taken to be two fully explicit, rival systems. In the following discussion, an argument is formulated in terms of transitions. That is to say, dogmatic conceptions in the West regarding both the nature of and conflict between science and religion have spent themselves. They therefore need a reformulation in the context of a planetary age based on the principle that mankind is one.

In Jantsch's terms, cultural guiding images are a principal part of human experience, and as such are reflected in a range of social practices and institutions.[1018] They are an aspect of what he refers to as man-in-the-universe. Such images can also be linked to what Arnold Toynbee describes as the two spiritual faculties which are the distinguishing marks of human nature, namely, our consciousness and will.[1019] And yet for Toynbee, our consciousness and will gives rise to a divided, ambivalent self, a self which because of the knowledge and freedom our nature gives us, we can act in ways that hurt or heal, maim or mend. For Toynbee then, who we are as beings of consciousness and will speak to our ends or goals of life – ends which we struggle to find or hold on to, which we live well or poorly, and which, in the context of this discussion, the world's cultural guiding images can help us understand.[1020]

In the context of this subsection then, guiding images or a picturing of man-in-the-universe, can, using Toynbee's terms, help make sense of the context to those hopes and perils that a divided self impose on us, and so perhaps learn to regard them from a different, less divisive, more encompassing point of view.[1021]

A useful starting point for the remainder of the discussion is the following quote from the 1982 Mexico City Declaration on Cultural Policy:

> Culture may ... be said to be the whole complex of distinctive spiritual, material, intellectual and emotional features that characterize society ... It is culture that gives man the ability to reflect upon himself. It is culture that makes us specifically human, rational beings endowed with critical judgement and a sense of moral commitment. It is through culture that we discern values and make choices. It is through culture that man expresses himself, becomes aware of himself, recognized his incompleteness, questions his own achievements, seeks untiringly for new meanings and creates work through which he transcends his own limitations.[1022]

The same declaration goes on to state that:

> The universal cannot be postulated in the abstract by any single culture: it emerges from the experience of all the world's peoples as each affirms its own identity. Cultural identity and cultural diversity are inseparable.[1023]

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Here then, the awareness, questioning, and recognition spoken of in the first passage, and by which we might transcend the limitations of our own identity as referred to in the second, is part of what cultural guiding images help to bring about.

Exploring these ideas further, Jantsch notes that during ages, often gauged in centuries, when these images assist mankind to rise above the limitations of a divided self, then the individuals and institutions of society are more likely to find creative, constructive channels for the furtherance of human ends. When such images fail to inspire, or when their originating spirit is spent, then a society may tend towards maintaining established practice, perhaps in the face of decay or demise, and which may no longer speak well or adequately to what have become the anxious, harrowing problems of an age.[1024] In a related sense, Toynbee suggests that the breakdown of societies can be partly explained as resulting from the loss of their own powers of self-articulation, and with this their power of self-determination.[1025]

Jantsch states that the longest phase for such cultural images is taken up by the world's religions which, in his terms, contribute to "the self-image of man-in-universe", and which "guide mankind through long periods of time like the shining light at the end of a long tunnel".[1026] Of course, many of the world religions have fallen into episodes of fanaticism, infighting, and war. There is also no ignoring the fact that a host of "historically antagonistic religions and sects" continue today to walk the same path.[1027] Yet in a broader context, and following Jantsch, neither is there reason to discount the effect the world's religious teachings have had at differing times on humanity's effort to ennoble the character of the individual, and to provide a sense of significance to people's community and societal life. The following text conveys a similar idea, though written from a different starting point:

> Throughout recorded history, human consciousness has depended upon two basic knowledge systems through which its potentialities have progressively been expressed: science and religion. Through these two agencies, the race's experience has been organized, its environment interpreted, its latent powers explored, and its moral and intellectual life disciplined.[1028]

So far as the thesis discussion is concerned, the notion that the potential of human consciousness has been progressively expressed through the agencies of science and religion, as suggested in the passage immediately above, is not restricted to the modern natural and social sciences. Neither does it refer to those formalized doctrines and established practices often identified with religion. The notions they imply are richer. If so, then, human consciousness has engendered growth in such phases of history as when humankind's 's reasoning faculty, our faculty of belief in action and a certain depth of moral insight, have tended to work more in relation, less so as strangers or as antagonists.

Jacob Bronowski offers a like-minded observation when he states that in the absence of the moral imagination, "man and beliefs and science will perish together".[1029] He then goes on to add that: "Knowledge is not a loose-leaf notebooks of facts. Above all, it is a responsibility for the integrity of what we are, primarily of what we are as ethical creatures".[1030] To quote more fully, and from his point of view as a scientist, Bronowski has the following to say:

> The intellectual leadership of the twentieth century rests with scientists. And that poses a grave problem, because science is also a source of power that walks close to government and that the state wants to harness. But if science allows itself to go that way the beliefs of the twentieth century will fall to pieces in cynicism. We shall be left without belief, because no beliefs can be built up in this century that are not based on science as the recognition of the uniqueness of man and a pride in his gifts and works.[1031]

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Toynbee, writing as a historian, puts across similar ideas, supported by evidence from history, which he conveys in terms the growth of civilizations through a process of challenge-and-response:

> True growth consists in a progressive change of emphasis and transfer of energy and shifting of the scene of action out of the field of the macrocosm and into that of the microcosm; and in this new arena victorious challenges to responses do not take the form of overcoming an external obstacle, but manifest themselves instead in a progressive self-articulation.[1032]
>
> ...
>
> Growth means that the growing personality or civilization tends to become its own environment and its own challenge in its own field of action. In other words, the criterion of growth is progress towards self-determination.[1033]

He also presents similar ideas in terms of "the transition from a static condition to a dynamic activity in which the genesis of every civilization [and post-civilizational society] consists.[1034] The following text again from Toynbee highlights this idea further, some parts of which were referred to in this subsection's opening comments:

> [E]ach of these post-civilizational societies has pointed out Mankind's goal and has given us prescriptions for attaining it. Thus, though the goal of Mankind's continuous and increasing endeavours is still out of sight, we know nevertheless what it is. We can discern it, without having to divine the future, by looking inwards; for Mankind's goal is written large in the constitution of human nature. What changed our pre-human ancestors into human beings like ourselves was the acquisition of consciousness and will. These two spiritual faculties are human nature's distinguishing marks.[1035]

So far as the thesis argument is concerned, by Toynbee's reference to consciousness and will relates to matters of significance and human agency. It has also been referred to repeatedly in the thesis discussion, though in an indirect sense, as the unfolding of mankind's various potentials, as an attempt to discern good, decent or acceptable forms of life, and, ultimately, the unity that exists between our capacity to know the world and our ability to judge the worth of our actions within it. So far as concerns the discussion in this sub-section, they also refer to notions of science and religion as systems of knowledge by which we can explore, interpret and organize our world.

Toynbee goes on to clarify his notion of the two spiritual faculties in human nature, some aspects of which were also cited earlier:

> [T]heir character is ambivalent. They are both a treasure that gives us hope and a burden that puts us in peril. Their emergence in Man has split the Universe and broken its harmony, for every conscious, wilful, human soul. The price of human knowledge and freedom is an intellectual and moral relativity. Each of us sees the Universe divided between himself and the rest of it; and each of us seeks to make himself the centre around which all the rest shall revolve. This constitution of human nature sets human nature's goal. Its goal is to transcend the intellectual and moral limitations its relativity imposes on it.[1036]

In the context of Toynbee's ideas about limitation and transition in the divided self, then it is not unreasonable to regard the lack of unity in our age between a broader sense of science and religion as constituting one of its main limiting features. Again, it is important to note that neither religious fanaticism nor outworn religious dogma is what is intended here by the above reference to man's faculty of belief in action. Neither is science to be regarded as a strictly empirical approach to the study of phenomena conducted from within a set of assumptions about the inanimate workings of the universe. In its broader sense science is a form of rational and systematic investigation.[1037]

With these ideas in mind, it is worth exploring some contributions which changing viewpoints concerning science and religion as systems of knowledge about our world might make to Western-

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inspired notions of cultural guiding images. It is of course true that contemporary doubt about religion is reinforced by modern expressions of fanaticism, or the practice of bigotry by the adherents of one or another religious community. Furthermore, as a result of the protracted and acrimonious divorce in Western intellectual culture between science and religion, and with it the sharp conceptual lines in terms of which protagonists on each side have tended to depict the other, it can be difficult to write in sensible terms about a supposed unity between science and religion in contemporary life without eliciting incredulity on the part of the reader.

The following two passages from *The Promise of World Peace* (1985) suggest some ideas that may arguably help to put these views into a broader context:

> The resurgence of fanatical religious fervour occurring in many lands cannot be regarded as more than a dying convulsion. The very nature of the violent and disruptive phenomena associated with it testifies to the spiritual bankruptcy it represents. Indeed, one of the strangest and saddest features of the current outbreak of religious fanaticism is the extent to which, in each case, it is undermining not only the spiritual values which are conducive to the unity of mankind but also those unique moral victories won by the particular religion it purports to serve.[1038]

The same work also refers to the role science can play in helping humankind to overcome those various prejudices which contribute to the existing dislocation in world affairs:[1039]

> World order can be founded only on an unshakeable consciousness of the oneness of mankind, a spiritual truth which all the human sciences confirm. Anthropology, physiology, psychology, recognize only one human species, albeit infinitely varied in the secondary aspects of life. Recognition of this truth requires abandonment of prejudice – prejudice of every kind – race, class, colour, creed, nation, sex, degree of material civilization, everything which enables people to consider themselves superior to others.[1040]

Scepticism regarding matters of non-scientific faith in the West is generally portrayed as turning in part on the conflict born in the 16th century between the protagonists of the new natural philosophy, and the incumbents of the established church authority.[1041] Or, as Charles Coulson Gillispie has described it: "The drama between science and the church ... unfolds with that inevitability which is tragic because it arises from the characters of men rather than the necessities of things".[1042] Of course, the historical conflict between science and institutionalized religion in the West is a long and complicated one, and is outside the domain of this discussion. The overall point to make here is that while the conflict has continued over the centuries, there are certain more recent changes in both the scientific dialogue with nature as well as in people's own understanding of the nature of belief that need not require the one to reject the other. The references in the two passages immediately above that speak of "the spiritual values which are conductive to the unity of mankind" and the "consciousness of the oneness of mankind, a spiritual truth which all the human sciences confirm" is a case in point.

For example, the outlook in Western intellectual culture sometimes focuses on the view, correct within it limits, that one will find in mankind's institutionalized religious practices a collection of outmoded dogma and a host of accepted truths that no person interested in investigating reality for himself would likely be able to accept. With this has come the view that religion as a whole, because it is based in myth or superstition, has no useful role to play in our attempts to explain the world or to improve the lot of mankind's life in it.[1043]

Accompanying this view is a range nineteenth century ideas regarding strictly materialistic assumptions about physical reality and human nature.[1044] For a time these assumptions tended to take hold of the intellectual world, sometimes dogmatically so, including as well ideas about the underlying workings of human society. A materialistic conception of life came to occupy centre stage in the West's conception of man, and hence too in the primary sense of his existence as a

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social and economic being. And yet such a strict conception of human motivation has shown itself to be faulty, as evidenced by the harrowing experiences of those masses of people who lived in societies that were consciously constructed on the basis of such assumptions.[1045]

In general, neither the conflict between proponents of a scientific or religious outlook taken as rival points of view, nor the adoption in the modern age of a strictly materialistic view of life, nor the contemporary expressions of narrow-minded prejudice can be properly understood in a planetary age if they are viewed apart from the historically widespread sense of a deeper, more balanced notion of reality. What both a strictly materialistic view of life and narrow-minded belief have arguably done, however, is to add to the ways in which these broader dimensions of life became irrelevant to contemporary decisions regarding social development and human prosperity.[1046]

Over the last one hundred and fifty years or so, however, developments in science have moved towards a recasting of nineteenth century conceptions of the workings of the universe in less strictly material and mechanistic images – a recasting of ideas which calls into question explanation based on the classical notion of material antecedents, and which in turn provides for a different kind of dialogue with nature.[1047] At the same time that has been a gradual lessening of an age-long authority held by the leaders of formalized religion over the thoughts of people. In this regard then, the established poles of the opposition, at least in the West, between these two guiding images can be said to wearing away. While new opposing poles may have emerged, still, the change witnessed here opens a door to a new dialogue, to borrow from Prigogine and Stengers. In other words, it provides the opportunity for a dialogue between our understanding of the modes of reason used in science and the multiple dimensions of thought that make up mankind's spiritual life – his consciousness and will – both of which are part of coming to terms with an evolving planetary age.

To close this sub-section it is worth highlighting a few ideas regarding cultural guiding images and assumptions about development, the point being that in a planetary age our guiding images can adopt a new lease on life, so to say. More particularly, Western intellectual culture has entered a stage of thought arguably more at home in recognizing proper limits to the general conception of the universe as being strictly and classically inanimate in its workings, and hence as well in some contemporary economic assumptions about what constitutes social development. Morin and Kern for example place particular emphasis on this latter point when they write that:

> Development must be divorced from its economic matrix, become multidimensional, include cultural and civilizational meaning and norms, be conceived anthropologically, and include the unfolding of our psychic, spiritual, ethical and social potential.[1048]

A main point to make here is that in practical terms it makes no sense for development efforts to look for ways by which the social and material conditions of people can be improved, yet avoid the cultural guiding images people have about themselves and their world which are a source of their life's deepest incentives for learning, achieving, being and becoming.

The following passage serves to expand on this idea:

> It would seem obvious, therefore, that efforts of any kind to promote human progress must seek to tap capacities so universal and so immensely creative. Why, then, have spiritual issues facing humanity not been central to the development discourse? Why have most of the priorities—indeed most of the underlying assumptions—of the international development agenda been determined so far by materialistic world views to which only small minorities of the earth's population subscribe? How much weight can be placed on a professed devotion to the principle of universal participation that denies the validity of the participants' defining cultural experience?[1049]

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Noting that spiritual and moral issues have historically been bound up with contending theological doctrines, then there is an element of truth in the argument that

> ... [T]hese [moral and spiritual] issues lie outside the framework of the international community's development concerns. To accord them any significant role would be to open the door to precisely those dogmatic influences that have nurtured social conflict and blocked human progress ... To conclude, however, that the answer lies in discouraging the investigation of spiritual reality and ignoring the deepest roots of human motivation is a self-evident delusion. The sole effect, to the degree that such censorship has been achieved in recent history, has been to deliver the shaping of humanity's future into the hands of a new orthodoxy, one which argues that truth is amoral and facts are independent of values.[1050]

In conjunction with the above reference to the investigation of reality, our contemporary age is one where people across the globe are choosing to investigate and act in ways that directly influence the quality of life in their societies. Institutions of society, communities and individuals are learning how to recognize a confluence of events that make possible some new advance in thought, to see in it some matter of importance or consequence for present life, and to act to bring it about. In other words, we are witnessing a watershed in the way people are taking responsibility for the further evolution of their society. Hence we see the rise of groups, associations and organizations across the planet acting outside the organs of state, and which seek to advance the cause of international peace, social justice, and human welfare and wellbeing.[1051] Such smaller scale patterns of action are arguably one example of cultural guiding images made personal and practical in a planetary age.

Finally, so far as the thesis discussion in this subsection is concerned, a certain maturity in decision as might be fostered through practical reason and consultation can help to connect these smaller scale patterns of action with expanding circles of organic unity on a broader societal or planetary scale. One way to do this is by attending to a certain depth of knowledge of the past, an awareness of a future-in-waiting, and a recognition of or openness to that which is significant in the present. Attending to things in this way is to engage with our cultural guiding images so as to make greater sense of who we are and the ethical choices we face in a planetary age. Such notions are also linked to what can be called multi-levelled ethics, the main topic for the next section.

Section 2: Ethics and co-evolution

The following pages in Section 2 will highlight some key ideas regarding the broad notion of ethics and co-evolution. As with Section 1, Part A, the general frame of the discussion comes from Eric Jantsch's work *The Self-organizing Universe* (1980).[1052] The discussion is split into two sub-sections. The first, Multilevelled ethics, highlights notions of terrestrial and socio-cultural evolution, links between self-reflection and socio-cultural evolution, and the kinds of obligations that fall to us as creatures who have the wherewithal to make something of a future-in-waiting. The second, Acting ethically, will address topics such as a naturalist account of human behaviour, thinking of ethics from a co-evolving viewpoint, and a richer ontology than is found in naturalism.

Multileveled ethics

To begin with, for the sake of clarity two terms will be used in the following discussion, terrestrial evolution and socio-cultural evolution. The first refers to the four billion year-long evolution of microbial, plant and animal life, together with the evolution of the earth's atmosphere, oceans and soil. In other words, the idea of the earth as an ecosystem. In co-evolving terms we could then speak of the earth as a living planet, the various systems of which respond to stresses or fluctuations in order to maintain life. The second, socio-cultural evolution, refers to the emergence of the human species and our powers of self-reflection, for whom significance and purpose exist before the fact. and where life in a social and cultural setting takes centre stage in our development as a species.

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According to Jantsch, ethical behaviour is "behaviour which enhances evolution", and which for him stands as a general notion.[1053] In other words, each new life form that develops in the long history of terrestrial evolution on earth has its own ethics, that is to say, behaviour that advances evolution.[1054] In the case of socio-cultural evolution, the discussion here will regard ethical behaviour in such a way that it be past, present, and future-regarding. In part this is because we are self-understanding beings for whom the significance of an intended form of life can be discerned before the fact, but which cannot be fully appreciated apart from a past that has served to bring us to where we are. Such a notion also links to a main thesis question about our capacity to know the world and to judge the worthiness of our actions within it.

One implication here is that what we know of the world and the significances we discern in it, both attend to a rich variety of scales of time and place, each spread out in history and across a range of differing societal conditions, or places.[1055] Given that human evolution has become socio-cultural, then what we know of the world and the significance we make of it is not just contemporary in time and place, but also concern decisions that are past and future-regarding. In other words, given that we are beings capable of self-reflection, then a future-in-waiting is partly in our hands to make, and this notably so in light of the decisions and actions we continually face. One perhaps could then say that to the extent that we reflect on who we are and what we can do as self-understanding persons, then we are better able to discern the multiple levels at which we can act as moral agents. From the thesis point of view, thinking about such a multileveled, ethical future-in-waiting is one that aspires to take as its province the planet as a whole, and all the people who live in it.

In an another sense, if ethical behaviour is behaviour which enhances evolution, then the various phases of evolution via which forms of life arose would each have carried certain aspects or indicators of a dynamic that could called ethical. However, this is not to say that we can make decisions about human ethical behaviour by looking to the kinds of dynamics that accompanied the emergence of life across evolutionary time. Our human capacity to experience what it is to be moral and code it in ethical action is of a different order. Being aware of norms that guide our actions, and remaining open to that quality of inner experience which serves to qualify or enrich them, make up part of the pursuit of human dignity, a recognition of inescapable significance, and how we might discern that which is worthy in the being of others. Said differently, the significance things have for us as self-understanding persons takes central place in our judgements of and decisions about how to rightly regard others. For the thesis argument, these notions cannot be made sense of apart from a deeper-current sense of human diversity and the dignity due to others.

Three additional observations are in order. First, the above ideas could be thought of as fitting in to the notion that ethical behaviour is behaviour which enhances evolution. Here however the notion refers to mankind's socio-cultural evolution, the dynamics of which work at a different level of realty compared to the usual biological sort. Second, it is worth noting that the discussion here also touches on the notion of autonomy, which is not the liberty to act as one might choose. Here autonomy more properly involves an ability to discern with a greater breadth of awareness, to be able to be influenced by and be open to matters of significance, in the way we experience the world and decide the worth of our actions in it. Third, this being said, and taking a step, back there is much to be learned from the dynamic interactions that make up the multileveled tapestry of terrestrial life. Among other things, they possess a deep metaphorical significance for us. To ignore them is to forget who and what we are as a co-inhabitant of one planetary home.

A deeper-current conception of human diversity

The search for an image of man-in-the-universe, or what can otherwise be called spiritual principle, can help make greater sense of the choices we face in light of a deeper-current sense of human diversity. Such ideas constitute one aspect of what it is to come to terms with the requirements of

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life in a planetary age. There is a possible connection here to contemporary scientific ideas based on the evolution of the species *Homo sapiens*, and humankind's place in an ecological circle of life. In mainstream scientific terms, the theory of evolution has been called "the most powerful idea in science".[1056] In other words, evolution by natural selection can explain more about the behaviour of man, his origins as a species and the beginnings and development of life than can any other idea or theory in science.[1057] Such ideas could be described as being naturalistic in focus, in the sense that they turn on established principles that come from within the usual range of naturalist abstractions. Even here however, recent developments in science have taken the notion of Darwinian evolution far beyond the usual range of ideas, for example that cooperation is a key evolutionary factor.[1058]

Naturalistic ideas regarding human behaviour and man as a species are important. However, from the thesis point of view, arguments about ethics based on notions from complexity and co-evolution need not always be naturalistic, and this because we are also looking here at a richer ontology. In this regard, ideas that concern human behaviour need not be understood on a solely naturalist principle, and particularly so if this is taken to work at what in thesis Chapter One called a more fundamental descriptive level where, ultimately, all observable phenomena can be explained in terms of their material antecedents. Arguably, man's moral awareness, his sense of that which is most worthy in life, what it is to treat others as beings of worth and dignity, or that which is of necessary significance in our relations with other persons, will not be understood solely in terms of classical evolution. Here, the question 'What does it mean to act ethically?' is not answered by referring *strictly* to the lessons found in the order in nature, however inspiring may be our experiences of these lessons, or how clearly we see in the order in nature the working out of a more general molecular or genetic code. The point discussed earlier in Part C of thesis Chapter Four is central here, namely, that in our efforts to give an account of human behaviour from an evolutionary or genetic point of view, we need to avoid explaining away the life we experience as self-understanding beings. These ideas were discussed in that chapter under the heading: How is Mechanism Conceivable? The point then is that an evolutionary, mechanistic account need not be rejected, that it has value and that it can contribute to our understanding of human behaviour. At the same time, because of the ontological level at which such explanations work, we cannot assume that they can in principle give a complete accounting of human behaviour. Using an idea from Taylor, the usual net of naturalistic abstractions is inadequate to such a task.

For example, supposing humankind constitutes an organic whole, then the life of each person born into the world constitutes a common trust to protect and foster.[1059] This principle of trusteeship would then serve as a starting point for ethical decisions that find expression in actions done for the good of others who are no different than ourselves. Given that such a principle fits into the notion that mankind's socio-cultural form of life is co-evolving, then one could indeed look to arguments from nature and lessons from the terrestrial and living worlds as an avenue for elaborating on what it is to act ethically, in the sense, say, that we are part of a larger organic whole. Also, our use of language often relies on metaphor involving the physical and living worlds in order to help give expression to a vast range of experiences and ideas that are hard to understand in other ways.[1060]

From the point of view being argued for here, explanation grounded in our genetic/metabolic/neural nature can be used to gain a more encompassing perspective, but not at the cost of explaining away what it is to live as self-understanding agents. This is because, first, no one level of description can adequately account for the meanings inherent in human moral awareness. Some one or another aspect of significance will be left out. But second, and as argued by Taylor, a richer ontology is needed than what is found in the natural sciences. This is precisely the point made by Nicolescu in his notion of levels of reality and the included middle, as well as Laszlo's idea that values constitute the chief defining feature of human culture.[1061] Attempts to explain the function of cultural values in terms of our genetic inheritance, or the effort to account for consciousness in terms of neural

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processes, may involve the idea that explanation takes place at the more fundamental level of their mechanical and material antecedents. The key point here is that man's dialogue with nature has entered a phase where it is possible to question classical assumptions without compromising intellectual integrity, and this with particular regard to the classical principle that human behaviour can be explained first in terms of neurology and physiology as well as genetics and molecular biology, but ultimately in terms of the laws of physics and chemistry.[1062] These ideas have their place, but only partially so.

This latter point again highlights one of this section's main organizing themes, that the emergence and evolution of our powers of self reflection, of which our sense of moral significance is one central form, has given rise to principles of socio-cultural evolution that cannot be understood solely in terms of the evolution of living organisms.[1063] Human consciousness, that is, self-consciousness in the sense Laszlo uses the term, is able to connect events in the past with the possibilities of the future, and perceive how our socio-cultural life in the present involves a host of interactions that take place across a wide range of value-scales, to coin a term. The extent to which life displays such characteristics is some measure of the growing complexity of the evolutionary process *per se*. In other words, and from this point of view, because humans are able to place themselves in historical circumstances that have long vanished from sight, imagine the prospects that current actions might hold for the future, and do so in ways that are not limited to any one place and time, then the levels of reality we can function across, be aware of, and make decisions about are correspondingly wider, and hence are more complex. This is one reason why questions about what it is to act ethically cannot be limited to, say, the preservation of a natural ecology of living things, but also speaks to the worth and dignity of people as self-reflecting beings whose societal life evolves through an expanded set of principles, not only the physical and biological realms, but also those that pertain to the intellectual, spiritual and intentional dimensions of life.

Our powers of self-reflection enable us to look back across the processes by which evolution itself has worked, to see how our powers of self-reflection serve to transform the entire evolutionary dynamic, and to use the powers thus gained to investigate, reflect over and act to change the human world. From the point of view being argued for here, part of this involves investigating and consulting over matters of inescapable significance through a language of qualitative contrasts, to reflect on what such contrasts say to us as persons, and as agents to link these to actions in ever widening circles of social responsibility and obligation. Some of these obligations are based on questions of worth or dignity in the practical moral sphere. Others deal with a set of encompassing or transcending values. Still others treat questions of productive purposes, the use of technology, and the leverage of natural forces for human well being. While yet still others concern questions of aesthetics and craftsmanship. All of these, can involve a deeper-current sense of human diversity, one that could lead to gains in both knowing and judging the principles at work in man's socio-cultural life in a planetary world, and the spiritual significance of the decisions we make within it.

One of the principles at work in a complex planetary age concerns the organization of knowledge – an aspect about which Edgar Morin has written extensively. Ideally, and in Morin's thinking, complexity is linked to the organization of knowledge as well as the knowledge of organization, the complimentarity of which should open up opportunities for the exercise of our human capacity, including the amplification and extension of that capacity through technology. A key question that emerges here concerns the links between such knowledge, the character and extent of the interdependence that actually exists in our world, the kinds of human-centred judgements this calls for, and assumptions about the nature of socio-economic development. Such ideas are discussed in the next Part.

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Part B: Complexity

Part B will attempt to present a limited set of ideas on what it is to think in complex terms, together with some of their broader implications for patterns of practical reason and consultation that can aid in making sense of decisions about the development and use of technology in a planetary context. The main focus of the discussion will be on Morin's work From the Concept of System to the Paradigm of Complexity (1992), and Morin and Kern's *Homeland Earth: A Manifesto for the New Millennium* (1999).[1064] Part B will thus pick up on ideas first discussed in Part B of thesis Chapter Three, and is divided into two sections. Section 1 will present Morin's ideas on complex systems. Section 2 will consider how such ideas relate to what Morin and Kern call the planetary era.

Section 1: General principles

Some initial comments about technology

In general, Morin and Kern in *Homeland Earth* (1999) argue that humanity is in crisis due in part to a runaway positive feedback in technological, scientific and economic production.[1065] Such a runaway feedback results, they argue, in the accelerating dominance of a technological-scientific mindset over culture, civilization and man's understanding of his world. While the processes at work here can give rise to new ordering principles and new forms of knowledge, including the technological and scientific, Morin and Kern would argue that this can only come about if some kind of boundary is created around what they view as a hyper-expansion in techno-scientific thinking and production. In the form of control or regulation, such boundaries would serve to guide the use of technology in line with what they call Earth centred goals, but would be required only to the extent that a technological mindset in fact poses a threat to man's cultural life, to his qualities of spirit, to the emergence of a planetary civilization, and to the living, terrestrial world.[1066] In other words, their argument is not an anti-scientific one, but is directed against the excesses of what they view as an overly technological-scientific mindset that, without proper attention, would tend to dominate our thoughts and decisions, arguably for the worse.

The point to make here, therefore, is not to dismiss the use of science and technology as some kind of blight on the life of mankind. Indeed, they can offer "the very means for the administration of the complex life of a united world".[1067] The point instead is to find a balance between the kinds of decisions we make concerning their development and use, and the transformation in the forms of human living that are more aligned to the central dynamics and underlying spirit of a planetary age.

Morin and Kern have the following to say about the threats that face humankind in a planetary era:

> If one considers together the two crisical and critical cyclones of the two World Wars of the 20th century along with the unknown cyclone in the process of formation, if one considers the deadly threats that humanity has brought on itself, and if, finally and especially, one considers the current situation of overlapping and indissociable crises, we see the planetary crisis of a humanity still incapable of realizing itself as humanity.[1068] Humanity is caught in a tragic and uncertain struggle in which symptoms of death and birth wrestle and fuse with one another.
> ...
> The world is being swept by blind forces, by runaway positive feedback, by suicidal folly. However, there is also the globalization of the call for peace, democracy, freedom and tolerance.[1069]

Another aspect in Morin and Kern's explanation for this crisis comes from what they consider to be a general acceptance of the Western paradigm of disjunction/simplification, in other words, a paradigm which "separates the different aspects of reality from one another and isolates objects or phenomena from their environments".[1070] They hold that by thinking in terms of this paradigm one

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tends to get a truncated image of our social and historical life, wherein the picture of reality is typically limited to a single place or time, misconstrues the human and the living dimensions, and opens the door to a callousness towards the sufferings of an age. Conceptions about the purpose of technology, as well as economic and institutional decisions about its development and use that derive from this paradigm, would then be additional aspects in what they describe as a runaway positive feedback.

Instead, Morin and Kern argue that the mutual interdependence in which all human persons live, and by virtue of which societies now exist and function, requires a planetary perspective that combines both the local and global, and which includes as well a sense of the reality of ourselves as persons living in a complex, multilevelled social world.[1071] In this respect it becomes crucial to reason about the threats of the age in complex terms. While conceding that what they call complex reason is itself partial and unsure at best, especially given that in their view any attempt to grasp reality is partial, Morin and Kern argue that thinking in complex terms allows us to recognize the "transformative potential of time", to thus realize what is possible in the organization of knowledge, and so contribute to finding new opportunities for the exercise of human capacity.[1072] In addition, notions of a complex social world can be related not only to the way decisions are made about the development and use of technology, but also to the very conception of what technology is and does.

Such a transformation implies the coming into being of a humanity that recognizes itself as humanity, where the conscious pursuit of what Morin and Kern call hominization as the aim of development would contribute to a civilization wherein one might "witness a planetary community/society of individuals, tribes, and nations".[1073]

Morin and Kern situate their notion of development in a multidimensional context. They write:

> The notion of development therefore must be extracted from its economic matrix. Development should no longer be equated with growth, which, as Jean-Marc Pelt has put it, "has become cancerous". The notion of development must become multidimensional and escape from or break the Western moulds that control its meaning and norms, not only the economic ones, but the cultural and civilizational ones as well.[1074]

From their point of view, notions of development need to be divorced from a strict economic matrix, become multidimensional, include what they call cultural and civilizational meaning and norms, be conceived anthropologically, and include "the unfolding of our potential, whether psychic, spiritual, ethical, cultural or social".[1075]

It is worth noting that, so far as the thesis argument is concerned, a language of qualitative contrasts as well as patterns of reason and consultation based on strong evaluation could arguably provide gains in understanding such a multidimensional notion of development, and more specifically those decisions regarding the development and use of technology that might accompany it.

Two preliminary ideas

Turning now to the abstract notion of complexity, in the article, From Concept of System to Paradigm of Complexity (1992), Morin's presents his ideas in terms of complex systems and the interactions and organization they involve.[1076] Two preliminary notions need to be mentioned regarding such systems. First, a key point for Morin is that complex systems cannot be simplified in an attempt to understand them. He develops this point in two senses. First, they cannot be simplified by breaking them into component parts, each to be analysed separately. For him such simplification is one of the key aspects to thinking in terms of disjunction. Though this manner of thinking may be central in explaining the workings of some systems, it does not fit particularly well

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into the kind of dynamics that characterize complex systems. Second, complex systems cannot be simplified by considering them as a totality, or through what Morin calls holistic simplification.[1077]

For him, both disjunction and holistic simplification are an attempt to reduce the idea of complex phenomena to a single explanatory level. Instead, the notion of complex systems, or complex organization, is more properly a macroconcept wherein a range of ideas are involved in mutual implication, such that the only way to get at any one of them is to consider each of them in relation.[1078] It is in this sense then that complex systems cannot be completely understood through the logic of disjunctive reason, that is, the breaking of the whole into component parts followed by its analysis down to the level of elementary constituents localized in time and/or space. Nor can such systems be grasped by regarding the complex as a simple totality, that is to say, by reducing everything to a characteristic of the whole. Instead, complex thinking for Morin "endeavours to connect that which was separate, while preserving distinctiveness and difference".[1079]

The second preliminary idea for Morin is that the notion of mutual implication involves what he calls an active loop, a phrase he uses to try to characterize in more precise terms the link between whole and parts. In Morin's words, such a link involves a "constructive circularity of the explanation of [first] the whole through the parts and [second] of the parts through the whole".[1080] He furthermore holds that the two explanatory avenues at work here, if viewed from the stance of disjunction, would be thought of as being mutually exclusive.[1081] However in such complex, or recursive, pattern of thought, what is involved in the one aspect cannot be grasped without referencing what is involved in the other. According to Morin then, when thinking in terms of an active loop there is no one-way implication from first premise to conclusion. Each highlights aspects of the other which could not be realized by reasoning in strictly sequential terms. He argues that it is via such active loops that thinking about complex systems avoids being limited to a single category. Given this, Morin goes on to make the point that if the notion of complexity is to reach its full potential in our thinking, then it needs to be grasped as a paradigm, not as a concept.[1082]

System unity

The image of an active loop provides an avenue by which complex phenomena can be conceptualized, but, more than this, Morin argues complexity can be taken up at the level of explanatory principle. That is to say, from Morin's point of view we do not adopt a way of thinking or a method of research that aims to reveal the characteristics of some system or phenomena which, when all is said and done, is identified as being complex. Instead, phenomena *are* complex. The fact that they are complex is the starting point of for further knowledge. As such Morin argues that a different species of explanatory principle can be invoked. According to him, the explanatory principle typically used by classical science, based on the existence of particular entities and their simple location in space, "held explanation to consist in reduction to a principle of order (laws, invariances, averages, etc.)".[1083] Instead, the paradigm of complexity asks that one speak of complex organization as an irreducible principle, one in terms of which we can then begin to make sense of other things related to it.[1084]

Morin links his views of complex organization to what he calls macro-unity, in the sense of a unity which comes from the way wholes and parts relate.[1085] Perhaps another way to think of macro-unity is that the dynamic interaction and organization found in a given complex system serves to produce a set of observable system-wide characteristics, or what Morin calls the phenomenality of the system. In other words, we see in it these particular characteristics, all of which make it the kind of phenomena it is. The phenomenality of a system, or what here will also be called system unity, emerges from the mutual interaction between parts and wholes. Each part in its own proper context can itself be a whole with respect to those relations that comprise it, while each whole can act as part of a more encompassing set of relations. Such unity is what gives phenomena a reality that we

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experience as being over and against our thinking about them – the traits, characteristics, features, attributes etc. that something possesses, and by which we recognize it as *that* entity. Hence, Morin speaks of the phenomenality of the system, as possessing a reality that is of its own – that it resists our thinking about it, to repeat Morin's characterization.[1086] In this respect then, system unity is another way to speak of the observable properties or qualities of a given phenomena that come about from the way in which whole and parts interact. It is worth adding, however, that the unity here intended is not an undifferentiated mass, but an expression of inner diversity.

Morin identifies nine ways in which whole and parts interact. In other words, there are nine dimensions to system unity. Three of these speak directly to the notion being discussed here.[1087] First, the whole possesses traits that are not found in any of its parts. Such traits emerge from their interaction. An inspection of the parts would find no evidence of these global traits. Second, there is a kind of tension, so to say, between the whole and the parts such that the organization of the whole can restrain or dampen the appearance of characteristics that would properly belong to the parts. Third, a given system has "dynamic organization" where, on the one hand, multiple levels interact to create attributes which characterize the entire process-reality of that system, and on the other, the overall organization acts on the processes occurring at multiple levels within it.[1088] In other words, complex systems are systems that are partly characterized by their non-linear interactions, or positive feedback loops.

Morin goes on to argue that it is out the framework of such relations between parts and whole that we can begin to account for living systems:

> Life is a cluster of emergent qualities resulting from the process of interaction and organization between the parts and the whole, a cluster which itself retroactively affects the parts, the interactions and the global processes that produced it.[1089]

In a related move, Morin goes on to argue that "being and existence are emergent from all processes containing feedback loops". From this stance the concepts of being and existence need not be identified as primary, radical or essential qualities, but as "real instances of emergence", or what he also calls global emergent qualities.[1090] Clearly, the kind of being or existence referred to here is different from that which is posited in the conception of an entity as a whole – the existence of a single totality, or its essence.[1091]

System organization

According to Morin, it is not entirely correct to say that the whole is made of parts as such, "but of actions among complex units which are themselves composed of interactions".[1092] In a similar move, and as was suggested above, the notion of system is more correctly seen as a macroconcept:

> It has been justly remarked that it is not the cells, but the action taking place among the cells that constitute an organism. Now, the set of these interactions constitutes the organization of the system. Organization is the concept that gives constructive coherence, order, regulation, structure etc. to the interactions. In fact, the notion of system comprises three different concepts:
>
> * system (which expresses the complex unity and phenomenal character of the whole, as well as the complex of relations between the whole and the parts)
> * interaction (which expresses the set of interwoven relations, actions and reactions which collectively create a system); and
> * organization (which expresses the constitutive character of these interactions as forming, maintaining, protecting, regulating, governing, and regenerating the system – in short, the thing that gives the idea of system its conceptual back bone).[1093]

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Furthermore, Morin states that:

> These three terms are indissoluble; each one implies the other two, and the absence of any one seriously mutilates the macroconcept of system. The idea of system without the notion of organization is just as defective as the notion of organization without the idea of system. We are dealing with a macroconcept. We must recognize that our consciousness has been shaped by the paradigm of simplification and that the concepts we have at our disposal are atomistic rather than molar, chemical rather than organismic, isolated and static rather than coproductive, recursive, and interdependent.[1094]

In a similar way, the notion of hidden structure that is used in classical scientific thinking has limits when it comes to complex organization, in that the former speaks more to the idea of an invariant order. Approaching phenomena from such a point of view tends to simplify the phenomenality of the system to the architecture that frames it – the hidden structure emphasized in thesis Chapter One. For Morin this approach arguably fails to consider the recursive relations that obtain between system, interaction and organization.[1095]

In Morin's scheme of thought it is given that organization is dynamic. All living systems, and many physical ones, include various energy or information exchanges as an integral part of their organization. Morin mentions supply, storage, distribution, and control of energy and its expenditure and dissipation through work.[1096] These ideas go back to Prigogine and Stengers' notion of dissipative structures, which are process structures that channel energy, matter and information in such a way as to build up and maintain novel states of order in far-from-equilibrium conditions that should otherwise produce disorder.[1097] For Morin, two main characteristics distinguish the concept of organization. First, systems tend towards disorganization, and so are continually being reorganized. In this sense systems are not characterized by organization but by continual "re-organization".[1098] Second, systems that are self-organizing involve "auto-re-organization".[1099] According to him, this holds for a wide range of physical, biological, ecological, knowledge or social systems. They are continually degenerating, and are in turn being regenerated.

Living things add extra dimensions to the macroconcept of system-interaction-organization. For Morin these include the distinction and interaction between genotype and phenotype, as well as a wide range of exchanges with the environment. As a result, living things or "biological organization" as Morin calls it, are also characterized by the ability to maintain their integrity and autonomy, interact openly with their environment, and evolve over time.[1100]

Furthermore, and along a slightly different train of thought, thinking of system organization as an irreducible explanatory principle contributes to gains in knowledge by enabling us to recognize that uncertainty, which is an analogue for disorder in a system, has a place in the way we picture what it is to know something. To use a metaphor, we need to be cognisant of a kind of penumbra that is a part of all areas of knowledge.[1101] Continuing with this idea, there is something different between ignorance as the simple absence of knowledge, and ignorance as something we can be aware of and which always accompanies what it is to know something.[1102] Arguably, such a distinction plays a part in notions of lived time. In other words someone who has a grasp of the link between what is known and what is unknown, or what is still to be known, will not regard them as negatives but as necessary, complementary components of what it is to explain or judge the world. In other words, explanations would involve some kind of transition, or epistemic gains, to use a phrase from Taylor. Such a person may well have a different notion of the passing time than might someone who thinks of knowledge as the elimination of uncertainty and the removal of contradiction.

According to Morin, system organization as an explanatory principle serves to counter two habits of thought that he argues often appear in the paradigm of disjunction/simplification.[1103] First, disjunction tends to reduce things to their structural features, or otherwise abstracts them from their

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rich interconnectedness, and so tends to focus on what is regarded as their essential aspect (i.e. that which can be said to exist in its proper sense). In so doing we may get a skeletal picture of existence in that it is truncated, cut off, or isolated. We are then left with only the outline of things, having set aside other aspects that make up an actual being. Second, the paradigm of simplification tends to restrict thinking to a static sense of being or existence, one which, according to Morin, the paradigm of disjunction has helped to cement in our understanding of reality. A sense of what makes up things, so to say, can be analysed into simplest existing parts.

From Morin's stance then, by virtue of the effort to view things in complex terms, and by the use of ideas such as the macroconcept of system-interaction-organization, being and existence are understood differently in regard to what constitutes reality. In Morin's words, "the idea of self-organization is productive of being and existence"[1104]

Complexity and ontology

The paradigm of disjunction/simplification employs, according to Morin, at least two views regarding the ontology of systems. In the first, it is physically real and stands on its own as an object of study, in which case part of the task of explanation is to represent its workings.[1105] Alternatively, it is an aspect of mentation, a design idea, a thought model or an intellectual construct that is used to guide thinking.[1106] For Morin, such distinctions would tend to limit thinking about complex systems. In terms of the paradigm of disjunction, there is something externally real going on. However, the reality of complex systems cannot be represented or explained in the usual intersubjective sense, that is to say, in the way we have become accustomed to in Western intellectual culture when thinking in terms of disjunction or simplification.

For Morin, and as with the relation between parts and wholes, the ontological status of systems involves a mutual link between two aspects, the psychical and physical:

> The fact that the psychical and physical nature of systems are indissociable also entails the indissociability of the relation between the observer/subject and the observed/object. This leads to the necessity of including, not excluding, the observer in the observation.[1107]

A material system exists physically in its actual (e.g. measurable) interactions, part of which come from the conditions that brought it about, and part from those conditions that presently characterize it. In other words, its history is part of what makes it real.[1108] It exists psychically in the sense that we choose a conceptual focus in order to make sense of the system. In other words, a system has certain distinguishing features that we recognize according to the knowledge available to us, such as subsystem, supra-system and eco-system, to cite Morin's terms.[1109]

As just quoted, for Morin there are close links between the act of observing and the condition of being observed, or between being a subject and being an object. In other words, the problem of ontology here is not a question of establishing essential or abstract features and identifying them as that which makes up something, the problem then being how do we come to know it. Instead, it would be more proper to try to grasp the way things exist in relation to others. In Morin's view, the way in which we can say a complex system has phenomenal existence, or has a particular dynamic reality, is by acknowledging and investigating the links between system, interaction, and organization. Said differently, to be able to make sense of what something is, we need the macroconcept of system-interaction-organization. Included here as well is the distinction made earlier between knowledge and ignorance. The latter is not about the simple absence of knowledge. It is used to help demarcate and describe that which we know, so as to keep us from making distinctions that do not necessarily exist in reality.

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In general then, Morin argues that in the case of complex systems, to know them involves a kind of meta-system of understanding. Morin writes:

> This, in turn, leads to the necessity of elaborating a meta-system of understanding in which the system of observation/perception/conception is itself observed/perceived/conceived within the observation/perception/conception of the observed system. This, then, sets in motion a series of consequences which lead to the complexification of our very mode of perceiving/conceiving the phenomenal world.[1110]

Continuing with the same idea, Morin then notes that the paradigm of complexity in fact calls for another shift in thinking. He writes:

> Whence the necessity for an even more significant paradigmatic and epistemological reform than the one we have envisioned up to this point, since the connection between the knowledge of organization and the organization of knowledge demands a reorganization of the process of knowing. This can be done by introducing a second-order reflection – that is, a knowing of knowing.[1111]

In terms of the discussion earlier in this chapter, this knowing of knowing is of a reflexive, recursive or self-referring sort. It is the sort of thing that humans do pre-eminently as self-understanding beings, to use an idea from Taylor.

Complex organization

Morin agrees that some phenomena "can be explained at a fundamental level in terms of a few simple principles that allow for an almost infinite combination of a few equally simple elements".[1112] In other words, explanation based on the principle of simplification does hit the mark. However, there also exists a wide range of phenomena that cannot be explained in this way. This is where the notion of system organization as an explanatory principle comes into play. In general, complex phenomena have their own emergent qualities, so to speak, depending on the dynamic principles and history that give rise to them. In other words, the explanation of complex organization is of a different order, or occurs at a different level of reality, to cite an idea from Nicolescu.[1113] In Taylor's terms, we are looking at a richer ontology than naturalism allows.[1114]

More specifically, there are a range of aspects in the physical and living world that can be explained via simple elements and basic laws. Morin cites the explanation of speech based in the combination of phonemes and words, and DNA based on the combination of the two base pairs (A-T/G-C).[1115] However, while the four bases in DNA explain something of the machinery of life, they do not give us life as such – the emergent qualities that constitute the phenomena of living beings. Likewise, even if phonemes and words account for the formation of speech, they cannot be used to explain what is it to have language. The characteristics that we recognize as constituting living things or which gives language significance will not be accounted for via simple or underlying elements.

A few comments are useful as a follow-up to these ideas. Modern empirical science is, in both its theoretical and applied aspects, driven in part by a striding confidence in the concepts and methods it uses. With this comes a belief that natural phenomena can in principle be explained from within its conceptual tack. As argued at length in thesis Chapter One, classical science looks for the truth found in a hidden structure or an underlying mechanism, or at least what can be said about such mechanisms. However, its failure to account for phenomena such as the emergent qualities of living beings or the significance language gives us, has tended not to encourage exploration of other avenues of knowledge but to argue that these emergent phenomena are in some sense secondary. That is to say, they do not speak to the reality of the thing being studied. The actual explanation is located in its hidden structure, at a more fundamental descriptive level, to borrow an idea from Prigogine and Stengers. As a result, such phenomena tend to be overlooked, or may be disregarded

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as objects of proper study, or are to be explained on scientific grounds that tend to turn them into surface features, epi-phenomena, subjective experiences, personal interpretations, or pro-con attitudes.[1116] Morin's argument for a paradigm of complexity in part is to help to bring back into our sense of reality the concrete being and existence of these kinds of phenomena – that they not be explained away. There are obvious similarities here to the discussion earlier in thesis Chapter Four regarding the notion of significance, and the ontological link between intent and action.

However, Morin also acknowledges that his approach too cannot account for the world we see, and seek to know. He argues that there is always some level of uncertainty or gaps in accounts based on complexity.[1117] What thinking in complex terms can arguably do is to make the links between system, interaction and organization part of open discovery.[1118]

Writing in the context of the consequences of modern theories of the atom, elementary particles, and the evolution of the universe, Morin notes that:

> Uncertainty, indeterminacy, randomness, and contradiction appear, not as residues to be eliminated by explanation, but as ineliminable ingredients of our perception/conception of reality – thus spelling ruin for simplification as an explanatory principle. From now on, all of these ingredients must nourish the elaboration of a principle of complex explanation.[1119]

Commenting further about the "physical foundation of what we call reality" Morin holds that:

> Complexity cannot be simplified – that is the moral of the system paradigm. It is complex because it forces us to unite ideas which are mutually exclusive within the framework of the principle of simplification/reduction ... It is complex because it establishes mutual implication – and therefore necessary conjunction – between notions which that [sic] classically disjunct.[1120]

A notion of dynamic organization is key in such thinking. To be precise, the paradigm Morin speaks of is not one of complexity as such, but organization. Organization in a system is "the play of interactions between the parts involved and the whole".[1121]

Furthermore, links between knowledge of organization and the organization of knowledge create the possibility for expanded notions of evaluative social issues, and hence the decisions made regarding them, including questions about the development and use of technology. From Morin's point of view, the paradigm of complex organization calls for additional patterns of reasoning:

> We begin to catch a glimpse of a new form of rationality. The old rationality was content to fish for order in a sea of nature. But it caught no fish – only fishbones! By allowing us to conceive of organization and existence, the new rationality allows us to perceive not only the fish, but the ocean as well – that is to say, that which can never be caught.[1122]

Section 2: Complex reason

Relevant knowledge and reforms in thinking

Morin and Kern attempt to think through the paradigm of complex organization from the point of view of the Earth as the planetary home of a diverse, multi-cultural humankind. They give further attention to the kind of rationality needed to make knowledge of complex organization relevant to planetary goals, and hence the evolution of human society. Their ideas can arguably be used to help expand notions of what constitutes practical reason and, and so make gains in understanding the significance of the decisions people make with respect to technology in a planetary age.

Contemporary societal problems and the attempts to respond them signal a historic change in perception. The most pressing questions of the age are global in scope. There is a sense of

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significance and consequence in these problems which did not occupy the thinking of prior generations in the same way. The planetary age has arguably served to transform people's understanding of the choices they face, be they of local, national or regional concern. More particularly, matters of substance and consequence in the problems humanity faces call for a reform in thinking about our planetary context. Concerning this reform in thinking Morin and Kern write:

> To be sure, it is impossible to know everything about the world or to grasp its multiform transformations. However, although chance ridden and difficult to attain, one must strive for knowledge of key information concerning the world, otherwise one will be condemned to cognitive imbecility. This is true even more so given that the current context of all political, economic, anthropological, ecological, and so on, knowledge is the world itself.
>
> The Planetary Era demands that we situate everything in the planetary context. Knowledge of the world as world has become an intellectual as well as vital necessity. It is the universal problem of every citizen: how to gain access to global information, and how to acquire the possibility of linking together and organizing it. To do so, and thereby recognize, acknowledge and know the problems of the world, we need a reform in thinking.[1123]

It is useful to note that technological and scientific knowledge can be added this reform in thinking. Such thinking can as well include evaluative decisions regarding their development and use according to the lights of the world's various cultures. Such a reform would also include learning how to link together these different knowledges, to organize them, to grasp their significance in a multicultural and planetary era, and to better discern the problems of the world based on the understanding to which they contribute. Collectively, these can form a larger context in terms of which this thesis argument has tried to make sense of practical reason in a planetary age. This is especially so where the notion of practical reason, à la Taylor, involves a being open to, a being able to be influenced by the distinctly human grasp of what is significant in our world

From another standpoint, the reform Morin and Kern refer to is away from what they describe as fragmented thinking, towards thinking that is placed in a planetary context.[1124] Here fragmented thinking refers to thinking that "compartmentalizes, divides, and isolates".[1125] According to Morin and Kern, such thinking is partly characteristic of highly focussed disciplinary fields of research, and tends to encounter problems in making sense of the kinds of mutual implication that is needed to come to terms with the dynamics of complex systems. A similar point was mentioned in the discussion on Nicolescu in Chapter Three. Morin and Kern describe such fragmented thinking as "technobureaucratic mind", a mode of thought that "is as incapable of perceiving as of conceiving the global, the fundamental, and the complexity of human problems".[1126]

Furthermore, an "abstract and unidimensional rationalization" for Morin and Kern shows itself in an institutional mindset, and in the way decisions are made where fragmented thinking holds sway.[1127] They use the example of how such intelligence has shown itself in land-use planning, both in agricultural production and in urban growth. Their most severe criticism is reserved for 20th century disciplinary experts and decision-makers who were convinced that their knowledge of the world was adequate to the consequences of their choices. In Morin and Kern's words:

> Everywhere, and for decades now, supposedly rational solutions put forward by experts convinced they were working for reason and progress, and that the customs and fears of the populations they encountered were based on mere superstition, have impoverished as much as they have enriched and have destroyed as much as they have created. The most monumental masterpieces of this technobureaucratic rationality were realized in the U.S.S.R.: Rivers were diverted to irrigate, even during the hottest times, hectares of treeless land to cultivate cotton, which led to the salinization of the soil through the surfacing of mineral salts, the evaporation of underground water, and the drying up of the Aral sea.[1128]

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Like Taylor, Morin and Kern argue against the kind of foundationalist thinking that tends to pass over the significance things have for human persons:

> Intelligence that is fragmented, compartmentalized, mechanistic, disjunctive, and reductionistic breaks up the complexity of the world into disjoined pieces, splits up problems, separates that which is linked together, and renders unidimensional the multidimensional.[1129]

This kind of thinking is easy to link to what appears to be a common pattern of reason about technology, or technical know-how, one which focuses on needs driven, analytical, empirical solutions to specific problems. In this regard, technology is a tool, or a means for achieving what people need or want. Of course, such tools have given us much, and modern living would be impossible without the kind of thinking that goes with them. However, from the point of view being developed here, this kind of needs driven approach to thinking about technology will likely struggle to get a proper grip on the problems of a multi-cultural and planetary age, and perhaps especially so when it comes to the principle that mankind is one..

There is an arguable connection here to Morin and Kern's various doubts concerning those forms of development thinking that are limited to a materialistic conception of human life, as well as a fragmented conception of that which constitutes development.[1130] In Morin and Kern's terms:

> The Earth is a complex biological/anthropological totality wherein life emerges out of the history of the Earth and humanity emerges out of the history of terrestrial life. The relation of humanity to nature must not be conceived in a reductionist or disjointed manner ... Humans are both natural and supernatural beings that, although rooted in living and physical nature, emerge from this nature and distinguish themselves from it through culture, thought, and consciousness/conscience.[1131]

The point here is that the majority of the human race does not accept a strictly materialistic conception of reality, even though it arguably remains the assumed starting point for debates about development choices. As a result, mainstream thinking about development and development goals may fail to recognize that, in so far as the majority of people who are the intended beneficiaries of planning are concerned, the deeper-current motives for advancement in human life do not come from the pursuit of material gain only. They derive as well from the aspirations of the spirit, the sense in which higher emotions constitute an abiding source of meaning and contentment in life, that these find significance in a rich community existence, and where, for many, the search for an acceptable form of life is not bound by the inconstant or fleeting.[1132]

The concrete universal

Morin and Kern contrast these latter ideas to what they call the standard model, one that guides a range of contemporary decisions which tend to be "more rationalizing than rational".[1133] They argue that:

> True rationality is open and enters into dialogue with a reality that resists it. It shuttles incessantly between the logical and the empirical. It is the fruit of considered debate and not the property of a system of ideas. A reason that ignores living beings, subjectivity, emotions and life is irrational. One must make room for myth, feeling, love, and regret, and consider them rationally. True rationality knows the limits of logic, of determinism and mechanism; it knows that the human mind is not omniscient and recognizes the mystery of reality ... True rationality is not merely critical, but self-critical. It is recognizable in its ability to recognize its own insufficiencies.[1134]

It is worth noting that in some respects Morin and Kern's notion of rationality may not be far removed from Taylor's characterization of reason as a being open to that which is of significance for self-understanding beings. In this respect then, the reform in rationality they refer to is part of an expanded conception of practical reason.

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As an aside, and from the thesis point of view, in an attempt to expand the notion of rationality it would be a mistake to simply replace or even discount classical modes of thought. These modes involve a rich tradition of ideas that continue to serve as an example of intellectual integrity and explanatory power. Thus, while a system of ideas based on disjunction may not be up to the task of reasoning practically about the decisions people face in a complex planetary world, this does not imply that it be abandoned. Foundational or apodictic patterns of reason have a place in coming to terms with how the world works and in making good the means to live in it. There is no need then to exclude these patterns of thinking from an expanded image of reason.

In any event, thinking within a planetary context involves what Morin and Kern call the concrete universal.[1135] According to them this is something of a logical category which is neither an abstract universal nor a concrete particular, and which they hold is needed to make sense of a rich planetary dynamic in its social, economic, cultural, artistic, spiritual, psychological, political, scientific and technological domains. Morin and Kern note a range of characteristics that belong to their notion of the concrete universal, namely, that it: i) links that which is disjointed or compartmentalized, ii) respects diversity as it recognizes unity, iii) tries to discern interdependencies, iv) is multidimensional, organizational and systemic, v) considers an object being studied in its relation to its cultural, social, economic, political, and terrestrial environment, vi) is capable of a strategy that allows for the modification, even nullification of one's actions, vii) recognizes its own incompleteness in explanation, viii) can deal with uncertainty, the unforeseen, and interdependencies, especially those that arise from an emerging planetary scale of awareness, and ix) is able to make sense of discontinuity, non-linearity, disequilibrium, and bifurcations.[1136]

The chief characteristic of thinking in concrete universal terms is the ability to conceive what Morin and Kern call the recursive relations between the whole and parts:

> The particular becomes abstract as soon as it is isolated from its context, from the whole of which it is a part. The global becomes abstract as soon as it is detached from its parts. Thinking the planetary complex involves a ceaseless movement from the part to the whole and from the whole to the part.[1137]
>
> Planetary thinking ceases opposing the universal and the concrete, the general and the singular: The universal has become singular – it is the cosmic universe – it is the terrestrial universe.[1138]

The following statement from a United Nations sponsored conference speaks to a similar theme:

> The universal cannot be postulated in the abstract by any single culture: it emerges from the experience of all the world's peoples as each affirms its own identity. Cultural identity and cultural diversity are inseparable.[1139]

Thinking in concrete universal terms is arguably part of a pattern of practical reason and consultation that work beyond the entrenched divisions and divergent goals of the world, beyond the limits of a divided self and its own interests, hence towards patterns of thought that are more unifying and just. Notions of justice therefore also come to the fore in the concrete universal. Some of these aspects are suggested in the following from *The Prosperity of Humankind* (1995):

> ... [A] concern for justice is the indispensable compass in collective decision making, because it is the only means by which unity of thought and action can be achieved ... [J]ustice is the practical expression of awareness that, in the achievement of human progress, the interests of the individual and those of society are inextricably linked. To the extent that justice becomes a guiding concern of human interaction, a consultative climate is encouraged that permits options to be examined dispassionately and appropriate courses of action selected. In such a climate the perennial tendencies toward manipulation and partisanship are far less likely to deflect the decision-making process.[1140]

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From the perspective being discussed here, thinking in the context of the entire planet, or what the thesis discussion earlier referred to as a world-embracing point of view, partly involves seeing things in their mutual relation. It is a point of view wherein the significance of our actions can link to each other in sometimes unexpected ways, and so serve to change that which was the original point to our thinking and acting. Laszlo makes the following comments in this regard:

> If extremes of unco-ordinated chaos or imposed uniformity are to be averted, cultures will have to evolve a new level of understanding of themselves and others. Such understanding means accepting differences and recognizing that the cultures of the world are dynamic yet fragile entities. Cultures can change rapidly in a world of free-flowing information, and the change can enrich or impoverish them.[1141]
>
> On a crowded planet there is one future for all, or no future for any. The common future of humanity cannot be diverse without co-ordination, nor can it be united without diversity. To achieve such a world is a challenge to contemporary humanity, first and foremost to the cultures that inspire people's world-views and shape their values.[1142]

Such levels of understanding are arguably part of what the patterns of practical reason and consultation being explored in this thesis can help to realize.

Part C: Chapter summary

The discussion in Chapter Five highlighted two largely explorative approaches to explanation coming out of changes in the scientific view of the world that occurred over the last century. In particular, it tried to highlight some implications these approaches have for thinking about society, including some ideas at work behind the development and use of technology. It attempted to highlight certain patterns of reasoning and consultation in complex and co-evolutionary terms that are not strictly based on the notion of scientific explanation that dominates thinking about the development and use of technology. In addition, it attempted to draw out a set of ideas that speak to a planet-wide transformation in the way we organize knowledge and make decisions about technology, given such a planet-wide dynamic.

As a philosophical study of a select set of assumptions at work behind those decisions, the thesis thus far has proceeded along two avenues. First, it explored what it is to reason practically, and in this way attempted to avoid some of the chief sceptical pitfalls that arise when we think unreflectingly from within the naturalistic stance. This was the point to the discussion in Chapter Four. Secondly, and a key point to the discussion in this chapter, it pointed out that decisions about technology have a necessary social dimension. There is a dynamic to the way any society works, and this can come into play when trying to understand those assumptions. The position taken here is that such a dynamic now involves organization and society on a planetary scale. To consider a lesser scale is to ignore the transformation society is passing through. It is essential then to place decisions about the development and use of technology in the context of a planetary existence.

The next chapter brings together the analyses of the naturalistic stance carried out in Chapters One and Two, and the more exploratory discussions of Chapters Three, Four and Five. Its focus will be on technology and the evaluative decisions made about its development and use. The aim is to explore the way contemporary social transformation, understood in the context a slowly maturing planetary age and based in principle on the consciousness of the oneness of the entire human race, serves to change the very conception of what technology is about.

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Chapter Six: Practical reason and technology in a planetary age

Introduction

This last but one chapter explores some further aspects of a planetary dynamic as a proper context for thinking about technology, together with patterns of practical reason and consultation that can help make sense of decisions regarding its development and use. The discussion is wide-ranging and explorative. It brings together a host of ideas and points of view highlighted throughout the thesis discussion in order to explore four main areas. First, different conceptions of technology and related patterns of practical reason. Second, what is involved in rethinking existing technology incentives, or aspirations, in light of the requirements of living in a planetary age. Third, the links these first two points have with contemporary notions of socio-economic development, and what contribution they might make to alternative conceptions. Fourth, notions of consultation and the transformative potential of time which arguably form an integral aspect of practical reason, and what implications these notions might have for making sense of decisions about technology in a planetary domain.

The general theme of the chapter discussion concerns notions such as dignity, worth, the search for social justice and the pursuit of peace, and the unfolding of our psychic, spiritual, ethical, cultural or social potential – in sum, the spiritual dimensions of life – and the connection these have with patterns of practical reason and consultation in a planetary age. The discussion throughout will try to link these themes to Taylor's ideas regarding distinctly human significances, strong evaluation, and a language of qualitative contrasts. The chapter discussion will conduct a somewhat detailed examination of Morin and Kern's conception of social and technology development, and the patterns of practical reason such a conception calls for. Their notion of development is one that arguably works outside a strictly materialistic view of life, and which is based on the idea that humankind inhabits a single planetary home.[1143] The chapter discussion furthermore sets out to explore in broad yet bounded terms the overall thesis question: In what sense do decisions about technology speak to an advance or to a decline in human social well-being?

The discussion in Chapter Six is divided into six main parts. Part A serves as an introductory discussion of global choices involving possibilities for the organization of knowledge, what this means for learning in a planetary era, and their relation to decisions about technology. It is written to help set the stage for the discussion that follows in the remaining five parts. Part B, titled Conceptions of technology, will examine what might be called a classical characterization of technology based largely on the ideas of Frederic Ferré, to be followed by alternative notions of technology using Taylor's ideas of human agency, strong evaluation, a language of qualitative contrasts, and *ad hominem* patterns of practical reason. Part C attempts a broad, often explorative discussion of the idea of technology incentives, or aspirations, the inadequacy of a strictly materialistic view of life for making sense of a co-evolving society, and the implications these ideas have for making sense of technology decisions in a planetary age. Part D constitutes an expanded analysis of Morin and Kern's notion of development and its connection to complex organization, Earth-centred goals, and the transformative potential of time. Some specific links are also made between development and patterns of practical reason discussed in earlier chapters. Part E looks specifically at the transformative potential of time as it relates to consultation, patterns of reason, and the organization of knowledge on a planet-wide scale.[1144] Part F is the chapter summary

A note about the sources used in the chapter discussion is in order. A range of texts have been cited. Among these are quotations from Laszlo, Morin and Kern, Taylor, Bruner Bronowski, Ferré,

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Mouton and Shoghi Effendi, as well as institutional texts from UNESCO, The Universal House of Justice, the Institute for Global Prosperity and the Baha'i International Community – an NGO having observer status at the United Nations. As noted in the Introduction to this thesis, all of these texts have been chosen for the insights they offer into its three main thesis research questions, the exploration of which has engaged the whole of its discussion. As was also noted in the introduction to the previous chapter, the inclusion of texts from a faith-based organization is therefore not an attempt to advance any particular religious point of view, but to provide added depth of analysis to the chapter discussion.

Finally, as has been the case throughout the thesis argument, ideas discussed in previous chapters will be brought to the fore, not as simple repetition, but as a way of exploring things in such a way as to gain added depth of insight.

Part A: Global choices and human action

Introduction

As was suggested in thesis Chapter Five, the crises that engulfed peoples and nations in the 20th century has not put a stop to an expanding awareness of the necessity for a planetary outlook in the organization of knowledge, learning and human action – in Morin and Kern's terms "to work at what unites, to fight against what separates".[1145]

Even though conflict still dominates the issues of today, and while prejudice, malice and hate among people hinder the emergence of broader perspectives, yet authors such as Laszlo, Morin and Kern, Nicolescu, Jantsch and Prigogine and Stengers each argue in their own way for the necessity of a change in outlook that highlights some central characteristics of a planet-wide awareness.

It is perhaps easy to think that the move to a global understanding is now commonplace, for even though the peoples of the world appear to remain wedded to conflict it has long been impossible to see one's self or society in isolation from the rest of the planet's inhabitants. Two points are worth noting here. First, the historical significance of these changes, and second, the extent of learning still needed to bring them about. In the first point, nearly all established social and knowledge structures are in transition, which in turn asks for new patterns of consultation and decision-making. In other words, past experience is neither adequate for making sense of the decisions needed, nor sufficient to the conceptions called for in an emerging, co-evolving planetary era. This is particularly so when it come to the principle that mankind is one.

In the second point, thinking through some implications of a deeper-current, planet-wide point of view suggests how far actual decision and practice are from the requirements of the transitions being faced by people and societies across the globe. One example of this is the extent of the limits to unrestricted national sovereignty such transitions call for. This may be one reason why, despite the general recognition that people inhabit one planet, its practical transitions can be viewed as being politically naive. Yet for many people, communities, organizations and institutions, the harrowing trials of this and the last century serve to focus attention on the needs of humankind as a concrete universal, to form grassroots groups and associations bent on rendering some form of service or aid to their fellows, and hence on a growing resolve to move beyond the planet's current state of discord.

The general position taken here is that such discord is a reflection of mankind's failure to recognize and acknowledge that all people share a common terrestrial life, necessarily diverse in its particular social forms and cultural expressions, and based on the principle of the oneness of the entire human race. Each author and institution cited in the thesis adopts a generally similar stance. Laszlo, for

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example, argues at length for the embryonic prospect of an enriching unity in cultural diversity as a necessary step in the evolution of mankind's social life.[1146] Nicolescu holds that the trials and dislocations of the age in which we live require for their resolution conceptions operating at a next level of reality, involving in part a planet-wide perspective.[1147] It is obvious though that such prospects and conceptions must be learned. One aspect to this species of learning deals with decisions about the development and use of technology. Another concerns how our being open to, our being able to be influenced by distinctly human significances, to use Taylor's phrasing, can contribute to a mature consultation in general and to decisions about technology in particular. For this thesis the latter approach to practical reason constitutes a key dimension in learning to think in different terms about technology, and about the incentives or aspirations that accompany our technology choices in a planetary age.

Technology aspirations (I)

One key thread in the thesis argument is Taylor's point that understanding the patterns of reason used in the natural and social sciences can help bring to light what it is to reason practically. The relation of ideas here is mutual, as he repeatedly notes, such that to understand the one is to help make better sense of the other.[1148] Connections arguably exist as well between developments in contemporary science and changes in world-outlook. It is generally well recognized that the revolution in scientific thought that has taken place over the last 150 years or so, its associated effects on conceptions of technology, and the systematic application of knowledge to invention and productive capacity has helped to create the material, or metabolic-like, conditions within which contemporary societies operate. Whitehead, for example, argues that "The greatest invention of the nineteenth century was the invention of the method of invention".[1149] Furthermore, the clockwork image of an inanimate universe has been supplanted by new discoveries in contemporary scientific research. Areas such as quantum mechanics and irreversible processes are part of a move away from such classical notions as strict material cause, the explanatory reduction of all phenomena to a single descriptive level, the fact that only particular entities exist, the idea of simple location, and the premise that what is observed is distinct from the act of observation.

Two observations are worth making here. First, transformations in scientific and technological research have gone far to deliver the infrastructure needed for global co-operation across a wide range of undertakings. However, such transformation in research has also helped open the door to an exponential increase in the tools of war. At the same time, this machinery has provided people with avenues for witnessing human action across the planet as a whole, to know about and be affected by events taking place daily across the earth's entire surface, to be prompted and assisted in their own efforts to investigate reality and to make sense of the human and social world in which they live. In this respect then, one of the main scientific revolutions that have contributed to an emerging planetary awareness has been in geography. Together these factors can arguably help to promote a global transformation in thought and undertaking through various forms of cooperation and association. They can, however, also be used to maintain divisions, deepen inequalities, or serve the ends of those whose actions speak of a desire to exercise power in its dominating and ultimately corrosive forms.

Hence, and second, transformations in the organization of knowledge and society are accompanied by incongruities, conflict, and discord. Truly harrowing events have transpired in this and the previous century. Humanity appears to pursue crisis after crisis. People have employed sophisticated technology know-how and their society's productive capacity to destroy their fellow humans, each other, and the terrestrial world on an unheard of scale.[1150]

Yet authors such as Laszlo, Morin and Kern, Nicolescu, Jantsch and Prigogine and Stengers argue that a bifurcation has occurred in the organization of knowledge as well as in humankind's social

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life. This is shown, for example, in the manner by which Western and Near Eastern empires were swept away at the end of the First World War, and with them various entrenched religious and political systems that contributed to their own sense of moral right and dominating, colonial power. Over time a range of agreements, declarations and decisions have since been made which link all people to the prospect of an interdependent planet of nations, but whose leaders are now still only, and at times hesitantly, learning to work beyond the anarchy inherent in unfettered national sovereignty.[1151] The same authors also warn that what is currently witnessed are aspects of an immature or embryonic, sometimes only grudgingly acknowledged, interdependence. The main characteristics of a mature, mutual interdependence arguably remain to be fully understood or appreciated, let alone practiced. Indeed, from the point of view of the thesis argument, the failure to recognize the principle involved, namely, the oneness and wholeness of the entire human race, as well as the "peace-inducing attitude" that goes hand in hand with the level of awareness such a principle calls for, is cause for the continued disarray in human affairs and between nations and peoples.[1152] As such it arguably ranks among the first lessons still to be learned from the ruin and harrowing trials which the Earth's inhabitants have had to face over the previous 150 years.

A central and perhaps obvious point here is that contemporary problems cannot be thought through at the local, national, regional or continental levels only. To think about the problems of the age also requires a planetary perspective. That is to say, and picking up on an idea from Nicolescu, a next level of reality is called for in our conception of the workings of human society, the organization of knowledge, and the forms of consultation among the institutions of society that will take thinking beyond the idea of independent state sovereignty – what Nicolescu refers to as a transnational conception.[1153]

One aspect of the learning called required here might be called technology aspirations, or incentives, of a modern age. The idea of technology aspirations or incentives, as part of the "incentives of a prevailing order", is hinted at in the following passage from *The Prosperity of Humankind* (1985), written to help illustrate the extent of the transition called for in the conception and organization of human society in a planetary age:

> As the twentieth century draws to a close, it is no longer possible to maintain the belief that the approach to social and economic development to which the materialistic conception of life has given rise is capable of meeting humanity's needs. Optimistic forecasts about the changes it would generate have vanished into the ever-widening abyss that separates the living standards of a small and relatively diminishing minority of the world's inhabitants from the poverty experienced by the vast majority of the globe's population.
>
> ...
>
> This unprecedented economic crisis, together with the social breakdown it has helped engender, reflects a profound error of conception about human nature itself. For the levels of response elicited from human beings by the incentives of a prevailing order are not only inadequate, but seem almost irrelevant in the face of world events.
>
> We are being shown that, unless the development of society finds a purpose beyond the mere amelioration of material conditions, it will fail of attaining even these goals. That purpose must be sought in the spiritual dimensions of life and motivation that transcend a constantly changing economic landscape and an artificially imposed division of human societies into "developed" and "developing".[1154]

Following from the discussion of the ideas of Morin and Kern in thesis Chapter Five, it may be that some of these inadequate, perhaps even irrelevant incentives in the West involve a technoscientific mindset, which Morin and Kern argue still remains a key part of development thinking. According to them, such a mindset has worked hand in hand with an overly economic, at times materialistic, conception of human nature and of the workings of society in general.[1155] They note that the

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wholehearted pursuit of development in these terms served in part to brutalize individuals, families, communities and entire societies over the last century or so, as for example through forms of totalitarian rule, genocide, the destruction of the natural environment, or in the pursuit of a rampant personal liberty.[1156]

Part of humanity's co-evolution here arguably involves visualizing different patterns in the organization of knowledge and society. Included as well are attempts to find expression to our faculty for knowing or investigating reality, as well as for discerning or judging what actions are worthy of us in strongly evaluated terms – an attempt which Taylor would perhaps describe as constituting an epistemic gain.[1157] In Morin and Kern's terms, and to quote again from the discussion of their ideas in the previous chapter:

> The Planetary Era demands that we situate everything in the planetary context. Knowledge of the world as world has become an intellectual as well as vital necessity. It is the universal problem of every citizen: how to gain access to global information, and how to acquire the possibility of linking together and organizing it. To do so, and thereby recognize, acknowledge and know the problems of the world, we need a reform in thinking[1158].

Part of this reform in thinking arguably involves learning to recast the technology "incentives of a prevailing order", to put them in a "planetary context of political, economic, anthropological, and ecological knowledge" and so make arguable gains in discerning the worthiness or significance of decisions regarding the use of technology.[1159] One possibly fruitful avenue here is via the patterns of practical reason under discussion in the thesis – those based on self-understanding, complexity and co-evolution. Gains might also come about where decisions that need to be made are thought through in terms of the unique contribution people from each nation or culture can make.[1160] Included here as well, and equally so, would be such knowledge as concerns the unfolding of all people's "psychic, spiritual, ethical and social potential".[1161] Lastly, "knowledge of the world as world" and learning how to link it together and organize it would likely constitute a fruitful contribution to notions of development conceived in terms of the oneness and wholeness of human relations.[1162]

In the context of the above discussion, the rest of the chapter will highlight some different conceptions of technology, attempt to explore some implications these conceptions have for different patterns of practical reason and consultation, as well as for making sense of decisions about its development and use in a planetary age.

Part B: Conceptions of technology

Technology, evolution and intelligence

Ervin Laszlo speaks of "western rationalist-empiricist culture".[1163] Part of this culture arguably involves a tendency to link technology to intelligence, and intelligence to survival. In other words, human intelligence is shown up in the tools and techniques we learn to make and use in order to adapt to and survive the rigours of a harsh environment. In what could be called a mainline or classical point of view, the connection between technology and intelligence is shown up in part in learning how to fabricate and to use tools, in becoming adept in the various performances and outcomes they make possible, in a host of choices or actions people cannot reliably make or achieve without them, and in using them to find ways to adapt to and meet the challenges people face in a given social time or place.

In a reverse sense, existing tools, their mass production and distribution, and the particular focus or intent with which they are used may well help to create those very challenges. Accompanying this

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is the notion that modern technologies and the incentive of systematic innovation have so altered the face of human social and individual living as to influence our very ideas about what intelligence is, how we recognize and use it, the character of society and the functioning of its institutions, the patterns of conceiving and imagining possibilities for the future, as well as the kinds or species of choices people as self-defining individuals can make.

Working in conjunction with these mainstream ideas is the notion that the powers of the human central nervous system (CNS) are revealed, amplified, and extended via the tools people make and use – what Jerome Bruner calls "outside devices", a notion that is sometimes referred to as extension theory.[1164] Because of the way our powers are extended or amplified, a host of possibilities for action are created. In some cases the precise forms of action so created have never previously existed. In other cases the distribution of these tools on an unheard of scale, the possibilities for action that accompany them, and an attitude that seeks to derive advantage from their use has been such as to change the very contours and conceptions of social living, which paradoxically those same tools, possibilities and attitudes often help us to visualize and create.

The view that connects intelligence and technology to survival is also arguably found in classical notions of evolution which link the evolution of the brain and the central nervous system with the making and use of tools that aid survival.[1165] Such behaviour is part of the struggle for existence against a harsh environment that is central to a Darwinian conception of natural selection. The implied complementarity provides a mutual ascent of cortex, central nervous system and tool use, driven, for example, by the survival value of an ever more sophisticated brain-hand connection, stereoscopic vision, upright posture, language, and the capacity for planning outside the primary demands of immediate time and place.[1166]

Howsoever human intelligence may have evolved, four aspects of this mainline picture are worth highlighting.[1167] First, intelligence and its development can be pictured through devices, tools, and technologies made over recorded time and passing generations. These appear to display a generally ascending form of sophistication in their know-how and design within a given culture or civilization. Second, such inventions help to extend or to amplify human abilities or powers.[1168] For example, the invention of the airfoil and heavier-than-air flight brought to within human reach abilities not otherwise within the power of human action to achieve. Combustion engines serve to amplify long practised and familiar human powers, and multiply them in scales of strength, size or pace. Third, tools and machines provide leverage over natural forces, and deliver the wherewithal to build environments according to human designs.[1169] Fourth, in addition to machines and devices, intelligence is often characterized by theories, methods, models, and techniques of abstract analysis. The range of intellectual or conceptual tools here is extraordinarily wide, and includes ideas in physics, mathematics, chemistry, and biology, such as the theories of DNA leading to genetic engineering, chemical bonding and modern chemical synthesis, microelectronic materials and computer design, and the theory of differential equations in mathematics. Included here as well are theories from applied subjects such as medicine, agriculture, population geography, remote sensing, information and communication systems, and the many engineering sciences. Finally there is also a superabundant set of specific conceptual instruments and methods for research, analysis and the like, all of which are designed to assist in making observations, collecting analyzing and mining data, forming judgments and in making conclusions or decisions.

Extending this discussion, five riders to the above ideas are worth noting here. First, due perhaps to the current dominance of an analytical/empirical culture, it may be commonplace initially to think of such tools, implements, procedures, inventions, systems, instruments, concepts, theories etc. as coming out of or possessing a legacy from within the Western scientific or intellectual tradition. There are, however, a host of historic civilizations which have invented wide ranging tools and instruments that could be included in any such picturing of human intelligence. Second, it is not

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unusual for such civilizations to be classified or described in part by the materials from which their tools and artefacts are made, the techniques that were used to make them, as well as the systems of manufacture or communication its people invented. Third, it is hardly possible to separate tools, artefacts or systems of manufacture from the skills required to conceive, design, make, use, maintain, transmit and improve them. It is worth observing here that passing on such skills to a next generation of makers and users of technology is a main preoccupation of systems of modern mass education – itself a kind of cultural technology. In this regard, Jerome Bruner makes the point that classroom learning had to replace the kind of traditional, apprentice-like learning passed on from a master craftsman or from father to son because i) the tools of civilization became too sophisticated, that is, they became based on an extensive theory, and ii) the workforce required to run modern systems of technology and industry far outpaced the potential of such master or family based apprenticeships to provide the needed skills.[1170]

Fourth, the success with which tools are used influence the way we think about our technology choices. Part of the notion here is that a certain set of approaches to doing things is set up which tends to be self-sustaining. If these approaches meet with considerable success, then they tend also to set down habitual ways of thinking about what technology is and does, as well as the patterns of reason called on to make intelligent societal choices with respect to them. From this point of view, certain habits of thought may become so widespread as to put in the shadows, as it were, other modes of thinking about technology. Fifth, technology is accompanied by institutional processes and procedures that arguably give it a social reality requiring forms consultation to bring them off. Perhaps it is not far off the mark to say that without specific social institutions and their consultative procedures technology would not exist. It is thus proper to include the institutional and consultative dimension in a net of ideas that might try to link technology and intelligence.

Such a view suggests that a paired dynamic is at work. First, in many cases behind a technology or system there is some kind of design, image, or conception which serves to guide its construction or to direct its use. Second, a given instrument or contrivance makes it possible for humans to demonstrate a skill, or to assist in the performance of some action. From a classical stance, the link between the design of the outside device and the demonstration of the skill is a strong one in that, arguably and in Bruner's terms, human abilities or capacities are made apparent, and are developed and refined thereafter, by the use of outside devices that serve as extensions to the human central nervous system.[1171] In one sense, and in general terms, the notion of outside device could refer to our use of tools, apparatus, instruments, mechanisms, implements, and the like. The metaphor here appears to have a somewhat broad use, for example that the way we speak of our physical tools also serves to describe the way people use concepts, ideas, images and the like when constructing, as it were, the instruments needed to conduct research.

An extension of this metaphor is given by Jerome Burner who writes:

> Man's use of mind is dependent on his ability to develop and use 'tools' or 'instruments' or 'technologies' that make it possible for him to express and amplify his powers. His very evolution as a species speaks to this point. It was consequent upon the development of bipedalism and the use of spontaneous pebble tools that man's brain and particularly his cortex developed. It was not a large-brained hominid that developed the technical-social life of the human; rather it was the tool-using, co-operative pattern that gradually changed man's morphology by favouring the survival of those who could link themselves with tool systems and disfavoring those who tried to go it on big jaws, heavy dentition, or superior weight. What evolved as a human nervous system was something, then, that required outside devices for expressing its potential.[1172]

Burner goes on to add that man depends on the use of tools "for the realization of his humanity".[1173] He argues that it is important not only to think of the invention or mechanical device *per se*, but the

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skills needed to bring them about i.e. the "software" and "hardware".[1174] Language for Bruner is an example of the latter, and particularly so when it comes to what he refers to as our "powers of reflection":[1175]

> Language is perhaps the ideal example of one such powerful technology, with its power not only for communication but for encoding 'reality', for representing matters remote as well as immediate, and for doing all these things according to rules that permit us both to represent 'reality' and to transform it by conventional yet appropriate rules.[1176]

He continues by suggesting that in the evolution of *Homo sapiens* the use of stone tools as well as standing upright, with eyes set forward in the skull thus providing for stereoscopic vision, brings with them a basic social framework, the use of language, and some kind of culture.[1177] Jacob Bronowski in *The Ascent of Man* (1973) argues from a similar stance:

> I believe that as soon as the forerunners of man began to be nimble with their hands in making tools and clever with their brains in planning them, the nimble and clever enjoyed a selective advantage. They were able to get more mates and to beget and feed more children than the rest.
>
> ...
>
> It explains how the nimble-fingered and quick-witted were able to dominate the biological evolution of man, and take it ahead so fast. And it shows that even in his biological evolution, man has been nudged and driven by a cultural talent, the ability to make tools and community plans.[1178]

The human nervous system is central in such arguments, acting as the hidden or implicit organic mechanism that makes possible the expression of various powers, nimble-fingered or quick-witted action, as well as language and community plans.[1179]

In this view then, humans are partly characterized by the ability to successfully adjust in extraordinarily subtle and adaptable ways to changes in their environment, be it natural or built. In such accounts human potential is rooted in the workings of the central nervous system.[1180] From this point of view, the human brain is an instrument for thinking out a host of steps yet to come, and then putting them into action at the right time and in the correct sequence – a thoroughly practical aspect of reason. Intelligent behaviour would then involve mapping out actions in some order, or according to a chosen pattern or procedure. Such behaviour is arguably impossible without a language and a syntax that can be manipulated to assess both possible and probable sets of outcomes, and relate them via a set of steps ordered from first to last.[1181] From this point of view the intelligence humans possess via the instrumentality of the Central Nervous System is shown up in the tools people make, via their conception and planning, and in the way they are used use by individuals, in a community or by an institution.

Practical and theoretical intelligence

In line with the above ideas, Frederick Ferré in *The Philosophy of Technology* (1995) offers what might be called a mainstream account of technology.[1182] In so doing he makes a distinction between what he calls "practical intelligence" and "theoretical intelligence", relates intelligence in general to certain traits of thinking or "purposeful qualities of mentality" and associates these with technology and the use of tools in general.

According to Ferré, intelligence in a general sense is linked to a range of broad characteristics, for example, that it involves a flexible response capable of modification, is directly proportional to the speed of the response, makes for refined and subtle distinctions in concepts or mental categories, is especially adept at decoding complex combinations and identifying characteristic patterns, infers or plans for future events based on current actions, finds effective means of achieving goals through calculating courses of action, and assesses and chooses goals that can be effectively achieved.[1183]

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Such features of intelligence arguably follow some of the ideas discussed in thesis Chapter One on instrumental or procedural thought and foundational reason, and may also link to Morin and Kern's views regarding the paradigm of disjunction/simplification, as was discussed in thesis Chapter Five.

In this regard, Ferré's descriptions make for a clear division between i) reason as means, as a calculator of behaviour, or as a way to order actions in their correct time and place sequence, and ii) reason as a form of logical analysis, thinking in the abstract, and the uncovering of generalized patterns. It may also be that both are linked to the use of external performance standards or criteria set down in order to judge when reasoning is sound, notably where sequential planning and procedural thinking are prerequisites to successful action, or in formulating some kind of conclusion. From this point of view it may be apt to describe Ferré's ideas as comprising a classically Cartesian conception of technology.

Regarding what he calls practical intelligence, Ferré argues that it offers

> ... a regular way of achieving some abstractly envisioned aim. ... [M]otivated by the urge to live and thrive, practical intelligence sorts these envisaged possibilities into orders of relevance for realization and attempts to guide action into fruitful channels of regular method.[1184]

Here learning, or intelligence, carries with it a distinctly practical sense, and includes finding systematic, procedural methods that can aid living or bring increased prosperity. Later in the same passage Ferré's characterization of intelligence includes making practical use of some newly conceived possibility, or an untried course of action. In other words, part of practical intelligence involves learning when and how to make use of such situations as might present themselves, to manipulate them, and to turn them to one's advantage.

Ferré links practical intelligence to the use of tools, and what they say to us as about the intelligence that went into their design. For example, he notes that finding a spearhead implies that those who used it had a method for hunting, and that some technique was used to chisel it out of stone. He notes that "Wherever there are practical artefacts, there is technology; wherever technology, there are artefacts".[1185] Ferré goes on to describe technology as "practical implementations of intelligence", arguing that such intelligence involves "implementing envisaged practical possibilities".[1186] This includes for him various tools and craft devices, in addition to a range of modern industrial products, techniques and processes. Technology thus implies the use of apparatus, machines, contrivances, instruments and the like as means to practical ends. It also involves the use of intellectual tools, so to speak, in the planning or execution of such ends.[1187]

Continuing with this line of thought, technology, in the sense of practical intelligence, turns on the design of systematic methods of designing, making and doing in order to meet some need or desire. Given that practical intelligence is shown up and is made relatively long-lasting in reproducible artefacts, then one implication here is that a particular technology can be sustained or promoted as long as its method of design, and the skills for its manufacture and maintenance, is not lost to a next generation. There is an implied link here to the institutions of society, and what might be called a mainstream conception of their function and role – to sustain, promote and carry forward the inheritance of a society's technology know-how. Furthermore, and assuming that intelligence is exhibited in the architecture of a device or in the manner of its use, then technology can show to people something of their own ability, at least in the sense that the use of outside devices reveals one or another aspect of human potential as provided for by the central nervous system.[1188]

On the other hand, theoretical intelligence for Ferré centres on an analysis of ideas at the level of basic principle, or the uncovering of the logic of an argument down to its founding premises. According to Ferré, such analyses can be described as being disinterested, curious, detailed, self-

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critical, and explicit.[1189] He makes a distinction between what he terms "unimplemented theoretical intelligence" and "implemented theoretical intelligence".[1190] The former involves the conceptual analysis of some aspect of the world from an overriding perspective, hence understanding it via theoretical principles. The latter applies theoretical principles in order to achieve a systematic, methodological construction of tools or artefacts.[1191] Unimplemented theoretical intelligence is perhaps then closely aligned to foundational reasoning as was treated in thesis Chapter One. It also echoes Whitehead's comment that among the greater intellectual achievements of the 19th century was the invention of the method of invention.[1192]

Implemented theoretical intelligence implies formulating and using a deliberate, systematic method aimed at assembling or inventing. Ferré argues that this is done through what he calls mental envisionment, the articulation of possible consequences, the manufacture of some artefact, the empirical analysis of outcomes resulting from its use, the evaluation of these outcomes, identifying faults and reworking the theoretical base where needed, modifying the artefact and seeing again how well the invention works.[1193] Notably, he appears to leave out an institutional or consultative sense to these steps. Here invention is purpose built for controlled, carefully researched, empirically based or engineered mass production, as opposed to a more tacit craft skill.[1194] Arguably, technology in this sense has become abstract knowledge, and where the methods of scientific research and discovery coincide with those of achieving technology know-how.[1195] One possibly related aspect here is that such descriptions of intelligence-cum-technology may link to mainstream Western notions of decision-making, the planning of policy actions, and rational conduct.[1196] One example to consider here is that the economic way of thinking concerns patterns of reason in making decisions and taking action based on factors such as opportunity costs, choosing at the margin and responding to incentives.[1197]

Practical intelligence and institutional decisions

Although Ferré does not treat the institutional side of technology *per se*, some possible inferences from his ideas are worth exploring, at least tentatively so. The workings of technology as implemented intelligence are impossible without the institutions of society to guide, fund, direct or otherwise organize its development and use or market its products. In this regard our conception of technology and how we make sense of its development and use has a social dimension. It may even be that a kind of technology-inspired image of intelligence and the decisions the institutions of society make tend to co-evolve, thereby also influencing the way know-how is conceptualized and put to practice. An accelerating and uncontrolled use of what might be called technological intelligence on a planetary scale is one basis for Morin and Kern's criticism of the modern techno-scientific mentality, aspects of which for them are shown up in the existence of hugely impersonal institutions. Ferré's focus appears to be different, as in where he writes that the "contributions of theoretical intelligence to technology have changed the world" in the sense that such contributions have made possible wholesale advances to people's quality of life.[1198]

Some of Jacob Bronowski's ideas are also worth mentioning here. In his work *The Ascent of Man* (1973), he attempts to map out the emergence of modern Western culture via the enriching contributions made by science and technology.[1199] He notes how the early industrial revolution led to a terrible exploitation of human life for its advancement's sake, and that there still remains much to set right in it.[1200] One particularly telling observation he makes in his *Science and Human Values* (1990) concerns the fact that the atomic bomb that laid waste to Hiroshima, and for which the United States had spent huge sums of money, manpower and human inventiveness to build, was dropped on a city that had, for all intents and purposes, been deliberately turned into a industrial slum organized around the single-minded production of war materiel.[1201]

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As just suggested, various kinds of theory-based systematic know-how are characteristic of much of contemporary productive capacity, centred on systematic or planned innovation, large scale output, and the widespread exploration and exploitation of resources. In some sense this reflects Bruner's notion of the link between intelligence and technology in the way the human central nervous system has evolved so as to require outside devices to express itself.[1202] The accompanying adoption of technoscientific outputs which are marketed as being innovative, efficient and effective, has also influenced in part the form and function of institutions making up part of modern social life. These institutions then work in turn to help promote or maintain that same scientific-technological-industrial capacity. In this regard, and as an aside, the workings of such institutions could include the structure and membership of their governing bodies, the organizational culture they espouse, the management and labour relations framework they establish, the rules, regulations, policies and procedures under which they operate, the way those who work within their structures understand, portray and publicise what they do, the manner by which funds are solicited, invested and used, and the influence they exert on what is required of mass public and higher education. In some sense mass public education may itself be one of these institutions, at least to the extent we can see it as a factory for producing the skills needed to maintain a science-based, technology driven society.

In such a context then, techno-scientific patterns of thinking may become relatively easy to adopt in Western culture, and perhaps unreflectingly so. They may even be thought of as the best approach to reasoning about choices for society. From a point of view such as Taylor's, however, what is mistaken or missing in such patterns of thought is not that they are adopted and extensively used, but that they tend to put in the shadows other conceptions and patterns of reason that might offer added and possibly fruitful gains in understanding the practical choices people face. In a related idea, the contemporary world is one where some of its chief symbols, images and metaphors derive from its technology. In other words, given that metaphor is central to both how meaning is conveyed and to the meaning actually conveyed, then some of the meaning or significance people see in their social and cultural lives may also come from technology inspired images.[1203]

Technology know-how is a social and institutional process, at least in part. The design and use of any particular technology is impossible without planning and decision-making, as well as the interaction of a vast range of logistical inputs. Technology in a more comprehensive sense is thus also part of the dynamic structure of society. However, in the West's analytical/empirical culture decisions about technology within an institutional setting may well tend towards an overreliance on patterns of procedural reason, or the use of measurable or utilitarian criteria for evaluating choices regarding what technologies to pursue or employ. The consequent learning required to design, make or use tools, would then provide both motive and means for continuing that same kind of learning and its accompanying patterns of reason. This at least in the sense that a successful use of tools would make further learning and thinking along the same line both doable and desirable. Included here as well would be technical matters of engineering and design, the success of which would tend to extend or amplify a level of commitment to existing technology goals.

Furthermore, the pursuit of systematic research in science, the study of technology innovation, and a search for means to increase society's industrial output and overall productive capacity are largely regarded as central to development. Their increase may well be regarded as among the more favoured prescriptions for addressing contemporary development problems. It may also be that thinking about such research and productive capacity reflects a tendency to regard procedural reason as being characteristic of reason as such. The intellectual tools put to use in research and innovation may at times be so highly regarded that the underlying picture of technology they adopt may overshadow alternative modes of thought, or cultural guiding images, such as those that concern the character and organization of human knowledge and what is required of the intellect in

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order to diagnose a problem, so to speak, and to prescribe a remedy. Taylor's conception of the primacy of the epistemological comes to the fore here. If so, and if it is taken that there is a preferred way of thinking and acting rationally and effectively in the world, that is to say, to reason practically, then this may well tend to set down in advance some of the ends or productive purposes people unreflectingly pursue, as well as the incentives that accompany their decisions about the development and use of technology. If so, then a key point involved here is that what tends to be set down, as it were, are not only the choice of specific ends, but notions about the nature of ends *per se*. In other words people may tend to think of ends, and perhaps especially the ends of technology, in a one dimensional sense, or from a single level of reality. To the extent that this is so, then related notions of what technology is and does for us may tend to be taken up as well.

To close out this sub-section, it is worth recalling here an idea from Taylor, namely, given that humans possess a kind of pre-understanding of their social world and their life within it, then a gain in knowledge involves making this pre-understanding explicit.[1204] Taylor writes:

> One of the directions of increasing knowledge of which we are capable consists in making this pre-understanding explicit, and then in extending our grasp of the connections which underlie our ability to deal with the world the way we do. Knowledge of this kind is intrinsically linked with increased ability to effect our purposes, with the acquisition of potential recipes for more effective practice. In some cases it is virtually impossible to extend such knowledge without making new recipes available; and an extension of our practical capacities is therefore a reliable criterion of increasing knowledge.[1205]

The notion of practical capacities just mentioned arguably includes, but could extend beyond, what has been written here about intelligence and technology. In this respect then, there may be some aspects to intelligence as a practical activity that thinking along the lines of human agency could express in different terms and for different ends. More than this though, it is not only a matter of thinking about different ends, but of thinking about ends differently, and this, oddly, due to the ontological link that exists between intent and action. In other words, our conception of that which constitutes ends as such would change as we call up a different ontology compared to the one that is employed in conceptions of practical and theoretical intelligence. If so, then Taylor's ideas may offer one way to expand on what might be called the mainstream conception of what technology is about. Some of these ideas are the topic for the discussion in next two sub-sections, the first of which will explore the ontology inherent in the naturalistic stance and related patterns of procedural reason as was discussed in thesis Chapters One and Four.

Technology and human agency (I)

The ontology inherent in classical science appears to be taken up, at least in part, in the conception of technology as implemented intelligence. This ties partly into the West's intellectual tradition, where the characteristics of procedural reason are taken as the characteristics of reason *per se*, and where it is commonplace "to think out the question of what something is in terms of the question of how it is known", to use Taylor's phrase.[1206] There may also be close links here to Morin and Kern's criticism of the paradigm of disjunction, as was discussed in thesis Chapter 5, Part B, Section 1. For the natural sciences, engineering and technology innovation, procedural and disjunctive reasoning is a winning combination. It is less, but still distinctly so, for the sciences of man. At times however it may be something of a misadventure for notions of human worth, our knowledge of human significance, or the chief characteristics of human agency and motivation as are shown up in what Taylor refers to as our most prescient ordinary language descriptions.

Part of the reason for this is the way Western intellectual culture inherits methods of reasoning and the assessing of evidence from contemporary empirical science. William Hatcher, for instance,

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holds that science instead needs to be seen as a systematic study via specific methods of observation and analysis fitted to an object of study. He furthermore argues that there is a mistaken tendency to conflate scientific method *per se*, to the methods used in the natural and quantitative human sciences.[1207] His argument then is not against the natural sciences as such, but a tendency to restrict a rich set of possible forms or patterns of reason to a single form or pattern. Or as Nicolescu puts it, to a single level of reality

Nevertheless, some mainstream notions of intelligence and technology likely fit into the classical image of a neutral universe. Or perhaps it should be put the other way around, that notions of intelligence and technology that fit into the classical image of a neutral universe can therefore be called mainstream. Here the chief features of intelligence would coincide with those of reason, at least in a foundational or procedural sense. If technology is a kind of implemented intelligence, then the various analyses by which people plan and reflect on its use may turn out to be akin to patterns of apodictic or instrumental reasoning. This may apply as well to views of intelligence based on the evolution of brain-hand coordination, and the character of sequentially planned actions in a world of impersonal means or inanimate instruments that can be used for any intended outcome. In such a view, the world might be thought of as a set of resources, be it natural, human, manufactured or financial, that people use as needed.[1208] Another possible point here is that conceptions of implemented intelligence also subsume notions of competition, struggle, and conflict based on the mechanisms people create to help ensure their individual and social survival. Such conflict and struggle in the evolution of mankind may then become principles or primary assumptions in terms of which social action is conceptualized, including decisions about technology and the uses to which it is put.

From this point of view then, many ideas discussed in thesis Chapters Three and Four, such as Taylor's conception of human agency, significance, and an expressive use of language, would make little sense so far as implemented intelligence is concerned, particularly if such a conception is understood in terms of the usual range of naturalistic abstractions. Or, as noted in the sub-section's opening paragraph, they are something of a misadventure in our actual choices for technology. However, part of the idea being highlighted here concerns Taylor's argument in that it is not possible to take a designative use of language intended to account for the workings of a neutral or inanimate universe and the self-defining individual, and describe adequately the world of human motivation and the higher emotions in terms of what the thesis discussion has been called distinctly human significances. To do so is to miss making the distinction, for example, between strong and weak evaluation, the relation these ideas have to a language of qualitative contrasts, to the ontological link between intent and action, as well as to the *ad hominem* pattern of argument that involves reasoning about transitions.

In a reading such as Taylor's, it is just this kind of assumption about the language of a neutral universe and of the self-defining individual (and hence a conception of implemented intelligence) that can be questioned. In this regard, as Taylor writes, reasoning in terms of the *ad hominem* model

> ... tries to show that in all lucidity we cannot understand ourselves, or each other, cannot make sense of our lives or determine what to do, without accepting a richer ontology than naturalism allows, without thinking in terms of strong evaluation. This might be thought to beg the question, establishing the validity of a mode of argument through a use of it. But the presumption behind this objection ought to be challenged: what in fact ought to trump the ontology implicit in our best attempts to understand or explain ourselves? Should the epistemology derived from natural science be allowed to do so, so that its metaphysical bias in favour of a neutral universe overrules our most lucid self-understandings in strongly evaluated terms? But does this not beg the crucial question, namely, whether and to what extent human life is to be explained in terms modelled on natural science? And what better way to answer this question than by seeing what the explanations actually wash?[1209]

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From this point of view, the notion of technology as an artefact of implemented intelligence as discussed earlier would arguably miss out on the idea that humans are partly constituted by self-understanding, together with the point that we are dealing here with a richer ontology.[1210] Said differently, we should not too quickly dismiss the possibility of making gains in understanding our decisions for technology by reasoning in terms of human agency and strong evaluation; that the intelligence which technology implements need not be seen only in terms of the naturalistic stance.

One way to do this is to consider the notion that practical reason involves a being open to, a being able to be influenced by our grasp of that which is significant, as was discussed in thesis Chapters Three and Four. There may also exist here a connection to symbolic forms in structured social contexts, where technology is arguably a symbolic form in the sense used by Thompson.[1211] Such ideas can be used to suggest what might be involved in an expanded conception of technology, as well as patterns of practical reason that can help make sense of our decisions regarding its development and use. The following sub-section picks up on this theme. Some of the ideas treated here will be elaborated on as the chapter discussion continues.

Technology and human agency (II)

Our conceptions of technology have a social-institutional past. They operate in a social world where meanings are conveyed, taken in, and made sense of by people who already understand something of their actions, intents and the tools they use.[1212] People design and use technology for people, at least in part. Where this is so technology can be studied for the ways in which people understand it, and where a reinterpretation can bring to light some aspect of its use, or an intent in using it, which was previously unclear, overlooked, or perhaps misconstrued.

An added sense to technology can arguably be made through what John B. Thompson calls the operation of meaningful symbolic forms.[1213] Given that in some sense technology is symbolic in the way people use it, or in the way it is put to practice in its social and historical dimensions, then it may carry a host of significances concerning the way people produce and receive it.[1214] As noted in thesis Chapter Four, Thompson pictures symbolic forms as working within structured social contexts. These have both a social and cultural past. They as well serve to create, maintain, and sustain various fields of meaning, notably via organized social practices. Some of these practices may contribute to relations of domination, which Thompson characterizes as meaning in the service of power.[1215] However, people possess a varying and different understanding of symbolic forms, some of the meanings of which may be unclear or confused such that a reinterpretation can render their meaning in a different way. Here, for Thompson, reinterpretation also involves giving a different sense to the workings of the structured social contexts within which given symbolic forms operate.[1216] To the extent that technology involves the operation of symbolic forms, then the meanings people ascribe to technology are themselves open to a variety of interpretations of what technology is and does in specific social or cultural contexts. If so, then reinterpretation could serve to alter one's grasp of the workings of the world of technology and tools, say, in the way they are actually put to practice in socio-cultural life, in the species of actions their envisaged use would make possible, as well as the utilitarian ends towards which those actions might be directed.

Furthermore, and in broad terms, there is a message in the way people use and develop their tools or technology, this depending in part on how they are applied, exploited, prioritized, manipulated, controlled, accommodated, managed, apprised, or otherwise regarded. A specific mindset towards what technology is and does might determine in advance not only the specific doable ends towards which people act, but the notion of what constitutes ends *per se*. In this respect there is an arguable connection to Taylor's position that the primacy of the epistemological is adopted unreflectingly in Western intellectual culture, thus influencing a wide range of fields of knowledge and conception,

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and including some of our notions regarding what is involved in human agency. It is also worth adding that if something of ourselves or our capacities are given expression by our use of tools or technology, then an interpretation can help to reveal or make more clear what our technology says about us and our decisions.

As noted earlier, if it is the case that conceptions of what technology is about, as based on the notion of practical implementations of intelligence, adopt the ontology inherent in the natural sciences, and if this ontology contributes to misidentifying some of what is real about human agency and motivation, then seeing technology as a matter of implemented intelligence only or mainly may serve to misconstrue the way choices about its use and the sphere of human purpose or intent are linked together. One way to think about this is in terms of strong and weak evaluation. For the sake of argument, if Ferré's notion of implemented practical intelligence involves one as a simple weigher of alternatives, to use Taylor's wording, then, to the extent that this is so, questions of worth in a strongly evaluated sense would not enter the reasoning process. The decisions taken would tend to follow from judgments made in weakly evaluated terms. Choices would be based on such things as contingent factors, pro-con attitudes, matters of utility efficiency and convenience, a balancing of costs and benefits, or efforts to maximize outcomes. Of course, these are not unimportant considerations, only that they tend to pass by a stronger sense of what it is to be a human agent, at least so far as the quality of our commitments might be concerned.

A different sense behind reasoning about our choices arguably comes to the fore if focus shifts to a substantive grasp of human motivation, worth, or desire, as opposed to a procedural one. That is to say, one where motivations are thought through in terms of the procedures used to represent, test for, or describe them in pro/con terms.[1217] What we could then refer to as a more substantive distinction would turn on whether or not intents are shown up in strongly evaluated terms via a language of qualitative contrasts that employ distinctions as to worth or significance and which centre on the attempt to reason about transitions. From the point of view of distinctions as to the worthiness of our actions, practical reason would then tend to centre on the way in which technology belongs to a world of human intents. These could be spoken of via an expressive use of language with regard to the meanings, plans, purposes, desires, hopes that accompany our use of technology, and which we can try to make sense of not only as self-defining individuals but also as self-understanding beings.

More particularly, Taylor's notion of human agency includes the idea that for self-interpreting persons there are some questions regarding human intent and action that have about them a sense of inescapable commitment – that some things matter inescapably in what Taylor calls a non-observer relative way, such that to ignore or discount them is to be shown up as a lesser being.[1218] This notion of agency tends to shift thinking so that reasoning about human intents involves a substantive grasp of what is worthy of us as persons. Once again, Taylor's notion of reason here, that it involves a substantive grasp of worth or significance, is set off against a procedural one where external criteria are to be used. In other words, his notion of significance and agency is an attempt to expand the usual range of naturalist abstractions. Such abstractions tend one to opt for a rational reconstruction of human motivation and conscious choice within a field of neutral resources, which in thesis Chapter One was characterized through the workings of an underlying explanation and a designative use of language.

However the object of practical reason is not only to achieve what Taylor sometimes calls productive purposes, or to select efficiently chosen ends that are instrumental to human survival, or to design and use tools that amplify or extend powers of control, manipulation and leverage over a natural or built environment. Practical reason as well helps to seek out the proper forms of human meaning – to find ways of being open to, to being able to be transformed by, distinctly human significances.[1219] Among other things, such ideas employ an expressive use of language, and in

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particular a language of qualitative contrasts, which can assist in making sense of social practices, at least in so far as they concern matters of worth or significance. Furthermore, once these matters of worth or significance are expressed in language and given a greater sense of reality via a contrastive background, the meanings that emerge may also serve to transform those same practices, together with the inner intents that might qualify them.

Taylor repeatedly notes that, by making sense of things in these terms, calls for a richer ontology than naturalism allows. According to him, and as discussed in Chapter Four, the attempt to map out human motivation through a designative use of language based on the image of a universe that make no claim on us as beings of significance, together with various pro/con attitudes will fail to offer an adequate account of human agency and our actual moral debates.[1220]

From this point of view the attempt to make sense of decisions about technology would likely come up short by regarding devices or technical procedures as a collection of resources to be employed as they will by those that design, build, own or use them. To be sure, technology and its artefacts carry a sense of conscious design and purposeful use, but there is something more to technology that is arguably misplaced when limited to these terms. Adopting Taylor's formulation of reason in a study of technology might then arguably offer gains in what we know about our tools and techniques, as well as in discerning or judging the significance they have for us.

Further gains could be made in conceptions of what technology is when viewed as part of the institutions people create in order to make the technology work for them, so to say. Here technology would be a part of human practice in a social and institutional setting, but, since conceived in terms of human agency, would be understood in terms other than an objective practice in an empirical scientific sense, or as one dominated by attempts to deliver it for purchase in a consumer market, or as an instrument for exploitation of the built or natural worlds. In this regard, patterns of naturalistic reason would give a poor account of technology as an aspect of human agency, with its closely-knit links to the idea that humans are not just self-defining subjects but are also self-understanding beings.

In yet another sense, Taylor's view of human significance and its implications for patterns of *ad hominem* reason could offer gains in the way people think about the use of technology and tools in their specific society or within a given culture – notably where patterns of *ad hominem* reason are about transitions and where social theory is a kind of social practice. In other words, social theories can serve to alter or transform that which the theory is about, instead of standing as an independent object of study. Here one's conception of practical reason need not be designative or procedural in character, or based for example on Morin's paradigm of disjunction/simplification, or operate from a single level of reality in Nicolescu's terms.[1221] It can also offer a substantive grasp with respect to human motivation and worth, and the higher emotions. Where this happens the character of actions may be transformed in cases where language is used in such a way as to reveal some non-contingent dimension in thinking about their intent. Here the contrastive background, to use Taylor's phrase, which such a use of language helps to foster could arguably provide for a greater subtlety of distinction in the accounts people give to their intents, goals or technology incentives, and in this way help make more refined characterizations of their use of technology in strong or weakly evaluated terms – be they personal, institutional or societal.[1222]

Related to these ideas is the notion that social and cultural life are part of a co-evolving process, and are therefore open to the transformative potential of time. The same subtlety of distinction used in a language of qualitative contrasts when giving expression to our intents and actions as agents could thus be employed in attempts to make gains in our knowledge of the workings of a co-evolving socio-cultural world. If so, then, for example, the distinctions people make regarding the development and use of technology might depend, at least in part, on the question of whether or not

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they stop at simply weighing alternatives or become open to a substantive grasp of motivations. To pursue the latter, one would be on the lookout for a richer contrastive background regarding what it is for our societal choices and actions to be thought of in co-evolving terms, as well as what might be called the technology incentives of a planetary age. Such a contrastive background would feed back into practical forms of reasoning about transitions in society, but in the context of co-evolving processes. In other words, to argue about transitions in society is another way of referring to the transformative potential of time.

It is worth noting that, recalling the discussion in thesis Chapter Four, in Taylor's terms practical reason in its substantive sense can provide for gains in understanding what he calls good and acceptable forms of life. From the point of view of the thesis argument, this would include the notion of an evolving society, or evolving forms of societal life. If so, then practical reason, in so far as it concerns matters related to the worthiness or significance of our actions, can be linked to those decisions that have a bearing on the evolution of society in a planetary age, and hence the manner by which the consequences of those decisions emerge over time. In other words, the patterns of reason used to make sense of decisions made regarding the evolution of society in a planetary age speaks directly to the transformative potential of time. And, as Morin and Kern might say, to expand the conception of time in this way is to make possible a different experience of being and existence.[1223]

With this would arguably come reworked notions of what is involved in making sense of the societal choices people make regarding the development and use of technology, and particularly so in regard to its evolving aspects. In other words, the way we formulate or give expression to the worth or significance of our technology choices would differ depending on if we are thinking in terms of an underlying mechanism and hidden structure, or in terms of that which is significant in our lives in a co-evolving society. More than this though, such an enlarged notion of time, linked as it is to distinctly human significances, may lead to a different conception of what technology is about. That is to say, the different sense of being and existence that emerges from these conceptions would also be accompanied by alternative notions of what kind of a thing technology is. Such alternative notions might then have a part to play when it comes to making decisions about acceptable forms of life in a co-evolving society, one where significance is present before the fact.

In general, thinking in terms of human significance, as well in terms of a co-evolving society, are both linked to the notion that practical moral argument is about transitions. In other words, practical reason involves i) a being open to, an ability to be transformed by the human significances and ii) an appreciation of the past, the anticipation of a future-in-waiting, and discerning that which is of significance in the present. From this point of view, to reason is to be open to certain gains in perceptiveness or to a greater discernment in decisions, but here with regard their worth. As discussed in Chapter Four, being open to matters of significance would then make possible alterations in one's own moral point of view, or sense of self and obligation – be it for the individual, community or institutions of society. Given that we are talking here about transitions, then the central issue is not a question of certainty in argument versus relativity or pluralism. It is instead about acquiring a language of qualitative contrasts with which to effect gains in the way one understands and consults over decisions faced in an evolving planetary age. *It is in this respect that practical reason involves an arrow of time.*

If so, then thinking about technology from within this broad stance could bring on board aspects of meaningful social practice and practical moral deliberation in the way technology is understood and used. The notion that practical reason involves an arrow of time could arguably help to mark out avenues for evaluating technology not only as a work of human intelligence in a world comprised of neutral resources, or as tools of human survival and leverage to ensure man's ascent over the

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challenges of nature, but also as a form of social practice that speaks to what Taylor calls good and acceptable forms of life. Included here as well, and for example, would be Morin and Kern's notion of Earth centred goals and what they call the concrete universal.[1224] It could also include Nicolescu's ideas about levels of reality, as well as Laszlo's notion that values constitute the chief defining feature of human culture.[1225] One might then say that such an arrow of time points towards our being open to those matters of significant that speak most urgently or presciently to us, and especially so when it comes to patterns of practical reason that foster gains in one's understanding as to whether or not the development and use of technology is an instance of the advance or decline in human well-being

Practical argument and consultation, from the thesis perspective, would thus employ in part a language of qualitative contrasts that speaks to the motives, aspirations or incentives of our technology decisions judged or discerned in strongly evaluated terms. As noted repeatedly, such epistemic gains as a language of qualitative contrasts might provide are such as to make greater sense of the context of our planetary age, and with it the significance of the principle of the oneness and wholeness of the entire human race. Put differently, the attempt here would be to answer the question: In what sense do our decisions in a planetary age serve to orientate our lesser loyalties according to wider or more inclusive ones? If so, then technology incentives, or aspirations, could also speak to such questions as: In what sense are we open to distinctly human significances, and to what extent do they aim at promoting that which unites and fight against that which separates? More specific incentives might relate to the equality between men and women, the independent investigation of reality, and equity and justice.[1226]

Finally, such a language could as well alter conceptions of what constitutes human powers *per se*, and hence the very notion of what technology is and does. In other words, the expressive use of language could provide gains in understanding that which constitutes such powers available to us as self-reflecting beings, and therefore alter what it would mean for technology to expand or amplify them. With this would come as well a different picture of what kind of a thing technology is. It could arguably show up the limits to the idea that the central nervous system requires outside devices to express itself, and that technology serves to extend or amplify those powers. For example, developing a language of qualitative contrasts would help draw out and refine notions of worth or dignity conceived in terms of the distinction between weak and strong evaluation. This could open avenues for consultation about the development and use of technology in relation to our powers of self-reflection and our co-evolving social world without being restricted to thought that simply weighs pro/con alternatives or conceives of technology as a form of implemented intelligence, or perhaps in ways akin to the logic of the artificial machine. It could also direct reflections about technology – among individuals, in a community, and within institutions – according to conceptions of what is worthy of human action in a world of interdependent peoples and nations. The overall point here would then be to attend to those aspects of worth or dignity in a co-evolving planetary age which, if ignored or dismissed, would show us up as lesser beings for the way we put practice to our human powers.

The next part looks at conceptions of technology and their implications for development thinking. To do this the discussion will try to pull together a host of ideas highlighted in earlier thesis chapters, but with special emphasis on technology incentives and "the aspirations of a prevailing order", together with some added comments on the nature of decisions regarding the development and use of technology in a multi-cultural context.[1227] The same themes will again be treated in Part D, but with particular emphasis on Morin and Kern's ideas regarding metadevelopment and thinking in terms of the concrete universal.[1228]

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Part C: Technology and a technology mindset

Learning in a planetary age

The previous discussion suggested that thinking differently about our human powers – those that derive from our capacity for self-reflection as well as from the fact that significance is original to who we are as self-understanding beings – in part concerns the way matters of worth depicted via a language of qualitative contrasts might alter some of our conceptions of technology. That same discussion also tried to paint a different picture of the connection technology has to a co-evolving society and to the transformative potential of time. Connected with these ideas is a close-knit range of development questions. A key point to emphasize about such questions is that decisions concerning the development and use of technology involve evaluative judgements based on notions of worth, dignity, social justice, the pursuit of peace, and the like. If so, and so far as the argument in Part C is concerned, then our views regarding technology could gain in realism or post epistemic gains if i) a language used to frame such judgements was structured around the distinction between strong and weak evaluation, ii) reflections about technology take place in a context where human socio-cultural life is gradually evolving towards a planetary scale of awareness, that is, towards the perspective of a single yet diverse human race, and iii) our reflections on the impact of technology incorporate the growing relations between people of different nations, languages, religions and cultures, the various development practices found in their respective societies, and the patterns of practical reason that are used to help make sense of those practices.

Included here as well are broad-ranging opportunities for consultation and learning not normally connected with questions about technology and development. These include a people's conceptions of reality, their views about human nature and person-hood, notions of what constitutes good and acceptable forms of life, their experience of time and a pace of living or being, a sense of beauty of form in all aspects of their built environment, the practice put to a political economy, attitudes towards poverty, prosperity and material well-being, notions of justice, equity, equality or obligation, a peoples' source of abiding motivation and meaning, their attitudes towards death and dying, and notions of the transcending or the enduring in contrast to the ordinary or the fleeting.

Furthermore, a language of qualitative contrasts might help promote such opportunities for consultation and learning about both one's own and another's society and its practices, and perhaps especially so where ideas are used to help express or make more real and moving a sense common humanity. In this regard, different conceptions of technology can come about through shifts that occur from within one's own society or culture, as well as those that arise from a growing openness to and influence from a sister society. At the same time, the distinction between own and other cannot be made in a disjunctive sense in a planetary age partly characterized by interdependence and continuous interactions between peoples.

In addition, it is perhaps a commonplace to say that the way technology is taken up and used by people in a society is often double-edged. It may be welcomed or opposed, give advantage to some, deliver hardship for others, or is otherwise unwanted for the threat it may pose to a familiar and well loved way of life. Part of the reason for this may be in the way a range of choices that accompany technology are taken up in a society and are incorporated into the lives of its inhabitants, thereby serving to alter those practices that speak to the values by which people might make sense of their life choices. For some this might be an agreeable change, perhaps because it provides some kind of an advantage over past practice, or is taken as an advance of sorts which opens a range of choice and outcome not previously available or possible. For others the possibility or probability of change portrayed as development may in some sense mean a painful forfeiting of familiar and respected practices or life conditions which have become part of a people's sense of

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self. In other words, such development is unwanted or is resisted due to the forfeiting of a way of life that it implies or actually threatens. One instance here may be where technology is seen as the product of a foreign, especially Western culture, and where its use or adoption might therefore be suspect because of this.

Furthermore, our technology tools can alter the range of possible choices available to us, and this in at least two senses. Either a particularly sophisticated technique is found that makes it possible for a relatively small group of individuals to consider options never before thought possible, or a change in technology on a mass scale alters the forms of life in a society as a whole. In either case an extension or amplification of human powers may spark a deep-current, even painful reflection on assumptions about acceptable forms of life, or about the ethical boundaries to the choices available to individuals. In this sense advances in technology may also induce changes in attitudes, in notions of what is worthy, or even in conceptions of one's world and of others. Said differently, advances in technology that create a new species of decision or greater subtlety of leverage over nature often create a new category of consequence from its use, and may spark a searching reflection over what such powers and decisions say to us about who we are as persons, the kind of society we inhabit, the forms of life we leave to future generations, be these for better or for worse.

Finally, and according to Morin and Kern's criticism as discussed in thesis Chapter Five, a modern technology mindset may become integral to a given society and culture, but may also become overly dominating in its influence.[1229] In other words, it may threaten to erode the special wisdom of that society's perspective on life and living. Morin and Kern's particular concern here is that in the contemporary world this undoing of wisdom is taking place across all cultures. One example here is the contemporary concern with the destruction of the living environment, thanks in part to the combination of industrialization, mass production technologies, and consumer economics that use the planet's human and natural resources without sufficient reflection or restraint. While there may be justifiable concerns here about the influence of a uniformly utilitarian point of view, a more central point to make is that humankind would be at a loss should any one particular form of cultural wisdom, its forms of life and its patterns of practical reason come to dominate all others.

Modes of thought in the Western intellectual tradition

Another aspect to consider here, and shifting gears slightly, involves changes from within the Western scientific tradition itself that contribute to different conceptions of technology, as well as the influence this change in the tradition has on thinking about its development and use. It is perhaps useful to qualify the point here with the phrase, science-based technology. Using the collection of ideas from the authors discussed in thesis Chapters Three and Five, such alternative conceptions of science-based technology and its social development and use could emerge from thinking along the line of Morin and Kern's concrete universal, Prigogine and Stengers' new dialogue with nature, Jantsch's self-organizing system dynamics, Nicolescu's notion of complex reality and the included middle, and Laszlo's idea of an evolving hierarchy of organization and the status of values as being constitutive of human culture.[1230] The comments below are an attempt to expand on this theme, and notably so in relation to a mainstream conception of development based on material prosperity as one which appears to commonplace in Western views of progress.

As discussed in thesis Chapter Three, in a classical sense, that is to say from ideas set squarely in the naturalistic stance, there appears to be a habit of thought about technology choices that is based on well known practices in technical design and manufacture, continuous innovation flowing from disciplinary research in the engineering and natural sciences, the analysis of costs and benefits, decision analysis and the theory of rational actors, growing levels of sophistication in management studies and their accompanying normative practices, as well as a host of calculations of outcomes based on utility, competitive advantage, maximizing productive capacity, marketing strategies, the

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efficient use of resources and exploitation of markets, accelerated expansion, and the like. Given that these practices and the ideas behind them carry a certain intellectual momentum, then an approach to thinking about technology that does not in some way fit into this established pattern would likely find its place along the margins of the decision-making process.

One obvious reason for this is that an alternate conception of what technology is about, as well as the kinds of decisions needed to implement it, would not fit well into existing, mainstream decision-making contexts. For one, the practical consequences resulting from an alternate conception of technology would be unfamiliar to those who make these kinds of decisions. In other words, when making decisions that require some form of large scale commitment or funding, there are likely few people who would be willing to consider what they regard as untried ideas, unless perhaps they are dealing expressly with matters of research and development.

Caution in this regard would certainly be warranted, especially where there exists a host of well established policy prescriptions and funding procedures to follow in order to make such decisions. These would obviously weigh heavily in favour of established practice. They would also have to pay attention to the controlling interests of investors or boards of directors. Having said this, however, there are also limits to judging choices based on the above mentioned tradition of thinking about technology, such as those that concern the push towards innovation in technical design and manufacture, the analysis of costs and benefits, decision analysis and rational actors, and the like. In other words, the knowledge and judgement used here is not perfect, and, as has been argued throughout the thesis discussion, makes certain assumptions about the nature of practical reason that can be questioned. The difference is that these mainstream approaches to decision-making and the calculations of costs constitute familiar practice, and hence are accompanied by a certain degree of confidence born of knowing what risks and benefits to expect from their application. In other words, our ignorance of how the world actually works, and hence the risks we take when choosing to pursue a particular course of action, has been factored into the decision-making process and its policy procedures. However, and as cited by Morin and Kern, there have been cases were the presumption to know such risks and benefits led those who regarded themselves as experts and decision-makers to pursue courses action that had catastrophic effects.[1231]

One additional aspect to such assumptions within the naturalistic stance is that choices based on well established practice may tend to restrict or channel notions of development and the use of technology to a tight economic matrix. Morin and Kern are particularly emphatic on this point, and especially so where such a matrix fits generally into a materialistic view of development. (In other words, material existence is taken to constitute reality.) Hence, their position that notions of development need to be divorced from its economic matrix, become multidimensional, include cultural and civilizational meaning and norms, be conceived anthropologically, and include the "unfolding of our potential, whether psychic, spiritual, ethical, cultural or social".[1232] An overemphasis on notions of development and technology as being bound to a tight economic matrix is also part of their criticism of a runaway techno-scientific mentality.[1233]

From the thesis point of view, such an overemphasis may arguably be accompanied by an overreliance on a language of weakly evaluated goals. That is, decision-making may tend towards the weighing of alternatives according to risks, costs and foreseeable economic advantage or material benefit, as well as the fulfilling of various needs or wants. It is true that factors such as the exploitation of markets, an efficient use of resources, or maximization of production are placed in a global economic context and in this respect reflect in a rudimentary sense something of planetary level of awareness. However, the view of development arguably at work here appears to tend towards achieving maximum material prosperity or productive social outputs from limited inputs.

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In other words, and as a consequence of a broadly materialistic view of life and its purposes, development's main focus has been on securing material prosperity.

Finally, the following summary account of 20th century social and economic development speaks to the limits of a broadly materialist conception of the workings of society and it consequences for human well-being. The sentiments it expresses are echoed by Morin and Kern.

> The fate of what the world has learned to call social and economic development has left no doubt that not even the most idealistic motives can correct materialism's fundamental flaws. Born in the wake of the chaos of the Second World War, "development" became by far the largest and most ambitious collective undertaking on which the human race has ever embarked. Its humanitarian motivation matched its enormous material and technological investment. Fifty years later, while acknowledging the impressive benefits development has brought, the enterprise must be adjudged, by its own standards, a disheartening failure. Far from narrowing the gap between the well-being of the small segment of the human family who enjoy the benefits of modernity and the condition of the vast populations mired in hopeless want, the collective effort that began with such high hopes has seen the gap widen into an abyss.
>
> [H]owever, arbitrary efforts to disengage such physical and material well-being from humanity's spiritual and moral development have ended by forfeiting the allegiance of the very populations whose interests a materialistic culture purports to serve.[1234]

Mutual benefit and cooperation

A main point in emphasizing the above ideas is that, while there may be many aspects of contemporary development thinking that accept the premise of a planetary perspective, such thinking may also give expression to a set of weakly evaluated ends as, for example, where competitive advantage, market forces and bottom line profit take final precedence over, say, mutual benefit and cooperation. Yet the point here is not to regard mutual material benefit as something that needs to be factored into equations for economic growth so as to give them a human face, as it were. The point is that a new ordering regime has emerged where key principles of organization are rooted in mutuality, not as an add-on, and where the satisfaction of people's material needs and wants cannot in principle alone succeed in addressing the requirements and challenges of development in a planetary age.

> If so, then this might suggest one factor behind the dislocation in human affairs that has occurred in contemporary societies which take as a high-end value that of the consumer market place. In such societies humans are regarded as creatures of wants and desires who are essentially driven by self-interest. Whereas the central requirements of the planetary age, namely the essential oneness of human relations, suggests that, as Morin and Kern note: Development as a goal serves other purposes, namely, *true* living, *better* living...A living that includes understanding, fellowship, compassion, and that excludes exploitation, outrage, and contempt. That is, the goals of development are ascribable to ethical imperatives. The economy must be supervised and orientated by anthropo-ethical norms.[1235]

The above reference to weak evaluation may also be accompanied by assumptions concerning the self-defining individual, in contrast to the self-understanding person, as the main beneficiary of development work. In addition, and from the stance being argued for here, the classic scientific world view, the paradigm of disjunction/simplification, or apodictic modes of reason may provide good measurable means and know-how, but they may fall short when it comes to discerning the significance of our decision or the worthiness of our actions, and notably so when these are understood in terms of strong evaluation. This is in part because the former mentioned views, paradigms and modes of reason are tasked with a job – to both grasp and to better the world –

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which their conceptual machinery cannot arguably bear. Simply said, patterns of practical reason in analytical/empirical terms may deliver the intellectual power to see through things, but not necessarily beyond them.[1236]

For example, Western intellectual culture tends to place high-end value on knowledge as manipulation, leverage and control such as is provided by the natural and mainstream social sciences.[1237] And, of course, finding solutions to a precisely formulated question is what science-based technology and engineering are about. The results achieved here tend to reinforce the well respected tradition of empirical research and technical know-how in the physical, engineering, biological and social sciences. The enormous success had here relies in part on formulating questions about the world of experience in rigorous terms, and which can be measured, analyzed and reworked through the control or leverage of specific variables for the sake of obtaining detailed, measureable outcomes.

Given the commitment to such approaches in making decisions, it is not at all reasonable to expect people who carry a burden of responsibility for the development choices they make to base their judgements on intriguing arguments for complex thinking in context, but where results may yet be slim.[1238] Even for those who can see good cause to so adjust their conception of things may not be able to resist what remains an overriding momentum of thought and established procedure for making social decisions, especially when these are often tied directly to binding policy prescriptions, accounting procedures, legal regulations, and a tight economic matrix within which decisions perforce are analyzed, formulated and carried out. In such cases managers of projects and programs are hired to act in line with measurable outcomes according to specific timeframes and to deliver results according to a strict budget. Technology that makes this possible will naturally be encouraged, in part because this is what people want to see happen. The influence also goes in reverse. Projects and plans can be conceived in such measurable terms because people possess the intent, skills and tools to do it that way. Arguably, this is also shown up in economic and management thinking which holds that in order for something to be managed it must be measured.

In general, such knowledge and know-how appear to have a world-wide influence, the uncontrolled acceleration of which is a key aspect to Morin's criticism of what he calls a technoscientific mindset. Laszlo starts from a different set of ideas. He refers to an assumed, but questionable "coupling between technology and culture".[1239] He writes as follows about the pragmatic, analytical world view of the West, and its association with science, technology and development:

> An equation seems to take shape: if society wants material, economic development it must gain access to and proper use of modern technology; and if it wants to master modern technology it needs to adopt the rationalist, pragmatic culture of the West. The equation seems convincing; it has swayed the thinking of the great majority of the world's leaders. But whether it is correct is another matter entirely.
>
> Fundamental to this equation is the assumption of a specific coupling between technology and culture. The latest technologies are seen to be the most desirable: they assure the highest productivity and decide each nation's ability to compete in the world economy, they are assumed to be the basis of all socio-economic development. Since the technologies are largely the products of western culture, mastering their use is believed to call for western patterns of thinking and behaving.[1240]

After briefly reviewing something of the history of this equation, which he relates to the concept of the railroad theory of development, and noting that even though this concept has been discredited it still survives, Laszlo goes on to comment that:

> It [the railroad concept of development] could be usefully surrendered in favour of a different image: that of a meadow where all manner of plants can flower and grow in harmonious diversity. The

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> pattern of the meadow reflects humanity's unity in diversity; a unity born of tolerance, nourished on understanding and bearing the fruit of mutual benefit.[1241]

Though they emphasize different ideas, in other respects the conclusions of Morin and Laszlo tend to coincide. Both argue against a monolithic view of development conceived in Western terms, and both point to a conception that is more at home with a sense of mutual benefit and cooperation, as well as a deeper-current notion of unity in diversity. However, the argument here is not against development decisions being based on careful and exacting analysis, and the best possible use of empirical data. The general point is to be aware of the limits of our choices when made in terms of an analytical/empirical guiding image of social planning and economic competition only or mainly. In other words, buy thinking in such terms, we may close off alternative modes of thought that might work at a different level of reality, and so obscure from view, as it were, other possibly fruitful courses of action. It is also worth noting here that assumptions about the nature of time and its passing, as well as what kind of a 'thing' the future is, might influence in a similar way the manner by which we think about our choices. In other words, given that planning is by its nature future-regarding, then a different conception of what the future entails, or what it holds for us, would serve to transform the notion of what it is to plan for it.

The main authors discussed in thesis Chapters Three and Four, namely, Prigogine and Stengers, Laszlo, Nicolescu, Morin and Kern, and Jantsch, all work within and are committed to the Western scientific tradition, but not necessarily its classical formulation. The new dialogue with nature referred to by Prigogine and Stengers enables these authors to think in terms of an evolving dynamic, and this can arguably open the door to consider different patterns of reason as well as expanded conceptions of what technology is about. One aspect here concerns the notion of technology incentives, and what it is to recast them in light of the requirements of a global age.

Technology and prosperity

The development and use of technology in a planetary age speaks directly to the idea of technology incentives, or, to put it differently, those incentives that decide a people on what use they will make of technology. These ideas are in line with the larger concerns discussed above regarding the need to move away from conceptions of development that seek to ameliorate a society's material condition, towards one in which an expanded notion of human motivation can also take hold, that is to say, one which also looks to the "unfolding of our potential, whether psychic, spiritual, ethical, cultural or social".[1242] The obvious question to ask here therefore is: What is it to recast notions of technology incentives in light of this richer conception of development?

Arguably, existing incentives for development partly derivefrom the idea of progress as involving some idea of material benefit or prosperity, and from there to various forms of physiological, psychological and social well-being, all of which it is the role of a given socio-economic system to provide. It will be argued below in Part D that if it is the case that development goals are conceived mainly in terms of material benefit or prosperity, then, paradoxically, such a focus makes the goal more difficult to achieve. In other words, the view of human motivation needed to make sense of development's ends that cannot be limited to an appeal to economic well being.[1243]

At the same time however, and within contemporary development work, it is not incorrect to query thinking in terms of complex wholes in cases where such thinking might have a slim record of achievement, and is thus too risky to adopt as an avenue for making decisions. Creating a body of learning that employs thinking in complex or co-evolving terms, to find ways to make such learning part of the consultative processes that are part and parcel of practical reason, and to make such thinking systematic and productive of fruitful results would give decision-makers options they could consider using with some degree of confidence.

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However, Morin and Kern are more critical here, given their view that contemporary conceptions of human well-being remain much indebted to forms of reason found in the paradigm of disjunction/simplification. Instead, according to Morin and Kern, ideas about development need to be divorced from a tight economic matrix, as well as to become multidimensional, include cultural and civilizational meaning and norms, and be conceived anthropologically.[1244] In addition, and crucially for them, the idea of development needs to be separated from a sense of societal progress as certain and linear. In terms of ideas discussed earlier in the thesis argument, the quality of consultation needed to achieve this is a chief challenge to the whole notion of thinking in concrete universal terms, in co-evolving terms, or in terms of qualitative contrasts and strong evaluation that would work outside the primacy of the epistemological. If so, then understanding how the motives that accompany development thinking can be expanded beyond a mainly economic matrix becomes one of the central points in what it is to recast the idea of technology incentives. Included here as well would be a searching study of consultation and patterns of practical reason by which we make sense of decisions about technology. In this case, contemporary procedures for making choices about technology, which are institutional in nature, may turn out to be structured in such a way that complex thinking in concrete universal terms cannot be taken on board. Some of this may be due to shortcomings in its institutional structure and mandate, or in the way consultation is conceptualized, or even in assumptions about what constitutes knowledge and how to go about validating it.

At this stage in the chapter discussion it is therefore worth looking in greater detail at some of Morin and Kern's ideas regarding development as something that must be removed from a strict economic matrix. Their ideas are presented in Part D. The discussion that follows provides a conceptual background for thinking about development and technology in a planetary age. This background will be useful further in the chapter discussion when it comes to the idea of technology aspirations, as well as the notion of consultation and the transformative potential of time.

Part D: Technology and metadevelopment

Two images of development

Morin and Kern write at length about development, and in so doing they criticise the actual path 20th century Western development thinking has taken. They argue for a reworked conception of what development is and should do. To begin with, and regarding the notion of development and progress, Morin and Kern write:

> Development is the master word, adopted by the United Nations, upon which all the popular ideologies of the second half of this century converged. At the base of the master idea of development stands the great Western paradigm of progress. Development is supposed to ensure progress, which in turn is supposed to ensure development.[1245]

For them the conception of development has proceeded along two general lines. The first provided people with a largely socialist guiding image namely, the idea that "societies, having become industrialized, attain well-being, reduce their extreme inequalities, and dispense to individuals the maximum amount of happiness that a society is capable of dispensing".[1246] The image here centres mainly on multiplying material output so to achieve physiological and social well-being, and to redress inequalities. Social policies, government plans, various funding schemes, and organs and institutions of State are set up to achieve this end. While much attention may be paid to questions of social inequality, these may well be argued from the stance that education, healthcare, housing, food security, transport, access to justice, and the like are premised on the idea that by achieving overall material well being, together with national and social security, the State's chief obligation to its citizenry will have been carried out. As an aside, the image used here by Morin and Kern is at

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least suggestive of some notion of stepwise growth, possibly through state control, aligned to the idea of incremental maximization, and which may partly rest on assumptions regarding the earth's capacity to meet the demands that are both promoted and supplied by industrialized mass production. Some notion of linear time and its one-dimensional unfolding may also be at work.

The second image of development according to Morin and Kern is based on notions of techno-economic innovation, production and consumption. The assumption here is that "economic growth is the necessary and sufficient condition for all social psychological, and moral developments".[1247] Morin and Kern, however, argue that this image of development likewise has shortcomings, for instance where they write: "This techno-economic conception ignores the human problems of identity, community solidarity and culture".[1248] The tendency to ignore such problems is for them partly due to what they refer to as the paradigm of disjunction/simplification and the fragmented patterns of thinking that tend to accompany it. In such a case there may be a tendency to think of technology as involving the design of products and techniques so as to fulfil people's needs and wants, solve problems, or to exploit opportunities for economic innovation.

For Morin and Kern both these images of development, the former being historically more socialist in tenor and the latter more capitalist, are lacking as a sufficient guide for creating human well-being. According to them, a single-minded pursuit of their goals by the ideologies of the modern age has played its part in the trials inflicted on humankind over the last one hundred years or so.

In the first place, according to Morin and Kern, both images of development subscribe to the West's overarching belief in material progress largely for its own sake, one which has been accompanied by an uncontrolled expansion in technoscience.[1249] They argue that such a belief required all aspects of social life to yield to it. In other words, it would permit no doubts to divert a single-minded pursuit of its respective goals, no matter how contrary to the needs of the age, the well-being of men, or the recognition of a common humanity. It tended either to suppress other intellectual and spiritual positions that might counter its mandate, or co-opted them into its overall scheme of thought. As Morin and Kern write:

> Bound to blind faith in the irresistible forward march of progress, the blind faith in development allowed, on the one hand, for the elimination of doubts, and, on the other, for the obscuring of the barbarities set in motion by the development of development.[1250]

They furthermore go on to state that:

> The myth of development called for the belief that everything had to be sacrificed to it. It made possible the justification of pitiless dictatorships, whether of the "socialist' (single party) or pro-Western (military dictatorship) type. The cruelties of the revolutions of development aggravated the tragedies of underdevelopment.[1251]

Morin and Kern's own list of these cruelties committed in the name of development and its two chief agencies in the 20th century – socialism and capitalism – is extensive, and covers such things as the accelerating gap between rich and poor, the superabundant use of energy by a minority of nations, the monopoly on high technology and genetic engineering held by elite powers, the underuse of agricultural land by the rich, drought and famine that afflict the rural poor, and the shanty towns and megacities that arise from the influx of people seeking to escape from rural poverty or what is otherwise believed to be a rudimentary way of life.[1252] Furthermore, the destruction wrought by two World Wars, the radical and purposeful reconstruction of some societies, and various attempts at genocide are among the more striking of 20th century cruelties.

Particularly tragic in the view of Morin and Kern is that, as a result of 20th century development, the best of indigenous culture is disappearing, to be replaced by the worst of Western civilization. In

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this regard they argue that choices made from a technoscientific viewpoint are blind to the cultural riches of what they call archaic societies, and where such viewpoints tend to see things mainly in economic and quantitative terms.[1253] They argue that so far as Western civilization versus indigenous cultures is concerned:

> All that has been seen in such cultures is false ideas, ignorance, and superstitions, without even imagining that they contain profound intuitions, knowledge gathered over the centuries, and life-wisdom and ethical values that have been left to atrophy.[1254]

Morin and Kern also argue that European and North American societies – those usually taken to be the models of successful development – are themselves in a state of deep despair.[1255] Their analysis of the ills that afflict Western civilization, in what they call the technobureaucratic era, include such aspects as fragmented work that lacks initiative, responsibility or interest, the racing forward of clock time and its chasing away of habits of reflection and meditation, the overall pace of living and work that stifles existence, how a "bureaucratic/technological/industrial megamachine" forces people to follow its "prescriptions, injunctions and formulae", the resulting loss of a sense of concrete existence, the consumption of the present, the void that pretends to be modern entertainment, the degrading of language and loss of personal communication, the inverse rise in a standard of living at the expense of the quality of life, and lastly, solitude, the loss of certainty, and the inability to face uncertainty.[1256]

In summary, Western guiding images of society as being fundamentally materialistic in their incentives or aspirations, arguably continue to drive some basic development assumptions. Such assumptions can in turn influence approaches to planning and execution in decisions made about the development and use of technology. Even where decisions are intended to involve the beneficiaries of development work, in practice it is perhaps more often the case of their being its passive recipient.[1257] As quoted at the start of the section, Morin and Kern call development a master word which is now in use across the planet. They argue that contemporary development thinking is strikingly inadequate, first for its focus on material or economic needs, and second for the various barbarisms that have risen in pursuit of its goals. They link these to the way either capitalism or socialism were seen as the true agents of development.[1258] Each had a recipe for economic order, and became either totalitarian in approach or reduced human effort and aspiration to the struggle between labour and capital, or to the requirements of the marketplace. In this regard, Morin and Kern hold that both socialist and capitalist development has been a myth. Purporting to be the agent of prosperity, they instead worked to sacrifice humanity for the sake of their specific world conception. In addition, they are particularly critical of the role that a runaway techno-science mentality played as both locomotive and fruit of development in either system. It is perhaps worth noting that to the extent to which these ideas make sense, then there is value in questioning "the incentives of a prevailing order" in terms of which people tend to makes sense of their decisions regarding the development and use of technology.[1259]

In response, Morin and Kern discuss what they call metadevelopment – the thinking and acting beyond typically accepted domains of what constitutes development and its incentives. However, for them metadevelopment is not an end. It is a move towards what they term Earth-centred goals.

Metadevelopment and Earth-centred goals

So far as the thesis discussion is concerned, the animating spirit of our planetary age is the recognition of the oneness of human race. This idea is also central for Morin and Kern, who argue that there are two historical currents are at work in contemporary life, or what they refer to as Earth-centred goals: i) to preserve mankind's extraordinary cultural diversity, and to foster a planetary culture common to all humanity and ii) to work at what unites, to resist what divides.[1260] In this

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regard, one could say that the organization of human social life has grown through a number of stages, each encompassing a wider circle of unity. For example, given that human social life has passed through the stages of family, tribe, city-state, and nation, then a next stage in mankind's social evolution involves the organizing of human affairs across the planet as a whole.[1261] Obviously, the workings of contemporary society are filled with a strong sense of tragedy, division and loss, and in this respect we are far from any mature expression of this guiding image. Yet, as noted in thesis Chapter Five, humankind is passing through a stage where key social institutions and patterns of life are in transition – a bifurcation is happening where, for example, the sovereign nation state as an organizing principle is no longer sufficient to meet the requirements of what is in many cases a *de facto* supra-national human world.

The multiplicity of human, societal and cultural forms of life – or what Laszlo refers to as a multi-cultural planet – calls for different organizing principles to emerge compared to the kind of pluralism that is found, for example, in assumptions regarding unfettered state sovereignty.[1262] One possible pattern of thinking is suggested in the following two passages from Shoghi Effendi:

> The emergence of a world community, the consciousness of world citizenship, the founding of a world civilization and culture ... should, by their nature, be regarded, as far as this planetary life is concerned, as the furthermost limits of the organization of human society, though man, as an individual, will, nay must indeed as a result of such a consummation, continue indefinitely to progress and develop.[1263]
>
> ...
>
> World unity is the goal towards which a harassed humanity is striving. Nation-building has come to an end. The anarchy inherent in state sovereignty is moving towards a climax. A world, growing to maturity, must abandon this fetish, recognize the oneness and wholeness of human relationships, and establish once and for all the machinery that can best incarnate this fundamental principle of its life.[1264]

Morin and Kern's general position here is also worth quoting at length, though they write in terms of cultures and not sovereign states.

> One must not, of course, idealize cultures. One must recognize that all evolutions involve leaving something behind, that all creation involves destruction, and that every historical gain is paid for with a loss. One must understand that, as everything that lives is bound to die, each culture is worthy of living but must know how to die. We must also maintain the necessity for a planetary culture. It is true that a multiplicity of cultures, with their marvellous adaptation to local conditions and problems, stand out as an obstacle to the attainment of planetary culture. Yet can we not extract from each one and generalize the richness of what each has to offer? How then can we integrate the values and treasures of cultures in the process of disintegration? Is it not too late? We therefore have to come to terms with two contradictory injunctions: to save the extraordinary cultural diversity created by the human diaspora and, at the same time, to nourish a planetary culture common to us all.[1265]

It is important to note that the sense of unity implied in such ideas speaks directly to what Morin and Kern refer to as Earth-centred goals, and is based on maintaining a mutual interrelation between parts, a rich diversity out of which emerges a co-evolving, dynamic whole.

Furthermore, and arguably, any conception of unity, including "a planetary culture common to us all", needs to be rich enough to serve as an image of organic growth.[1266] The idea of organic growth here implies that the unity we see emerging from living processes comes from the creative, organized arrangement of those diverse aspects that make it up. As discussed in thesis Chapter Five, there is an expanded mutual connection here between parts and wholes. From this stance then, it would not be the case that a multiplicity of cultures *per se* is an obstacle to a planetary perspective, culture or civilization. Such multiplicity is actually required for a sense of unity beyond sameness or plurality.

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If so, then Morin and Kern's point in the quote immediately above is not that, in principle, a multiplicity of cultures is an obstacle to unity, but that given current levels of fragmented, insular thinking, people tend towards the view that multiplicity means divergence – a pluralism of cultures or points of view that holds out little opportunity for a vision of unity that could, for example, enable us to be open to the range of human abilities and insights specific to those cultures, as something to be held in common, to be collectively treasured and promoted. The main idea here is that in a planetary age unity is not something to be achieved only after overcoming a host of obstacles, trials and divisions. Instead, unity is posited at the start in order that one might make sense of the way societies are co-evolving, and notably so in terms of organic-like processes that involve integration and disintegration.

According to Morin and Kern, Earth-centred goals involve two distinct levels of awareness.[1267] The first is to realize our humanity by recognizing what they term our common anthropological roots that are shared across a vast range of expressions of the human spirit.[1268] The second goal rests on the realization that the earth's inhabitants have a shared future, one that requires learning how to create global levels of significance in the main through the recognition of our common humanity.[1269] Similar ideas are expressed in the following from *Culture and the Future* (1988):

> Cultural co-operation ... is the ideal instrument for strengthening mutual tolerance and understanding between societies and ultimately securing peace in the world.[1270]
>
> There can be no positive or promising sense of identity without openness to the world, without a constant search for links to other cultures.[1271]

Rephrasing the above in terms of complex systems, the goal to safeguard cultural diversity is conserving or confirming. It aims to protect and preserve human as well as natural diversity, and what Morin and Kern call "cultural and civilizational gains".[1272] These, they argue, are threatened not only by the brutality of contemporary life with its various forms of violence, prejudice and hate, but also, according to them, by "technobureaucratic forces that work to undo both humanity and nature".[1273] It is worth noting that John Thompson's notion of symbolic forms and meaning in the service of power may link to the operation of technobureaucratic institutions.[1274] The second aspect, to foster a shared planetary culture, is tied to the emergence of novelty and the rise of new ordering regimes. It is important as well to note how both these goals assume that the image of a common humanity is part and parcel of a being open to, a being able to be transformed by, such significances as might be found among the rich and diverse forms of human living exhibited by the peoples and cultures of the world – not in the sense that any and every detailed form of social life can be taken as significant, but that in the main there is a mutual relation between our societal forms of life such that no one of them can presume to encompass the others.

Technology aspirations (II)

As noted earlier, Morin and Kern argue that current notions of development are locked into an economic matrix intended mainly for material gain or well-being. The thesis discussion argued that such notions are inadequate to a fuller expression of our human potential, for "extending the reach of human abilities", and notably so with respect to what has been referred to elsewhere in this thesis as distinctly human significances.[1275] Also involved here is a mature consultation on the evolving nature of society, or what Jantsch has called socio-cultural evolution, and which Laszlo connects to a hierarchy of values that constitute the high-end expression of human cultural living.[1276]

The following analysis, written at the end of the previous century, helps to highlight these ideas:

> As the twentieth century draws to a close, it is no longer possible to maintain the belief that the approach to social and economic development to which the materialistic conception of life has given

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> rise is capable of meeting humanity's needs. Optimistic forecasts about the changes it would generate have vanished into the ever-widening abyss that separates the living standards of a small and relatively diminishing minority of the world's inhabitants from the poverty experienced by the vast majority of the globe's population.[1277]

As stated earlier, existing technology incentives or aspirations – arguably one aspect of the "incentives of a prevailing order" – are part and parcel of this inadequate, even partly irrelevant response to the trials of an age.[1278] The immediate point here is that the aspirations of people and the goals of society are, obviously, not only material or technology-centred. Jantsch, as noted in the previous thesis chapter, argued that incentives pitched at the level of technology innovation (or the metabolic workings of society) still appear to be driving a range of contemporary social choices. However, in principle it is the realm of distinctly human significances that speak in a deeper current sense to the pressing decisions that confront humankind in a planetary age.

Morin and Kern pick up on similar themes and argue that those societies which have succeeded in achieving the heights of productive capacity as the basis for the overall material well-being of their inhabitants – the most developed – are, in many cases, groaning as well under the weight of a deep seated "moral, psychological, and intellectual" malaise or "mental misery".[1279] According to Morin and Kern, every culture and society will in some way fail to do justice to its human potential – intellectual, aesthetic, emotional, spiritual, or ethical. However, in developed societies, they argue, "there is a misery that does not decrease with decreasing physiological and material misery, which rather increases with affluence and leisure".[1280] Morin and Kern are inclined to account for this "mental underdevelopment" on the central worth such societies give to aspects such as a closed rationality, machine abstraction, the push to quantify, and restricting the use of mind to a point of dependency on fragmented thinking.[1281] Arguably, such aspects may also form part of contemporary technological incentives, that is to say, the set of desires that tend people toward particular conceptions of, attitudes towards or uses for technology. It perhaps goes without saying that from the point of view being argued here, existing technology incentives hardly do justice to those "potentialities latent in human consciousness" and matters of significance that are arguably among the high-water mark of an evolving planetary age.[1282]

Of course, no society can be properly judged on its tools and technology incentives. Nor is any culture completely well within itself, free of contradiction, confusion, harm, or distress.[1283] An analysis of the ills of an age must take care not to judge too swiftly, for example, what is superstitious and what is sound. The byways of someone else's rationality takes time to understand, and it goes without saying that the task of understanding one's own is no less delicate to achieve.

Still, the argument here is that motivation based on the "psychic, spiritual, ethical, cultural or social" dimensions of life are intimate to all social purposes – that technology and economic incentives, for example and as currently conceived, suffice perhaps only for weakly evaluated intents.[1284] As argued for earlier in this chapter, to the extent that distinctly human significances and the spiritual dimensions of life are ignored or misconstrued, then even the physiological and material goals of social and economic development will be beyond our capacity to achieve.[1285] In Morin and Kern's words:

> Lessening the mental poverty of the developed would rapidly, in our scientific era, procure solutions to the problem of underdeveloped material poverty. Unfortunately, we cannot manage to shake this mental underdevelopment. We are not even aware of it. *Therefore, we are driven to the view that mental, emotional, human underdevelopment, even of the developed, is henceforth a key issue of hominization.*[1286]

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Using Nicolescu's idea, the message behind development's failure will not be deciphered by conceptions that tend to put economic and technology incentives at its core, but may be resolvable if a next level of reality is used to help realign these conceptions.[1287] Or, as Morin and Kern put it: "Development is indeed a goal, but we should stop making it a myopic or terminal goal. Development as a goal serves other purposes, namely, *true* living, *better* living".[1288]

According to this point of view, an over reliance on weakly evaluated technology incentives can become an obstacle to achieving the goals of development.[1289] Yet, in light of the above discussion, the point is to change the notion of what it is to achieve them. Ironically, a deeply engaged pursuit of those goals of development that focus on material advantage is what makes them difficult to achieve, and which might at times turn the effort into a recipe for decline in a people's sense of well-being. In Morin and Kern's way of thinking, notions of social and technology development would arguably gain from guiding images that look "beyond the mere amelioration of material conditions", and so also work to overcome a relative poverty of spirit, so to speak, that accompanies the "misery that does not decrease with decreasing physiological and material misery, which rather increases with affluence and leisure".[1290]

For Morin and Kern, broader purposes that look beyond the mere amelioration of material conditions would include the concrete, universal dimensions of life and subjectivity, and which would therefore also speak to that which can promote "*true* living, *better* living", or "[a] living that includes understanding, fellowship, compassion, and that excludes exploitation, outrage, and contempt."[1291] Here the question comes down to principles that ride on more than economic goals and associated technology incentives, and hence on an expanded image of what constitutes prosperity. Morin and Kern call this metadevelopment, an idea that connects to Laszlo's notion of values in a system view of man, what Jantsch speaks of as meaning found in conceptions of man-in-the-universe, and what Taylor refers to as good/decent/acceptable forms of life.[1292]

Ideas will of course vary over those attributes, aspirations or virtues that speak to "*true* living, *better* living".[1293] The world is big enough for that. However as regards Taylor's position, a central idea in coming to terms with such forms of life is the sense of inescapable commitment that urges people, as it were, to think about their choices and incentives in ways that go beyond the attempt to simply weigh up or balance out the material and physiological conditions of their existence.

Furthermore, questions as to the worthiness of our actions, and hence how we might judge them or otherwise discern or make sense of them in strongly evaluated terms, is part of consultation and practical reason. In a similar vein, and as Nicolescu emphasizes, the contradictions that development thinking entail require a move to a different level of reality for their resolution.[1294] This is not a question of reducing everything to values, if by this is meant the various pro-con attitudes that people espouse and which, in terms of foundational reason and the self-defining individual, result from the play of personal opinion or from what feels or seems right to someone. To think of values in this way would likely tend to limit thinking to a simple pluralism of views.

A language of qualitative contrasts comes to the fore here. From a position such as Taylor's, one could argue that paying attention to what is significant in us as creatures of worth conceived in strongly evaluated terms would help to expand thinking beyond existing technology choices and the "incentives of a prevailing order" that move people to make them.[1295] In other words, we would likely improve our epistemic position – especially in the way we makes sense of our human capacities and tools – by thinking in terms of inescapable commitment and strong evaluation. Which goals these might involve, and the nature of the claim they make on us, is part of what a language of qualitative contrasts could arguably help us to explore. To explore things in this way could also help rethink some contemporary notions of technology incentives or aspirations. In other words, our exploration would serve to expand thinking about intents and goals, from those judged

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on the basis of weak evaluation and the relative weighing of alternatives, to those that consider the worthiness or significance of our actions judged on terms of inescapable commitment.

The above ideas obviously deal with questions about how to reason practically. From a position such as Taylor's one might argue that the expressive use of language can help uncover those matters of human significance which speak in strongly evaluated terms to contemporary technology aspirations. It is worth noting here that to argue in these terms is not just about how to understand the nature of technology incentives or aspirations, or how to address the problems that accompany the way we develop and use technology, It more primarily concerns what it is to rethink at a planetary level of awareness the very conception of what technology is about, and therefore to understand those aspirations from a different level of reality.

As an aside, the notion that technology is designed to solve problems might carry with it certain ideas regarding linear time. Each age has its particular aspirations, its unique problems which require their own anxious attention. The idea that societal problems are things that can be solved using technology or otherwise, may be based in part on a notion of time that unfolds along a one-dimensional queue. The resolution of each problem takes us one step along the queue. Problems are as a list of tasks to strike off one after another. It may be correct that we will never return to *that* problem again, however this is not because we have deposited it in the past, but because it compounds itself over time and returns again, sometimes with interest to pay. In other words, problems have a history and an anticipated future that give them a dynamic reality in the present. That is why we do not solve problems as if in an equation, but, in our attempt to come to terms with them, we help to create the very conditions that enable us to move past them, and so also help to create possibilities for a different future such that aspects from a different level of reality might come to the fore in relations among people. That is to say, a particular issue no longer dominates relations among people because, in the attempt to meet its adversities, challengers and trials, the peoples involved learn to grow or mature in a particular way such that they understand themselves and others in light of a different grasp of what is significant or worthy in a human life.[1296]

In any event, and finally, advances in learning may well occur where individuals, communities, or the institutions of society come to see themselves not as recipients of aid, or as the beneficiaries of someone else's technology decision, but as agents or actors in promoting human well-being. Hence, we see a vast increase world-wide in organizations and associations outside of government whose object is to advance human well-being, protect the helpless, seek justice for the broken, or generally foster a more full expression of human potential. These actions set up multiple trajectories for development along which people consult over and make decisions in a different way – for example, what in the thesis Introduction was referred to as the democracy of the intellect. These organizations also contribute to a kind of practical learning over time, through action and reflection. Here patterns of practical reason and the dynamics of a mature consultation can arguably assist in coming to terms with the worth or significance of what has been learned. So far as the thesis discussion is concerned, this kind of practical learning could involve aspects such as the mutual implication between parts and whole, the co-evolving character of complex organization, the organization of complex knowledge, advancing a more planet-wide sense of human relation and interaction, and a sense of time's potential to transform existing forms of social life and aspiration.

Such learning therefore takes place in a slowly maturing planetary age, and as such is also linked to the transformative potential of time.[1297] Taylor for example holds that social theorizing is actually a form of social practice, one where, in terms of the thesis argument, reason about transitions and forms of consultation can offer gains in making sense of those practical, collective decisions that emerge over time.[1298] Morin and Kern suggest that thinking in terms of the concrete universal and Earth-centred goals can assist the process of learning from experience, and, partly through adversity, what it is to inhabit a single planetary home.[1299] Laszlo looks to human values as the

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central dimension in man's social life, and hence in finding what he calls natural norms that can give fuller sense to the evolving organization of human life on a planetary scale.[1300] In general, this range of conceptions calls up an expanded sense of what technology is about when compared, say, to thinking in terms of the usual range of naturalistic abstractions. One reason for this is that the ontology found in the former is richer than that which obtains in the latter. The chapter's next and final main part offers a somewhat wide-ranging exploration of a few of these ideas.

Part E: Consultation and future-regarding decisions

The transformative potential of time[1301]

Our notions of consultation and practical reason will change or mature according to changing societal conditions. This is part of what makes them future-regarding activities. In this regard, over time the structure and workings of our social world will be rewritten. The phrase, structure and workings, is used here to suggest a range of institutions, practices, policies, patterns of belief and action, attitudes and aspirations and the like. Similarly, our conceptions, attitudes and approaches to practical reason and consultation will also evolve. For example, that which is currently viewed as constituting a complex state of affairs will alter, or our capacity to deal with it will be such that it is no longer framed or modelled in contemporary complex terms. It will be complex in a different sense, or possess characteristics that cannot be grasped using conceptions presently in use. Said differently, the language people use to describe their world, to give expression to their intents, as well as to make sense of the actions they take will necessarily change, will at times mature, and which in turn will serve to alter the social world in which they live.[1302]

Among other things, in such a process people will come to make different sense of their moral commitments and practical deliberations, including some of the inner intents that accompany the decisions they make. In other words, the language of moral reflection, practical argument and consultation will change as people learn to face the pressing, anxiety-ridden concerns of the particular age in which they live.[1303] In terms of the thesis argument, such a language would serve to express and give greater reality to the motives and actions of the moral-self, such as those that speak to matters of dignity, worth, significance and acceptable forms of life.

In this respect, and with regard to the motives and actions of the moral-self, two questions could be posed here: i) How to treat others as beings of worth? and ii) How should society be organized so that the worth of all its inhabitants can be recognized and can find expression? There is, of course, no full answer to these kinds of questions. In one sense, each age or generation would pose them according to its lights, and where the manner of their posing as well as the answers that emerge would help reveal to that generation something of the breadth or depth of their moral headwaters.

However, it probably goes without saying that no one age or generation ever draws solely from its own moral sources. Based on a number of arguments found in previous thesis chapters, societies co-evolve, significance is present before the fact, moral arguments are about transitions, and historical processes can converge or open up through the transformative potential of time. These notions speak to mutual relation and shared experience, which, despite the many conflicts that engage people's lives, is based on a sense of underlying unity among people.

For example, as people come to terms with the significance of a planetary age and the principle of the oneness of the entire human race that animates it, then gains in maturity of expression might be found that could serve as part answer to these questions about the motives and actions of the moral-self. Here then, the recognition of the unity of the human race would serve to convey the central spirit of the present age, and, according to the way it finds expression in the organization of society, would likely influence that society's main recognizable forms of organization. If so, then much that

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currently qualifies the language in terms of which people understand the moral sphere of experience will change as this recognition of unity takes added shape in our thoughts, and in the quality of our consultation about its significance. In other words, the full consequences of the principle of unity on the conduct and organization of mankind's social life are far from being recognized, and may well imply something of a deep-level change in the very conception of modern society.g

From this stance then, there is a crucial sense in which patterns of a mature consultation are at work in a planetary age. In this regard the maturity of our consultation can be linked to action and reflection in a kind of time-arc of learning. In other words, one way to learn from our actions is to reflect on their consequences and consult on the lessons learned, so that our next decisions will be made in light of the understanding gained from that reflection and consultation. One implication here is that a mature consultation forms an important ingredient to way in which practical reason involves an arrow of time. In other words, practical reason in so far as it is the possession of a community grows in maturity with experience, and so can also grow in conjunction with the continued evolution of broader society in a planetary age.

The following passage from the statement *Transforming Collective Deliberation: Valuing Unity and Justice*, speaks of "emerging processes of decision-making that are increasingly inclusive, unifying and just, and that challenge partisanship as a means of addressing problems facing increasingly interdependent communities".[1304] It is worth quoting here at some length to help point out some key features of consultation that underpin the discussion in this Part E:

> The principles and objectives of the consultative process rest on the understanding that human beings are essentially noble – they possess reason and conscience as well as capacities for inquiry, understanding, compassion and service to the common good. In the absence of this perspective, labels such as 'marginalized', 'poor', or 'vulnerable', with their emphasis on needs and deficiencies, often obscure these human qualities and capacities. To be sure, needs and underlying injustices must be addressed by the consultative process but, as participants in the consultation, individuals must strive to see each other in light of their inherent nobility and potential. They must each be accorded the freedom to exercise the faculties of reason and conscience; to set forth their views; to seek out truth and meaning for themselves; and to see the world through their own eyes. For the many who have not experienced these freedoms, consultation helps to initiate a process by which they gradually become protagonists of their own development and full participants in a world civilization.[1305]
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> ...
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> As this practice [consultation] is refined, it allows participants to attain greater levels of insight and understanding about the matters under consideration; to foster more constructive modes of expression; to channel diverse talents and perspectives towards common goals; to build solidarity of thought and action; and to uphold justice at every stage of the process. In order to develop and apply these integrative processes worldwide and to enable them to truly yield their fruit, they will need to be coupled with efforts to provide universal education, to reform modes of governance, to eliminate prejudice and the extremes of wealth and poverty, as well as to promote an international auxiliary language to facilitate communication among all peoples and nations. Such efforts will give rise to forms of social integration that are unifying and just, and through which all peoples can strive together to build a new social order.[1306]

Consultation

A set of related ideas regarding consultation and the transformative potential of time can be posed in term of co-evolution, as was discussed in thesis Chapters Three and Five. To begin, although the principles of the evolution of life imply that one cannot ascribe a specific end in advance towards which evolution proceeds, this does not necessarily keep one from finding after-the-fact significances in its overall processes.[1307] Furthermore, evolution takes its own course in creating novel outcomes, this within the constraints imposed by the larger environment or surrounding

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ecology, but which may also serve to alter that larger environment. However, this notion of evolution is overwritten by the appearance of *Homo sapiens*, for whom evolution is partly socio-cultural.[1308] This because humans possess the capacity for self-reflection, but also because they are self-understanding beings for whom significance is original. It exists before the fact.

One aspect here, at least from the point of view of the thesis argument, is that a range of abilities inform part of what it is for human evolution to be socio-cultural. Four of these are worth mentioning in the context of the present discussion, and as a means of taking it forward: first, the ability to investigate reality, second, to grasp the significance of our intents and actions, third, to attend to the anxious concerns of present day society, fourth, to do so in light of those forewarnings that appear on the horizon of a future-in-waiting. And so, as an example, in the attempt to understand more clearly the decisions we face, we would seek to know more about the immediate social sphere within which those decisions make sense, try to grasp something of the significance those decisions have for a given form of life, reconsider them in light of those aspects of a co-evolving society that can lead to a more world-embracing point of view, this in light of the learning found in the experiences of other peoples and cultures. It is worth adding that, as argued for repeatedly in the thesis, there is a certain maturity of understanding to be gained here that partly depends on the quality of consultation a people achieve, and which in Arnold Toynbee's terms is part and parcel of that which concerns a people's self-articulation.[1309] These kind of ideas also relate to Bronowski's distinction between a democracy of the intellect and the aristocracy of the intellect, as was first cited in the thesis Introduction.[1310]

In a related idea, people's actions change the social world in which they live, and alter the terms by which they use language to grasp or understand it. In a co-evolving sense, the one influences the other. It may even be argued that the way such actions are understood adds trace lines to a cultural guiding image, increasing its detail and resolution as it were, and making more clear thereby its implications, significances or limitations. This in turn not only makes it possible to understand the world in a different way, but requires that people in their guise as self-reflecting beings rethink the language in terms of which they make sense of their decisions and actions. Actions that once made sense under the conditions that obtained in specific fields of meaning-giving ideas will change as new conditions, practices, or social contexts come about.[1311]

The point though, and extending the above discussion, is that as self-understanding beings the effort to make sense of changes in social contexts or in fields of meaning-giving ideas can lead towards actual gains in knowing the world and in judging or discerning the worthiness of our actions within it.[1312] The changes here are not random or irrational, in that a sensible account of our intents and actions cannot be formulated. Instead, their time-relations may be complex. They require one to investigate, consult, interpret and learn. The interpretation is incomplete, but sensible nonetheless. In this way of thinking, learning via an arc of reflection, consultation and action is directed by the spiritual principles involved, but is open-ended. An expressive use of language would then permit one to be open to a sense of significance that conveys a greater (or lesser) sense of coherence, a relatively more elegant (or coarser) grasp of the issues at hand, an improved (or impoverished) facility in understanding how things work or in what is needed to make things work. From such a standpoint one could then act to promote (or to diminish) the effect some actions have over others, or which, for example, might make possible a richer (or more restricted) image of technology, its use or development. The general point here about learning and consultation is not to seek for absolute certainty in one's conclusions, but that, using Taylor's phrase, such conclusions or decisions be open to, remain able to be influenced by, our distinctly human significances.

Furthermore, as creatures of self-reflection humans can look back over those historical, co-evolving processes which have helped to create an existing society, culture or civilization, to make gains in

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understanding those processes, and to avoid "the embittering traditions of history".[1313] In a similar way, we can anticipate some of the horizon features of a co-evolving future-in-waiting, and in the same breath, try to exercise partial responsibility for the writing of it.

In addition, one main idea discussed in Chapters Three and Five is that practical reason is linked to the dynamics of these co-evolving processes. For example, patterns of practical reason can help to ensure that the decisions we consult over, plan for and carry out are ethical in their nature – not by basing decisions on unregulated self-organization or a freely acting evolutionary dynamic, but by making decisions within the radius of existing spheres of knowledge and judgement. This suggests that to act ethically also includes efforts to expand such spheres of knowledge and judgement.

Argued differently, in the human social sphere there seems to be little assurance that the outcomes of free, creative co-evolving processes of themselves would produce ethical after-the-fact results, unless one defines ethical as that which emerges out of any given bifurcation in self-organizing processes. Jantsch argues that this is precisely the starting point for his notion of ethical behaviour in an evolutionary sense. However, and crucially, it is this whatever takes shape proviso that socio-cultural evolution turns on its head, so to say.[1314] In other words, to act with evolution is not to let our social and historical processes run freely, but is to make purposeful decisions during and in advance in order that, for example, the potential for human development unique to a planetary age might be realized more fully. Morin and Kern make a similar point against freely acting processes when they argue that an unchecked technoscientific mindset has come to dominate contemporary social choices.[1315] For them, to the extent that such a mindset is accompanied by an accelerating application of the paradigm of disjunction, then it needs to be channelled in some way.[1316]

It is worth noting, however, that in some cases no matter how well thought out or consulted over the decisions made might be, a variety of problems can appear which serve to alert us to some unforeseen process that was not properly considered, or to an aspect of the knowledge of ourselves or our society about which there remains much to learn. In this sense then some aspects to socio-cultural evolution are found after the fact. Even if so, we can learn from them. But not all socio-cultural workings are like this, or few are entirely so, and it is not the case that once some direction is taken then decisions must be left to themselves, as it were, to see what comes of them.

Accompanying such ideas is a sense of time and its passing in the socio-cultural world. Arguably, in the context of co-evolving systems this sense of time can also be linked the complex interaction between parts and wholes. The notion of what might here be called complex time appears to have two rudimentary aspects. First, the working of time is such that it is impossible to anticipate future societal conditions in detail. In other words the dynamics of our socio-cultural existence is complex in such a way that we cannot see into them as regards their exact future state. Supposing that time is something of an ocean in which one swims, then this first aspect is like trying to grasp the comings and goings of each individual wave on the shore. Second, the transformative potential of time is such that we can see necessary dimensions or principled aspects of worth or significance in our socio-cultural world, and in terms of which we can try to anticipate desirable or harmful future societal features. Depending in part on our ability to discern matters of worth or significance, say, by virtue of a language of qualitative contrasts or the quality of consultation we have managed to achieve, then some key societal patterns or processes could be anticipated in advance. Using the ocean analogy, this second aspect is like paying attention to the incoming and outgoing tides.

Knowing and judging

And yet, in the context of the thesis discussion, what has been referred to here as a future-in-waiting is not just a matter of anticipating future conditions from existing ones. It can also involve the way significance exists for humans before the fact, and therefore in the attempt to discern beforehand

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the kind of society worthy of inhabiting, or the form of life worth living.[1317] These ideas pick up on a topic discussed in various stages of the thesis argument. namely, that in terms of co-evolution, as well as in terms of who we are as self-understanding beings, a deep-current unity exists between knowing the world and judging the worthiness of our actions within it, which the usual range of naturalistic abstractions tend to belie. A few further comments on this idea will be made in the paragraphs that follow.

Part of what it is to know the world and to judge or discern the worthiness of our actions within it involves learning by doing. For example, the principles of right action may be given in outline in so far as we possess a more or less coherent image of them, but their fuller significance needs to be found out in the decisions we make and the actions we take. The outline provides a guiding image, but besides being incomplete it lacks a certain richness of meaning and significance that needs to be filled in by the knowledge that comes from action, by our reflecting and consulting over our actions or conduct and the intents that accompany them. In this way, for example, we might build up a language of qualitative contrasts and distinctions as to worth and intent that can express in more illuminating terms that which constitutes "the peculiarly human motivations", to borrow a phrase from Taylor.[1318] It is worth adding here that, in line with the thesis argument, the notion of distinctly human significances also means in part that there is a reality to the human and social world that is not the making of any one person or people, and about which it makes sense to say that a reading of that world can be mistaken.

Recalling also the ontological link between intent and action, where the language used to express the intent differently can thereby change what the action *is*, then as we come to possess a more prescient or expressive use of language, we can also offer a richer or more moving account of that which is of significance in our social world, or more worthy of our actions as agents and self-understanding beings. As noted in thesis Chapter Four, *learning to describe our intentions via a richer set of contrastive terms, then not only are we able to be more articulate about our actual intentions, but we are able to experience a richer set of intentions to be more articulate about*.[1319] If so, then coming to possess a more illuminating or more moving account of our intention can in turn serve to transform our actions and our self-interpretations. By doing so we may transform not only what we know about the world in which we live, but also our conception of the kind of world that is worth living in and which we would therefore want to act in ways to help bring about.[1320] Hence, and to emphasize again, building up an expressive use language that speaks in illuminating terms about the significance of our world and our intents is one example of the unity that can exist between knowing the world and judging or discerning the worthiness of our actions within in it.[1321]

Of course, this kind of unity between knowing and judging does not always hold. For one, there is a strong sense in which the consequences of our actions cannot be known in advance. One is simply unable to know in precise terms what will obtain in the future. Perhaps decisions are made without sufficient insight, or the needed depth or extent of fact is missing, or such knowledge cannot in principle be had. In any event, things just don't work out as planned, and, unannounced, the script changes along the way no matter how worthy our intentions may have been.

In a related sense, Jacob Bronowski in *The Ascent of Man* (1973) argues that a lack of certainty in knowledge is part of the human condition, and is an aspect of what he refers to as the democracy of the intellect.[1322] Bronowski develops this idea around the fact that every observation in science, no matter how exacting the instrument used to make it, carries with it some form of internal error that cannot be resolved. Bronowski notes that, for instance, in spite of the development of increasingly powerful microscopes in the attempt to view the constituents of matter at finer levels of resolutions, the image we get remains as imprecise as ever. More generally, he writes:

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> The world is not a fixed solid array of objects, out there, for it cannot be fully separated from our perception of it. It shifts under our gaze, it interacts with us, and the knowledge it yields must be interpreted by us. There is no way of exchanging information that does not demand an act of judgement.[1323]

Bronowski bases his ideas on the results of 20th century physics. Despite the development of increasingly powerful instruments in the attempt to view the constituents of matter at finer resolutions, the image we get remains as imprecise as ever. However, for him the notion applies to all the empirical sciences, both natural and human, as where he writes in the quote immediately above: "There is no way of exchanging information that does not demand an act of judgement". Bronowski's observations lead to a few additional ideas.

First, the idea of certain knowledge and the accompanying notion of certainty in argument were discussed in thesis Chapters One to Four. According to the discussion in those chapters, the lack of such certainty in argument is the starting point in the West's intellectual tradition for a general scepticism towards practical reason, or, to paraphrase Taylor, the belief that when it comes to the moral sphere of experience there are no good arguments to be found there.[1324] This for him in part is because the naturalistic model of reason in Western intellectual culture is procedural and foundational in nature, and calls for the use of explicit, external criteria. In the absence of such criteria, no rational judgments can be made. In other words, and in terms of the abstractions of the naturalistic stance, without such criteria our arguments are suspect. Scepticism follows since no external criteria can be found when it comes to people's differing beliefs about morals.

Second, accompanying this scepticism is the apparent assumption in Western intellectual culture that to the extent that we pursue knowledge, then we are to aim at being certain about what we know. In other words, that we can be convinced that what is said is not false. For example, and as was discussed in thesis Chapter One, Part A, Johann Mouton notes that science's epistemic imperative requires that its practitioners seek for the truth in the statements they make about either the objects they study or the theories they formulate. In the words of Mouton:

> The search for truth is not just another option or matter of choice. Scientists who are engaged in scientific research are bound, as it were, in a 'moral contract' to commit themselves to the pursuit of truth. In fact, violation of this imperative implies total rejection or suspension of the notion of 'science'. This is another way of saying that the terms 'science' and 'truth' are intrinsically linked. We would argue that once we relinquish the ideal of truth we no longer have the right to claim that we are involved in the game of 'science'.[1325]

The point here is that so far as Western intellectual culture is concerned, the aim is that knowledge be demonstrable – that when you claim to know something then you can convince someone rationally that what you say is true. That in some sense you are certain about it. Of course this is an ideal, and as such it is something that can help to characterize the thing called knowledge. The actual search for certainty, or the search for truth in Mouton's sense, is what all the carefully constructed, doggedly pursued research procedures in science are about. And even here, as Mouton notes, sometimes research can at best obtain an approximation to the truth. This is particularly true in the case of the social sciences which, because of the nature of the object of study, distinct limits are placed on what researchers can investigate or observe.

Third, it is important to note that these ideas regarding certain knowledge and certainty in argument were related in the thesis discussion to the abstractions of naturalistic stance. As noted many times in the thesis narrative, this does not make them wrong or mistaken, only that ideas regarding certainty and scepticism towards practical reason can be expanded when we rethink naturalistic abstractions in terms of ideas from complexity, co-evolution and the notion that humans are self-understanding beings. Here then the naturalistic stance is not wrong or mistaken, in the sense that it

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has behind it proven explanatory power for the level of reality at which its abstractions are formulated. The issue instead is the apparent assumption that there is only one level of reality, namely, the one wherein we use the abstractions of the naturalist stance to study and know.

On a point of clarity, it is worth adding that the notion of certainty in knowledge can take on a dogmatic tone in social theorizing, or what Bronowski describes as the aristocracy of the intellect.[1326] Such ideas were discussed in thesis Chapter Five concerning Morin and Kern's criticism of socialism and capitalism as the main agents of contemporary development, the brutalization that visited humanity as a result, as well as the contributing role certain forms of reason played in so far as they were influenced by the paradigm of disjunction and by a generally dogmatic, often materialist conception of reality.[1327]

In a similar way, the links between knowing the world and judging our actions in it, and which constitutes the main point of discussion in this sub-section, are not dogmatic or absolute in tone. They are instead related to a move away from those naturalistic abstractions that contribute to a sceptical stance towards practical reason. Hence, for instance, the notion that we are partly responsible for a future-in-waiting is not an attempt to engineer some future social state, but to bring matters of worth or significance into the way we make sense of the decisions we currently face as part of an evolving planetary age.

Hence, and fourth, when it comes to self-understanding persons we are primarily dealing with "a richer ontology than naturalism allows".[1328] It is in the terms of this ontology that an added relation between knowing and judging is set up, and which is not to be found in naturalist conceptions of certainty and scepticism. This is not to deny, for instance, that we cannot be certain about future consequences from present actions. The point is that a different sense of certainty comes on board, so that the usual sceptical conclusions regarding practical reason do not necessarily follow.

Here, and as discussed at some length in thesis Chapter Four, we are secondly dealing with arguments about transitions, that is, *ad hominem* forms of reason.[1329] These forms are neither procedural, nor are they about foundations, and they do not rely on external criteria in order to make rational judgements. In this sense then, we cannot expect *ad hominem* arguments to be certain in the way apodictic forms are thought to be. They are more comparative and referential. They turn on the way humans are creatures of significance, and on how an expressive use of language can help uncover that significance – not in the sense of showing someone that his position is false, but in a being open to, a being able to be influenced by a progressively more rich understanding of it, or how it connects to wider notions that offer an added, more illuminating sense of meaning, or of what is worthy of our intents, actions and our forms of life in an inescapable sense.[1330]

Fifth, and finally, when it comes to co-evolving or complex systems, as discussed in thesis Chapter Five, the patterns of reason involved here include notions such as complementarity, complex relations between parts and wholes, levels of reality and the transformative potential of time, to mention a few. In general, these ideas do not fit into the assumption that knowledge implies the search for certain knowledge. In other words, the kind of knowledge gained from thinking in terms of complexity or co-evolution is not of a dogmatic sort, or what in the thesis Introduction was referred to as the aristocracy of the intellect. Knowledge of the world gained in terms of complexity or co-evolution is therefore apart from the presumption to know with certainty the workings of society, as discussed by Morin and Kern. Here they gave the example of central planners who thought that their knowledge was equal to the consequences of their actions, but whose decisions instead wreaked havoc on their own people and the natural environment.

More particularly, our understanding of the co-evolving nature of mankind's socio-cultural life is itself evolving. Among others, it likely calls for knowledge of the world from more than one level

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of reality, being able to situate one's practical knowledge and foresight in the context of what Morin and Kern call the concrete universal, and finding ways to reason about and consult over how notions of human worth or significance might be expressed in terms of wider circles of unity.

The range of moral self-reflection and ethical debate that accompany these ideas goes hand in hand with the task of remaining anxiously concerned with the problems of the age in which we live. Part of this would involve a continuous effort to better understand the directions our responses to them are taking us. This latter point implies remaining alert to the emerging consequences of our societal actions. One way to think of this is in terms of what the discussion in thesis Chapter Five, Part A Section 1, described as "patterns of practical reason and consultation that can help us to listen to, as it were, a certain depth of knowledge of the past – those that 'avoid the embittering traditions of history' – a prescient anticipation of the future – the best one's knowledge and judgement can offer – and hence to make arguable gains in recognizing that which is significant or worthy of attention in the present". It is worth noting that these kinds of ideas are linked to the two questions posed at the start of this Part E, namely, i) How to treat others as beings of worth? and ii) How might society be organized so that the worth of all its inhabitants can be recognized and given expression?

Furthermore, patterns of practical reason that deal with co-evolution and arguments about transitions could add to the quality of consultation achieved in deciding some courses of action over others. One could, for example, seek to improve insight into practical argument via a language of qualitative contrasts, and thus understand our actions as flowing from an attempt to understand the nature of strongly evaluated ends. Said differently, the aim would be to seek out courses of action the intents of which do not show us up as lesser beings in strongly evaluated terms. Particular attitudes towards knowledge and learning could also be useful here, such as an awareness of time-linked processes, seeking out the principles at work and learning how to apply them, learning to build up and to put trust in the consultative processes people use in so far as they derive from cooperation, and not from conflict or struggle. The aim in such notions would be to balance the ideal of certainty of knowledge with an openness to the way intents and actions have a distinct significance for humans as moral agents. Included here as well would be learning how to incorporate the insights gained from the guiding images in different cultures and intellectual traditions in order to better reason about, consult over and make sense of those decisions that speak to a shared planetary future.

For example, there would be little use in insisting on some efficient course of action in the assumption that the knowledge of its workings provide for productive outcomes, yet where its pursuit would create such division and rancour as to destroy a unity of purpose or ruin the very thing the course of action was intended to achieve. The discussion in thesis Chapter Five regarding the nature of ignorance is also apropos here. Ignorance is not just an absence of knowledge to be systematically overcome. It also marks out the contours of what is known, or what can be done, in order that we might not presume to overstep the limits of our intellect.

Cultural guiding images and development

Picking up briefly on the contribution cultural guiding images can make to the way we reason about, or otherwise make sense of, contemporary development decisions, according to Morin and Kern the chief agent of 20th century development was the instrumentality of either socialism or capitalism. Each of these in their own way subscribed to certain images of what form society should take.[1331] As was argued in Chapter Five, such images tended towards one form or another of economic growth and prosperity as part of a generally materialist view of progress. For Morin and Kern, however, there is much to be critical of regarding the historic consequences of contemporary development choices and the guiding images that drove them. As a result they want to widen the image of development, where, for example, they argue that development needs to be divorced from

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a tight economic matrix, become multidimensional, include cultural and civilizational meaning and norms, be conceived anthropologically, and involve what they refer to as the unfolding of our psychic, spiritual, ethical cultural and social potential.[1332] Obviously such an expanded conception of development would as well impact on how we make sense of our decision for technology.

In broader terms, cultural guiding images can speak to a people's more reflective sense of who or what they are, their psychic, spiritual, ethical cultural and social potential, and may to a certain extent foster a richer sense of human social life. Such reflections can also provide a degree of assurance by which people can face an unknown future, but then still act with a measure of confidence with regard to the decisions they face in the present. Cultural guiding images may also speak to the sense that there is a history to human living which can help direct and guide the current doings of men, and that the characteristics of a future social world are being written in part through the manner in which a present life is being lived, or perhaps is being outlived. These guiding images, when speaking to a community of listeners, might also convey a picture of reality as possessing a greater compass than one's own self, and in terms of which the actions of daily life and mundane choice can have about them a sense of greater significance.

Jantsch for example uses the phrase, man-in-the-universe, to refer to the ways in which cultural guiding images convey meaning or significance.[1333] As noted in thesis Chapter Five, he argues that the world's great religious and cultural traditions are one source of ideas and guidance regarding man in relation to the universe. In this regard, though differences between mankind's religious life have been the source of closed-minded or fanatic attitudes, at the same time there is hardly a civilization or a people that do not derive a sense of dignity, beauty, obligation or justice, as well as a sense of personal character and community life from the guiding images found in many of the world's moral traditions. Furthermore, a people's communal world is filled with metaphor and meaning that speak to their actions not as individuals, but as participants in a shared reality.
Of course some of these images may still tend to promote close-minded attitudes towards others, or towards the broader use of the mind. People of differing backgrounds or beliefs forever seem to be at loggerheads. However, in a planetary age it has become more difficult to spurn knowledge simply because it derives from a tradition of thought that is not of one's own, or to act against another because theirs is a tradition different from yours. Laszlo for one speaks to this point:

> Genuine unity should not be confused with uniformity. Uniformity comes about when one element in the system dominates or subordinates the other elements. Unity, however, resides in the integration of all the system's elements into a mutually beneficial order. Genuine unity complements diversity rather than destroying it, for it occurs on a shared, community level where all elements of the system are equal participants.[1334]
>
> ...
>
> If the peoples of this planet perceived mutual complementarities and forged relationships of mutual benefit and support, they could join together, like the diverse organs of a single body, to maintain the whole systems in which they are a part. That system is now the entire human community and its planetary home.[1335]

The following quote from the United Nations World Conference on Cultural Policies is also apropos here: "In all their rich variety and diversity, and in the reciprocal influences they exert on one another, all cultures form part of the common heritage belonging to all mankind".[1336]

The perception of "mutual complementarities" and "relationships of mutual benefit and support" that "could join together, like the diverse organs of a single body" are arguably part of a guiding image for a planetary age, and would as well be part of making sense of contemporary development decisions. Furthermore, and despite the confusion or rancour that accompanies many aspect of a society in disorder, people's abiding beliefs and motives found, for example, in the world's various

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ethical and moral traditions can be a part of this perception of mutual complementarity. As such they can also in principle contribute to notions of development and the aspirations of a prevailing order that are more open to the unfolding of mankind's psychic, spiritual, ethical, cultural or social potential.[1337] To try to think in terms of such complementarities may in part serve to alter how we think about ourselves and our intents or aspirations, and hence our commitment to act in ways which over time can influence community life.[1338]

As presented here, what the thesis discussion has called the spiritual dimensions of life link to a number of aspects of practical reason, and particularly so when it comes to thinking about technology incentives. Laszlo argues about such issues in terms of unity and diversity in cultural and social systems. In order to close out Part E, an exploration of some of his ideas will follow.

Unity with diversity

Laszlo argues up front for the principle of balance between unity and diversity in all aspects of natural and human systems.[1339] Such a balance serves, for him, as an indicator of development:

> If systems, whether natural or human, are to survive and develop, their interactions must be harmonized. If and when they are, a new level of order emerges. In nature this is the cellular level for molecules, the organic level for cells, and the social and ecological level for organisms. In the human world the next level of order is the global. Unity on the global scale need not diminish diversity on national, sub-national and regional levels. On the contrary, national, local and regional diversity is an enduring precondition of global-level integration.[1340]

Laszlo goes on to write:

> If humanity is to regain the balance necessary for social, economic and human development, it must enter a phase aimed at the unity within diversity that results from successful integration. Current calls for world peace, for a new world order, and for social and economic justice already express and reflect this need.[1341]
>
> During the process of development, diversification is followed, indeed complemented, by integration. But integration and diversification are not always in balance; at various stages in the process one or the other may come to predominate. A phase of self-correction then becomes imperative: towards diversification if integration is dominant, and towards integration if diversification gains an upper hand.[1342]
>
> This interplay illuminates the problem of the contemporary human condition. Today the diversity of societies is insufficiently matched by their unity.[1343]

It is worth noting that the overall thesis discussion is along the same lines as Laszlo's ideas, though the emphasis is different in that so far as the thesis argument is concerned, unity is not the result of successful integration, but that successful integration is made possible by first recognizing the principle oneness of the entire human race. Thereafter the question would become: How can humanity regain the balance between diversification and integration that, according to Laszlo, is necessary for development, be it social, economic, human or technological?

One contribution the thesis discussion has arguably made here is that regaining the balance will involve transitions that are understood as being rationally motivated, though perhaps not in the usual naturalistic sense.[1344] For instance, the organization of society and the forms of life we find in it also come from the sense of significance or purpose that is present to humans before the fact, which we can therefore act to bring about, and which are open to us as self-understanding beings. With the idea of unity in mind, the sense of significance or purpose available to us can find practical expression in a wide range of experience based on community and cooperative interaction,

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and hence via forms of practical reason and consultation. In other words, and to use an idea from Taylor, we can make epistemic gains in our grasp of those purposes and significances through forms of practical reason that involve arguments about transitions.[1345] As noted repeatedly in thesis Chapter Four, these transitions are rational in a different, *ad hominem* sense, in that they involve a being open to, a being able to be influenced by what Taylor variously calls the peculiarly human motivations, and our powers of evaluating and choosing.[1346]

Being thus open to distinctly human significances is arguably more in tune with Laszlo's notion of successful integration, and restoring a balance in the organization of human affairs which is necessary for human development. In the context of the thesis discussion, this notion of *ad hominem* practical argument offers a gain over its sister, apodictic form in so far as the latter tends to focus on the use of external criteria and the working of an argument down to foundational premises in terms of which all contrary moral positions are to be argued against as rivals. However, apodictic forms of reason have their place, but may not take us as far as we might wish in a world where the principle of the oneness of the human race is central to the aspirations of a planetary age.

Furthermore, and arguably so, patterns of practical reason that look to a "richer ontology than naturalism allows" may be productive of a different sense to being and existence, as was noted earlier in the discussion in Part B of this chapter concerning some ideas from Morin and Kern.[1347] In addition, by paying attention to the ontological link between intent and action that comes with who we are as self-understanding beings, then forms of practical reason could come on board that are inherently about transitions, and notably so when dealing with matters of the worthiness or significance of our actions judged in strongly evaluated terms. This is especially so when we consider the links between community meaning and the way self-interpreting persons use language to express, make real and give a depth of sense to their intents, and hence to the quality or significance of their actions and societal decisions. As noted earlier in the thesis, such a notion of *ad hominem* practical reason is inherently consultative in nature, and this may again offer it a useful place in the attempt to come to grips with the decisions people face in an interdependent, planetary age, but one where currently "the diversity of societies is insufficiently matched by their unity".

Part of the idea behind transitions is that they can take you somewhere. For example, Laszlo's principle of balance between unity and diversity in all aspects of natural and human systems can arguably add to the guiding images of a planetary age, as discussed in the previous sub-section. Morin and Kern's notion of the concrete universal is also apropos here, by which they mean in part that the way we picture evolving relations among people and the organization of society in its global aspects, are to be joined to the awareness that we inhabit a single planetary home.[1348] In other words, for them the concrete universe is the planet Earth.[1349] Similarly, it is also worth recalling Morin and Kern's notion of Earth-centred goals discussed earlier in this thesis chapter.[1350] Another principle that could as well be included here is the need to see the growth of unity among societies as proceeding from participation in associative and consultative wholes, not through coercion.[1351] Agreement in the form of associative fellowship and consultation needs to become, in the words of Morin and Kern, the chief mover of our historical choices.[1352] In the same vein, they also hold that "A planetary association is rationally and minimally required by a contracted and interdependent world."[1353] The main point here is that these various principles or goals could arguably help to decipher the decisions people face in so far as they involve, in the words of Laszlo, a transition from a state of imbalance between integration and diversification in the organization of human society to one where the diversity becomes sufficiently matched by their unity.[1354]

A few comments may be added at this stage of the discussion so as to link ideas regarding transitions and guiding images, to notions about the transformative potential of time.

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In the sense being used here, the transformative potential of time suggest that debilitating struggles between peoples, or the continued harmful or destructive imbalance in our understanding of social, economic, human and technological development, need not be seen as permanent states. There are at least two broad, perhaps obvious senses in which this may be so. First, time has a creative aspect.[1355] In other words, the conditions that obtain in society, or in the relations between societies, will change in unexpected ways, or in ways that show up a previously unknown or discounted background dynamic, but which then rises into prominence. This creative aspect of time may offer ways of thinking or acting that were impossible beforehand, and which may provide an opportunity for growth beyond existing states of struggle or imbalance. Here the transformations that come with time are creative but, having once appeared, are also influenced by our decisions and actions according to the significances we discern in them. However, they could as well open the door to an intensification of struggle, as where Whitehead writes that "the major advances in civilization are processes which all but wreck the societies in which they occur".[1356]

Second, transformation over time is influenced by our own decisions and actions according to those before-the-fact significances that speak to us regarding the kind of society that is worth inhabiting. In other words, we are partly responsible for a future-in-waiting. In the context of the discussion in this sub-section, both of these senses regarding a potential to transform could have something to say about the need, as Laszlo writes, for humanity to "enter a phase aimed at the unity within diversity that results from successful integration".[1357] Or, to put it simply, that over time people can learn to "exchange unconcealed hostility for conversation between equals".[1358]

There is a third aspect here that concerns the nature of practical argument and consultation, and which elsewhere in the thesis discussion was referred to as the arrow of time that accompanies practical reason. This is the idea that patterns of practical reason can themselves evolve, so that, for example, what might be first presented as irreconcilable differences could be bridged over time via some form of learning from collective experience. More particularly, the way in which practical reason involves a being open to distinctly human significances can involve changing one's own position. This is particularly the case where the language we use to express our moral insights and experiences can mature as we build up an increasingly more expressive set of qualitative contrasts. As was noted in thesis Chapter Four, such a language can not only enable us to be more articulate about the higher emotions we experience, but can open up the door to an expanded range of higher emotions to become more articulate about. The growth here in the quality and use of language speaks to the way in which practical reason can develop over time. Crucially, such growth in the expressive use of language is not done in isolation, but in conjunction with an evolving society and the ways in which the planet's diverse peoples and cultures might learn to live in a planetary age.

Along a different but related line of thought, practical reason is arguably intended to help make better sense of those matters of worth or significance as might be found in our forms of life at the level of the individual, the community or the institutions of a co-evolving society. In this regard, and as stated earlier in this thesis chapter, in a co-evolving society we need to be open to some of the broader significance of our decisions, this in part through patterns of practical reason and consultation that can attend to a knowledge of the past, a discerning anticipation of the future, and hence to a more prescient grasp of that which is significant or worthy of attention in the present.[1359]

So far as the thesis argument is concerned, humans live within an evolving dynamic in which they are partly responsible for creating both an own and mutual future, one based in part on learning how to value the worth and dignity of others, and with these the sense of unity among people that is missing in the planet's current state of diversification. Such notions can be found in part through an inner search as to what it is to be a person, the significance of underlying meanings found in the guiding images of a culture or society, in the nature and workings of the goals and principles of a

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planetary age, as well as in those consultative procedures and patterns of practical reason that can assist in learning from experience and in overcoming adversity. Also, and in a crucial sense, learning from experience is inherently comparative, which brings to the fore once again Taylor's notion that some of the more fruitful forms of practical reason are about transitions.[1360] It is important to note as well that learning over time how to recognize and give expression to that which is worthy in others, includes the search for knowledge that can help us to be open to, to expand, or to amplify opportunities for the exercise of human capacity. These ideas therefore relate back to the questions posed at the beginning of this Part E regarding the motives and actions of the moral-self, namely, i) How to treat others as beings of worth? and ii) How might society be organized so that the worth of all its inhabitants is recognized and can find expression?

Remaining alert to this sense of worth and dignity due to others, as well as the exercise of human capacity that accompanies it, could arguably help to sound out directions for action, as well as forms of practice that work co-operatively towards their accomplishment. From this point of view, patterns of reason that are comparative in nature, and which deal with transitions conceived in strongly evaluated terms, could offer gains in understanding how particular aspects of the present socio-cultural world might be used to discern those aspects of worth or significance we want to see emerge from a future-in-waiting. In other words, practical reason and consultation conducted from the point of view that we are self-interpreting beings is part of being more open to those aspects of life that work at what unites and fight against what separates.[1361] More than this, not only are they a part of being open to those significances that unite, but that as we come to make greater sense of them, as we come to use, for example, Taylor's notion of a language of qualitative contrasts, we might also gain a more mature grasp of the very notion of what it is to work at what unites, or, as was quoted earlier, how to "exchange unconcealed hostility for conversation between equals".[1362]

Some closing comments regarding technology

A point made repeatedly in the thesis discussion is that in the contemporary world all key social nodes are in transition. For example, the anarchy inherent in unfettered national sovereignty is now generally acknowledged.[1363] The revolution in science-based technology has altered our views of ourselves and the world we inhabit. Systematic invention has changed people's practical lives, and provided part means for generating a measure of material wealth never before seen, but which we are not sure how to use. Furthermore, planet-wide conceptions of social organization are slowly in the making, at the heart of which lies the notion of unity within diversity.[1364]

However, the turmoil peculiar to our age shows how much still needs to be learned about such unity. Morin would argue that a different organization of knowledge is required.[1365] In other words, and as noted repeatedly elsewhere in the thesis, the trials of our age are not to be understood primarily in terms of antagonism and struggle. They instead derive from the failure to recognize that humankind is one. Here then, principles that can help create a vision for human life and its significance that are world embracing rather than confined to one's own self, instead of being naive in conception, are in fact a necessary part of peoples practical choices and quality of consultation. As Laszlo notes: "The balance between unity and diversity must not only be understood; it must also be adopted in practice ... [D]ifferent people and different societies must do more than tolerate each other: they must learn to live together, to complete and complement each other".[1366]

In the context of the thesis argument, learning how to put aside these conflicts has special reference to those conceptions of human life, the aspirations and incentives of which are couched mainly in terms of, say, economic growth, or a self-regarding consumer culture, or the choices of the free, self-defining individual. Part of the argument here was that these conceptions of human life took root in the context of a generally materialist view of reality, but that, over time, such a view of

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reality has proven itself inadequate to the task of development seen as material well-being, let alone the broader task of human development.

In the context of the thesis argument, part of the problem with "the incentives of a prevailing order", besides the fact that they reflect a "profound error of conception about human nature itself" is that the decisions people make in light of those incentives are likely to be understood in terms of what Taylor calls weakly evaluated ends, and with them a possibly truncated picture of what the thesis discussion has referred to as distinctly human significances.[1367] As argued in thesis Chapter Four, the nature of weakly evaluated ends is such that they are not particularly adept when it comes to dealing with the special nature of moral goals, or of the ontological link between intent and action. As a result, making sense of our decisions or actions in terms of weak evaluation, or what Taylor also describes as the simple weighing of alternatives, may tend to give a reasonable account of human agency from the point of view of the self-defining individual, but less so where humans are recognized as being self-understanding persons.[1368]

Assuming the above points, it may be the case then that contemporary conceptions of what technology is about, and how we judge our choices for its development or use, have grown in a climate of thought that reflects something of those misconceptions about human nature, as well as the prevailing aspirations or incentives of our age. Perhaps obviously, it is in terms of those conceptions, aspirations and incentives that people would try to understand their decisions about technology, the motives behind its use, and the ends to which it is put. If so, then to the extent that we make sense of such conceptions, aspirations and incentives in different terms, then we might also thereby come to possess a different picture of what technology is all about, as it were. More than this, however, if we can reason about our technology in the form of a transition, then we could arguably see more clearly how a move from existing conceptions, aspirations and incentives could constitute a gain. Transitions might occur here, say, between conceptions of the self-defining individual and self-understanding person, or between weak and strongly evaluated ends, or via motives understood in terms of significance. One could even argue for a gain by moving to a richer ontology, or by turning to a different level of reality in order to resolve a paradox.

In this regard, decisions for technology would not then be based solely on efficient or effective means to achieve clearly conceived productive ends, or on the diffusion of technology in accordance with the demands of an open consumer market, or the freedom of choice in a world rich in means and resources, or in the push to advance technology along paths of continuous of innovation, or even on the basis that *Homo sapiens* is by nature a tool user, and that therefore creating sophisticated techniques and technology can serve to show up more of who and what man is. Decisions for technology could also proceed from attempts to make sense of ourselves as beings of worth or significance, through notions of inescapable commitment and strong evaluation.[1369]

This is one reason why it is important to keep asking questions about human agency and the images we use to picture it. Whether if, for instance, we view it in terms of a Central Nervous System that requires outside devices to express itself, or as our being subjects in a self-organising system, or as functionaries of the invisible hand of the market place, or that our actions are the working out of the laws of natural selection and the survival of the fittest. Each of these instances would tend to imply one or another conception of what is it for humans to act, as well as how to make sense of or otherwise judge those actions, say, in the sense of determining how effectively they are carried out. From the point of view of the thesis argument in Chapter Four, however, human agency is about those actions that speak to who we are as beings of worth or significance. That is to say, by virtue of our intents and actions, do we show ourselves as a lesser being for them? What does it mean to fulfil our obligations and commitments? And, to repeat again a question posed at the start of this discussion: How to treat others as beings of worth?

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One possibly useful notion here is that the context of an evolving planetary dynamic provides for an additional ways of picturing those conditions that give rise to ingrained conflict, the brutalization of society, or a callous disregard for the weak or voiceless. In such circumstances one might watch for attitudes towards the development and use of technology that tend to go hand in hand with increased conflict or exploitation. At the same time, attempts to discern the richness of meaning found in our past without succumbing to "the embittering traditions of history", and to try to realize more clearly that which is worthy of us in our present decisions can help to write a future in which such conflict will have been put aside as a prime mover of history.[1370] This latter notion speaks to the second question posed at the start of this Part E, namely: How might society be organized so that the worth of all its inhabitants is recognized and can find expression? Here too one might be on the look-out for those strongly evaluated aspirations and choices for technology that tend to go hand in hand with increased cooperation and associative wholes, to use a phrase from Morin.[1371]

The notion that societies and cultures co-evolve, that our terrestrial and human systems are variously connected, and that our decisions need to reflect a world-embracing point of view are all aspects of what it might mean to think in terms of a planetary age. Such ideas could as well have a say in the process of trying to discern if, and to what extent, the decisions we make regarding the development and use of technology contributes to an advance or decline in human well-being. Accompanying this effort to discern something of the significance of our decisions about technology is a maturity of thought that can sometimes come from our consultative practices and forms of practical reason. The thesis discussion has repeatedly tried to suggest that accompanying such consultative practices and forms of practical reason is a continued search for knowledge, including the acquisition of the arts, crafts and sciences, from whatever of the world's cultures and intellectual traditions they may come, as well as how to organize that knowledge into something of an open book available for all the world's inhabitants to read. To this search for knowledge might also be paired the efforts of each person to discern, to a greater or lesser degree and in accordance with his lights, some of the meanings that can be found in the world's cultures and traditions.

If so, then gains could be made in understanding our technology decisions by reflecting over our forms of life and motivation that, as was cited earlier, "transcend a constantly changing economic landscape and an artificially imposed division of human societies into 'developed' and 'developing'."[1372] Such ideas could aid in helping to recast the technology aspirations of a prevailing order, at least in so far as their worthiness or significance is concerned. Perhaps equally crucial here is the notion that the human powers which technology extends or amplifies are not just a matter of individual capacity, but of the consultative powers wielded by the institutions of society.

The thesis has tried to argue that in certain ways these and other aspects of knowledge can be linked to patterns of practical reason that speak in transitional, but not sceptical terms when it comes to discerning the significance of our decisions or the worthiness of our actions. Such transitions were said to constitute an epistemic gain.[1373] Furthermore, there is a unity in our capacity to know the world, to be open to its significances, and to judge the worthiness of our actions in it. The thesis discussion also tried to point out that such a unity can be enriched through the quality of consultation that individuals, communities and the institutions of society might achieve. It has even been suggested in these pages that a people's quality of self-articulation and their powers of self-determination can benefit from the kind of understanding that comes from a mature consultation.

Patterns of practical reason and consultation discussed in this thesis, whether proceeding from naturalistic abstractions, complexity, co-evolution or who we are as self-understanding beings, can thus arguably contribute something to our understanding of the transitions that will likely emerge as people come to terms with the awareness that humankind is one, and with it the practice of unity with diversity called for in an interdependent world.

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Part F: Chapter summary

The discussion in Chapter Six highlighted the dynamic of a global humanity as a point of view from which thinking about the development and use of technology can take place. To take on this perspective requires noticeable changes in thinking about what technology is, particularly what this implies for patterns of practical reason and technology incentives. The chapter attempted to tie together ideas developed in each of the previous chapters in order to suggest some of these pattern's main characteristics. Mainstream notions of intelligence and technology were used as the starting point for discussion. Focus here was on the classical idea that the human nervous system has evolved in such a way as to require outside devices to express itself. The chapter discussion also considered some key implications for planning and consultation that arise in an interdependent age, the concept of system organization, as well as global norms and technology incentives within which decisions about technology might be placed. It also attempted to balance its systems discussion by linking these ideas to some implications about practical reflection and technology that come from a point of view based on *ad hominem* reason, strong evaluation, a language of qualitative contrasts, and reasoning about transitions. It furthermore attempted to suggest what reason in terms of the concrete universal might imply for conceptions of what technology is about, and hence in what sense its development and use arguably contributes to an advance or a decline in human well being.

Such ideas were discussed so as to to bring together a host of ideas treated throughout the thesis, and to explore the implications they have for notions of practical reason and consultation. The aim throughout has been to develop a set of concepts that can be used to make better sense of the technology decisions we are faced with in a planetary age.

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Chapter Seven: Findings and Conclusion

Introduction

One of the central ideas coming out of the thesis discussion is that a host of connections exist between practical reason, consultation, and the decisions that must be made regarding the development and use of technology in a planetary age. The thesis argument served to demonstrate that these connections are particularly relevant in light of the interdependencies and mutual relations among peoples and nations that characterize a co-evolving global society. While the discussion in the thesis has been wide-ranging in this regard, three aspects came repeatedly to the fore. First, that self-understanding is partly constitutive of humans as persons, second, that the related patterns of practical reason by which people come to discern the worthiness of their own and others' intents and action can be made sense of in strongly evaluative terms, that is to say, in terms of inescapable commitment and a language of qualitative contrasts, and third, that aspects of this self-understanding and related patterns of practical reflection necessarily involve individuals, communities and institutions in a mature consultation over those decisions about a collective future-in-waiting that speak in some sense to good or acceptable forms of life.[1374]

The thesis argument, furthermore, has repeatedly emphasized that in a co-evolving, planetary age the continued focus of such a mature consultation is more properly directed to the significance of an essential unity that obtains in the relation between the peoples of the earth, a theme to which the majority of the authors consulted in this work would subscribe. Indeed, a key point made throughout the thesis discussion is not to deny the harrowing trials of this and the previous century, but to recognize that they result from our continued collective failure to come to terms with the principle that humankind is one.

In this regard, a central point repeatedly set out in the thesis discussion is that thinking in terms of these ideas can contribute to an expanded conception of what technology is about, as well as offer gains in understanding the significance of the decisions that face humankind in a planetary age. In a broad sense, the thesis argument has tried to demonstrate the working unity of these ideas, at least within the confines of the thesis discussion and the scope of its central research questions.

In order to pick up further on these broad findings, this final chapter will briefly revisit the thesis purpose and its central research questions, review its main conclusions, point out the relevant subsidiary ideas from its various chapters, bring to the fore some of the essential insights and supporting conclusions that speak to the thesis objective, point out some of the limitations of the ideas it has tried to explore, and suggest a set of issues and questions for further consideration.

In order to accomplish this, and following a brief review of the thesis purpose and the scope of its central research questions, Chapter Seven is divided into four parts. Part A deals with the main findings of the thesis regarding our planetary age, complexity and co-evolution as were discussed in the second half of Chapter Three and in Chapter Five. Part B looks at the central conclusions regarding the notion of self-understanding and the specific conception of practical reason that comes from it, as treated in the first part of Chapter Three and again in Chapter Four, as well as some preliminary ideas that were discussed in both Chapters One and Two. Part C will look as some of the main points that were established in the thesis argument in Chapter Six regarding the conception and use of technology, with special emphasis on the technology aspirations of a planetary age. Part D offers some questions and areas for further consideration that emerged from the thesis discussion.

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Purpose and scope

The purpose of the thesis discussion was twofold. First, to consider a variety of ideas regarding the nature of reason and resulting conceptions of practical moral argument, both those indebted to the assumptions of the naturalistic stance as well as those that work outside its conceptual scheme, so as to better understand the nature of contemporary moral scepticism and the conditions under which such scepticism may be unwarranted or premature. Second, to explore what this analysis of practical moral argument implies for our conception of what technology is about, as well as the significance of the decisions we make regarding its development and use in a planetary age.

In the attempt to carry out these purposes, the thesis explored three broad areas. First, an analysis of the naturalistic stance in Western intellectual culture as exemplified in the notion of explanation on the one hand and of understanding on the other. In order to do this the thesis discussion explored patterns of reasoning found in the natural and quantitative social sciences related to explanation, as well as the patterns of reasoning found in the qualitative social sciences related to understanding. The main concern here was to highlight the specific avenues by which these patterns of reason tend to take on a sceptical stance towards practical moral argument.

Second, an analysis of the notion that humans are self-understanding creatures, as well as ideas from complexity and co-evolution, so as to uncover alternative patterns of practical reason that i) are not expressly indebted to the abstractions of the naturalist stance, ii) which might therefore provide a different set of perspectives concerning the sceptical attitude towards practical argument usually associated with that stance, and iii) offer a range of insights into notions of worth and significance so far as concerns the nature and conduct of practical reason in general and in a planetary age in particular.

Third, to use all four notions of practical reason, namely those based on the naturalistic stance, self-understanding, complexity and co-evolution, to explore a range of ideas concerning contemporary conceptions of technology and what sense can be made of our decisions regarding its development and use in a planetary age.

Lastly, the thesis narrative was guided by three broad questions. First, what is the nature of the unity that exists between our capacity to know the world in an epistemological sense, and our ability to judge the moral significance of our actions within it? Second, what sense can we make of our decisions about technology in so far as they might be said to contribute to an advance or a decline in human social well-being? Third, what insights can we gain into our patterns of practical reason and decisions for technology when viewed in the context of a planetary age, and considered in light of the principle of the oneness of mankind?

Part A: Our planetary age, complexity and co-evolution

The main findings of the thesis regarding our planetary age, complexity and co-evolution are presented in Part A. This will be done in five brief sub-sections: Humankind is one, Patterns of reason for a planetary age, Practical reason and an arrow of time, Socio-cultural evolution, and Self-articulation and arguments about transitions. The treatment in Part A is not exhaustive, and other related findings will be presented in Part B and Part C as the discussion warrants.

Humankind is one

The idea that a certain unity exists in the relation between the peoples of the earth was central to the thesis argument, and has been set out and argued for from a variety of perspectives within different chapter discussions. The discussion in Chapter Six, for example, worked to established the idea that

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in our social choices we cannot look only or even mainly to the tight economic matrix in terms of which socio-economic development has often been conceived and carried out, be it in either its more socialist or capitalist forms. Instead, there is a need rethink this largely materialistic conception of development by looking to the unfolding of our social, cultural, psychic, ethical and spiritual potential. More than this though, it is not that material well-being is an inappropriate focus of practical augment regarding development decisions, including here the use of technology. It is instead that the more our notions of development and the motives that drive our actions in regard to it are restricted to the "mere amelioration of material conditions", then the less likely it is that we will reach even these goals of well-being.[1375] The discussion in the thesis Introduction as well as in Chapters Five and Six emphasized that the counter-intuitive character of this statement points to a fundamental misconception in Western intellectual culture regarding the nature and scope of human motivation, namely, the misconception that as a species *Homo sapiens* is incorrigibly selfish and aggressive, and as such is wedded to struggle, division and conflict.

In this regard, the central idea of unity in human relations was again set out in Chapter Six where, in light of the requirements of a planetary age, it was argued that agreement and associative fellowship need to replace struggle and conflict as the prime movers of historical choices.[1376] Instead of being intrinsic to *Homo sapiens* as a species, and therefore an ineradicable part of human behaviour, the various forms of prejudice, war and exploitation that have troubled human societies and civilizations are here viewed as constituting a transitional phase involving first, an evolving planetary age, and second, our corresponding failure to recognize the extent to which our best interests cannot be made sense of apart from a principle of unity in human relations among all the earth's inhabitants.[1377]

Patterns of reason for a planetary age

Furthermore, ideas from Chapters Three and Five, dealing with complexity, co-evolving processes and different levels of reality, combined to establish three subsidiary principles also in evidence throughout much of the thesis discussion.

First, many of the interactions that characterize contemporary societal choices can be conceptualized more adequately if we expand our notions of practical argument beyond the usual range of abstractions and patterns of reason that accompany thinking from within the naturalistic standpoint. The discussion in Chapters One and Four more specifically referred to this as foundational reason and apodictic forms of argument, and which in Chapter Three was described as the logic of disjunction and the paradigm of simplification.

Second, needed in addition are patterns of reason that speak to who we are as self-reflecting creatures, and hence to our capacity for knowing the world and judging or discerning the significance of our actions within it. Such patterns were variously referred to as complex explanation, thinking in terms of the concrete universal, transdiciplinary modes of thought and the *ad hominem* form of practical argument. In the thesis discussion the first two were related to what in Chapter Five was called Earth-centred goals and the transformative potential of time; the lattermost in Chapter Four to the ways in which fruitful forms of practical argument about transitions was formulated.

Third, the thesis discussion in this regard also put forth one of its main characterisations of practical reason, namely, that gains can be made in understanding contemporary societal decisions, including those that concern the development and use of technology, by employing modes of thought and consultation that speak to our knowledge of the past, the anticipation of a future-in-waiting, and a more alert grasp of that which is significant or worthy of us in the decisions we face in the present. The discussion in both the thesis Introduction and in Chapter Six pointed out that to reflect on our

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choices in these terms is to at least take one step back from the embittering conflicts of the past, those conflicts which if allowed to live on in the present could keep us from recognizing the unique opportunities of our age for altering the basis upon which our historical choices have usually been conceived.[1378] The idea here that practical argument is carried forward by a reflection on our past, present and future-regarding social choices thus leads then to a second major thesis finding, that practical reason is directed by an arrow of time, in other words, it can evolve. This finding is an important one, and the rest of Part A will review the main ideas in the thesis that contributed to it.

Practical reason and an arrow of time

The idea that practical reason can evolve comes from two sources in the thesis discussion. First, the idea of co-evolving systems, as treated in Chapters Three and Five, and second, the notion that practical reason is substantive, not procedural, in nature, and that it therefore involves arguments about transitions. Both are linked to the way language can give expression to a prescient reading of our intents and actions, and hence to their significance, as discussed in Chapter Four.

Using the ideas first highlighted in Chapter Three, the discussion in Chapter Five served to link the idea of co-evolution and the emergence of living systems that are complex in nature, the idea being that in our terrestrial, or macro-world within which the emergence of living systems takes place, then this opens the door to the notion that such systems co-evolve. Three initial features of co-evolution were set out in this regard. First, it is possible to try to visualize the history of the universe in co-evolving terms. In other words, the physical universe has co-evolved along both the micro-scale and macro-scale, at the level of elements and compounds on the one hand, and at the level stars and of galaxies on the other. Second, the emergence of life on earth and the conditions that obtain in the terrestrial environment have co-evolved, such as in the interaction between living systems and the earth's oceans, atmosphere and land. Third, the species *Homo sapiens* has emerged out of these co-evolving processes, but more specifically, the human capacity for self-reflection has evolved in such a way that we can consider and deliberate over the transformative potential of time. In other words, by virtue of our ability to envisage and weigh up our past, present and future-regarding social choices, that is, to reason practically, we are better able to mark out those courses of action that help us realize our various potentials, put practice to good and acceptable forms of life, promote the principles of justice and peace, and nurture a consciousness that mankind is one.

Socio-cultural evolution

According to the self-organizing principles discussed in Chapters Three and Five, in evolving terrestrial systems any subsequent phase in the emergence of complex forms of life cannot be anticipated in advance. However, in looking back over these broad evolutionary phases, we can paint a picture of certain after-the-fact processes that speak to the emergence of complexity in living forms and in their functioning.[1379] Three such processes were set out in the discussion in Chapter Three, namely, evolution towards greater individuality, increased diversity, and the growing interconnectedness between them.

However, the discussion in this same chapter served to show that the emergence of our human capacity for self-reflection reverses the working of these kinds of after-the-fact processes. Whereas before we could at most picture some form of process involving greater organic complexity, but known only after-the-fact. Now a form of co-evolving purpose exists before the fact, and this because for beings with the capacity to know their world and to judge or discern the worthiness of their actions in it, evolution has become partly socio-cultural. In other words, in order to make sense of ourselves we need to expand our notions beyond the principles of the evolution of species as such. Evolution still takes place, but at a different level of reality.

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More particularly, the discussion in Chapter Three served to establish that: i) human societies are only partially natural systems that respond in self-organizing ways to the various dynamics at work in and around them, ii) the form and quality of our societies is also written by the actions of self-understanding persons as opposed to self-defining individuals, and iii) since humans can see into, consult over, plan for, and act towards creating a future-in-waiting, then some of the dynamics proper do not hold in the case of socio-cultural evolution. In other words, a future-in-waiting exists for beings who can know their world and themselves, reason practically about the worthiness of their actions in it, and envisage a society worthy of inhabiting. Of course, the writing of such a future is not some fictional account, but involves us in the working out of the transformative potential of time. The discussion in Chapters Five and Six picked up on these ideas, and argued that three related points can be made. First, such a future is one that can be written, at least in part. Second, within the powers humans possess the responsibility is ours to do so. Third, and crucially, in a planetary age the exercise of our powers of practical reason and consultation are more fruitful when they direct us to towards a world-embracing perspective.[1380]

This latter idea concerning a world-embracing point of view was visited repeatedly in the thesis discussion. One general observation that can be made in this regard is that it is only over the last six thousand years or so that human collective life has recorded exceptional movements towards greater organization and complexity, proceeding for example from family to tribe and from city state to nation.[1381] And yet compared to the time-frames involved in the evolution of modern man, six thousand years is a small, almost insignificant length of time to consider. That much has comparatively been accomplished across the first six thousand years of mankind's recorded history gives to the question "What might the next six thousand have in store?" a sense of richness and possibility which existing global conditions might seem to belie.

Here the point needs also to be made that our age is the first that can perceive the entire earth as a single geographic entity, and so regard all its peoples as inhabitants of a single planetary home.[1382] In this respect we are in the earliest stages of seeing ourselves in planetary terms. However, if it is the case that we are in the early, turbulent steps leading to the organization of life across the planet as a whole, then the fact must also loom large that the continuing trials of our age derive from our primary failure to recognize that humanity is one.

By thinking in such terms the notion of the arrow of time has shifted somewhat. Terrestrial evolutionary processes that created greater individuality, increased diversity, and the growing interconnectedness of living systems are still at work. The discussion in Chapters Three and Five pointed out that much emphasis of late has been put on ecological awareness, for example, and the various lessons for human living that can be learned from it. But a socio-cultural setting adds another set of time-dimensions, or, if one prefers, it creates processes that work at a different level of reality from the usual evolutionary sort. Here the socio-cultural arrow of time can be redirected by our capacity to envisage and weigh up our past, present and future-regarding social choices.

Another key idea developed in Chapter Five is that, quoting from a passage first cited in that chapter, "Knowledge of the world as world has become an intellectual as well as vital necessity. It is the universal problem of every citizen: how to gain access to global information, and how to acquire the possibility of linking together and organizing it".[1383] One point of repeated emphasis in the thesis argument was that when it comes to the necessity of linking together and organizing our knowledge, then thinking in terms of co-evolution or self-understanding can help us visualize in more integrative terms what it is to unite our capacity to know the world with our capacity to judge the worth of our actions in it.

In general then, one of the main conclusions established in the argument in Chapter Five is that we have the capacity to take directed action in our social world, instead of letting self-organizing

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processes run their course. To redirect the arrow of time in this way, so to say, would then be to act according to that which is worthy of who we know ourselves to be, or towards the kind of society we seek to inhabit. To act otherwise would show us up as a lesser being, or that ours is a society in decline And this because, paradoxically, the self-organizing processes out of which have emerged our capacity for self-reflection or self-understanding cannot be used to understand the nature of the socio-cultural world which that same capacity for self-reflection makes possible. This is one reason why it is part of our collective responsibility to try to understand what makes for a quality of life in that socio-cultural world, and how to go about fostering its growth.

Reasoning about transitions

This then leads to the third aspect established in the thesis regarding time and the evolution of practical reason, one equally crucial for the thesis argument since it dealt with the notion that the language in terms of which we understand the sphere of moral argument, being about transitions, can itself grow or evolve.

Three thesis findings in particular contributed to this idea. First, and as discussed in Chapter Four, as self-understanding persons we are able to form judgements about our actions according to their worth or significance, say, in terms of justice, dignity, honour, trustworthiness, the pursuit of peace, and the like. Of course, one need not only think in terms of self-understanding to be able to judge the worthiness of actions. However, from within the point of view of self-understanding argued for in the thesis, matters of significance speak in a particularly emphatic or distinctive way regarding the special nature of moral goals – be it at the level of the individual, the community or the institutions of society – in that they involve notions of inescapable commitment and strong evaluation. In this regard, the thesis argued that both the notion of inescapable commitment and strong evaluation can take thinking about what it is to be a moral agent well outside the usual range of naturalistic abstractions, as was discussed in Chapters One and Two.

Second, and as also treated in Chapter Four, within a given social setting our judgements of worth or significance are a part of those shared meanings that make up various community or institutional practices. The chapter argument here went to some length to show how it is that shared, or community meanings cannot be made sense of via a language of neutral descriptions or in terms of the naturalistic conception of a person as a self-defining individual. They require instead the notion that humans are self-interpreting persons for whom matters of significance cannot be divorced from our most prescient self-understandings.

Crucially as well, the same notion of shared or community meanings was linked to what the thesis discussion in Chapter Five called cultural guiding images. The main point argued for in this regard was that we will more likely fail to make adequate sense of our choices as agents if we avoid giving expression to the unfolding of our social, cultural, psychic, ethical and spiritual potential in planetary terms, and hence in terms that can give greater effect to the consciousness of the oneness and wholeness of the entire human race. A related point established in Chapter Six is that an attempt to sound out, say, the nature and practice of justice as the preliminary to peace in a planetary age, and hence to grasp more clearly the consequences of our decisions and actions regarding a future-in-waiting, obliges us to move away from parochial points of view. Hence, contemporary moral judgment resides in an age that calls for planetary levels of significance.

Third, and perhaps most important so far as concerns an evolving view of practical reason, a language of moral commitments can act as the currency of practical argument in a given age. Such a language serves to help decipher the moral issues and decisions people face. Since we think linguistically, we necessarily call on language in order to make sense of the special nature of moral goals, and to recognize more clearly what is worthy of us in our intents and actions, or significant in

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regard to the guiding images of a planetary age. This is especially so for those that speak to the principle of the oneness and wholeness of human relations.[1384]

However, such a language can itself advance or grow, or fall into disuse, according to the tests, adversities and successes of a given age or society. More specifically, the continuing argument in Chapters Four to Six tried to show that a language of qualitative contrasts can offer gains in understanding the practice of justice, dignity and the like, or in realizing more fully the significance of those ethical choices people face, including decision about the development and use of technology. As the expressive capacity of such a language progresses or retreats, then so too will progress or retreat the range of significances we can be open to, and in terms of which we realize the nature of our commitments. In other words, the way we express and realize the nature of our moral commitments will itself evolve. For example,, we might come to unravel the implications of our moral commitments using a different contrastive background. Whereas today the moral sphere of argument is expressed primarily via the language of human rights, over time other terms will evolve so as to convey our deepest moral insights. An alternate sense will be given to the outcomes of our practical choices, or how we understand our own or others' past, make sense of a future-in-waiting, or come to realize what constitutes the significant or worthy course of action in the present.

An important point established in Chapter Four with regard to a language of qualitative contrasts is that, not only can such a language help us to be more articulate about our higher emotions, but it also opens to our experience a broader range of higher emotions to be more articulate about.[1385] This is due to the link that exists between an expressive use of language, and who we are as self-interpreting persons. Such is one aspect of the ontological link between intent and action. In other words, it is through language that we are able to express the sense of worth, or its lack, that we experience. But more than this, it is possible to come to a new understanding of the world, what it is that is worthy of us as persons, and to change the quality of our actions within it.

By putting things in such terms, the thesis argument concluded that, first, to the extent that practical reason about our moral commitments is wedded to a language of qualitative contrasts expressed in strongly evaluative terms, then the exercise of practical reason will develop different forms according to the ways in which such a language and a socio-cultural world co-evolve. Second, implied here is the idea that transitions will occur in the way we think about the nature and conduct of practical moral argument, and that furthermore, such transitions can have a rational motivation. In other words, such transitions occur in a co-evolving world where purpose exists before the fact, and where it is partly pictured in terms of a future-in-waiting. Third, the kind of society a people inhabit, and the powers of self-determination they might achieve, depend in part on the sense they can make of good and acceptable forms of life. In other words, it is in part through a language of worth and significance that we come to possess a greater or lesser, a more prescient or more obscure self-understanding of what such a life entails. Fourth, the language of contemporary moral judgment, and with it the particular quality of self-understanding, or self-articulation, a society achieves, resides in an age that calls for a planetary level of awareness. Such a planetary level of awareness involves, for example, deep-seated notions of mutual support and benefit, as well as a unity in relations among people, communities and the institutions of society from across the globe.

Part B: Self-understanding and practical reason

The focus of this next Part B is on the central findings regarding the notion of self-understanding as established and emphasized in Chapters Three and Four, but which also had a role to play in the discussion in the two subsequent chapters. In addition, a range of background ideas which were established in Chapters One and Two will also be brought on board, notably those regarding the naturalistic stance, its ontological assumptions and accompanying notions of intersubjectivity, the

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self-defining individual, the subjective nature of moral judgements, the procedural conception of reason, and the generally sceptical attitude towards practical argument found in Western intellectual culture. Within the thesis argument itself, these ideas set the stage for the discussion in Chapters Three and Four that established a different conception of practical reason, one which worked outside the usual range of naturalistic abstractions, and which could therefore better identify in what sense is scepticism towards practical reason unwarranted in the moral sphere. The following discussion in Part B of findings from the thesis argument in this regard will cover ten short themes, namely: Background notions in the naturalistic stance, Explanation and understanding, Intent and action, Mechanism, Mechanism and a materialistic view of life, The primacy of the epistemological, Substantive reason, Practical reason and human significance, Consultation and practical reason, and lastly Self-understanding, complex reason and co-evolution. In some places ideas from Chapters Five and Six will also be discussed in so far as they provide further social context for making sense of those forms of practical reason based on the notion that humans are self-understanding beings.

Background notions in the naturalistic standpoint

The language of practical moral argument was the special focus of the discussion in the first half of Chapter Three and all of Chapter Four. Emphasis in these chapters was placed on ideas such as human agency, inescapable commitment, strong evaluation, community meaning, a language of qualitative contrasts and the ad-hominem form of argument. The treatment of these ideas in Chapter Four in particular served to establish the second specific characterization in the thesis of what it is to reason practically, namely, that it involves a being open to, a being able to be influenced by our grasp of that which is distinctly significant or worthy of who we are as moral agents. Furthermore, the same argument pointed out that this cluster of ideas revolves around two specific ontological and epistemological beliefs that are non-naturalistic in character, namely, first, that we are self-understanding beings, and second, that as regards reasoning in the moral sphere, we can have a substantive grasp of that which is worthy of our actions or of significance to our lives and decisions. Such ideas were argued for in terms of the ontological link between intent and action.

Regarding the background conceptions in the naturalistic stance, the thesis discussion in Chapters One and Two formulated a set of ideas regarding the nature of intersubjective accounts and the accounts of subjects. Three main conclusions came from this formulation of ideas. First, that they play a central role in mainstream conceptions of practical reason, mainstream meaning those indebted to the abstractions of the naturalistic stance. Second, that the patterns of thinking associated with intersubjective accounts and the accounts of subjects, while of profound use in the social sciences that aim respectively at explanation or understanding, can otherwise lead to a position of scepticism regarding the moral sphere of argument. In other words, when it comes to resolving differences between moral beliefs and practices, there is no such thing as a conclusive practical argument. Third, there exist cases where such an attitude of doubt is unwarranted, and this because there exist other patterns of practical reason that do not turn on the usual range of naturalistic assumptions regarding the nature of the world and what it is to know it, and hence on the idea that reason proceeds either in terms of intersubjective accounts or in terms of the accounts of subjects. As such these other patterns of reason can i) offer an expanded set of insights into the nature of argument in the moral sphere, and ii) help illuminate some of the generally accepted yet paradoxical sources of doubt in Western intellectual culture regarding questions of worth and the judgement of values.

More generally, the thesis argument in the first four chapters was guided by the principle that gains can be made in understanding the nature of practical moral argument in Western intellectual culture by looking at patterns of reason used in explanation and understanding, as exemplified in the natural and social sciences. In this regard, the argument in Chapters One and Two showed the

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various ways in which the patterns of reason used in the modern sciences reflect important aspects of the naturalistic standpoint. It also argued that the two developed historically in tandem such that each influenced, and therefore reflects, the development of the other. In the chapter discussions the actual link was made first in terms of the natural and quantitative social sciences that are said to aim at explanation, and second, in terms of the qualitative social sciences that are said to aim at understanding. Such an analysis of ideas in Chapters One and Two had the specific purpose of trying to come to grips with some of the main sources of moral scepticism in Western intellectual culture, and, having attempted to sound these out, to investigate in Chapters Three and Four those contexts where such scepticism is misconstrued, premature or is otherwise unwarranted.

Explanation and understanding

A number of other background assumptions in explanation and understanding emerged in the discussion in the first two chapters. First, and in no particular order, the assumption the naturalistic standpoint makes regarding the existence of a neutral, inanimate universe on the one hand and of individual conscious minds on the other. Second, the assumption that reason is foundational and procedural in nature, and is likewise based on the use of external criteria in terms of which an argument is to be judged as rational or not. Third, the assumption that moral argument is to be conducted in such a way as to shake one's opponent free of his mistaken moral beliefs. Fourth, the tendency in the natural and social sciences to pattern models of reason on either intersubjective accounts or the accounts of subjects. Fifth, the central role the designative use of language plays in the reasoning process in the natural and mainstream social sciences, as well as in the manner by which abstractions in the naturalistic stance tend to be formulated. Sixth, the tendency in Western intellectual culture to regard human persons as self-defining individuals. Seventh, the tendency to associate a sceptical attitude towards moral argument with one form or another of moral relativism.

These same background ideas also served as starting points for the discussion in Chapters Three and Four regarding an expanded notion of practical argument that proceeds from self-understanding and substantive reason, and where it was also established that part of this expanded notion of argument in the moral sphere involves turning to a richer ontology than naturalism allows. Among these background ideas three in particular stand out for the insight they give into naturalistic notions of reason and practical argument. First, the assumption made regarding the existence of a neutral universe on the one hand and of individual conscious minds on the other. In other words, those key ideas in the naturalistic stance that speak to the nature of the world and what it is to know it, or what the thesis discussion also referred to as the ontology inherent in the natural sciences. This assumption was the starting point for the discussion in the first two chapters regarding objective knowledge and subjective opinion, or intersubjective accounts and the accounts of subjects. Second, the assumption that reason, or rationality, is foundational and procedural in nature, and is likewise based on the use of external criteria in terms of which an argument is to be judged rational or not. This second assumption is where the primacy of the epistemological comes to the fore in naturalistic thinking, and in Western intellectual culture generally. In other words, "the tendency to think out the question what something *is* in terms of the question how it is *known*".[1386] Third, the assumption that moral argument is to be conducted in such a way as to shake one's opponent free of his mistaken moral beliefs, or what the discussion in Chapter Four referred to as a critical morality. In other words, when faced with a rival moral position, true moral argument requires one to show up in the most clear terms possible the faulty beliefs upon which that moral position is based.

In a related move, the discussion in Chapter Two analysed a tendency in Western intellectual culture to join a sceptical attitude towards moral argument with one or another form of moral relativism. For example, that the moral beliefs and ethical practices of a person, society or culture are neither more nor less valid when compared to the moral beliefs and ethical practices of any

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other individual, society or culture. This latter idea was the particular focus of the discussion in Chapter Two on understanding and the qualitative social sciences, where it was highlighted that, according to thinking in terms of the naturalistic stance, to judge the moral worthiness of someone else's beliefs or practices constitutes either a form of cultural imperialism or is an attempt by one party to dominate the other. In this regard, ideas related to moral scepticism and relativism were part of the analysis in Chapter Two, where what was called positivist and post-positivist thinking was presented in terms of an axiomatic analysis.

The discussion in Chapters Three and Four picked up on this analysis in Chapter Two, and argued that in circumstances where the three above-mentioned assumptions come into play, then sceptical conclusions regarding practical moral argument are likely to follow, and this for a number of reasons. Three of these reasons in particular were highlighted in Chapter Four.

First, neutral language accounts go hand in hand with the assumption that the order in nature is neutral in its workings. In other words, since the universe exists independently of the conscious mind that might know it, then it is best known on its own terms, and is in this respect neutral with regard to any particular human hopes or aspirations. However, the discussion in the fourth chapter regarding *ad hominem* reason argued that it is precisely here that a language of neutral descriptions cannot make proper sense of our actual moral commitments, presumed in the naturalistic ontology to be the province of the individual mind, or subject. Alternatively, we turn to the accounts of subjects, or subjective opinion. But then, as argued in Chapter Two, either no one person's position can possess greater moral merit than another, in which case moral judgement is merely suspended, or it is the result of mere consensus or happenstance should it be that people actually manage to agree on some moral issue.[1387]

Second, foundational reason requires us to work our moral positions down to their basic underlying premises. And yet, at that level, any differences that remain are such that they cannot be arbitrated by recourse to further rational review. This was also one of the main defining features of axiomatic systems, as discussed in Chapter Two. In other words, the statements that serve as axioms are to be taken as such, not subject to proof, the consequence being that should disagreement occur at this level of analysis then no further rational appeal is possible. Hence, and as argued in Chapter Four, the notion that disputed positions are to be arbitrated by appeal to independent criteria puts paid to moral argumentation since no such criteria exist for the important moral questions people face.

Third, and finally, a critical morality assumes that all alternative standpoints are rivals, and as such must be shown to be wrong in their fundamentals. But, as just noted, it is precisely at this point that our options for further rational judgment become exhausted. However, the argument in Chapters Three and Four tried to establish the point that these kinds of considerations are somewhat indebted to thinking in terms of naturalistic abstractions. The discussion in Chapter Four argued that this does not make them wrong as such, only that there are other patterns for reason that need not take on such assumptions. If so, then the sceptical conclusions regarding practical argument that we formulate in naturalistic terms could fall away should we turn to a richer ontology, and hence to different notions of what practical reason entails.

Intent and action

One main position set out in both Chapters Three and Four is that in order to make sense of argumentation in the moral sphere we need to turn to a richer ontology than naturalism allows. The point made here was that explanatory accounts based on underlying mechanisms together with a language of neutral descriptions cannot give an adequate account of our "actual explanations, analysis, or deliberations" when it comes, for example, to judging our intents or actions in terms of their worth or significance.[1388] The discussion in Chapter Four thus served to bring home the point

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that in some cases, neutral language accounts tend instead to explain away what it is we do when we judge the worthiness of our actions or try to discern the significance of our decisions.

In this regard, a number of key points were established in the same chapter concerning what it is for humans to be partly constituted by self-understanding, the links self-understanding has to the expressive use of language, the nature of human agency and, therefore, the ontological link that obtains between intent and action. Here, to realize our intentions differently by the way we use language to make sense of them, say, in strongly evaluative terms, is to change what the action is. The nature of the ontological link between intent and act was the object of an extended exploration in Chapter Four, and constitutes one of the hallmark ideas in that chapter. That the link between intent and action constitutes such a richer ontology than is found in naturalism is also one of the main findings not only in Chapter Four, but in the thesis as a whole. A second conclusion followed in this regard. Since the ontology found in self-understanding provides for a more discerning or substantive grasp of our experience as moral creatures, then, in comparison with neutral language explanatory accounts based on underlying mechanisms, our most prescient ordinary language accounts need to take precedence. It is worth noting that the reference to our most prescient accounts is crucial here, since ordinary language accounts can also be muddled or obscure.

Mechanism

Regarding this second conclusion, in an attempt to explore the question: How is mechanism conceivable in relation to who we are as persons?, the argument in Chapter Four was at pains to emphasize that a machine-like image of the order in nature and society need not be rejected outright. Instead, mechanism is conceivable, but only if its conceptual framework is expanded in such as way as to include our most prescient ordinary language accounts regarding matters of worth or significance, say, those judged in terms of inescapable commitment. One central point made in this regard was that, should our most prescient ordinary language account differ from an explanatory account of the same phenomena based on neutral language or underlying mechanisms, then we need to question the mechanist account. This is because our most prescient ordinary language descriptions can offer a substantive grasp of our actual deliberations regarding matters of worth or significance, compared to the procedural accounts that are a hallmark of mechanism. Hence, if we are sure about both versions, yet they offer statements which at some point cannot be squared with one another, then we should look more carefully at our neutral language accounts. One point made here was that to side by default with an account based on underlying mechanisms may serve to help explain away something crucial to a more deep-seated self-articulation of our moral selves, and where to fail in our self-articulation would also serve to compromise our powers of decision and self-determination as self-understanding beings.[1389]

However, this conclusion needs to be read in conjunction with a second main result in Chapter Four, namely, that a conceptually expanded explanatory account is to be questioned only when propositions arise that cannot be squared with one another. In other words, i) the stronger position is the one where the two accounts square with each other and ii) gains in knowledge, which in Chapter Four were termed epistemic gains, come about where we actively seek out those expanded conceptual schemes. In terms of the argument in Chapter Four, to possess a conceptually expanded mechanistic account that does not explain away our most prescient ordinary language descriptions constitutes a gain in understanding. Here such gains in understanding offer additional links between our capacity to know the world and our capacity to judge the worthiness of our actions within it – a conclusion that in the context of the thesis argument is particularly relevant to the decisions that preoccupy our individual, community and institutional lives in a planetary age characterized by the consciousness of the oneness of human relations.

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An inanimate view of life

A related point set out in the thesis discussion concerning the question: How is mechanism conceivable? is that there are a number of other considerations at work in rethinking the notion of what a mechanistic account is all about. Two in particular stand out.

First, part of the very reason the discussion in Chapters Three and Five focussed on advances in contemporary science such as irreversible processes,, co-evolution, transdisciplinary thinking and complexity is that they offer a new dialogue with nature, one for which patterns of explanation are not classically mechanistic in origin. The various terms employed in the thesis discussion in these chapters, such as non-linear interactions, autopoesis, recursive procedures, levels of reality and active loops, point to the fact that a richer notion of mechanism is at work, the product of a richer ontology than classical naturalism allows. Given this, then we can incorporate into our thinking an organic image of the processes found in the natural and human worlds without compromising intellectual integrity.[1390] This reference to an organic image calls up two particularly influential background notions in the naturalistic stance against which the thesis discussion argued, that i) a mechanistic explanation in science is necessarily based on an inanimate world view, and ii) the assumption that deep down, the universe is inanimate in nature. A closely related naturalistic assumption also discussed is that science can in principle account for phenomena related to life and consciousness, first in terms of neurology and physiology, but ultimately in terms of physics and chemistry.[1391] The thesis discussion instead argued that the emergence of 20th century ideas in complexity and co-evolution, for example, implies that a strictly materialist, mechanical world view is no longer tenable in contemporary scientific terms, and notably so regarding the conception that all phenomena can be explained ultimately in terms of their material antecedents only.

Because of the rich conceptual framework found in both complexity and co-evolution, notably in the way they treat mutual interactions and the parts-whole relationship, as well as Nicolescu's ideas regarding different levels of reality, the thesis discussion was able to link these ideas to the other main area of its focus, that humans are self-understanding beings. The main link here in the thesis argument was based on notions of practical reason that arise from these two sets of concepts (co-evolution and self-understanding), and notably so for the way they serve to unite our capacity to know the world and to judge the worthiness of our actions within it. Here the discussion in Chapters Five and Six brought together ideas from co-evolution, complexity and self-understanding so as to point out a few key historical misconceptions regarding Western notions of development, and then to formulate some alternative characterizations of practical reason and consultation that might offer gains in understanding the significance of the development decisions we face in a planetary age.

Second, the thesis discussion in Chapters Five and Six pointed out how it is that contemporary notions of development based on a materialistic view of life, and which the thesis discussion related to some key ideas in the naturalistic standpoint, struggle to make sufficient sense of those complex and co-evolving processes that are part of our present-day societies. Special emphasis here was placed on what the thesis discussion collectively called the spiritual dimensions of life, and particularly so those that emerge from the way we conceive of complex and co-evolving societal processes. Thses same ideas were related to different sense of being and existence as found, for example, in the unfolding of our social, cultural, psychic, ethical and spiritual potential, as well as in the attempt to sound out that which constitutes good and acceptable forms of life. Here the idea that we also exist in part as self-understanding agents lead to notions of practical reason and consultation that fit particularly well into those dimensions of life initially associated in the thesis discussion with complexity and co-evolution. The thesis discussion argued that this is notably so for the attempt to understand the significance of societal decisions regarding the development and use of technology in a planetary age. If so, then the ability to speak in different terms about the significance of our societal decisions is one of the fruits of a richer ontology.

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The primacy of the epistemological

The above idea regarding the attempt to sound out the spiritual dimensions of our being and existence leads to another central argument in Chapters Three and Four, dealing with the notion of what it is to have a substantive grasp of worth or significance. More particularly, the ideas in Chapter Four that involved what it is to have a substantive grasp of, say, the worthiness of our intents or actions, were set out in relation to "the primacy of the epistemological", here meaning, "the tendency to think out the question what something *is* in terms of the question how it is *known*", and which was first discussed in Chapter One.[1392] The implications of the primacy of the epistemological *per se* were the object of repeated comment and analysis throughout the thesis argument. In general, however, the thesis discussion focused on the idea that in the West's modern intellectual tradition, epistemology is central to all questions regarding what the world is like, what kind of things make it up, how to live in it, or even what makes it go. The crux behind the priority given to the epistemological in Western intellectual culture is that you cannot begin to answer such questions with any degree of certainty unless you have a clear method, or a well marked out procedure, in terms of which reasoning or research is to be conducted. There is a missing part here, namely, that the manner by which such reasoning or research is conducted aims to deliver valid results or demonstrable conclusions in an intersubjective sense.

The other main side to the primacy of the epistemological highlighted in the thesis argument in Chapters One, Three and Four is that, given the assumption about what it is to know something in intersubjective terms, then this marks out in advance the kinds of answers we will get regarding that which we are trying to know. In other words, if our dialogue with the natural or the social world is posed in terms of intersubjective accounts, then the kinds of answers about the nature and working of the world that we will receive back will be those that speak in intersubjective terms. Other responses, so to say, that are not coded in intersubjective terms will likely be ignored, or will be dismissed as non-answers. Similarly, if our inquiry into either the human or social world is conducted in terms of the accounts of subjects, then the picture of those worlds that we thereby reconstruct will perforce be traced out in similar subjective terms.

The continued discussion in Chapters One, Two and Three tried to show that these results follow from the assumptions of the naturalistic standpoint regarding the nature of the world and what it is to know it, namely, that on the one hand we have the order in nature and on the other we have individual conscious minds, both of which exist independently of the other. The thesis argument also pointed out that the ideas of intersubjective accounts and the accounts of subjects come directly from this naturalist assumption. Furthermore, having posited the existence of individual conscious minds then the question becomes: How is it possible for such minds to gain certain knowledge of the world? The answer in Western intellectual culture has tended to be that a procedure is to be followed, hence leading to the primacy of the epistemological. The argument in Chapters One and Two served to establish that such procedural conceptions of what it is to reason and know, be they based either on intersubjective accounts or the accounts of subjects, gives one cause to question the validity of practical moral argument.

More specifically, and to summarize something of the argument from Chapters One and Two, the success of such methods or procedures turns on the use of externally defined criteria. In the thesis discussion the use of externally defined criteria was taken to be part of the West's broader notion of reason or rationality. Without them we cannot judge the correctness of each step in the reasoning process, the validity of the argument as a whole and therefore the truth of its concluding statements. And yet, when it comes to moral disputes, independent criteria cannot be found by which to formulate a valid moral argument, or, if such criteria exist, none can agree on what they are. In this latter case, one could say that we do not have a way of determining for sure which criteria to use. Said differently, we do not have criteria that can be used to determine, formulate or select the

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external criteria for judging the soundness of an argument. From this point of view then, an attitude of doubt towards practical moral augment is warranted since, in the absence of such criteria, one cannot presume to formulate a convincing argument in so far as it concerns moral choices.

Substantive reason

When compared to the procedural requirements of the primacy of the epistemological, substantive reason follows a different conceptual tack. For example, the main notion established in the discussion in both Chapters Three and Four is that there are aspects of the human and social world which can be known in ways without having to use external or independent criteria. In other words, it gives a different reading of what it is to be certain about something. So far as the thesis discussion was concerned, these aspects revolved around the notion that humans are self-understanding beings, and that as such we are self-interpreting persons and not just self-defining subjects. As already noted in the sub-section above on Intent and action, the notion of self-understanding involves a richer ontology than is found in the naturalistic stance, as is for example illustrated in the natural and mainstream social sciences, be they quantitative or qualitative. Since the ontology of self-understanding does not turn on a distinction between objective knowledge and subjective opinion, or between intersubjective accounts and the accounts of subjects, or between the existence of an order in nature and the existence of individual conscious minds, then the thesis argued that when it comes to who we are as self-understanding persons, different conclusions follow regarding what it is to know the world and to judge the significance of our actions in it.

The thesis discussion further argued that these conclusions come in part from the ontological link between intent and action. It argued that such an ontological link derives from the way in which the significance of our intents and actions are present in a primary sense to self-understanding persons. In other words, we can grasp the worthiness or significance of our intents and actions in a substantive sense, not a procedural one. Crucial to this idea is the point established in Chapter Four that in a substantive grasp of things, language not only expresses but also makes that which is significant real and present to us, whereas in the procedural case language is a tool for formulating neutral descriptions, or is otherwise employed in accordance with the notion that persons are self-defining individuals. The thesis argument also worked out a connection between our capacity to have a substantive grasp of our intents and notions of community meaning that are rooted in the way the expressive use of language can be said to exist among a community of self-interpreting persons, versus the way meaning is constructed by or among self-defining individuals. A central point also established in the discussion in Chapter Four was that the range of abstractions employed in the social sciences are generally not sufficient to conceptualize the ways in which shared or community meanings exists for self-understanding beings. The overall conclusion made here is that to conceptualize things in such as way as to make room for the existence of shared or community meaning would serve to change the very notion of what practical reason is all about, that it be done substantively, not only procedurally.

Practical reason and human significance

The idea that we can grasp the worth of our actions in substantive terms, and that this realization serves to change the very notion of what practical reason is about, led to one of the four main characterizations of practical reason used in the thesis, this one closely linked to the notion of human significance. To summarize, these four are: i) the idea that reason is procedural and foundational in nature (the apodictic form of reason), ii) that it involves a being open to those matters of significance that surround us as self-understanding beings (the *ad hominem* form of reason), iii) that in co-evolving terms practical reason attends to our past, present and future-regarding social choices (the co-evolving form of reason) and iv) that in terms of complexity practical reason engages with the non-linear or recursive interactions that make up our thinking

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about society and the decisions we face, and which are part of thinking in terms of the concrete universal and the parts-whole relationship (the form of complexity in reason).

The discussion in Chapter Four in particular explored the wide sphere of experience available to us as self-understanding beings. These include everyday life choices, life directing decisions, matters of family and community, broader institutional and societal concerns, and questions of aesthetics, learning, science, technology and the like.

According to the argument in Chapter Four, as self-understanding persons we are everywhere confronted in these spheres of experience with judgements regarding the worthiness of our intents and actions, or the significance of the decisions we face. This is not limited to one's own intents, actions and decisions, but also concerns a broader or more inclusive sense. One could perhaps say that these kinds of judgements surround us, at least in so far as we are moral agents. More particularly, the point argued for in the thesis was that the significance of these kinds of experiences understood in strongly evaluative terms is what gives to moral goals their special nature, and which therefore makes it possible to characterize practical reason in terms of who we are as creatures of distinctly human significance, or what the thesis discussion in Chapter Four also described as significance in an original sense.

One of the main arguments in Chapter Four, the implications of which were felt throughout the remainder of the thesis discussion, was that if it is the case that as persons we are partly constituted by self-understanding, or if the capacity for self-interpretation is part of who we are and what we can do, then the significance of our actions rooted in the human world cannot be divorced from the kind of beings we are. In other words, significance is present and real in our lives and in how we live by virtue of our existence as self-understanding beings. In this sense then, one could say that, when it comes to the worthiness of our intents or the significance of our decisions, our grasp of such matters can be substantive, and not only procedural.

From this followed the conclusion regarding the nature of practical reason for beings partly constituted by self-understanding that i) the attempt to make sense of the significance of our intents, actions and decisions as self-understanding beings is what practical reason is all about, that ii) this 'making sense of' involves an attitude of being open to those wider realizations of significance or worth in our actions which the expressive use of language makes available to us, and that iii) an evolving language of qualitative contrasts couched in terms of strong evaluation and arguments about transitions is a proper vehicle for the conduct of such reason.

The discussion in Chapter Four concerning *ad hominem* reason also served to expand on the idea that a particularly fruitful form of moral argument is about transitions. In part this was shown to imply that gains can be made over time in our understanding the significance of a moral issue, say, in the manner by which we give expression to it, or the ways our actions are altered by a more prescient realization of our responsibility or obligation to some good. Here the chapter discussion summarized three examples that progressively exemplified what it is to reason practically about our human significance without relying on independent criteria as the basis for making rational judgments regarding the worthiness of our intents or actions.

More generally, these observations again call up the idea that our modes of practical reason can evolve, or rather, co-evolve, and may thus offer a gradually more mature expression of our capacity as self-understanding beings, or at least in some its aspects.
A related point made in the thesis argument is that as self-understanding beings, judgements regarding the worth of our intents and actions, or the significance of our societal decisions, are carried out at the same ontological level as the world we seek to know or understand. Such knowledge would thereby contribute to, or perhaps even constitute, a substantive grasp of these

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intents or actions (not an intuitive one). Said differently, as self-understanding persons we use a language of qualitative contrasts to express or to help make real in strongly evaluative terms those aspects of our individual, community or institutional lives that are meaningful or significant. At the same time, the use of language in this way provides for a more prescient grasp of these same forms of community or shared meaning. In other words, such a grasp constitutes a gain in our knowledge of the world, at least to the extent that it involves matters of worth or significance. From this comes an expanded way of thinking about how it is our intents or actions speak to the inescapable commitments our gains in knowledge urge upon us. One conclusion here is that the ontology that comes with who we are as self-understanding beings serves to unite our capacity to know the world with the capacity to judge the worthiness of our actions within it. This is also where the discussion in Chapter Four made a link to the notion that consultation is a crucial part of practical reason.

Consultation and practical reason

One of the main ideas taken up in the thesis argument is that in a planetary age the exercise of a mature consultation is part of the attempt to see our moral choices in terms of the principle of the oneness of the entire human race. The thesis discussion also argued that to see things in such terms may make it possible to judge more ably the quality of our actions and the significance of our decisions, and with specific reference to the development and use of technology. Such a connection between practical reason and a mature consultation was discussed repeatedly in the thesis. The connection in fact served to unite three of the main points of view from within which the thesis argument has been conducted, namely, complexity, co-evolution and self-understanding.

For example, the discussion in Chapter Four noted that the larger part of *ad hominem* practical argument is biographical in nature. In other words, it is a model for moral reasoning in substantive terms (without requiring independent criteria) where conclusions regarding the worthiness of our actions are brought home in a biographical form. One could say here that the influence practical reason can exert with regard to matters of human significance is at its most worthwhile when conducted in this way. However, at the level of the community or the institutions of society, it makes less sense to speak of conducting practical reason in biographical terms. It is here then that consultation comes to the fore as the analogy for *ad hominem* reason in a community or institutional setting. In other words, and to continue with the analogy, practical reason is at its most fruitful in a community or institutional setting when conducted in a consultative form. Of course its biographical nature is not lost or excluded, since we are here everywhere dealing with self-understanding persons. Instead, extra dimensions are now added to practical reason, or, to put it differently, practical reflection takes place at an additional level of reality.

Such an additional level of reality is partly where the notion of shared or community meaning comes into its own, and this in two senses. First, there is a reality to community meanings which the net of naturalistic abstractions cannot capture. Second, community meaning is part of what it is for humans to be self-understanding creatures. In other words, one cannot be a self-understanding person apart from the reality of a world constituted in part by shared or community meaning.

As argued in Chapter Four then, community meaning cannot be expressed or realized via language regarded as the province of the individual only, at least not in the sense that humans are self-defining individuals. Instead, the discussion in Chapter Four argued that shared or community meaning is arrived at by self-understanding persons who speak a language and who hear it being spoken.[1393] Translating these ideas into the terms of practical argument, if we want to be able to reason about that which is worthy of our lives as persons and as a community, then we need an avenue of thought that works at the same ontological level as shared meaning. This avenue of thought is precisely what a mature consultation is about, or at least arguably can be if it is rightly regarded. This latter notion is one reason why the thesis discussion has repeatedly referred to the

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exercise of a mature consultation as being conductive to understanding in general, and in particular of a more fruitful grasp of the our intentions and the decisions we face in a planetary age. An additional aspect was highlighted in this regard. The point to consultation in asking questions about what course of action to take is not just to get a practical response, but to set the stage for a richer kind of response, namely, one posed in terms of worth or significance.

The thesis discussion on complexity and co-evolution provided other examples of how consultation and practical reason can be spoken of together. Among the more important of these concerns the principle established first in Chapter Five and again in Chapter Six, wherein it was argued that "agreement, that is, associative fellowship, must become ... the new prime mover of history, to which would be subordinated the other traditional mover, namely, struggle".[1394] Here the exercise of a mature consultation could be both a means by which struggle can be subordinated to an associative fellowship, as well as an indicator of the extent to which we have come to recognize the importance of pursuing a different prime mover of historical choices in a planetary age.

Another point highlighted in the thesis discussion was that, to the extent that a planetary age involves complex community and societal interactions, then consultation in one form or another can help to either better understand the complex nature of these interactions, or to make better sense of the decisions we face in so far as they involve matters of worth or significance.

In this regard, the discussion of complex systems in Chapter Five and the application of some of its ideas to the development and use of technology in Chapter Six, focused on the community and institutional aspects of society. Notions were introduced concerning forms of life and conceptions of development that were not restricted to a tight economic matrix only, and which might therefore move thinking away from a strictly materialist view of our incentives. In this context, the crux of the discussion in Chapter Five and Six was that such a move could serve to expand the range of contexts where it makes sense to conceive of practical reason as being open to distinctly human significances. Also discussed were the ideas of complex reason and the associative macroconcept of system-interaction-organization on the one hand and the concrete universal on the other. These ideas together led to a discussion of two main goals for a planetary age, to save our extraordinary cultural diversity and to nourish a planetary culture common to us all. Central to these twin goals was a principle of individual, community and institutional action, namely, to work at what unites and to resist that which would otherwise separate.[1395]

Furthermore, ideas such as good and acceptable forms of life, notions of development that speak to our human potential, the concrete universal and cultural unity and diversity are all linked in deep seated ways to notions of shared or community meaning. Here the thesis discussion in Chapters Five and Six tried to explore the ways a mature consultation can serve as one avenue for understanding these dimensions. In a more abstract sense, if properly conceptualized a mature consultation can arguably offer a fruitful grasp of these aspects of shared or community meaning. This is because such a consultation can take place at the same level of social reality as does our shared or community meanings. In other words, the modes of thought and language required for consultation are similar to the modes of thought and language involved in shared or community meaning. Since the two operate at the same ontological level, then the understanding of shared meanings that comes from a mature consultation would be neither reductive nor simplifying in its effects. It would instead be substantive in nature.

A similar argument was again put forth in Chapter Four, though it was formulated in different terms. First, practical reason is partly about the way in which humans are agents of worth or significance. That is to say, our capacity to form judgments regarding the worthiness of our actions or the significance of our decisions is part of what constitutes human agency. Second, the distinct sense of worth or significance that makes up our lives is grounded in part in who we are as self-

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understanding persons, as well as in what it is to live in a social world partly constituted by community meanings. The thesis therefore argued that in coming to terms with our self-understanding and community meanings, we need to possess a language of qualitative contrast expressed in terms of worth or significance. This was particularly so in regard to the ontological link between intent and action, such that to possess a different grasp of our intents, say in the way we come to express and realise them in strongly evaluative terms, is to change what the action is. In a similar way, and third, the thesis argued that a language of mature consultation, again expressed according to distinctions as to the worthiness of our intents and actions, can help to make sense of the community decisions and the institutional choices we face.

Using still different terms, a language of qualitative contrasts and a language of a mature consultation both make it possible to be open to, and to be influenced by, the significance our actions and decisions have for us, at least to the extent that we are beings capable of self-understanding. In exploring these ideas the thesis discussion suggested that a language of consultation might enable us to make added sense of our intents and actions in so far as they concern judging the worthiness or significance of our societal decisions in a planetary age, the chief characteristic being a consciousness of the one and wholeness of the entire human race. Once again, practical reason involves a being open to, an ability to be able to be influenced by the sphere of human significance that exists for us as self-understanding persons. How then are we to be open to, or to be influenced by such a sphere of meaningful actions? For one, via language that serves to express and to better realize the significance of our intentions and decisions. But also that through the evolution of such a language we can gain insights as to what is worthy or significant. Crucially, and as noted in Chapter Four, it is also via such an expressive use of language that we are able to experience a range of higher emotions to be more articulate about.[1396] In this regard then, the thesis argument held out two forms or patterns of practical reason, one via a language based on strong evaluation and expressed in terms of qualitative contrasts, another also via a language based on strong evaluation, or inescapable commitments, but expressed in terms of a mature consultation.

Combining the ideas discussed in Chapters Four and Five, the argument in Chapter Six therefore established three main points regarding the language of a mature consultation. First, a language of mature consultation can in principle offer gains in understanding and judging the significance of the societal decisions we face when it comes to the development and use of technology. Second, in a planetary age, judgements regarding the worthiness or significance of our societal decisions will make greater sense if they attend to questions regarding good and acceptable forms of life, notions of development that speak to the spiritual dimensions of human existence, cultural unity and diversity, and what it is to work at what unites and to fight against that which separates – all in all, how to replace struggle as the main driver of our historical choices. Third, that at a planetary level of reality, the attempt to reason practically in terms of those modes of thought that accompany a mature consultation would add to our capacity to judge well or more ably the worthiness and significance of our decisions regarding the development and use of technology. In approximate terms, part of what perhaps qualifies a mature consultation is that it promotes a world-embracing point of view, instead of an attitude that is confined to that which concerns one's own self.

Self-understanding, complexity and co-evolution

Finally, the discussion throughout Chapters Four, Five and Six served to bring home the notion that shared or community meaning, while perhaps invisible to the abstractions of the naturalistic stance, need not be grasped only in terms of who we are as self-understanding beings. The thesis tried to uncover additional insights into community meaning, practical argument, and its implications for consultation that can come from thinking in terms of what in Chapter Five was called complex reason. It also considered the complementarities that constitute the very conception of co-evolution, transdisciplinarity and different levels of reality, as was first discussed in Chapter Three. One

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common thread in the thesis discussion here was its attempt to explore the ways in which self-understanding, complex reason and co-evolution relate to human agency, decisions regarding acceptable forms of life, and notions of development that speak to the social, cultural, ethical, psychic and spiritual potential of human existence.

So far as the overall thesis argument was concerned, one of the main reasons for looking at complexity and co-evolution in the first place was for the non-classical patterns of reason they employ in their dialogue with the natural and social worlds. This was done so as to offer patterns of thought that contribute to an expanded picture of practical argument, and especially so in respect to the usual range of abstractions in the naturalistic stance. In this regard, ideas such as the recursive nature of parts-whole relations, the transformative potential of time and the complementarities that obtain in systems that co-evolve were used in the discussion in Chapters Five and Six to explore an alternative picturing of practical reason, namely, that it includes modes of thought and consultation that speak to our knowledge of the past, to a prescient anticipation of the future, and to a clearer grasp of that which is significant or worthy of us in the decisions we face in the present. In Chapter Six this picturing of practical reason was used to help explore some non-classical conceptions of what technology is about, and how such a picture of practical reason might lead to gains in understanding the decisions we face in a planetary age regarding its development and use.

In this regard, the discussion of the ontology of self-understanding in Chapter Four and Six also dealt with the way practical argument is about transitions, in that they need not necessarily rely on independent criteria. But here the whole notion of transitions was said to speak to the ways in which practical reason has an arrow of time about it, and where a language of qualitative contrasts, a mature consultation and the quality of our socio-cultural life all co-evolve. In other words, we will come to express and realise the nature of our inescapable commitments in different terms, not irrationally so, but as part of what it is to come to terms with the moral challenges of an evolving planetary age, understood in part in terms of complexity and co-evolution, and notably so with regard to the quality of our actions that work at what unites and against what separates.

Using these ideas the thesis discussion looked into notions of being and existence found in complexity that serve to complement the ontology that obtains in self-understanding. First, the ontology in both is richer than what is found in naturalism, at least when it comes to knowing and judging the worth or significance of our intents and actions. Second, their ontology offers a different reading of what it is to be a subject and agent, not posed in terms of objective knowledge versus subjective opinion, or in terms of conflict, ego and struggle, but in terms of what it is for persons to exist as part of a community that speaks to an essential unity in human relations and among the Earth's many peoples, institutions and cultures. Here the quality of understanding a mature reflection and consultation can achieve when dealing with the pressing needs of the age would be part of what it is to know the world more fully, and to discern more ably, the worthiness of our actions in it. Furthermore, the expanded reading of what it is to be a subject and agent that comes with the ontology of self-understanding, complexity, co-evolution can set the stage for an expanded grasp of what technology is about, as well as what its development and use might entail.

Part C: The development and use of technology

The overall idea discussed in the thesis regarding the development and use of technology is that the patterns of practical reason related to self-understanding, complexity, co-evolution, and which were the object of discussion in Chapters Three Four and Five, can offer added gains in understanding the significance of our technology decisions in an age characterized by an essential unity in human relations. Much has already been said in the Parts A and B above regarding the conclusions and findings in the thesis argument when it comes to technology and practical reason in planetary age.

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However, there are a number of additional insights and findings that come out of the discussion in Chapter Six. These will be considered in the paragraphs that follow. More particularly, the first sub-section below will attempt to highlight an idea that has been working in the background of the discussion in Chapter Six, namely, that of self-articulation and self-determination. This idea will then be used to help present a number of additional insights and findings. More specifically, Part C is divided into eight subsections: Self-articulation and self-determination, Intelligence, An expanded class of human powers, Conceptions of development, Contemporary development goals, Earth-centred goals, Technology aspirations and Powers of self-determination.

Self-articulation and self-determination

A major portion of the discussion in Chapter Six explored the relation between a materialistic view of life, the unfolding of our social, cultural, ethical, psychic and spiritual potential, and questions regarding the aims or aspirations of development. This then led to a range of ideas regarding what it is to recast the notion of technology aspirations in light of a co-evolving society in a planetary age.

Working in the background of this exploration of ideas in Chapter Six is the notion that, when it comes to such views of life, we are also dealing with notions of being and existence. Whether we think in terms of a materialist view of life, or one tied to notions of our unfolding potential, we are looking at modes of self-reflection that will, depending on the discourse, cause one or another sense of being and existence to emerge in the way we regard the world, and notably so with respect to the significance of our societal choices. Using an oversimplified example, given a materialist view of life then a particular set of conceptions regarding human agency would emerge, whereas a different conceptualization would obtain from a view based on the unfolding of human potential. When put in this way, the emergence of different notions of being and existence according to one's first reading of reality makes it possible to think in terms of what can be called self-articulation and the powers of self-determination a people or society might achieve – be it with regard to the choices made in a co-evolving society, to the actions taken as self-understanding persons, or to those decisions that concern the development and use of technology in a planetary age.[1397]

This notion of self-articulation and powers of self-determination is borrowed from Arnold Toynbee's attempt to account for the emergence of different civilizations in history, notably with respect to the challenges a civilization faces from an external environment as well as from its own societal life and the quality of its people's inner character.[1398] While the discussion in the thesis has not used Toynbee's language of the rise and fall of civilizations, except to a certain degree in Chapter Six, it has proceeded from an associated line of thinking that concerns the significance of our outward-looking societal decisions on the one hand, and what has been portrayed at times as a more inward-regarding sense of intent and action, on the other.

More particularly, and in terms of the Toynbee's idea, the powers of self-determination a people achieve are a proper measure of growth in their civilization, but where, crucially, the maturity of such powers depends on the quality of self-articulation its peoples realize.[1399] Here a distinction can be made between powers of self-determination that arise through challenges faced from the external environment, which include interactions with other civilizations, and those challenges faced from within, as it were, by the form and quality of societal life. Included also in the latter would be the depth or richness of a people's sense of inner being and self-understanding, good and acceptable forms of life and notions regarding the harmonizing of relationships, be they with regard to the individual, community or the institutions of society, as discussed in chapters Five and Six.

In this regard, the substance or quality of expression a people achieve in the path towards self-articulation would arguably serve as one indicator of that society's well-being. One idea implied here may be that by seeing things in terms of who we are as self-interpreting beings, then the

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richness of self-articulation a people achieve is in part a function of the use of a language of qualitative contrasts, and the making of distinctions between strong and weak evaluation.

Suggested here as well is the idea that the characteristics of social self-hood being expressed or articulated could accompany a certain picturing of human nature, as well as views regarding the nature of the world, that arguably take centre stage in the life of its peoples, in their beliefs and practices, in their sense of significance, in the way they relate to the natural or terrestrial world, as well as in the manner by which they reason about and judge the worthiness of their decisions and actions. Included here as well are the aspirations or incentives that accompany a people's thinking about the development and use of technology. The different articulations of self and society pictured here would then speak to the powers of self-determination available to a people, such as in the kind of society and quality of life they succeed in building up or creating.

One could then perhaps picture three levels of reality in terms of which self-articulation proceeds: i) the level of reality where matters of worth, significance and inescapable commitments come to the fore in our most prescient self-understanding, ii) the level where our unfolding human potential is expressed in terms of scholarship and leaning, art and music, law and the ordering of human relations and the like, and iii) the level where practical decisions and specific modes of action enable us to make our way around in the world, or to otherwise give effect to the decisions we make, the aspirations, hopes or desires we might accomplish, and the forms of life we seek, whether they involve the individual, community or institutions of society.

For example, the self-articulation offered by naturalistic abstractions, as discussed in Chapters One and Two, is related to the image of self we see mirrored somewhat in the modern sciences, and hence to the kind of dialogue with nature and society which that kind thinking enters into. In this dialogue the answers we get to the questions we pose then deliver into our hands a certain class of powers of self-determination, usually pictured in terms of the knowledge, intellectual or abstract skills, and practical technique that can be used to manipulate, control or otherwise build our world. Similarly, a different set of powers of self-determination would emerge from, say, a picturing of human nature related to who we are as self-understanding beings, or from notions related to the organization of life and the socio-cultural world in a complex or co-evolving sense.

More particularly, the thesis argument in Chapters Five and Six suggested that the sort of self-articulation indebted to the modern sciences can give a truncated account of human motivation, if it is based too dogmatically on classical conceptions of a materialist view of life. Of course, any given account of human motivation would have to be incomplete in some sense, this in line with the idea of the democracy of the intellect as was first discussed in the thesis Introduction. However, in cases where a class of accounts are taken to possess an unequalled status so far as their explanatory power is concerned, then decisions might be made under the assumption that the powers of manipulation or control under one's command are sufficient to the task at hand. This then is one reason why the thesis argument repeatedly looked to the unfolding of mankind's social, cultural, ethical, psychic and spiritual potential as a starting point for its discussion of practical reason, variously characterized in terms of self-understanding, complexity and co-evolution.

In this regard, the discussion in Chapter Three also argued that classical, naturalist assumptions about man's dialogue with nature lack sufficient reference points with which to make proper sense of the living world, certain aspects of mankind's socio-cultural existence, as well as some of the technology decisions we face in a global age. A more specific secondary conclusion then followed, namely, that classical assumptions about explanation based on neutral language accounts of underlying mechanisms, as treated in Chapter One, as well as notions of understanding related to the accounts of subjects as self-defining individuals, as treated in Chapter Two, are not always an appropriate vehicle for coming to terms with the dynamics at work in the complex or co-evolving

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spheres of mankind's social, cultural and technological lifespan. A main focus of the argument here was presented in terms of the general scepticism towards the moral sphere of argument, as well as the adoption of a moral relativism, that seems to accompany thinking in terms of explanation and understanding, at least in terms of the discussion in the first two chapters.

The crucial point regarding such scepticism is not just the way it is based on a truncated picture of what moral argument consists of, and that it may therefore be premature, but that thinking in terms of either neutral language descriptions on the one hand, or in terms of the accounts of individual subjects and their self-defined values on the other, makes it harder to link our capacity to know the world with our capacity to judge the worthiness of our actions or decisions within it. As a result, our self-articulation and powers of self-determination suffer unnecessarily. If so, then a possibly fruitful avenue to follow would be to expand this kind of naturalistic self-articulation by including notions from self-understanding, complexity and living, co-evolving systems.

Having said this, the general conceptual backdrop regarding self-articulation and accompanying powers of self-determination will be used in the following sub-sections to summarize some of the insights and findings concerning the development and use of technology that were explored in Chapter Six. The exploration here centred on conceptions of development that deal with the anxious concerns of a planetary age, as well as what expanded patterns of practical reason discussed in Chapters Three, Four and Five might add to those conceptions of development. The main conclusions from Chapter Six in this regard are discussed in the paragraphs that follow.

Intelligence

Early on in Chapter Six the discussion explored a mainstream conception of technology which relates to intelligence, innovation and know-how. More particularly, notions of theoretical and practical intelligence were used to help highlight a close connection between intelligence and survival, but notably so where the human central nervous system has evolved in such a way as to require outside devices to express itself.[1400] The Chapter discussion presented the connection between technology and intelligence as one that is largely utilitarian in form, and which possess a degree of indebtedness to naturalistic abstractions. In this regard, and to summarize the discussion in Chapter Six, theoretical intelligence is shown via one's quickness in unravelling a conceptual obscurity or seeing into abstract patterns. It aims to know or identify, and where ideas are judged by the precision of concept formation and the uncovering of an argument at the level of its essentials. Practical intelligence is shown via one's quickness in avoiding danger or in taking advantage of some circumstance. It aims to survive or to thrive, and where ideas are judged by their practical use and their applicability to a given task.[1401] On the surface at least, these ideas also have a certain kinship with the way our Central Nervous System has evolved so as to require outside devices to express itself – although the chapter discussion portrayed this view of technology as being about the way tools both extend and amplify our powers to act.[1402]

The discussion in Chapter Six also emphasized the wide-spread influence of this way of thinking about technology and intelligence in its practical and theoretical forms, the practice of which over the last 150 years or so has arguably changed the way people across the planet conduct their lives and understand what it is to make rational or intelligent decisions. This is notably so with what Whitehead calls the invention of the method of invention.[1403] Of equal influence are the societal aspects of this link between technology and intelligence. Here the chapter discussion pointed to the social or institutional processes that are part of technology as invention or innovation, and hence contributing to what is usually thought of as 20th century social and economic development. Here the chapter discussion pointed to the ways in which development is conceived in terms of, say, mass scale agricultural and industrial output, increasing rates of production and consumption, and

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the building of an efficient marketing, transport, energy, waste removal, communication and finance infrastructure – all the various metabolic-like operations of society.

Conceptions of development

In more general terms, the discussion in Chapter Six argued that Western conceptions of development are linked to a tight economic matrix and notions of material prosperity that have been especially influential in the rise of modern industrial economies, and with it the belief in an open form of socio-economic progress. The chapter discussion went on to argue that while the work of socio-economic development is said to constitute the largest collective societal effort of the 20th century, it is also said to be a failure even by its own standards. In this regard, and for example, the discussion in Chapter Six cited "the accelerating gap between rich and poor, the superabundant use of energy by a minority of nations, the monopoly on high technology and genetic engineering held by elite powers, the underuse of agricultural land by the rich, drought and famine that afflict the rural poor, and the shanty towns and megacities that arise from the influx of people seeking to escape from rural poverty or what is otherwise believed to be a backwards way of life".[1404]

The chapter discussion also noted however that the inhabitants of some of the most developed societies are experiencing a "moral, psychological, and intellectual misery", of a kind that "does not decrease with decreasing physiological and material misery, which rather increases with affluence and leisure".[1405] Such observations led to one of the key findings made in Chapter Six, namely, that the failure of these development efforts points to a faulty conception of human motivation based on an overly strict materialist view of life and the economic workings of society. The chapter discussion argued that to the extent development is conceived as having to do with economic gain, then societies will be unable to reach even the material goals they have set for themselves. In other words, a self-articulation based on a materialist reading of reality, and hence a particular notion of human motivation, provide for powers of self-determination that cannot achieve the very goals such a self-articulation posits as to the kind of society its members would wish to inhabit.

The argument in Chapter Six, although critical of a strictly materialist notion of reality, was at pains not to misconstrue what was intended by the phrase, the spiritual dimensions of life. It related these intents not only to material well-being, but also to such ideas as the unfolding of our social, cultural, aesthetic, ethical, scientific and spiritual potential, the pursuit of peace and that which unites, notions of man-in-the-universe, the inquiry into good and acceptable forms of life, and matters related to the worthiness of our actions and the significance of our decisions in a planetary age – all of which relate to the principle of the oneness and wholeness of the entire human race.

Contemporary development goals

Picking up on the notion of a materialist view of life, the discussion in Chapter Six established two differing sets of development goals which served as both a context for practical reason and to better understand the kinds of decisions societies face in the contemporary world.
The first explored the two key agents of 20th century development, socialism and capitalism, and their respective views of prosperity, namely i) "societies, having become industrialized, attain well-being, reduce their extreme inequalities, and dispense to individuals the maximum amount of happiness that a society is capable of dispensing"[1406] and ii) innovation, production and consumption are structured and pursued in such a way that "economic growth is the necessary and sufficient condition for all social psychological, and moral developments".[1407]

The central conclusion established in the chapter argument here was twofold. First, that in both cases the proponents of socialism and capitalism regarded their respective social systems as the true agents of prosperity, but who also used the powers of self-determination given them to sacrifice

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humanity for the sake of a specific, limited world conception and social self-articulation, based largely on a too strict materialist view of life and workings of society. Second, that neither of these avenues of development and their associated notions of growth and prosperity have what it takes to make adequate sense of, or engage fruitfully with, the anxious challenges people face in a planetary age. In other words, the quality or depth of their historic self-articulations no longer suffices a world that has changed all out of proportion to some of the social assumptions of the day upon which they were first formulated. Instead, a richer conception of motivation and action can be incorporated in conceptions of development and related notions of technology. Hence, the attempt in the thesis discussion to highlight patterns of practical reason that can offer gains in thinking about what it is to know the world and to judge the significance of our actions within it.

This is also where the chapter argument introduced what one pair of authors called the paradigm of simplification and disjunction, together with the kinds of fragmented thinking that may at times accompany it.[1408] These paradigms were presented as part of the explanation as to why the two central agents of 20th century development were able to formulate a set of abstract principles that, in the end, had little in common with the actual being and existence of real persons, and which, as a consequence of the working out of these abstractions, was able to sacrifice the very humanity which its vision of development and prosperity was intended to benefit.

Earth-centred goals

The second set of development notions set out in Chapter Six concerned what was called Earth-centred goals. The discussion in this regard also attempted to relate these goals to ideas discussed earlier in Chapters Three, Four and Five regarding self-understanding, complexity and co-evolution. Two such earth centred goals were the special focus of the discussion in Chapter Six, namely: i) to preserve mankind's extraordinary cultural diversity, and to foster a planetary culture common to all humanity, and ii) to work at what unites, and to resist what separates.[1409] The focus on these goals in the discussion in Chapter Six proceeded from their relation to the main thesis idea regarding our planetary age and the principle that mankind is one that informs it.

One key point noted in the chapter discussion is that over the last six thousand years of recorded human history, forms of organization among men have moved, for instance, from family to tribe and from city-state to nation. We have reached a stage of organization where we need to see our diverse but collective lives across the planet as a whole, compared to choosing a more parochial point of view. It is in this sense then that the theses discussion described the processes of our day as involving a "collective coming of age".[1410] The chapter discussion also suggested a number of other ideas that tend to go hand in hand with these two goals. For example, that a range of developments in science and technology help create the machinery needed for the organization of life across the planet as a whole. The discussion here also argued that the creation of such a machinery goes hand in hand with a recasting of the aspirations of the prevailing order. A more general point made here was that the prospects of our times ask that we gain a certain breadth of outlook, or what was also described as a world-embracing point of view, to parallel the essential unity of relations that exists among the Earth's inhabitants. The thesis discussion throughout has argued for patterns of practical reason and consultation that can help make sense of the kinds of decisions we face in this regard.

Technology aspirations

The whole notion of technology aspirations, as developed in the thesis argument, was introduced via the idea that many contemporary social ills reflect a conception of human nature and motivation that is incomplete, with the result that many of our actions in response to the crises of the age are inadequate, or perhaps even irrelevant.[1411] Here the discussion in Chapter Six argued that the satisfying of the individual's self-regarding wants and material needs or desires have become part

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of the root-system of a prevailing order.[1412] Accompanying this are conceptions of socio-economic development defined mainly in terms of material gain and economic productivity. In this context it also makes sense to ask about our conceptions of the human person, for example, to what extent might such a conception incorporate aspects of the self-defining individual.[1413]

And yet, as just discussed in the previous two sub-sections, the very focussing on those goals or self-articulations that seek mainly to restructure the material conditions of society is an important reason why they cannot be attained.[1414] More particularly, the position presented in Chapter Six was that 20th century conceptions of socio-economic development that focused mainly on material prosperity and the incentives needed to bring it about is said to have failed. Indeed, the failure has been such as to call into question the assumptions upon which contemporary notions of socio-economic development are based, this in part because they subscribe to a view of the world and what it is to act in it that are not of themselves particularly well suited to the kind of principles, knowledge and judgments called for by the planetary age in which we live.

The discussion in both Chapters Five and Six also argued the point that responsibility for the writing of a future-in-waiting in a planetary age will not be realized in societies whose self-articulations work to sacrifice humanity for the sake of a particular, dogmatic reading of reality. It was furthermore argued that there is no need to formulate self-articulations that explain away the complementarity between people's life of significance and their actions in the world, by limiting their conceptions of things to an unnecessarily strict view of material reality. In this regard, it is hard enough to make sense of our capacity for knowing, judging, reasoning and consulting without the added burden of thought that requires we think in terms of a single level of reality, one that can be explained in terms of its material antecedents only. Put in terms of the discussion in Chapter Four, we need to question those aspects of our self-articulations that serve to explain away the significance things necessarily have for us as self-understanding beings.

Powers of self-determination

Working in the background to the discussion in Chapter Six is the idea that a people's conception of things, say, of what kind of society to live in, goes hand in hand with those powers of self-determination by which they act in the world. Although there are times when these powers of self-determination are used at crossed purposes, and where conflict or mere opposition seem to be the norm, at other times these powers can be used collectively for the sake of bringing into realization a particular form of life which is judged to be good or acceptable in some sense. This lattermost point occupied a major part of the thesis discussion, and notably so in its analysis of four main patterns of practical reason, namely, the naturalistic standpoint, self-understanding, complexity and co-evolution, each providing for a different reading of what it is to know the world and to judge or to discern the worthiness of our intents and actions within it.

One way to illustrate the idea that a people's conception of things goes hand in hand with their powers of self-determination is via the ontological link between intent and action. The discussion in Chapter Four focused on the idea that the ways in which we give expression to intentions or aspirations in strongly evaluative terms can i) offer gains in our understanding of those aspirations, ii) serve to alter what the action is from what was called a non-observer relative point of view, and iii) help illuminate subsequent judgements with regard to the worthiness of the decisions people make, or the actions they take. In other words, giving expression to intents or aspirations in a more illuminating way, say through a language of qualitative contrasts, can in fact change what the action is from a non-observer relative point of view, contribute to a different self-understanding, and alter the way people regard others and choose to act in the world.

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In this regard, the self-understanding just referred to can be linked to what was described in Chapter Four as a conflict of self-interpretations, this in the attempt to find answers to the question: Which self-interpretation is truer of reality? This question also coincides with the obligation of the individual to understand things according to his own lights, and which, when joined to the principle that a person's vision needs to be world embracing instead of being confined to his own self, forms the joint basis for what the thesis discussion in Chapters Four and Six described as a mature consultation, one which can contribute to the quality of self-articulation a people might achieve.

As also argued in Chapter Four, engaging in, or being open to, one or more differing interpretations of intents or action serves to bring to light some new grasp of the world and its workings, what is significant about our actions in it, and what is worthy of us as a person or as a people, at least according to the new self-understanding which the resolution of the conflict of self-interpretations would bring about. This then is one of the main reasons why the discussion in Chapter Four adopted a characterization of practical reason as being open to, being able to be influenced by, the sphere of distinctly human significances that is intimate to who we are as self-understanding beings. In other words, we are creatures for whom our actions and intents possess significance such that to ignore its inner meaning is to risk falling into confusion about who we are and what we do.

Here then a new self-interpretation, or self-articulation, could also serve to alter a person's (or a society's) power of determination to act in the world in a definite way. Beforehand there may have been ambivalence about some decision, say due to ignorance of its significance or import. Perhaps it was a matter of commitment to a given course of action, or of being unable to see sufficiently into its consequences, or that it was previously impossible to consider, or even to be able to be recognized as a possible avenue to take. Alternatively, it may be that the implications of a particular idea, or of a given notion of worth or what is worthy, were either unknown or might have been present but in a confused or convoluted way. That is to say, someone might not see into what would elsewhere be urged upon him so far as his commitments or obligations are concerned.

However, the resolution of a conflict of self-interpretations could bring about a changed picture of what it is for a person or society to act in a definite way. Here the conflict between self-interpretations in part rests upon the fact that one is unclear about which powers of self-determination to pursue, or that one is unclear about their nature or character, such that a decision about how to act would involve too great a risk, say, in terms of the consequences it has for the lives of other people. The resolution might, for example, offer a more subtle or discerning appreciation of a particular obligation to some good or person. If the resolution is of more thorough-going nature, the resulting self-interpretation might institute a wholly new grasp of the nature of obligation *per se*, or of those to whom such commitment is now obligatory, though whereas before it was not.

These kinds of realizations suggest four additional aspects. First, they imply a different degree or even kind of determination to act. Second, they would serve to alter the actual choice or decision made in the sense that the actions to follow thereafter will be of a different sort than what would have otherwise been the case. Third, decisions made in the past will be re-interpreted or judged in a different light. In other words, they would now be known to be erroneous in some sense, or are such that they can no longer continue to be acted upon, or are such that they must now be acted upon. Fourth, decisions still in the making, so to say, would be approached or evaluated according to the scope of the self-understanding that has resulted from the resolution of the conflict of self-interpretations. In one sense then, to do all this is part of what it is to recast those aspirations or motives in terms of which decisions are made sense of and carried out. It is worth noting that this kind of thinking might also reflect part of the interior workings, so to say, of the ontology behind intent and action. In another sense, the entire thesis argument comes to the fore here in that certain patterns of practical reason can help us to understand some of what is involved in a recasting of

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incentives from within an institutional or societal setting, and notably so when it comes to the technology aspirations of a prevailing order.

To close out the discussion in Part C, nine notions of practical reason can be mentioned in so far as they might help us to understand what is involved in a recasting of our incentives or aspirations from within an institutional or societal setting. The first concerns that particular kind understanding which is the fruit of a mature consultation, as was discussed repeatedly in Chapter Six, and which in the thesis Introduction was described as the democracy of the intellect, in contradistinction to the aristocracy of the intellect. The second involves the attempt to formulate an understanding of things via the complementarity that is part of what it is to reason in terms of co-evolution, as discussed in Chapter Five. The third pertains to thinking along the lines of different levels of reality, as per the discussion in Chapter Three, such that intractable societal problems or seemingly contradictory aspirations might be resolved by looking at them, so to say, from another level of reality. The fourth concerns the various forms of *ad hominem* argument, based on the notion that we are self-understanding beings, and posed at the level of the individual, the community or the institutions of society, such that the more fruitful forms of practical argument are about transitions.

Fifth, the forms of practical reason that link an appreciation of the past, the anticipation of a future-in-waiting, and hence the ability to discern the significance of the decisions we face in the present. Sixth, that future-regarding social choices as a whole are joined to the idea that practical reasoning has an arrow of time about it, and so offer added insight into how such reasoning can itself evolve. With regard to this lattermost case, and as discussed in Chapter Four, there may be some circumstances where the language of strong evaluation via which expression is given to our most prescient self-understandings can co-evolve with the adversities people in society may face, but learn eventually to overcome. This is part of what the discussion in Chapter Five referred to as the transformative potential of time. The seventh concerns the notion of complex reason and thinking in terms of the concrete universal, as treated in Chapter Five, that can arguably help to replace struggle and conflict with associative wholes as the main driver of our historical choices. Or, as was quoted in Chapter Six, to learn to "exchange unconcealed hostility for conversation among equals".[1415] The eighth focuses on the ontological link between intent and action, such that practical reason involves being open to, being able to be influence by, the distinctly human significances that make up our self-understandings and community meanings. Lastly, the ninth deals with the ways in which human evolution, having become socio-cultural, makes it possible to see ourselves in a period of social and cultural co-evolution shaped in part by the search for that which unites and the desire to resist that which separates.[1416]

Part D: Some closing observations and recommendations

During the course of the thesis argument a number of unanswered questions, areas for further clarification, limitations, problems or issues have appeared, some of which, due to the limited scope of the work or to a lack of space, could not be discussed further. Some of these will be referred to briefly below. However, Part D is not an attempt to answer or respond to such questions, but only to highlight what they might be, and to suggest where they fit in to the point of view from within which the thesis narrative has tried to argue.

To begin with, it is obvious that the thesis is not a work of political philosophy. Issues around contemporary conceptions of development were discussed and some of its shortcomings highlighted, notably those regarding socialism or capitalism as the main agents of 20th century development. However, the point in doing so was to suggest how certain forms of reason current in such conceptions need to be expanded in light of the complex and co-evolving nature of an emerging planetary society, as well as notions of worth or significance that might accompany it.

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The point therefore was not to enter into the debate over the relative merits of socialist or capitalist conceptions of society, for example. The man aim was to highlight a central idea in the thesis, namely, that the ordeals of this and the previous century in large part derive from the fact that humankind has collectively failed to recognize an essential unity of relation among all the peoples of the world. Hence, the principle idea that mankind is one. While this idea may be thought of as being politically naive with regard to the actual functioning of independent nation states, and perhaps especially so with regard to the varied forms of entrenched political opposition and struggle for power that at times seems to dictate the terms of such functioning, there is also a certain turmoil in the relations between states that is implied in the notion of independent or unfettered national sovereignty. Given this, then the attempt to formulate the thesis argument in terms of a planetary age is to try to take notions of practical reason to a next level of reality from which the turmoil of existing conflicts and struggle between people can be thought of in different terms.

Of course, naturalistic modes of thought have contributed to a considerable advance in ideas in Western intellectual culture, and notably so when it comes to the rise of the modern sciences and technology. It is worth adding though that the success such naturalistic abstractions enjoy is part of the problem, in that the patterns of thought found in the natural sciences have tended to dominate contemporary Western notions of a rational inquiry, be they formulated in terms of either explanation or understanding. The thesis critique has not countered naturalistic thinking as such, which we cannot do without, but on the assumption first, that its abstractions and methods have a universal applicability, and second, that in regard to their explanatory power they have no equal. It is worth noting that a third, sceptical assumption also comes on board here, namely, that given the nature of the moral sphere of experience then no good arguments are to be found there.[1417]

This third assumption has of course been the subject of an extended exploration found in all of the thesis chapters. More particularly, the thesis exploration considered patterns of practical reason that might emerge from conceptions of self-understanding, complexity and co-evolution, and how these might differ from those patterns of practical reason found in naturalistic notions of explanation and understanding. In part the exploration served to establish a different sense to what it might mean for an idea to be universal in scope (e.g. the concrete universal) as well as to suggest alternative notions of explanatory power (e.g. causal accounts of people's intentions or actions based on distinctions of worth or significance that are brought to light via an expressive use of language). Of course, part of the thesis project as a whole was to look for patterns of practical reason that need not adopt a sceptical view of the moral sphere of argument, and much of the effort here has attempted to work out in broad outline the main characteristics of some of these patterns.

In a general sense, a related comment can be made of ideas based on co-evolution and complexity, namely, that in and of themselves these ideas will not give a complete picture of what it is to know the world and to judge or discern the worthiness of our actions within it. Of course, such a comment is not an expression of scepticism, but instead is a way of saying that no one such picture is ever complete. However, what the thesis discussion has tried to argue for is that notions from co-evolution and complexity can provide gains in our understanding of that which makes up the moral sphere of experience, and hence contribute to an expanded conceptual picture of the unity that already exists between the human capacity for knowing and judging. In other words, given that such a unity exists, then what are those patterns of thought and expression that make it possible to see more clearly into some of its workings.

In the course of the argument a number of ideas were raised that require further study or elaboration. One of these concerns a more detailed account of the links between complex reason and human agency. The same can be said of co-evolution. In other words, to continue to try to identify further conceptual ties between complexity, co-evolution and the notion of agency that belongs to the idea that humans are self-understanding beings. Such a further study would also

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involve the ontological link between intent and action on the one hand, and a more concrete sense of being or existence that accompanies thinking in terms of co-evolution on the other.

One area needing further clarification is the entire set of relations between the idea of mechanism, materialism and what the thesis discussion referred to as the spiritual dimensions of life. Included here as well would be the question as to where the notion of organic mechanism fits in.

A more detailed study would emerge from the attempt to answer two related questions: i) What more precisely might a language of qualitative contrasts look like? and ii) What are some of the more specific aspects involved in the language of a mature consultation? A related point would be to look more closely at those unique qualities of understanding which the thesis argument suggested constitute the fruit of such consultation. Such ideas would likely be illuminated by a further exploration of the idea that our modes of practical reason evolve, or co-evolve, over time. Or, as it was expressed in the thesis discussion, that practical reason has an arrow of time about it. All of these ideas have a likely connection to the unity that exists between our capacity to know the world and our capacity to judge or to discern the significance of our intents and actions within it.

Yet another avenue would involve exploring further what ideas from complexity and co-evolution have to say about our concept of a person, or alternatively, what concept of a person arises from these notions, and what connections can be found to the idea that humans are self-understanding beings. It may also be worth exploring some of what it means for our forms of life and aspiration in an evolving planetary age to become increasingly open to wider dimensions of human significance.

In a different sense, the link between what was earlier referred to as a people's self-articulation and their powers of self-determination may offer a fruitful line of study. For example, if it is the case that neutral language descriptions on the one hand, and accounts based on the notion that humans are of self-defining individuals on the other, make it harder to link our capacity to know the world with our capacity to judge the worthiness of our actions or decisions in it, and if as a result our self-articulation and powers of self-determination suffer unnecessarily for it, then one task would be to explore what it is to expand this kind of naturalistic self-articulation by including notions from self-understanding, complexity and co-evolution. Included here as well would be a study of the kinds of powers of self-determination that emerge from such articulations, to analyze what such ideas might say regarding our very notions of technology, and to look further into questions regarding the nature of those intents or aspirations that accompany our thinking about it. All of these ideas would link to the question: To what extent do our decisions regarding the development and use of technology contribute to an advance or a decline in human social well-being?

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Footnotes

Introduction

[1] Ervin Laszlo (ed.), *The Multi-cultural Planet: The report of a UNESCO international expert group*, Oneworld, Oxford, 1993, p. 3.
[2] Laszlo, *The Multi-cultural Planet*, p. 5.
[3] The Universal House of Justice, *To the World's Religious Leaders*, Baha'i World Centre, Haifa, 2002, paragraph 1.
[4] The Universal House of Justice, *To the World's Religious Leaders*, paragraph 6.
[5] Laszlo, *The Multi-cultural Planet*, p. 3.
[6] Laszlo, *The Multi-cultural Planet*, p. 3. The examples Laszlo explicitly refers to are the European Community and the Baha'i Faith.
[7] *Culture and the Future*, UNESCO Information Document, Paris, 1988, p. 56.
[8] UNESCO, Mexico City Declaration on Cultural Policies,World Conference on Cultural Policies Mexico City, 1982. *Declaration of Principles*, Article I, 3.
[9] Baha'i International Community, *Who is writing the future? Reflections on the Twentieth Century*, Baha'i World Centre, Haifa, 1999, section 2, paragraph 3. This notion will appear repeatedly in the thesis argument.
[10] The Universal House of Justice, *One Common Faith*, Baha'i World Centre, Haifa, 2005, paragraph 19.
[11] The notion that we are here dealing with individuals, communities and the institutions of society is repeatedly referred to in this thesis. The idea is used by the Universal House of Justice in some of its works.
[12] Laszlo, *The Multi-cultural Planet*, p. 5.
[13] The Universal House of Justice, *One Common Faith*, Baha'i World Centre, Haifa, 2005, paragraph 19.
[14] Baha'i International Community, *Who is Writing the future?*, section 2.
[15] Baha'i International Community, *The Prosperity of Humankind*, Baha'i World Centre, Haifa, 1995, paragraph 11.
[16] The Universal House of Justice, *One Common Faith*, paragraph 19.
[17] The Universal House of Justice, *One Common Faith*, paragraph 19.
[18] Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999, p. 5.
[19] Morin and Kern, *Homeland Earth*, p. 81
[20] Morin and Kern refer to conceptions of development which they describe as being bound to a tight economic matrix. Morin and Kern, *Homeland Earth*, p. 82.
[21] Morin and Kern, *Homeland Earth*, p. 81.
[22] Laszlo, *The Multi-cultural Planet*, p. 5.
[23] The notion of mankind's various potentials is taken from Morin and Kern, *Homeland Earth*, p. 81. The phrase, spiritual dimensions of life, is taken from Baha'i International Community, *The Prosperity of Humankind*, paragraph 8. It is used repeatedly in the thesis discussion.
[24] In his writings Charles Taylor repeatedly refers to the notion of significance as part of his conception of practical reason. See, for example, Charles Taylor, *Human Agency and Language: Philosophical Papers I*, Cambridge University Press, Cambridge, 1985, and Charles Taylor, *Philosophy and the Human Sciences: Philosophical Papers II*, Cambridge University Press, Cambridge, 1985. In a related sense, Eric Jantsch uses the notion of man-in-the-universe. See Eric Jantsch, *The Self-Organizing Universe, Scientific and Human Implications of the Emerging Paradigm of Evolution*, Pergamon Press, Oxford, 1980. In addition, see Laszlo's broad discussion of an evolving hierarchy of values that form the main feature of human culture. Ervin Laszlo, *The Systems View of the World*, George Braziller, New York, 1972.
[25] The Universal House of Justice, *To the World's Religious Leaders*, paragraph 1. Jantsch refers to cultural guiding images. Jantsch, *The Self-Organizing Universe*, p. 256.
[26] The Universal House of Justice, *One Common Faith*, paragraph 19.
[27] The phrase, "good/decent/acceptable form of life", is from Taylor, *Human Agency and Language*, p. 98. The notion of unfolding potential is in Morin and Kern, *Homeland Earth*, p. 81.
[28] Charles Taylor, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995, pp. 34-60
[29] Taylor, *Philosophical Arguments*, pp. 41-52.
[30] Taylor, *Philosophical Arguments*, p. 39.

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[31] Taylor, *Human Agency and Language*, pp. 104-105; 114.
[32] This point is discussed at length in Taylor, *Philosophical Arguments*, pp. 34-60.
[33] The Universal House of Justice, *One Common Faith*, paragraph 19.
[34] The notion of a multi-cultural planet is taken from Laszlo, *The Multi-cultural Planet*. For ideas similar to those expressed here also see the Universal House of Justice, *The Promise of World Peace*, Baha'i World Centre, Haifa, 1985.
[35] The phrase "peace-inducing aspect" is from the Universal House of Justice, *Promise of World Peace*, section 1, paragraph 5.
[36] The notion of co-evolving processes is discussed at length in Jantsch, *The Self-Organizing Universe*.
[37] The Universal House of Justice, *The Promise of World Peace*, section 3, paragraph 1.
[38] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 7.
[39] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 7.
[40] The Universal House of Justice, *One Common Faith*, paragraph 49. Reference to the concern for the problems of the age will be made repeatedly in the thesis discussion.
[41] Baha'i International Community, *Who is writing the future? Reflections on the Twentieth Century*, section 2, paragraph 3.
[42] The notion of the oneness of mankind or of its oneness and wholeness are referred to in The Universal House of Justice, *The Promise of World Peace*.
[43] The phrase, the primacy of the epistemological, is from Taylor, *Philosophical Arguments*, p. 34. See also Taylor, *Philosophical Arguments*, pp. 1-19.
[44] Taylor, *Human Agency and Language*, p. 98.
[45] Taylor, *Philosophical Arguments*, p. 34.
[46] Frederick Ferré, *Philosophy of Technology*, University of Georgia Press, Athens, 1995, pp. 30-34.
[47] The reference to an intolerant use of naturalistic abstractions is an adaptation from Whitehead who writes: "Thought is abstract; and the intolerant use of abstractions is the major vice of the intellect". Whitehead, *Science and the Modern World*, p. 23.
[48] Taylor, *Philosophical arguments*, pp. 34-60.
[49] Martha Nussbaum and Amartya Sen (eds), *The Quality of Life*, Clarenden Press, Oxford, 1993, p. 234.
[50] There are a number of other authors whose ideas one could consider here, among these are Eric D. Hirsch, *Validity in Interpretation*, Yale University Press, New Haven, 1967; Martin Heidegger, *What is Called Thinking?* Trans. J. Glenn Gray, Harper Row, New York, 1968; Richard Rorty, *Philosophy and the Mirror of Nature*, Princeton University Press, Princeton, 1979; Paul Ricoeur, *Hermeneutics and the Human Sciences: Essays on Language, Action and Interpretation*, Trans. John B. Thompson. Cambridge University Press, Cambridge, 1981; Hans-Georg Gadamer, *Truth and Method.* Trans. Joel Weinsheimer and Donald G. Marshall. Continuum, New York, 1994 and John McDowell, *Mind and World*, Harvard University Press, Cambridge, MA, 1994.
[51] These terms are variously used in Morin and Kern, *Homeland Earth*, as well as in Jantsch, *The Self-organizing Universe.* The notion of spiritual dimensions of life is taken from Baha'i International Community, *Prosperity of Humankind*, paragraph 8.
[52] Baha'i International Community, *Transforming Collective Deliberation*, paragraph 2.
[53] Morin and Kern, *Homeland Earth*, p. 81.
[54] The quote is taken from Baha'i International Community, *The Prosperity of Humankind*, Introduction, paragraph 8.
[55] For an extended presentation of what goes into the scientific status of social research, see Johann Mouton, *Understanding Social Research*, van Schaik Publishers, Pretoria, 1996.
[56] See, for example, Taylor, *Philosophical Arguments*, pp. 49-50; 59-60.
[57] The phrase, human productive purposes, is used by Taylor throughout much of his writing.
[58] Craig Hanks, *Technology and Values: Essential Readings*, Wiley Blackwell, 2010.
[59] *The Prosperity of Humankind*, Introduction, paragraph 8.
[60] Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium, Hampton Press*, Cresskill New Jersey, 1999.
[61] Martin Heidegger, *The Question Concerning Technology and other Essays*, Garland Publishers, New York, 1977.
[62] John B. Thompson, *Ideology and Modern Culture*, Polity Press, Cambridge, 1990.

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[63] Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Harvard University Press, Harvard, 1989.
[64] Eric Jantsch, *The Self-Organizing Universe, Scientific and Human Implications of the Emerging Paradigm of Evolution*, Pergamon Press, Oxford, 1980.
[65] Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium, Hampton Press*, Cresskill New Jersey, 1999.
[66] Ilya Prigogine and Isabella Stengers, *Order Out of Chaos: Man's new Dialogue with Nature*, Bantam Press, New York, 1984.
[67] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002. Ervin Laszlo (ed), *The Multi-cultural Planet*, Oneworld Publications, Oxford, 1993.
[68]Alan Drengson, Four Philosophies of Technology, in Hanks, *Technology and Values: Essential Readings*, Wiley Blackwell, 2010, pp. 29-31.
[69] Hanks, *Technology and Values*, p. 36.
[70] The Universal House of Justice, *To the World's Religious Leaders*, paragraph 1.
[71] Morin and Kern, *Homeland Earth*, p. 131.
[72] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 7.
[73] Morin and Kern, Homeland Earth, *p. 101*.
[74] Jacob Bronowski, *The Ascent of Man*, p. 435.
[75] W. H. Hatcher, *Science and Religion*, Association for Baha'i Studies, Ottawa, volume 2, April, 1980
[76] Hatcher, *Science and Religion*, p. 1.
[77] Laszlo, *The Multi-cultural Planet*, p. 197.
[78] The Universal House of Justice, *To the World's Religious Leaders*, paragraph 1.
[79] Yvonna S. Lincoln and Egon G. Guba, *Naturalistic Inquiry*, Sage Publications, Beverly Hills, 1985.
[80] Lincoln and Guba, *Naturalistic Inquiry*.
[81] Taylor, Explanation and Practical Reason, *Philosophical Arguments*, Harvard University Press, Cambridge Mass, 1995, pp. 34-60.
[82] Morin and Kern, *Homeland Earth*, p. 79.

Chapter One: Explanation, rational argument and the naturalistic standpoint

[83] Charles Taylor, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995, p. 40.
[84] Taylor, *Philosophical Arguments*, p. 34. The phrase, Western rationalist-empiricist culture, is taken from Ervin Laszlo (ed.), *The Multi-cultural Planet: The Report of a UNESCO International Expert Group*, Oneworld, Oxford, 1993, p. 198. Laszlo also refers to the "pragmatic, analytical world view of the West" as well as "western scientific rationality". Laszlo, *The Multi-cultural Planet*, pp. 197-198.
[85] Taylor, *Philosophical Arguments*, p. 40.
[86] Taylor, *Philosophical Arguments*, p. 34.
[87] Taylor, *Philosophical Arguments*, p. 40.
[88] Taylor, *Philosophical Arguments*, p. 41.
[89] Taylor, *Philosophical Arguments*, p. 35.
[90] Taylor, *Philosophical Arguments*, p. 34.
[91] Whitehead, *Science and the Modern World*, pp. 63; 83.
[92] Stephen Weinberg, Life in the Universe. *Scientific American*, October, 1994. Also see, for example, Richard Dawkins, *The Blind Watchmaker*, Longman Scientific, 1986 and Jacque Monad, *Chance and Necessity*, Knopf Press, 1971.
[93] Howard Kahane, *Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life*, Wadsworth, 1971, pp. 30-31.
[94] Taylor, *Philosophical Arguments*, p. 38.
[95] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[96] See, for example, Whitehead, *Science and the Modern World*, pp. 119-122; 240-260.
[97] Whitehead, *Science and the Modern World*, pp. 64-72.
[98] Whitehead, *Science and the Modern World*, p. 69.
[99] Whitehead, *Science and the Modern World*, pp. 64-72.
[100] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.

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[101] Aage Peterson, The Philosophy of Neils Bohr, *Bulletin of Atomic Scientists*, September, 1963, p. 12.
[102] A nomological, or nomothetic, account refers to way in which the interpretation of data and the drawing of conclusions from them are done in terms of, or in ways which lead to, law-like generalizations. Lincoln and Guba, *Naturalistic Inquiry*, p. 116-117. It is worth noting that there are other kinds of scientific explanation beside the nomological, such as the genealogical and the structural. See, for example, Colin Koopman, *Genealogy as Critique: Foucault and the Problem of Modernity*, Indiana University Press, 2013 and Peter Caws, *Structuralism: A Philosophy for the Human Sciences (Contemporary Studies in Philosophy and the Human Sciences)*, Humanity Books, 1997. Also see Arnold Davidson, Archaeology, Genealogy, Ethics, in *Foucault: A Critical Reader*, David Couzens Hoy (ed.), Basil Blackwell, Oxford, 1986, pp. 221-233.
[103] Whitehead, *Science and the Modern World*, pp. 49-70.
[104] Prigogine and Stengers, *Order Out of Chaos*, pp. 213-232
[105] Prigogine and Stengers, *Order Out of Chaos*, p. 213.
[106] Prigogine and Stengers, *Order Out of Chaos*, p. 217.
[107] Prigogine and Stengers, *Order Out of Chaos*, p. 218.
[108] Prigogine and Stengers, *Order Out of Chaos*, pp. 217-218.
[109] Prigogine and Stengers, *Order Out of Chaos*, p. 217.
[110] Prigogine and Stengers, *Order Out of Chaos*, pp. 217-218.
[111] Prigogine and Stengers, *Order Out of Chaos*, p. 218.
[112] Whitehead, *Science and the Modern World*, pp. 75-78.
[113] Whitehead, *Science and the Modern World*, pp. 63; 75.
[114] Whitehead, *Science and the Modern World*, p. 49.
[115] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[116] John Casti, *Searching for Certainty*, Abacus, London, 1991, pp. 29-33.
[117] Johann Mouton, *Understanding Social Research*, J. L. van Schaik, Pretoria, 1996, p. 28.
[118] Peterson, *Bulletin of Atomic Scientists*, 1963, September, p. 12.
[119] Mouton, *Understanding Social Research*, p. 31.
[120] John Casti, *Searching for Certainty*, Abacus, London, 1991, pp. 28-29. The italics are from Casti.
[121] Casti, *Searching for Certainty*, pp. 28-29.
[122] Casti, *Searching for Certainty*, pp. 28-29.
[123] Charles Coulston Gillispie, *The Edge of Objectivity*, Princeton University Press, Princeton, 1960.
[124] Charles Taylor, *Philosophical Arguments*, p. 37.
[125] Richard Rhodes, *The Making of the Atomic Bomb*, Simon and Schuster, 1995, p 243. The context to the quote from Bohr as discussed by Rhodes is illustrative and is worth noting in more detail. In 1938, one year before the start of WW II, Bohr was invited to address The International Congress of Anthropological and Ethnological Sciences held in Helsingør Denmark. He intended in his address to challenge the racists' policies of Nationalist Socialism (the Nazi party). Speaking in terms of complementarity, he is quoted to have said: "[W]e may truly say that different human cultures are complementary to each other. Indeed, each culture represents a harmonious balance of traditional conventions by means of which latent possibilities of human life can unfold themselves in a way which reveals to us new aspects of its unlimited richness and variety." Following which he is reported to have said that instead of science being the quest for incontrovertible truth, the common aim of all science is "the gradual removal of prejudices".
[126] Jacob Bronowski, *Science and Human Values*, Harper and Row, 1956. Chapter Two of *Science and Human Values* is titled: The Habit of Truth.
[127] Bronowski, *Science and Human Values.*
[128] Mouton, *Understanding Social Research*, p. *x*.
[129] Mouton, *Understanding Social Research*, p. 109.
[130] Mouton, *Understanding Social Research*, p. 109.
[131] Mouton, *Understanding Social Research*, p. 109.
[132] These include criterion validity, conceptual validity, concurrent validity, construct validity, deductive validity, empirical validity, measurement validity and theoretical validity. See Mouton, *Understanding Social Research*, p. 272.
[133] Whitehead, *Science and the Modern World*, p. 6.
[134] Whitehead, *Science and the Modern World*, p. 23.
[135] Whitehead, *Science and the Modern World*, p. 6.

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[136] Whitehead, *Science and the Modern World*, p. 6.
[137] Whitehead, *Science and the Modern World*, p. 6.
[138] Taylor, *Philosophy and the Human Sciences, Philosophical Papers II*, Cambridge University Press, 1985, p. 36.
[139] Whitehead, *Science and the Modern World*, p. 15.
[140] Whitehead, *Science and the Modern World*, p. 15.
[141] Whitehead, *Science and the Modern World*, p. 15.
[142] Mouton, *Understanding Social Research*, p. 31.
[143] Whitehead, *Science and the Modern World*, p. 15.
[144] Mouton, *Understanding Social Research*, p. 29.
[145] Whitehead, *Science and the Modern World*, p. 15.
[146] Ilya Prigogine and Isabella Stengers, *Order Out of Chaos: Man's New Dialogue with Nature*, Bantam Press, New York, 1984.
[147] Taylor, *Philosophical Arguments*, p. 34. The italics are Taylor's.
[148] Taylor, *Philosophical Arguments*, p. 36.
[149] Whitehead, *Science and the Modern World*, p. 250.
[150] Taylor, *Philosophical Arguments*, p. 38.
[151] The first quote is from Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31. The second quote is from Peterson, *Bulletin of Atomic Scientists*, 1963, September, p. 12.
[152] Taylor, *Philosophical Arguments*, p. 34. The italics are Taylor's
[153] See Taylor, *Philosophical Arguments*, p. 40.
[154] Whitehead, *Science and the Modern World*, p. 6.
[155] Prigogine and Stengers, *Order Out of Chaos*, p. 46.
[156] Prigogine and Stengers, *Order Out of Chaos*, p. 46. In this regard they also note that "It is astonishing to find that the modern explanation has eliminated, on the grounds that it is irrelevant, the very thing that Aristotelian physics set out to explain", by which they mean the idea of natural motion. Prigogine and Stengers, *Order Out of Chaos*, p. 41.
[157] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[158] Whitehead, *Science and the Modern World*, p. 83.
[159] Prigogine and Stengers, *Order Out of Chaos*, p. 44. The italics are part of the original text.
[160] Prigogine and Stengers, *Order Out of Chaos*, p. 46.
[161] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, p. 25. The italics are Weinberg's. I take it that by history Weiberg is referring to the theory of evolution by natural selection.
[162] Whitehead, *Science and the Modern World*, p. 69.
[163] Whitehead, *Science and the Modern World*, p. 69.
[164] Prigogine and Stengers, *Order Out of Chaos*, p. 52. The italics are part of the original text.
[165] Both Morin and Kern as well as Nicolescu speak of reality as that which resists our attempts to understand it. Edgar Morin and Ann Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999. Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002.
[166] Whitehead, *Science and the Modern World*, p. 71.
[167] Whitehead, *Science and the Modern World*, p. 74.
[168] Whitehead, *Science and the Modern World*, p. 74.
[169] Casti, *Alternate Realities*, Wiley, 1982, p. 473.
[170] Whitehead, *Science and the Modern World*, p. 15.
[171] Whitehead, *Science and the Modern World*, p. 75.
[172] Whitehead, *Science and the Modern World*, p. 78.
[173] Whitehead, *Science and the Modern World*, p. 41.
[174] Whitehead, *Science and the Modern World*, p. 37.
[175] Whitehead, *Science and the Modern World*, p. 41.
[176] Whitehead, *Science and the Modern World*, p. 40.
[177] The notion of cause being discussed in these paragraphs is much indebted to ideas from Casti, *Searching for Certainty*, pp. 35-40.
[178] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[179] Casti, *Searching for Certainty*, p.p. 35-40.

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[180] John Gribbon, *In Search of Schrodinger's Cat: Quantum Physics and Reality*, Black Swan, London, 1991, pp. 155-176.
[181] Mouton, *Understanding Social Research*, p. 29.
[182] Whitehead, *Science and the Modern World*, p. 15.
[183] Whitehead, *Science and the Modern World*, p. 23.
[184] Whitehead, *Science and the Modern World*, p. 71.
[185] Whitehead, *Science and the Modern World*, p. 6.
[186] Prigogine and Stengers, *Order out of Chaos*, p. 5.
[187] Whitehead, *Science and the Modern World*, p. 21.
[188] Whitehead, *Science and the Modern World*, p. 22.
[189] Whitehead, *Science and the Modern World*, p. 69.
[190] Whitehead, *Science and the Modern World*, p. 134.
[191] Prigogine and Stengers, *Order Out of Chaos*, p. 52. The italics are part of the original text.
[192] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, p. 25. By the term, history, Weinberg is presumably referring to the theory of evolution.
[193] Whitehead, *Science and the Modern World*, p. 74.
[194] Taylor, *Human Agency and Language*, pp. 40; 59-60.
[195] Taylor, *Philosophical Arguments*, p. 38.
[196] Whitehead, *Science and the Modern World*, p. 69.
[197] Taylor, *Human Agency and Language*, p. 112.
[198] Taylor, *Human Agency and Language*, pp. 97-114. Also see Taylor, *Sources of the Self: The Making of the Modern Identity*, Cambridge University Press, Cambridge, 1989 for an extensive discussion of such ideas.
[199] Taylor, *Philosophy and the Human Sciences*, pp. 37-40; 45.
[200] Taylor, *Philosophy and the Human Sciences*, p. 40.
[201] Taylor, *Human Agency and Language*, pp. 118.
[202] One could perhaps coin the term intrasubjective, instead of intersubjective, in the discussion here.
[203] Mouton *Understanding Social Research*, p. 31.
[204] Mouton *Understanding Social Research*, pp. 28-34.
[205] Taylor, *Philosophical Arguments*, p. 34.
[206] Casti, *Searching for Certainty*, pp. 28-29.
[207] Whitehead, *Science and the Modern World*, pp. 50; 173.
[208] Whitehead, *Science and the Modern World*, p. 74.
[209] William H. Hatcher, *Minimalism*, Juxta Publishing, Hong Kong, 2004, p. 24.
[210] See Robert King Merton, Science and the Social Order, *The Sociology of Science*, B. Barber and W. Hirsch, (eds.), Free Press, 1962; Robert King Merton, *Social Theory and Social Structure*, The Free Press, 1968.
[211] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[212] See Prigogine and Stengers, *Order out of Chaos* for an extended discussion of this dialogue.
[213] Taylor, *Philosophical Arguments*, p. 38.
[214] Whitehead, *Science and the Modern World*, p. 134.
[215] Mouton *Understanding Social Research*, pp. 28; 109.
[216] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[217] Whitehead, *Science and the Modern World*, pp. 93-117.
[218] R. D. Laing, What is the Matter with Mind, *The Schumacher Lectures*, Satish Kumar (Ed) Abacus, London, 1982.
[219] Laing, *The Schumacher Lectures*, p. 6.
[220] Laing, *The Schumacher Lectures*, p. 6. The italics are from Laing.
[221] Laing, *The Schumacher Lectures*, p. 9.
[222] Laing, *The Schumacher Lectures*, p. 9.
[223] Laing, *The Schumacher Lectures*, p. 15.
[224] Laing, *The Schumacher Lectures*, p. 4-5.
[225] Laing, *The Schumacher Lectures*, p. 4-5.
[226] Laing, *The Schumacher Lectures*, p. 9.
[227] The notion of the consensus theory of truth will be brought up in the discussion in Chapter Two.

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[228] Taylor, *Philosophical Arguments*, P. 38
[229] Michael Polanyi refers to poetic truth, magical theory, and the noble vista of the natural order. See Michael Polanyi, *Science Faith and Society*, The University of Chicago Press, 1964, pp. 25-26.
[230] Whitehead, *Science and the Modern World*, pp. 109-112.
[231] Taylor, *Philosophical Arguments*, p. 38.
[232] Bronowski, *The Ascent of Man*, p. 435.
[233] Michael Gibbon and Björn Wittrock, (eds.), *Science as a Commodity: Threats to the Open Community of Scholars*, Longman, 1985.
[234] Mouton, *Understanding Social Research*, pp. 41-45; Casti, *Searching for Certainty*, pp. 28-29.
[235] This thought echoes Taylor's comments on the influence the primacy of the epistemological has in Western intellectual culture. See Taylor, *Philosophical Arguments*, p. 34.
[236] John Casti, *Searching for Certainty*, pp. 28-29.
[237] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, p. 39.
[238] Peterson, *Bulletin of Atomic Scientists*, 1963, September, p. 12.
[239] Bronowski, *The Ascent of Man*, p. 234.
[240] Whitehead, *Science and the Modern World*, pp. 67-69.
[241] Whitehead, *Science and the Modern World*, pp. 67; 113.
[242] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, p. 39.
[243] Mouton, *Understanding Social Research*, pp. 144-160.
[244] Mouton, *Understanding Social Research*, pp. 144-160.
[245] Jacob Bronowski, *Science and Human Values*, Hutchinson, 1961. The Habit of Truth is the title of the second chapter in his book.
[246] This is arguably what Taylor refers to as a critical morality. Taylor, *Philosophical Arguments*, p. 41. Such ideas are echoed in Michael Polanyi, *Science Faith and Society*, The University of Chicago Press, Chicago, 1964.
[247] Mouton, *Understanding Social Research*, pp. 103-107.
[248] Jacob Bronowski, *Science and Human Values*.
[249] For similar comments in this regard see, for example, Marvin Minsky, Will Robots Inherit the Earth? *Scientific American*, October, 1994. Also see John B. Thompson, *Ideology and Modern Culture*, Polity Press, Cambridge, 1990, p. 5.
[250] Jean-Mare Lehn, Science and society, the natural-unnatural dualism. *Interdisciplinary Science Reviews*, 2(2), 1996, p. 37.
[251] Laszlo, *The Multi-cultural Planet*, p. 201.
[252] Robert King Merton, Science and the Social Order, *The Sociology of Science*, B. Barber and W. Hirsch, (eds.), Free Press, 1962; Robert King Merton, *Social Theory and Social Structure*, The Free Press, 1968.
[253] Merton, *The Sociology of Science*, pp. 21-22.
[254] Merton, *The Sociology of Science*, p. 21-28.
[255] Merton, *The Sociology of Science*, p. 21-28.
[256] Mouton, *Understanding Social Research*, pp. 205-206.
[257] Merton, *The Sociology of Science*, p. 21-28.
[258] See Michael Polanyi, *Science Faith and Society*,The University of Chicago Press, Chicago, 1964, pp. 63-65.
[259] Merton, *The Sociology of Science*, pp. 23-24.
[260] Merton, *The Sociology of Science*, pp. 23-24. Also see Merton, *Social Theory and Social Structure*, pp. 604-605.
[261] Merton, *The Sociology of Science*, pp. 26-28; Merton, *Social Theory and Social Structure*, pp. 614-615.
[262] Michael Gibbons and Björn Wittrock (Eds), *Science as a Commodity: Threats to the Open community of Scholars*, Longman Essex, 1985. Also see Michael Gibbons, *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*, Sage Press, 1994.
[263] Kahane, *Logic and Contemporary Rhetoric*, pp. 30-31.
[264] Taylor, *Philosophical Arguments*, p. 34.
[265] Taylor, *Philosophical Arguments*, p. 41.
[266] Taylor, *Philosophical Arguments*, p. 41.
[267] Marzia Gail, *Dawn Over Mount Hira*, George Ronald, Oxford, 1976.
[268] This is sometimes labelled mode 2. Gibbons and Wittrock, *Science as Commodity*, pp. 2-20.

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[269] Gibbons and Wittrock, *Science as Commodity*, pp.15-16.
[270] Gibbons and Wittrock, *Science as Commodity*, pp.15-16.
[271] Frederic Ferré, *Philosophy of Technology*, University of Georgia Press, Athens, 1995, pp. 30-35.
[272] Gibbons and Wittrock, *Science as Commodity*, p.16.
[273] Gibbons and Wittrock, *Science as Commodity*, p. 17.
[274] These notions are discussed at length in Taylor, *Philosophical Arguments*, pp. 34-60.
[275] Taylor, *Philosophical Arguments*, p. 34.
[276] Bruner, *Toward a Theory of Instruction*. pp. 25-29. Bronowski, *The Ascent of Man*, pp. 36-45.
[277] Bruner *Toward a Theory of Instruction*, pp. 25-29. This is otherwise called extension theory. See, for example, Marshall McLuhan, *Understanding Media: The Extensions of Man*. New York: McGraw-Hill paperback edition, 1966. Also see Phillip Brey, Technology as Extension of Human Faculties, *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology*, vol. 19. Ed. C. Mitcham, London, Elsevier/JAI Press, 2000. In addition, see Richard Heersmink, Defending Extension Theory: A Response to Kiran and Verbeek, *Philosophy and Technology*, Springer-Verlag, published on-line 14 June 2011, pp. 2-3.
[278] Richard Heersmink, Defending Extension Theory: A Response to Kiran and Verbeek, *Philosophy and Technology*, Springer-Verlag, published on-line 14 June 2011, pp. 2-3.
[279] Taylor, *Philosophical Arguments*, p. 34.
[280] See J. S. Wolvaardt, *Models for Strategic Decision Making*, University of South Africa, Pretoria, 2001, for a technical treatment of specific models involved in making rational choices, namely the analytical hierarchy process, zero-based budgets, utility theory, and goal programming.

Chapter Two: Qualitative reasoning, understanding and the human sciences

[281] Charles Taylor, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995, p. 34-35.
[282] Taylor, *Philosophical Arguments*, p. 34.
[283] Martha Nussbaum and Amartya Sen (eds.), *The Quality of Life*, WIDER Studies in Development Economics, Clarendon Press, 1993, pp 232-241.
[284] Yvonna S. Lincoln, and Egon G. Guba, *Naturalistic Inquiry*, Sage Press, Beverly Hills, 1985.
[285] Charles Taylor, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995.
[286] Taylor, *Human Agency and Language*, p. 112. The terms self-defining subject and self-defining individual are used synonymously throughout the thesis discussion.
[287] Martha Nussbaum and Amartya Sen (eds.), *The Quality of Life*, WIDER Studies in Development Economics, Clarendon Press, 1993, pp 232-241.
[288] Nussbaum's use of the pronoun 'she' in this and the next quote speaks to a general dissatisfaction with the way the ordinary use of English promotes a patriarchal bias, and hence a certain unreflected assumptions about a dominant male perspective.
[289] Nussbaum and Sen, *The Quality of Life*, p. 233.
[290] Taylor, *Philosophical Arguments*, p. 39.
[291] Taylor, *Philosophical Arguments*, pp. 34-60. Also see the extended discussion in Ilya Prigogine and Isabelle Stengers, *Order out of chaos: Man's new Dialogue with Nature*, Bantam Books, New York, 1984.
[292] See Chapter One, Part C.
[293] Nussbaum and Sen, *The Quality of Life*, p. 233.
[294] Nussbaum and Sen, *The Quality of Life*, p. 233. The brackets are not part of the original text. I have inserted them in order to help make the meaning more clear.
[295] Chapter Two in Jacob Bronowski's book, *Science and Human Values*, is titled Habit of Truth. Jacob Bronowski, *Science and Human Values*, Harper Perennial, 1990.
[296] Alfred North Whitehead, *Science and the Modern World*, Lowell Lectures (1925), Free Association Books, London, 1995, p. 69.
[297] Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Cambridge University Press, Cambridge, 1989. See also Charles Taylor, *Human Agency and Language*; *Philosophical Papers I*, Cambridge University Press, Cambridge, 1985, pp. 97-114.
[298] Taylor, *Human Agency and Language*, p. 112.
[299] Taylor, *Human Agency and Language*, p. 112.
[300] Nussbaum and Sen, *The Quality of Life*, p. 233.

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[301] Taylor, *Philosophical Arguments*, p. 38.
[302] The wording here echoes Thompson's phrase, "meaning in the service of power". John B. Thompson, *Ideology and Modern Culture*, Polity Press, 1990, p. 7.
[303] Taylor, *Philosophical Arguments*, pp. 34-42.
[304] Taylor, *Philosophical Arguments*, pp. 34-42.
[305] The phrase, guiding cultural images, is adopted from Eric Jantsch, *The Self-organizing Universe*, Pergamon Press, Oxford, 1980, p. 257.
[306] Jacob Bronowski, *The Ascent of Man*, BBC Books, London, 1973, p. 435.
[307] Yvonna S. Lincoln and Egon G. Guba, *Naturalistic Inquiry*, Sage Publications, Beverly Hills, 1985.
[308] Lincoln and Guba, *Naturalistic Inquiry*, p. 15.
[309] Lincoln and Guba, *Naturalistic Inquiry*, pp. 15-16. The italics are from Lincoln and Guba.
[310] Lincoln and Guba, *Naturalistic Inquiry*, pp. 28-33.
[311] Lincoln and Guba, *Naturalistic Inquiry*, p. 33. The italics are from Lincoln and Guba.
[312] For these distinctions Lincoln and Guba cite the work of Julienne Ford, *Paradigms and Fairy Tales*, Routledge and Kegan Paul, 1975.
[313] Lincoln and Guba, *Naturalistic Inquiry*, p. 15.
[314] Lincoln and Guba, *Naturalistic Inquiry*, p. 15. The italics are from Lincoln and Guba.
[315] Lincoln and Guba, *Naturalistic Inquiry*, p. 15. The italics are from Lincoln and Guba.
[316] The notion of a first reading of the world is adapted from The Universal House of Justice, *Century Of Light*, p. 124
[317] Lincoln and Guba, *Naturalistic Inquiry*, p. 33.
[318] Lincoln and Guba, *Naturalistic Inquiry*, pp. 19-33. Lincoln and Guba offer seven challenges, as follows: i) it provides for an inadequate conceptualization of science, ii) it cannot deal with the way facts are theory-laden nor with the problem of induction, that is, "there is always a larger number of theories that can fit observations more or less adequately", iii) it is overly dependent on operationalism, iv) it leads to determinism and reductionism, v) it has produced research that ignores the humanness of its research object, vi) it cannot deal with such new formulations as Gödel's Incompleteness Theorem, Heisenberg's Uncertainty Principle and Bell's Theorem, and vii) it assumes there is a single reality, that the observer is distinct from the observed, that the statements it makes about some phenomena of study are true across time and place, that cause is linear, and that its results are free of unwanted value judgements.
[319] The other two are belief in a universal scientific language and a correspondence theory of truth. Lincoln and Guba, *Naturalistic Inquiry*, p. 24. For these distinctions Lincoln and Guba cite Mary Hesse: *Revolutions and Reconstructions in the Philosophy of Science*, Indiana University Press, Bloomington, 1980.
[320] Lincoln and Guba, *Naturalistic Inquiry*, p. 16.
[321] James Ladyman, Structural Realism, *Stanford Encyclopaedia of Philosophy*, First published Wed Nov 14, 2007; substantive revision Fri Jan 10, 2014, section 2, paragraph 8. Ladyman is summarizing an argument found in Larry Laudan, A confutation of convergent realism, *Philosophy of Science*, 48: pp. 19–49, 1981.
[322] Lincoln and Guba, *Naturalistic Inquiry*, p. 32.
[323] Lincoln and Guba, *Naturalistic Inquiry*, p. 33.
[324] See, for example, Hermann Weyl, *Space Time Matter*, Dover Publications, Mineola NY, 1952.
[325] Lincoln and Guba, *Naturalistic Inquiry*, p. 16.
[326] Lincoln and Guba, *Naturalistic Inquiry*, p. 37.
[327] Lincoln and Guba, *Naturalistic Inquiry*, pp. 37-38. The italics found in the axiom statements are those used by Lincoln and Guba. All parenthetical words and phrases are part of the original. Furthermore, in the original bullets are used to separate the positivist version of the axiom from what Lincoln and Guba call the naturalist version. These bullets have been removed here. Also, for the sake of clarity the bracketed term, [Postpositivist], has been inserted in each of the so-called Naturalist Versions of the axioms.
[328] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[329] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[330] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[331] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[332] Lincoln and Guba, *Naturalistic Inquiry*, pp. 70-91.
[333] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[334] Lincoln and Guba, *Naturalistic Inquiry*, p. 84.
[335] Lincoln and Guba, *Naturalistic Inquiry*, pp. 37-38.

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[337] Lincoln and Guba, *Naturalistic Inquiry*, pp. 28-30; 85-87.
[338] Lincoln and Guba, *Naturalistic Inquiry*, pp. 83-84.
[339] Lincoln and Guba, *Naturalistic Inquiry*, p.83-84.
[340] Lincoln and Guba, *Naturalistic Inquiry*, p.87. The italics are Lincoln and Guba's.
[341] Lincoln and Guba, *Naturalistic Inquiry*, p.83.
[342] Lincoln and Guba, *Naturalistic Inquiry*, p. 84-85.
[343] See Lincoln and Guba's Axiom 5, Corollary 5. Lincoln and Guba, *Naturalistic Inquiry*, p. 38.
[344] Hence their title, *Naturalistic Inquiry*. Regarding the idea of the natural setting, see Lincoln and Guba, *Naturalistic Inquiry*, p. 39.
[345] Lincoln and Guba, *Naturalistic Inquiry*, pp. 187-192.
[346] Lincoln and Guba, *Naturalistic Inquiry*, p. 38.
[347] In Lincoln and Guba's terms, nomothetic means that the interpretation of data and the drawing of conclusions are done in terms of law-like generalizations. Lincoln and Guba, *Naturalistic Inquiry*, p. 42.
[348] For Lincoln and Guba, ideographic means that the interpretation of data and the conclusions drawn from them are applicable to the individual case. Lincoln and Guba, *Naturalistic Inquiry*, p. 42.
[349] Whitehead, *Science and the Modern World*, p. 83.
[350] In the statement of the axiom that follows the italics are part of the original
[351] Lincoln and Guba, *Naturalistic Inquiry*, pp. 37-38.
[352] See William S. Hatcher, *Minimalism*, Juxta, Hong Kong, 2002.
[353] Nussbaum and Sen, *The Quality of Life*, p. 233.
[354] Lincoln and Guba *Naturalistic Inquiry*, pp. 14-18; 33-36.
[355] Lincoln and Guba *Naturalistic Inquiry*, pp. 24-28.
[356] The terms self-defining subject and self-defining individual are used synonymously in the thesis discussion.
[357] Lincoln and Guba, *Naturalistic Inquiry*, p. 38. The italics are from Lincoln and Guba.
[358] Lincoln and Guba *Naturalistic Inquiry*, pp. 47-69.
[359] Lincoln and Guba *Naturalistic Inquiry*, pp. 33-36.
[360] This general ideas is taken up by Taylor in his *Sources of the Self: The Making of the Modern Identity*, Harvard University Press, Harvard, 1989.
[361] Taylor, *Philosophical Arguments*, pp. 38-39.
[362] Taylor, *Philosophical Arguments*, pp. 39-42.
[363] Taylor, *Philosophical Arguments*, pp. 54-55.
[364] Taylor, *Philosophical Arguments*, pp. 39-42.
[365] Charles Taylor, Explanation and Practical Reason, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995, p. 34-60.
[366] Taylor, *Philosophical Arguments*, pp. 36-42.
[367] Whitehead, *Science and the Modern World*, p. 69.
[368] Whitehead, *Science and the Modern World*, p. 69.
[369] Taylor, *Philosophical Arguments*, pp. 38-39.
[370] Taylor, *Philosophical Arguments*, p. 39.
[371] The notions expressed in this paragraph are adapted from a range of ideas from Taylor. See, for example, Taylor, *Philosophical Arguments*, pp 34-60 and Taylor, *Human Agency and Language*, pp. 97-114.
[372] Taylor refers to "good/decent/acceptable forms of life". Taylor, *Human Agency and Language*, p. 98
[373] Taylor, *Philosophical Arguments*, pp. 39-40.
[374] Taylor, *Philosophical Arguments*, p. 40.
[375] Taylor, *Philosophical Arguments*, p. 35.
[376] Taylor, *Philosophical Arguments*, p. 40.
[377] Taylor, *Philosophical Arguments*, p. 41.
[378] Taylor, *Philosophical Arguments*, p. 39.
[379] Johann Mouton, *Understanding Social Research*, J. L. van Schaik, Pretoria, 1996.
[380] Taylor, *Philosophical Arguments*, pp. 41-42.
[381] Taylor, *Philosophical Arguments*, pp. 41-42.
[382] Taylor, *Philosophical Arguments*, pp. 41-42.

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[383] The literature on moral scepticism is extensive. See, for example, Leslie Mackie, *Ethics: Inventing Right and Wrong*, Penguin, 1977; Richard Joyce, *The Myth of Morality*, Cambridge University Studies in Philosophy, Cambridge, 2001; Walter S. Armstrong, *Moral Scepticisms*, Oxford University Press, Oxford, 2006.
[384] Taylor, *Philosophical Arguments*, p. 38.
[385] Nussbaum. *The Quality of Life*, p. 223.
[386] See, for example, Taylor, *Philosophical Arguments*, p 40.
[387] Taylor, *Philosophical Arguments*, p. 54.
[388] Taylor, *Philosophical Arguments*, pp. 42-53.
[389] Taylor, *Philosophical Arguments*, p. 41.
[390] Taylor, *Philosophical Arguments*, p. 54.
[391] Taylor, *Philosophical Arguments*, p. 54.
[392] Taylor, *Philosophical Arguments*, p. 55.
[393] Taylor, *Human Agency and Language*, pp. 97-114. The terms self-defining subject and self-defining individual are used synonymously throughout the thesis discussion.
[394] Taylor, *Philosophical Arguments*, p. 34.
[395] The ideas here are from Taylor, *Philosophical Arguments*, p. 39.
[396] Taylor, *Human Agency and Language*, pp. 97-114; 117-138.
[397] See, for example, Taylor, *Philosophy and the Human Sciences*, p. 40.
[398] See, for example, Taylor, *Philosophy and the Human Sciences*, p. 40.
[399] See, for example, Taylor, *Philosophy and the Human Sciences*, p. 21.
[400] Taylor refers to this as strong evaluation. Taylor. *Philosophical Arguments*, p. 37.
[401] Taylor, *Philosophical Arguments*, p. 37. The italics are from Taylor.
[402] Taylor, *Philosophical Arguments*, p. 37.
[403] Taylor, *Philosophical Arguments*, p. 34. The italics are from Taylor.
[404] Jerome Bruner, *Toward a Theory of Instruction*, Oxford University Press, Oxford, 1971, p. 25.
[405] Bruner, *Toward a Theory of Instruction*, p. 25.
[406] Richard Heersmink, Defending Extension Theory: A Response to Kiran and Verbeek, *Philosophy and Technology*, Springer-Verlag, published on-line 14 June 2011, pp. 2-3.
[407] Bruner, *Toward a Theory of Instruction*, pp. 24-25. Jacob Bronowski offers a similar argument. Bronowski, The Ascent of Man, pp. 41-42.
[408] Heersmink, *Philosophy and Technology*, pp. 2-3.
[409] Parts of this section are adopted from H. Baughan, *Science, Society, Technology and Holistic Modes of Thought*, M.Phil., University of Stellenbosch, 1999.
[410] Taylor, *Human Agency and Language*, p. 197.

Chapter Three: Human agency, complexity and co-evolution

[411] Taylor, *Human Agency and Language*, p. 112.
[412] Supporting ideas come from authors such as John Casti, *Searching for Certainty*, Abacus, London, 1991; John B. Thompson, *Ideology and Modern Culture*, Polity Press, Cambridge, 1990; Jacob Bronowski, *The Ascent of Man*, BBC Press, London, 1973; and Alfred North Whitehead *Science and the Modern World*, Free Association Books, London, 1985.
[413] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language*, *Philosophical Papers I*, Cambridge University Press, Cambridge, 1985. Charles Taylor, Peaceful Co-existence in Psychology, *Human Agency and Language*, *Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[414] Ilya Prigogine and Isabella Stengers, *Order Out of Chaos: Man's new Dialogue with Nature*, Bantam Books, New York, 1984; Eric Jantsch, *The Self-Organizing Universe: Scientific and Human Implications of the New Paradigm of Evolution*, Pergamon Press, Oxford, 1980; Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999; Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002; Ervin Laszlo, *The Systems View of the World*, George Braziller, New York, 1972.
[415] John Casti: *Nonlinear System*, Academic Press, London, 1985; *Alternative Realities*, Wiley, New York, 1982; and *Searching for Certainty*, Abacus, London, 1991

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[416] Lynn Margulis and Dorion Sagan, *Microcosmos: Four Billion Years of Microbial Evolution*, University of California Press, 1997; Ian Stewart, *Life's Other Secret: The New Maths of the Living World*, Wiley, 1999; Evelyn Fox Keller, *The Century of the Gene*, Harvard University Press, Cambridge, MA., 2000; Mark Swilling, *"Two Cultures": An African perspective on the emerging intellectual basis for greater cooperation between the natural and human sciences in the 21st Century*, Isandla Institute, Dark Roast Occasional Paper Series, No 11, 2003.
[417] Prigogine and Stengers, *Order Out of Chaos*.
[418] See, for example, Taylor, *Philosophical Arguments*, p. 60.
[419] Taylor, *Philosophical Arguments*, p. 43.
[420] Whitehead, *Science and the Modern World*, p. 94.
[421] Some of the beliefs summarized here are distilled from Whitehead, *Science and the Modern World*. A number of ideas from Taylor are also integrated into the discussion. See Taylor, *Sources of the Self: The Making of the Modern Ide*ntity, Cambridge University Press, Cambridge, 1989.
[422] Whitehead, *Science and the Modern World*, pp. 69-70.
[423] Prigogine and Stengers, *Order Out of Chaos*.
[424] Taylor, *Philosophical Arguments*, pp. 38-39.
[425] Taylor, *Human Agency and Language*, p. 98.
[426] Taylor, *Human Agency and Language*, p. 98.
[427] Taylor, *Philosophical Arguments*, p. 38.
[428] Howard Kahane, *Logic and Contemporary Rhetoric: The Use of Reason in Everyday Life*, Wadsworth, 1995, pp. 30-31.
[429] Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Harvard University Press, Harvard, 1989.
[430] Taylor, *Human Agency and Language*, p. 112.
[431] Taylor, *Human Agency and Language*, pp.113-114.
[432] Taylor, *Human Agency and Language*, pp. 112-113.
[433] Taylor, *Philosophical Arguments*, p. 34.
[434] Whitehead, *Science and the Modern World*, p. 94.
[435] Taylor, *Philosophical Arguments*, p.40. Also See Whitehead, *Science and the Modern World*, pp. 67-70.
[436] Taylor, *Philosophical Arguments*, p. 34-35.
[437] Morin and Kern, *Homeland Earth*, p. 81.
[438] Morin and Kern, *Homeland Earth*, p. 81.
[439] Taylor, *Human Agency and Language*, p. 174.
[440] Taylor, *Human Agency and Language*, p. 112.
[441] Martha Nussbaum and Amartya Sen (eds.), *The Quality of Life*, WIDER Studies in Development Economics, Clarendon Press, 1993, p. 233.
[442] Taylor, *Philosophical Arguments*, p. 38.
[443] Taylor, *Human Agency and Language*, p. 98.
[444] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, Cambridge , 1985. Charles Taylor, Peaceful Coexistence in Psychology, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[445] Taylor, *Philosophical Arguments*, pp. 34-60.
[446] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[447] See, for example, Taylor, Cognitive Psychology, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, 1985.
[448] Taylor, *Philosophical Arguments*, p. 34.
[449] Taylor, *Human Agency and Language*, pp. 185-186.
[450] Taylor, *Human Agency and Language*, p. 117.
[451] Marvin Minsky, Will Robots Inherit the Earth?, *Scientific American*, 271(4), 1994.
[452] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[453] Taylor, *Philosophy and the Human Sciences*, p. 40.
[454] Taylor, *Philosophical Arguments*, p. 38.
[455] Taylor, *Human Agency and Language*, p. 117-120.

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[456] Taylor, *Human Agency and Language*, p. 118.
[457] Whitehead, *Science and the Modern World*, p. 3.
[458] See Taylor, Rationality, *Philosophy and the Human Sciences Philosophical Papers II*, Cambridge University Press, Cambridge, 1985, for a discussion of the relation between contradiction and irrationality.
[459] Taylor, *Human Agency and Language*, p.117-120.
[460] Taylor, *Human Agency and Language*, pp. 118-120.
[461] Taylor, *Human Agency and Language*, pp. 164-169.
[462] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language*, *Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[463] Charles Taylor, What is Human Agency?, *Human Agency and Language*, Cambridge University Press, Cambridge, 1985. Charles Taylor, Language and Human Nature,, *Human Agency and Language*, Cambridge University Press, Cambridge, 1985.
[464] Taylor, *Philosophical Arguments*, pp. 50-53. Also see Taylor, *Human Agency and Language*, pp. 270-273.
[465] Taylor, *Human Agency and Language*, p. 124
[466] Taylor, *Philosophical Arguments*, pp. 38-41.
[467] Taylor, *Philosophical Arguments*, p. 38.
[468] Taylor, *Philosophical Arguments*, p. 40.
[469] Taylor, *Human Agency and Language*, pp. 187-199.
[470] Taylor, *Philosophical Arguments*, pp. 38-42.
[471] Taylor, *Human Agency and Language*, p. 112.
[472] Taylor, *Human Agency and Language*, p. 113. Also see Whitehead, *Science and the Modern World*, p. 169.
[473] Jerome Bruner, *Towards a Theory of Instruction*, Oxford University Press, London, 1971. Also see Marshall McLuhan, *Understanding Media: The Extensions of Man*, New York: McGraw-Hill, Paperback edition, 1966. Also see Phillip Brey, Technology as Extension of Human Faculties, *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology*, vol. 19. Ed. C. Mitcham, London, Elsevier/JAI Press, 2000. In addition, see Richard Heersmink, Defending Extension Theory: A Response to Kiran and Verbeek, *Philosophy and Technology*, Springer-Verlag, published on-line 14 June 2011, pp. 2-3.
[474] The ideas discussed in this subsection are indebted to Taylor's position as found in Charles Taylor, Language and Human Nature, *Human Agency and Language, Philosophical Papers I*, Cambridge University Press, Cambridge, 1985.
[475] Taylor, *Human Agency and Language*, pp. 218-221; 234-239.
[476] Taylor, *Philosophy and the Human Sciences*, pp. 38-40.
[477] Taylor, *Human Agency and Language*, p. 121.
[478] These ideas derive from the discussion in Taylor, Interpretation and the Sciences of Man, *Philosophy and the Human Sciences*, *Philosophical Papers II*, Cambridge University Press, 1985.
[479] There are some links here to Edgar Morin's notion of an active loop. See Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), Academic Press, 1992, pp. 371-385.
[480] Taylor, *Human Agency and Language*, P. 119. Also see Whitehead's ideas on what he calls "irreducible and stubborn facts". Whitehead, *Science and the Modern World*, p. 3.
[481] Taylor, *Philosophy and the Human Sciences*, p. 40.
[482] Taylor, *Human Agency and Language*, pp. 164-171
[483] Taylor, *Philosophical Arguments*, p. 171.
[484] Taylor, *Human Agency and Language*, pp. 171-186
[485] Taylor, *Philosophical Arguments*, p. 174.
[486] Taylor, *Philosophy and the Human Sciences*, p. 40.
[487] Taylor refers to this as the "requirement of compatibility". Taylor, *Human Agency and Language*, p. 176.
[488] Taylor, *Human Agency and Language*, pp. 173-178.
[489] Taylor, *Human Agency and Language*, pp. 164-186.
[490] Taylor, *Human Agency and Language*, p. 179.
[491] Taylor, *Philosophical Arguments*, p. 38.
[492] The gist of the argument here is from Taylor, *Human Agency and Language*, pp. 167-171.
[493] Taylor, *Human Agency and Language*, pp. 167-168.

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[494] Taylor, *Human Agency and Language*, p. 169.
[495] Also see Thompson's ideas regarding depth hermeneutics. Thompson, *Ideology and Modern Culture*. pp. 272-279.
[496] Taylor, *Human Agency and Language*, p. 197.
[497] These ideas are discussed at length in Taylor, Self-interpreting Animals, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, 1985. Also see John Thompson's ideas about symbolic forms. Thompson, *Ideology and Modern Culture*.
[498] Taylor, *Human Agency and Language*, p. 93.
[499] Thompson, *Ideology and Modern Culture*, pp. 274-275.
[500] An obvious exclusion here is when researchers set out to engineer, craft or synthesize some new material or work out some new process according to human needs. Even here though the assumption may be that the product and reactants are all independent objects, only that the researchers have the skill to manipulate or leverage the way they interact.
[501] Taylor, *Philosophical Arguments*, p. 45.
[502] Charles Taylor, Social Theory as Practice, *Philosophy and the Human Sciences; Philosophical Papers II*, Cambridge University Press, 1985.
[503] Taylor, *Philosophical Arguments*, p. 52.
[504] Taylor, *Philosophy and the Human Sciences*, pp. 91-115.
[505] See for example, Michael Polanyi, *Science, Faith and Society*, University of Chicago Press, Chicago, 1946.
[506] Taylor works out this notion of lucid self-understanding in his discussion on *ad hominem* reason. See Taylor, *Philosophical Arguments*, pp. 34-60.
[507] Taylor, *Philosophy and the Human Sciences*, p. 40.
[508] Thompson, *Ideology and Modern Culture*, p. 274. On a similar topic see Gadamer, *Truth and Method*, pp. 235-274.
[509] Taylor, *Human Agency and Language*, p. 94.
[510] Taylor, *Philosophy and the Human Sciences*, p. 91.
[511] Taylor, *Human Agency and Language*, pp. 120-128 Also see Taylor, *Philosophical Arguments*, pp. 38-39.
[512] Taylor, *Philosophical Arguments*, p. 39.
[513] Taylor, *Philosophical Arguments*, p. 39.
[514] Taylor, *Human Agency and Language*, pp. 97-114.
[515] Taylor, *Human Agency and Language*, p. 220.
[516] Some of these parings are from Taylor, *Human Agency and Language*, p. 15.
[517] Taylor, *Human Agency and Language*, p. 19.
[518] Whitehead, *Science and the Modern World*, p. 69.
[519] Taylor, *Philosophical Arguments*, p. 34.
[520] Taylor, *Philosophical Arguments*, pp. 38-39.
[521] Taylor, *Human Agency and Language*, p. 98; 246.
[522] Edgar Morin and Anne Brigitte Kern *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, Cresskill New Jersey, 1999, pp. 81.
[523] Taylor, *Human Agency and Language*, p. 167.
[524] Morin and Kern, *Homeland Earth*, pp. 81-82.
[525] Taylor, Human Agency and *Language*, pp. 164-170.
[526] If so then one could perhaps say that this as a chain of being of a different sort. Arthur O. Lovejoy, *The Great Chain of Being: A Study of the History of an Idea*, Harvard University Press, 1976.
[527] Taylor, *Human Agency and Language*. pp. 97-105.
[528] Whitehead, *Science and the Modern World*, p. 69.
[529] Taylor, *Human Agency and Language*. pp. 97-105.
[530] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994.
[531] Frederic Ferré, *Philosophy of Technology*, University of Georgia Press, 1995.
[532] Taylor, *Human Agency and Language*, p. 96.
[533] Bruner, *Towards a Theory of Instruction*, pp. 25-29. CNS stands for Central Nervous System.
[534] Taylor, *Human Agency and Language*, p. 97.
[535] Taylor, *Human Agency and Language*, p. 98.
[536] Ervin Laszlo, *The Systems View of the World*, George Braziller, New York, 1972.

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[537] Taylor, *Philosophy and the Human Sciences*, p. 40.
[538] Taylor, *Philosophical Arguments*, p. 40.
[539] Taylor, *Philosophy and the Human Sciences*, p. 40.
[540] Taylor, *Philosophy and the Human Sciences*, p. 98.
[541] Taylor, *Philosophy and the Human Sciences*, p. 99.
[542] Ilya Prigogine and Isabelle Stengers, *Order out of chaos: Man's new Dialogue with Nature*, Bantam Books, New York, 1984; Eric Jantsch, *The Self-organizing Universe*, Pergamon Press, Oxford, 1980.
[543] The discussion in Section 1 is based largely on Prigogine and Stengers, *Order Out of Chaos*. However, the ideas of John Cast are also much in evidence. John Casti, *Searching for Certainty*, Abacus, 1991. Also see James Gleick, *Chaos: Making a New Science*, Viking, 1987.
[544] Prigogine and Stengers, *Order Out of Chaos*, pp. 57-77.
[545] Prigogine and Stengers, *Order Out of Chaos*, p. 12.
[546] Prigogine and Stengers, *Order Out of Chaos*, pp. 261-271. Casti, *Searching for Certainty*, pp. 53-60. Casti also uses the term itinerary. Casti, *Searching for Certainty, pp.* 68-76.
[547] Prigogine and Stengers, *Order Out of Chaos*, pp. 111-129.
[548] Prigogine and Stengers, *Order Out of Chaos*, pp. 213-232.
[549] Prigogine and Stengers, *Order Out of Chaos*, pp. 111-145.
[550] Stephen Weinberg and Stephen Jay Gould appear to argue in just this way about the ability of science to reduce human behaviour to the physics and chemistry of cortex firings. Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994; Stephen Jay Gould, The Evolution of Life on Earth, *Scientific American*, October, 1994.
[551] Such was not the case in South Africa in 2007 and 2008 when Eskom engineers and technicians lost the ability to control the electricity distribution system.
[552] Prigogine and Stengers, *Order Out of Chaos*, pp. 27-77; 103-111.
[553] Prigogine and Stengers, *Order Out of Chaos*, pp. 117-146.
[554] Part of this arguably deals with what mathematicians call strange attractors. Casti, *Searching for Certainty*, pp. 61-76.
[555] Casti, *Searching for Certainty*, pp. 68-76.
[556] Casti, *Searching for Certainty*, pp. 72-74.
[557] Prigogine and Stengers, *Order Out of Chaos*, pp. 261-272.
[558] Casti, *Searching for Certainty*, pp. 68-76.
[559] Bronowski, *The Ascent of Man*, p. 353.
[560] Bronowski, *The Ascent of Man*, pp. 356-358
[561] Bronowski, *The Ascent of Man*, p. 358.
[562] Casti, *Searching for Certainty*, p. 73.
[563] The overall content of the following discussion has been distilled from Casti, *Searching for Certainty*, pp. 68-76.
[564] Casti, *Searching for Certainty*, pp. 72-74.
[565] Prigogine and Stengers, *Order Out of Chaos*, pp. 140-145.
[566] Casti, *Searching for Certainty*, pp.70-76.
[567] Casti, *Searching for Certainty*, pp.70-76.
[568] Casti, *Searching for Certainty*, p. 75.
[569] Casti, *Searching for Certainty*, p. 75.
[570] The ideas here are indebted to Casti, *Searching for Certainty*, pp. 75-76.
[571] Casti, *Searching for Certainty*, pp. 70-71.
[572] Mark Swilling, "*Two Cultures*"*: An African Perspective on the Emerging Intellectual Basis for Greater Cooperation between the Natural and Human Sciences in the 21st Century*, Dark Roast Occasional Paper Series, Isandla Institute.
[573] Francis Heylighen, and Paul Cilliers, and Carlos Gershenson, Complexity and Philosophy, Book Chapter, Cogprints, 2006.
[574] Paul Cilliers, *Modelling Complexity*, Routledge and Kegan Paul, 1998. Also see Mark Swilling, "*Two Cultures*".
[575] Mark Swilling, *"Two Cultures"*.
[576] Ilya Prigogine and Isabelle Stengers, *Order out of chaos: Man's new Dialogue with Nature*, Bantam Books, New York, 1984

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[577] Neils Bohr, Doctoral Dissertation as cited by Richard Rhodes, *The Making of the Atomic Bomb*, Schuster and Schuster, New York, 1986, p. 70.
[578] This is a topic of wide discussion in Prigogine and Stengers, *Order Out of Chaos*.
[579] Prigogine and Stengers, *Order Out of Chaos*, pp. 12-14; 142-143.
[580] Prigogine and Stengers, *Order Out of Chaos*, pp. 140-141.
[581] Prigogine and Stengers, *Order Out of Chaos*, pp. 233-256.
[582] Prigogine and Stengers, *Order Out of Chaos*, pp. 44-55; 57-77.
[583] Prigogine and Stengers, *Order Out of Chaos*, pp. 233-290.
[584] Prigogine and Stengers, *Order Out of Chaos*, pp. 144-145.
[585] Prigogine and Stengers, *Order Out of Chaos*, pp. 286-290.
[586] Prigogine and Stengers, *Order Out of Chaos*, p. 216.
[587] Prigogine and Stengers, *Order Out of Chaos*, p. 225.
[588] Prigogine and Stengers, *Order Out of Chaos*, pp. 297-298.
[589] Eric Jantsch, *The Self-organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution*, Pergamon Press, Oxford, 1980.
[590] John N. Thompson, *The Coevolutionary Process*, University of Chicago Press, Chicago, 1994; Lynn Margulis and Dorion Sagan, *Microcosmos: Four Billion Years of Microbial Evolution*, University of California Press, 1997.
[591] Jantsch, *The Self-organizing Universe*, p. 6.
[592] Jantsch, *The Self-organizing Universe*, pp. 29-41; 42-54; Prigogine and Stengers, *Order out of Chaos*.
[593] Lincoln and Guba, *Naturalistic Inquiry*, p. 37.
[594] Prigogine and Stengers, *Order Out of Chaos; Man's New Dialogue with Nature*.
[595] Jantsch states five principles of co-evolving systems. Jantsch, *The Self-organizing Universe*, pp. 219-248. There is arguably some similarity between these and Laszlo's four principles of natural systems. Laszlo, *The Systems View of the World*, pp. 34-67.
[596] Whitehead, *Science and the Modern World*, p. 250.
[597] Jantsch, *The Self-organizing Universe*, p. 29-41.
[598] Bronowski, *The Ascent of Man*, pp. 344-349.
[599] Prigogine and Stengers, *Order Out of Chaos*, pp. 12; 141-143
[600] Jantsch, *The Self-organizing Universe*, p. 6.
[601] Jantsch, *The Self-organizing Universe*, pp. 6-7. DNA is a likely example.
[602] Jantsch, *The Self-organizing Universe*, pp. 42-54.
[603] Prigogine and Stengers, *Order Out of Chaos*, pp. 141-143.
[604] Prigogine and Stengers, *Order Out of Chaos*, pp. 141-143.
[605] Jantsch, *The Self-organizing Universe*, *p. 6.*
[606] Jantsch, *The Self-organizing Universe*, p. 75; 224.
[607] Bronowski, *The Ascent of Man*, p. 343. In very approximate terms, stars are made mostly of hydrogen and the energy they emit comes from nuclear fusion occurring at their core. In such a process the nuclei of hydrogen atoms are fused together in such a way as to form a new nucleus of with more protons, which by definition is a different element – a process called stellar nucleosynthesis. Elements having larger number of protons in their nucleus also come about as stars age, that is, as their original store of hydrogen is used so that other, heavier elements begin to undergo fusion in order to keep the star burning. In this way for instance, the carbon which forms the basis of all living things on earth was first created in the core of stars.
[608] Jantsch, *The Self-organizing Universe*, p. 9.
[609] See, for example, Claude J. Allègre and Stephen H. Schneider, The Evolution of the Earth, *Scientific American*, October, 1994.
[610] Jantsch, *The Self-organizing Universe*, pp. 7.
[611] Jantsch, *The Self-organizing Universe*, p. 267.
[612] Capra, *The Turning Point*, Flamingo, London, 1983, p. 303.
[613] Capra, *The Turning Point*, Flamingo, London, 1983, p. 303.
[614] Capra, *The Turning Point*, p. 287.
[615] Prigogine and Stengers, *Order out of Chaos*, pp. 153-157.
[616] Prigogine and Stengers, *Order out of Chaos*, p. 225.
[617] Thompson, *Ideology and Modern Culture*, p. 276.
[618] See the discussion of complex systems in Part B, Section 1 of Chapter Three.

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[619] Jantsch, *The Self-organizing Universe*, p. 217-230.
[620] Jantsch, *The Self-organizing Universe*, pp. 157-158.
[621] Jantsch, *The Self-organizing Universe*, pp. 174-177.
[622] The notion that human self-consciousness is the arrowhead of evolution is taken from *Who is Writing the Future?*, Baha'i International Community, 1995, section 1, paragraph 2.
[623] Jantsch, *The Self-organizing Universe*, p. 217-230.
[624] See, for example, Frank Drake and Sobel Dava, *Is Anyone Out There?* New York: Delacourt Press, 1992. For an article on the search for life on other planets see Michael D. Lemonick, The Dawn of Distant Skies, *Scientific American*, July 2013, pp. 30-35.
[625] Jantsch, *The Self-organizing Universe*, p. 230.
[626]Jantsch, *The Self-organizing Universe*, p. 234.
[627] Jantsch, *The Self-organizing Universe*.
[628] The following discussion of after-the-fact processes comes from Jantsch, *The Self-organizing Universe*, pp. 236-238.
[629] Jantsch, *The Self-organizing Universe*, pp. 236-238.
[630] Jantsch, *The Self-organizing Universe*, pp. 236-238.
[631] The ideas discussed here are a much simplified version of Jantsch's extended and abstract discussion of what he calls space-binding and time-binding. Jantsch, *The Self-organizing Universe* p 231 – 238.
[632] Jantsch, *The Self-organizing Universe*, pp. 162-169.
[633] Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), 1992, pp. 371-385. Edgar Morin and Anne Brigitte Kern *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, Cresskill New Jersey, 1999.
[634] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002.
[635] Laszlo, *The Systems View of the World: The Natural Philosophy of the New Developments in the Sciences*, George Braziller, New York, 1972.
[636] Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), 1992, p. 372.
[637] Edgar Morin, *Journal of Social and Evolutionary Systems*, p. 380.
[638] Morin, *Journal of Social and Evolutionary Systems*, p. 372; 383.
[639] Morin, *Journal of Social and Evolutionary Systems*, p. 372.
[640] Morin, *Journal of Social and Evolutionary Systems*, p. 382.
[641] Morin, *Journal of Social and Evolutionary Systems*, p. 378.
[642] Morin, *Journal of Social and Evolutionary Systems*, pp. 378-379.
[643] Morin, *Journal of Social and Evolutionary Systems*, p. 383.
[644] Morin, *Journal of Social and Evolutionary Systems*, p. 383.
[645] Morin *Journal of Social and Evolutionary Systems*, pp. 380-383.
[646] Morin, *Journal of Social and Evolutionary Systems*, p. 382.
[647] Morin, *Journal of Social and Evolutionary Systems*, p. 382.
[648] Morin and Kern, *Homeland Earth*, p. 101.
[649] Edgar Morin and Anne Brigitte Kern *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, Cresskill New Jersey, 1999, p. 102.
[650] See thesis Chapter Two, Section B.
[651] Morin and Kern, *Homeland Earth*, p. 102.
[652] Morin and Kern, *Homeland Earth*, p. 101.
[653] Morin, *Journal of Social and Evolutionary Systems*, p. 376.
[654] Morin, *Journal of Social and Evolutionary Systems*, pp. 376-378.
[655] Morin, *Journal of Social and Evolutionary Systems*, p. 376.
[656] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[657] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[658] Morin, *Journal of Social and Evolutionary Systems*, p. 381.
[659] Morin, *Journal of Social and Evolutionary Systems*, pp. 372-375.
[660] Morin, *Journal of Social and Evolutionary Systems*, pp. 372-375
[661] Morin, *Journal of Social and Evolutionary Systems*, pp. 378-380.
[662] These ideas are taken up at length in Morin and Kern, *Homeland Earth*.
[663] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002.

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[664] Nicolescu, *Manifesto*, pp. 9-14. Jacob Bronowski gives expression to a similar idea. Bronowski, *The Ascent of Man*.
[665] Nicolescu, *Manifesto*, pp. 9-14.
[666] Nicolescu, *Manifesto*, pp. 9-14.
[667] Nicolescu, *Manifesto*, p. 45.
[668] Nicolescu, *Manifesto*, p. 34.
[669] Nicolescu, *Manifesto*, pp. 33-38.
[670] Nicolescu, *Manifesto*, pp. 33-34.
[671] Nicolescu, *Manifesto*, p. 34.
[672] Nicolescu, *Manifesto*, p. 34.
[673] Nicolescu, *Manifesto*, p. 37.
[674] Nicolescu, *Manifesto*, p. 37.
[675] Nicolescu, *Manifesto*, p. 34.
[676] Nicolescu, *Manifesto*, pp. 15-17.
[677] Nicolescu, *Manifesto*, p. 20.
[678] Nicolescu, *Manifesto*, p. 21.
[679] Nicolescu, *Manifesto*, pp. 88-89.
[680] Nicolescu, *Manifesto*, pp. 25-26.
[681] Nicolescu, *Manifesto*, p. 26.
[682] Nicolescu, *Manifesto*, pp. 15-21.
[683] Nicolescu, *Manifesto*, pp. 15-21.
[684] Nicolescu, *Manifesto*, p. 29.
[685] Nicolescu, *Manifesto*, p. 30.
[686] Nicolescu, *Manifesto*, p. 30.
[687] Nicolescu, *Manifesto*, pp. 147-148.
[688] Laszlo, *The Systems View of the World: The Natural Philosophy of the New Developments in the Sciences*, George Braziller, New York, 1972, p viii.
[689] Laszlo, *Systems*, p vii.
[690] Laszlo, *Systems*, p vi.
[691] Laszlo, *Systems*, p vi.
[692] Laszlo, *Systems*, p 24.
[693] Laszlo, *Systems*, p 3-4.
[694] Laszlo, *Systems*, pp. 19-20.
[695] Laszlo, *Systems*, p. 19.
[696] See, for example, Whitehead, *Science and the Modern World*, pp 72-73.
[697] Laszlo, *Systems*, p. 15.
[698] Laszlo, *Systems*, p. 12-13.
[699] Laszlo, *Systems*, p. 8.
[700] Laszlo, *Systems*, p. 8.
[701] Laszlo, *Systems*, p. 30.
[702] Laszlo, *Systems*, p. 19.
[703] Laszlo, *Systems*, pp. 21-22; 27.
[704] Laszlo, *Systems*, p. 25.
[705] See Laszlo, *Systems*, pp. 27-74, for an extended discussion of these organizational invariances.
[706] Laszlo, *Systems*, p. 74.
[707] Laszlo, *Systems*, p. 80.
[708] Laszlo, *Systems*, p. 85.
[709] Laszlo appears to argue that every other system level in nature also demonstrates this characteristic in some rudimentary and preliminary way Laszlo, *Systems*, pp. 87-91.
[710] Laszlo, *Systems*, pp. 86-87.
[711] Laszlo, *Systems*, pp. 86-87.
[712] Laszlo, *Systems*, p. 91.
[713] Laszlo, *Systems*, p. 92.
[714] Laszlo, *Systems*, p. 99. The italics are Laszlo's.
[715] Taylor, *Human Agency and Language*, p. 98.

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[716] Laszlo, *Systems*, p. 100.
[717] Laszlo, *Systems*, pp. 100-101.
[718] Laszlo, *Systems*, pp. 108-109.
[719] Laszlo, *Systems*, pp. 104-109. Such ideas here suggest Taylor's distinction between strong and weak evaluation or between strongly and weakly evaluated goals, to be discussed in detail in thesis Chapter Four.
[720] The notion of being open to, to be able to be transformed by, distinctly human significances is adopted from Taylor's ideas. See, for example, Taylor, *Human Agency and Language*, pp. 102-114.
[721] Taylor *Philosophical Arguments*, p. 37.
[722] Laszlo, *Systems*, p. 117.
[723] Laszlo, *Systems*, pp. 116-117.
[724] Taylor for one would likely offer some qualifications to this in favour of a community-centred sense to meaning and significance.
[725] Laszlo, *Systems*, pp. 117-118.
[726] Laszlo, *Systems*, p. 120.
[727] Laszlo, *The Multi-cultural Planet*, pp. 2-3.
[728] Ervin Laszlo, *That Peace May Prevail In This World: The Crucial Human Factors*, Commemorative Address, Goi Peace Award Ceremony Tokyo, October 21, 2001.

Chapter Four: Qualitative contrasts, strong evaluation and reasoning about transitions

[729] See, for example, Taylor, *Human Agency and Language*, pp. 102-105.
[730] These seven points were first mentioned in the introduction to Section 3, Part A of Chapter Three.
[731] The notion of an acceptable form of life is from Taylor, *Human Agency and Language*, p. 98.
For an extended discussion by Taylor's of these ideas see Charles Taylor, *Human Agency and Language: Philosophical Papers I*, Cambridge University Press, 1985; Charles Taylor, *Philosophy and the Human Sciences, Philosophical Papers II*, Cambridge University Press, 1985; Charles Taylor, *Sources of the Self: The Making of the Modern Identity*, Cambridge University Press, 1989.
[732] Richard Skemp, *The Psychology of Learning Mathematics*, Penguin Books, 1986.
[733] William H. Calvin, The Emergence of Intelligence, *Scientific American*, October, 1994.
[734] Calvin, *Scientific American*, p. 102.
[735] Taylor, *Human Agency and Language*, pp. 220-227.
[736] Taylor, *Human Agency and Language*, pp. 227-234.
[737] Taylor, *Human Agency and Language*, pp. 97-114
[738] Taylor, *Philosophy and the Human Sciences*, pp. 32-43.
[739] Taylor, *Philosophy and the Human Sciences*, p. 40.
[740] See, for example, Taylor's extended discussion of *ad hominem* verses apodictic reason. Taylor, *Philosophical Arguments*, pp. 34-60.
[741] Taylor, *Philosophical Arguments*, p. 39.
[742] Taylor, *Human Agency and Language*, p. 204. Taylor also refers to the notion "save the phenomena". Taylor *Human Agency and Language*, p. 179.
[743] This was discussed above in Section 1 of Chapter Three of this thesis. The phrase, the designative use of language, is taken from Taylor, *Human Agency and Language*, p. 220.
[744] Taylor, *Philosophy and the Human Sciences*, p. 33.
[745] Taylor, *Philosophy and the Human Sciences*, p. 33.
[746] Taylor, *Philosophy and the Human Sciences*, p. 34.
[747] Taylor, *Philosophy and the Human Sciences*, p. 38.
[748] Taylor, *Philosophy and the Human Sciences*, p. 38.
[749] Taylor, *Philosophy and the Human Sciences*, p. 39.
[750] Taylor, *Philosophy and the Human Sciences*, p. 39.
[751] Taylor, *Human Agency and Language*, p. 112.
[752] Taylor, *Human Agency and Language*, pp. 196-197.
[753] Taylor, *Human Agency and Language*, p. 169.
[754] Taylor, *Human Agency and Language*, pp. 178-181; 185-186.
[755] Johann Mouton, *Understanding Social Research*, J. L. van Schaik, Pretoria, 1996, p. 28.

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[756] Howard Kahane, *Logic and Contemporary Rhetoric: The use of Reason in Everyday Life*, Wadsworth, 1971, pp. 30-31.
[757] Taylor, *Philosophy and the Human Sciences*, p. 40.
[758] As per the clarification of terms above, the phrase common meaning is put in brackets here, but Taylor is actually referring to both common meaning and inter-subjective meaning.
[759] Taylor, *Philosophy and the Human Sciences*, p. 40.
[760] Taylor, *Human Agency and Language*, pp. 197.
[761] Taylor, *Human Agency and Language*, p. 18.
[762] Charles Taylor, How is Mechanism Conceivable?, *Human Agency and Language, Philosophical Papers I*, Cambridge University Press, 1985.
[763] Taylor, *Human Agency and Language*, pp. 201-202.
[764] Taylor *Human Agency and Language*, p. 200.
[765] Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, Simon and Schuster, Touchstone books, New York, 1995, p. 587.
[766] Thompson, *Ideology and Modern Culture*, p. 278.
[767] Taylor, *Human Agency and Language*, pp. 167-169.
[768] Taylor, *Human Agency and Language*, p. 169. Also See Whitehead's notion of the fallacy of misplaced concreteness. Alfred North Whitehead, *Science and the Modern World, Lowell lectures (1925)*, Free Association Books, London, 1985. p. 64; 72.
[769] Taylor, *Philosophical Arguments*, p. 46.
[770] Taylor, *Philosophical Arguments*, p. 38.
[771] Taylor, *Philosophical Arguments*, p. 37.
[772] Taylor, *Philosophical Arguments*, p. 39.
[773] Taylor, *Philosophical Arguments*, p. 37.
[774] Taylor, *Philosophical Arguments*, p. 39.
[775] William H. Hatcher, *Minimalism*, Juxta Publishing, Hong Kong, 2004.
[776] See Ilya Prigogine and Isabelle Stengers, *Order out of chaos: Man's New Dialogue With Nature*, Bantam Books, New York, 1984. Also, see Richard Rhodes account of Neils Bohr view on science as the gradual removal of prejudices in Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb*, Simon and Schuster, New York, 1985, p. 587.
[777] Taylor, *Philosophy and the Human Sciences*, pp. 38-40.
[778] Taylor, *Human Agency and Language*, pp. 222-223.
[779] There may some links here to Morin's ideas of an active loop. Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), Academic Press, 1992, pp. 371-385.
[780] Taylor, *Human Agency and Language*, pp. 104-105; 108-110.
[781] Taylor, *Philosophical Arguments*, p. 37.
[782] Taylor, *Human Agency and Language*, pp. 230-231.
[783] Taylor, *Human Agency and Language*, pp. 230-231.
[784] The phrase, the entirety of language, is taken from Taylor. Taylor, *Human Agency and Language*, pp. 230-231.
[785] Whitehead, *Science and the Modern World*, p. 3.
[786] See Morin's ideas on the paradigm of disjunction. Morin, *Journal of Social and Evolutionary Systems*, pp. 371-385. Also, see Taylor's discussion on the three ways in which we can gain access to the world – brute fact observation, absolute insight into the Real, and interpretation from within an already given stance. Taylor, *Philosophy and the Human Science*s, pp. 18-19.
[787] Taylor, *Human Agency and Language*, p. 98.
[788] Taylor, *Philosophy and the Human Sciences*, p. 91.
[789] Taylor, *Philosophy and the Human Sciences*, p. 40.
[790] Taylor, *Human Agency and Language*, p. 112.
[791] Taylor, *Philosophy and the Human Sciences*, p. 40.
[792] Taylor, *Philosophy and the Human Sciences*, pp, 37-38; 197.
[793] See Taylor, *Philosophical Arguments*, pp. 34-39 for one example of his thinking in this regard.
[794] See, for example, the discussion in Taylor, *Philosophical Arguments*, pp. 53-60.
[795] See, for example, Taylor, *Philosophy and the Human Sciences*, pp. 37-45.

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[796] The above ideas are from Taylor, *Philosophical Arguments*, p. 40.
[797] Mouton, *Understanding Social Research*, p. 109.
[798] Taylor, *Human Agency and Language*, p. 204.
[799] Taylor, *Human Agency and Language*, p. 70-71.
[800] Taylor, *Philosophical Arguments*, pp. 37; 56-60.
[801] Taylor, *Philosophical Arguments*, pp. 40-42.
[802] Taylor, *Philosophical Arguments*, p. 38.
[803] Whitehead, *Science and the Modern World*, p. 69.
[804] Taylor, *Philosophical Arguments*, p. 34.
[805] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002, p. 20.
[806] Taylor, *Human Agency and Language*, p. 118. Whitehead, *Science and the Modern World*, p. 3.
[807] The projection of subjects would include our experience of secondary qualities such as colour smell and sound. Whitehead, *Science and the Modern World*, p. 67; 113.
[808] Taylor, *Human Agency and Language*, pp. 118-119.
[809] John B. Thompson, *Ideology and Modern Culture*, Polity Press, New York, 1990.
[810] Thompson, *Ideology and Modern Culture*, p. 136.
[811] Thompson, *Ideology and Modern Culture*, p. 275. The italics are Thompson's.
[812] Thompson, *Ideology and Modern Culture*, p. 275. The original text is italicised by Thompson.
[813] Thompson, *Ideology and Modern Culture*, p. 275.
[814] Thompson, *Ideology and Modern Culture*, p. 276.
[815] Taylor, *Philosophy and the Human Sciences*, p. 40.
[816] Hans-Georg Gadamer, *Philosophical Hermeneutics*, University of California Press, Berkeley, 1976, p. 18.
[817] Thompson, *Ideology and Modern Culture*, p. 278.
[818] Thompson, *Ideology and Modern Culture*, p. 278.
[819] Taylor, *Philosophy and the Human Sciences*, p. 250.
[820] Taylor, *Philosophy and the Human Sciences*, p. 17.
[821] Taylor, *Philosophy and the Human Sciences*, p. 27.
[822] Thompson, *Ideology and Modern Culture*, pp. 137-144.
[823] Thompson notes three approaches to the ambiguous notion of ideology: i) the view that wants to dispel with the idea, it being too ambiguous and hence void of useful meaning, ii) a neutral conception – that ideology means no more than a system of belief or thought whatever its shape or size, iii) a critical conception of ideology, that it involves meaning in the service of power, and therefore has about it a negative sense of domination by some group or person by others. Thompson subscribes to the third approach. His ideas are developed around articulating the way in which symbolic forms arguably serve to create and sustain asymmetrical relation of power in socially structured contexts. Thompson, *Ideology and Modern Culture*, pp. 5-7.
[824] Taylor, *Philosophy and the Human Sciences*, pp. 16.
[825] Thompson, *Ideology and Modern Culture*, p. 60.
[826] Thompson, *Ideology and Modern Culture*, p. 61.
[827] Charles Taylor, Interpretation and the Sciences of Man, *Philosophy and the Human Sciences, Philosophical Papers II*, Cambridge University Press, 1995. Charles Taylor, Neutrality in Political Science, *Philosophy and the Human Sciences, Philosophical Papers II*, Cambridge University Press, 1995.
[828] Taylor, *Philosophy and the Human Sciences*, pp. 15-16.
[829] Taylor, *Philosophy and the Human Sciences*, pp. 15-16.
[830] Taylor, *Philosophy and the Human Sciences*, p. 15.
[831] Taylor, *Philosophy and the Human Sciences*, p. 15.
[832] Taylor, *Philosophy and the Human Sciences*, p. 21.
[833] Taylor, *Philosophy and the Human Sciences*, pp. 21-23.
[834] Taylor, *Philosophy and the Human Sciences*, p. 22.
[835] Taylor, *Philosophy and the Human Sciences*, p. 22.
[836] John S. Hatcher, The Metaphorical Nature of Physical Reality, *Bahá'í Studies*, volume 3, November, 1977.
[837] Taylor, *Philosophy and the Human Sciences*, p. 22.
[838] Taylor, *Philosophy and the Human Sciences*, p. 23.

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[839] Also see Morin's notion of the active loop. Edgar Morin, *From the Concept of System to the Paradigm of Complexity*, p. 373.
[840] Taylor, *Philosophy and the Human Sciences*, pp. 18-19.
[841] Taylor, *Philosophy and the Human Sciences*, p. 18.
[842] Taylor, What is Human Agency?, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, 1985.
[843] Taylor, *Human Agency and Language*, p. 16.
[844] Taylor, *Human Agency and Language*, pp. 15-21.
[845] Taylor, *Human Agency and Language*, pp. 21-27.
[846] Taylor, *Human Agency and Language*, p. 21.
[847] These could be linked to what are sometimes called non-moral goods, such as health, material security comfort or wealth, social living (friendship, sociability), and personal creativity or performance. See Baruch Brody, *Ethics and its Applications*, Harcourt Brace Jovanovich, San Diego, 1983. Also, Fredric Ferré, *Philosophy of Technology*, University of Georgia Press, Athens, 1995, p. 77. It is worth noting that such goods may be what the pursuit of technology and innovation tends to deliver. Such non-moral goods may also tend to be judged in weakly evaluated terms.
[848] Taylor, *Human Agency and Language*, p. 15-21.
[849] Taylor, *Human Agency and Language*, p. 23.
[850] Taylor, *Human Agency and Language*, p. 18.
[851] Taylor, *Human Agency and Language*, pp. 17-18
[852] See, for example, Taylor, *Philosophical Arguments*, pp. 38-42. Also see Taylor, *Human Agency and Language*, pp. 1-6.
[853] Taylor, *Human Agency and Language*, p. 17.
[854] Taylor, *Human Agency and Language*, p. 17.
[855] Taylor, *Human Agency and Language*, pp. 16-18.
[856] See, for example, Taylor's argument in Taylor, *Human Agency and Language*, pp. 21-27
[857] Taylor, *Human Agency and Language*, p. 18.
[858] Charles Taylor, *Human Agency and Language*, pp. 196-197. The italics are Taylor's.
[859] Charles Taylor, *Human Agency and Language*, p. 197.
[860] Taylor, *Human Agency and Language*, pp. 196-197.
[861] Taylor, *Philosophical Arguments*, p. 39.
[862] The following discussion in this and in the next two subsections is adapted from an extended account in Taylor, *Human Agency and Language*, pp. 18-27.
[863] Taylor, *Human Agency and Language*, p. 18-19.
[864] See Taylor, *Philosophical Arguments*, pp. 34-60, for an extended discussion of this general idea.
[865] Taylor, *Human Agency and Language*, pp. 18-19.
[866] Taylor, *Human Agency and Language*, pp. 20-21.
[867] Taylor, *Human Agency and Language*, p. 19.
[868] Taylor, *Human Agency and Language*, p. 19.
[869] Taylor, *Human Agency and Language*, pp. 19-21.
[870] Taylor, *Human Agency and Language*, p. 25.
[871] Taylor, *Human Agency and Language*, p 22.
[872] Taylor, *Human Agency and Language*, p. 19.
[873] Taylor, *Human Agency and Language*, p. 19.
[874] Taylor, *Human Agency and Language*, p. 22.
[875] Taylor, *Human Agency and Language*, p. 19.
[876] Taylor, *Human Agency and Language*, p. 20.
[877] Taylor, *Human Agency and Language*, p. 20.
[878] Taylor, *Human Agency and Language*, p. 20.
[879] The term alternative desires has been coined from the general tenor of Taylor's discussion. Taylor, *Human Agency and Language*, pp. 19-27.
[880] Taylor, *Human Agency and Language*, p. 20.
[881] Taylor, *Human Agency and Language*, p. 21.
[882] Taylor, *Human Agency and Language*, pp. 22-27.
[883] Taylor, *Human Agency and Language*, pp. 23..

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[884] Taylor, *Human Agency and Language*, pp. 22-27.
[885] Taylor, *Human Agency and Language*, p. 25.
[886] Jerome Bruner, *Towards a Theory of Instruction*, Oxford University Press, London, 1971. Also see Phillip Brey, Technology as Extension of Human Faculties, *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology*, vol. 19., Ed. C. Mitcham, Elsevier/JAI Press, London, 2000.
[887] Taylor, *Human Agency and Language*, p. 22.
[888] Taylor, *Human Agency and Language*, p. 22.
[889] Taylor, *Human Agency and Language*, p. 23.
[890] Taylor, *Human Agency and Language*, p. 22.
[891] The term, productive purposes, is from Taylor who uses it throughout his writings.
[892] Taylor, *Human Agency and Language*, p. 19.
[893] For a discussion of these ideas, see Baruch Brody, *Ethics and its Applications*.
[894] Taylor, *Philosophical Arguments*, p. 39.
[895] See, for example, Taylor, *Human Agency and Language*, p. 105
[896] Taylor, *Human Agency and Language*, p. 24
[897] Taylor, *Human Agency and Language*, p. 25
[898] Taylor, *Human Agency and Language*, p. 24.
[899] Taylor, *Human Agency and Language*, p. 22.
[900] Taylor, *Human Agency and Language*, p. 27.
[901] Taylor, *Human Agency and Language*, p. 26.
[902] Taylor, *Human Agency and Language*, p. 26.
[903] Taylor, *Human Agency and Language*, p. 24-26.
[904] Taylor, *Human Agency and Language*, p. 26.
[905] Taylor, *Human Agency and Language*, pp. 25-26.
[906] Taylor, *Human Agency and Language*, p. 27.
[907] Taylor, *Philosophical Arguments*, p. 41.
[908] Taylor, *Philosophical Arguments*, p. 42.
[909] Taylor, *Human Agency and Language*, p. 26.
[910] Taylor, *Philosophical Arguments*, p. 36.
[911] Taylor, *Philosophical Arguments*, pp. 41-42.
[912] Taylor, *Human Agency and Language*, pp. 104-105.
[913] Taylor, *Human Agency and Language*, p. 197. Taylor here contrasts a non-observer relative standpoint from what he calls an observer-relative or user relative standpoint.
[914] Taylor, *Philosophical Arguments*, p. 39.
[915] Taylor, *Philosophical Arguments*, p. 54.
[916] Taylor, *Philosophy and the Human Sciences*, p. 18.
[917] Taylor, *Philosophical Arguments*, p. 39.
[918] Taylor would perhaps use the phrase productive purposes.
[919] Taylor, *Philosophical Arguments*, pp. 34.
[920] Taylor, *Philosophical Arguments*, pp. 34-39.
[921] Taylor, *Philosophical Arguments*, p. 34.
[922] Taylor, *Philosophical Arguments*, pp. 34-39; 59-60.
[923] Charles Taylor, Explanation and Practical Reason, Philosophical Arguments, Harvard University Press, Cambridge Mass, 1995.
[924] Taylor, *Philosophical Arguments*, p. 35.
[925] Taylor, *Philosophical Arguments*, p. 35.
[926] Taylor, *Philosophical Arguments*, pp. 35-36.
[927] Taylor, *Philosophical Arguments*, p. 36.
[928] Taylor, *Philosophical Arguments*, p. 35.
[929] Taylor, *Philosophical Arguments*, p. 36.
[930] Taylor, *Philosophical Arguments*, p. 40.
[931] Taylor, *Philosophical Arguments*, p. 40.
[932] Taylor, *Philosophical Arguments*, p. 35.
[933] Taylor, *Philosophical Arguments*, p. 35.
[934] Taylor, *Philosophical Arguments*, p. 38.

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[935] Taylor, *Philosophical Arguments*, p. 34.
[936] Taylor, *Philosophical Arguments*, p. 50.
[937] Taylor, *Philosophical Arguments*, p. 38.
[938] Taylor, *Philosophical Arguments*, pp. 36-37. Also see comments made in Chapter Two, Part B, Section 2 of this thesis regarding Lincoln and Guba's position on a consensus theory of truth.
[939] Taylor, *Philosophical Arguments*, p. 37.
[940] Taylor, *Philosophical Arguments*, p. 37.
[941] Taylor, *Philosophical Arguments*, p. 39.
[942] Taylor, *Philosophical Arguments*, p. 39.
[943] Taylor, *Philosophical Arguments*, p. 40-41.
[944] Taylor, *Philosophical Arguments*, p. 40-41.
[945] Taylor, *Philosophical Arguments*, pp. 40-41.
[946] Taylor, *Philosophical Arguments*, p. 59-60.
[947] Taylor, *Philosophical Arguments*, p. 34.
[948] Taylor, *Philosophical Arguments*, p. 44-49.
[949] Taylor, *Philosophical Arguments*, p. 49.
[950] See the point made by Lincoln and Guba as discussed in Section B of thesis Chapter Two.
[951] Taylor, *Philosophical Arguments*, p. 42.
[952] Taylor, *Philosophical Arguments*, p. 49.
[953] Taylor, *Philosophical Arguments*, p. 42.
[954] There may be some similarities here to Lincoln and Guba's position that theirs is not an attempt to replace one kind of orthodoxy with another, but to avoid orthodoxy. Lincoln and Guba, *Naturalistic Inquiry*, p. 16.
[955] Taylor, *Philosophical Arguments*, p. 42.
[956] Taylor, *Philosophical Arguments*, p. 42. The italics are Taylor's.
[957] Taylor, *Philosophical Arguments*, p. 43.
[958] Taylor, *Philosophical Arguments*, p. 43.
[959] Taylor, *Philosophical Arguments*, p. 44.
[960] Taylor, *Philosophical Arguments*, pp. 44-50.
[961] The terms here are taken from mathematics where a set is said to be closed if, under certain well defined operations, calculations performed on any two elements of the set give a result that is an element of the same set. In addition, two sets are said to be disjoint if no elements are common to both sets.
[962] Taylor, *Philosophical Arguments*, p. 45.
[963] Taylor, *Philosophical Arguments*, p. 46.
[964] Taylor, *Philosophical Arguments*, p. 47.
[965] Taylor, *Philosophical Arguments*, p. 47. The italics are Taylor's.
[966] Taylor, *Philosophical Arguments*, p. 49.
[967] Taylor, *Philosophical Arguments*, p. 48.
[968] Taylor, *Philosophical Arguments*, p. 47.
[969] Taylor, *Philosophical Arguments*, p. 48.
[970] Taylor, *Philosophical Arguments*, p. 49.
[971] Taylor, *Philosophical Arguments*, p. 51.
[972] Taylor, *Philosophical Arguments*, p. 52.
[973] Taylor, *Philosophical Arguments*, p. 51.
[974] Taylor, *Philosophical Arguments*, p. 53.
[975] Taylor, *Philosophical Arguments*, p. 55.
[976] Taylor, *Philosophical Arguments*, p. 54.
[977] Taylor, *Human Agency and Language*, p. 109.
[978] Taylor, *Philosophical Arguments*, p. 54.
[979] Prigogine and Stengers, *Man's New Dialogue with Nature*.

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Chapter Five: Complexity, co-evolution and technology values

[980] Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999, pp. 81-82.
[981] Erich Jantsch, *The Self-Organizing Universe: Scientific and Human Implications of the New Paradigm of Evolution*, Pergamon Press, Oxford, 1980.
[982] Jantsch, *The Self-organizing Universe*, pp. 236-238.
[983] The notion of writing the future is from Baha'i International Community, *Who is writing the future?*
[984] These notions echo some ideas from Arnold Toynbee who writes extensively regarding the genesis, growth and breakdown of civilizations. Arnold Toynbee and Jane Caplan, *A Study of History* (revised and abridged edition), Weathervane Books, New York, 1972, pp. 73-199.
[985] See Chapter Four, Part D in the subsection titled Modes of being.
[986] Jantsch, *The Self-organizing Universe*, p. 177.
[987] The Universal House of Justice, *One Common Faith*, paragraph 53.
[988] Toynbee, *A Study of History*, p. 137.
[989] Alfred North Whitehead, *Science and the Modern World*, Free Association Books, London, 1985, p. 69.
[990] Taylor, *Philosophical Arguments*, p. 39.
[991] Ervin Laszlo, *The Systems View of the World*, George Braziller, New York, 1972, p. 24.
[992] Jantsch refers to neural, genetic, and metabolic forms of communication. Jantsch, *The Self-organizing Universe*, pp. 157-158.
[993] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, 2002, p. 21.
[994] Laszlo, *The Systems View of the World*, p. 30.
[995] Laszlo, *The Systems View of the World*, pp. 67-74.
[996] Morin and Kern, *Homeland Earth*, p. x; Jantsch *The Self-organizing Universe*, pp. 249-250.
[997] Morin and Kern, *Homeland Earth*, p. 60.
[998] Baha'i International Community, *The Prosperity of Humankind*, section 2, paragraph 9.
[999] Jantsch, *The Self-organizing Universe*, p. 255.
[1000] Jantsch, *The Self-organizing Universe*, p. 255.
[1001] Jantsch, *The Self-organizing Universe*, p. 255.
[1002] The notion of process structures is taken from Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Man's new Dialogue with Nature*, Bantam Books, New York, 1984, pp. 141-143
[1003] Jantsch, *The Self-Organizing Universe*, p. 225.
[1004] Jantsch, *The Self-Organizing Universe*, pp. 263-274.
[1005] Jantsch, *The Self-Organizing Universe*, p. 256.
[1006] Lincoln and Guba, *Naturalistic Inquiry*, p. 38.
[1007] The idea of being open to significance comes from Taylor, *Human Agency and Language*, pp. 102-105.
[1008] George Towshend, The *Genius of Ireland and other essays*, Talbot Press, Dublin, 1930.
[1009] Prigogine and Stengers, *Order out of Chaos*, pp. 177-209.
[1010] Prigogine and Stengers, *Order out of Chaos*, p. 177.
[1011] See, for example, Prigogine and Stengers, *Order out of Chaos, p. 207*
[1012] Prigogine and Stengers, *Order out of Chaos*, pp. 12-13; 286-290.
[1013] Prigogine and Stengers, *Order out of Chaos*, pp. 14-18.
[1014] Jantsch, *The Self-Organizing Universe*, p. 256.
[1015] Alfred North Whitehead, *Symbolism: Its Meaning and Effect* (Barbour-Page Lectures, University of Virginia, 1927), Fordham University Press. The passage quoted is from Whitehead's closing paragraph.
[1016] Whitehead, *Symbolism: Its Meaning and Effect*. The passage is from Whitehead's closing paragraph.
[1017] Jantsch, *The Self-Organizing Universe*, pp. 174-177.
[1018] Jantsch, *The Self-Organizing Universe*, p. 256.
[1019] Arnold Toynbee and Jane Caplan, *A Study of History* (revised and abridged edition), Weathervane Books, New York, 1972, p. 87.
[1020] Toynbee, *A Study of History*, p. 87.
[1021] Toynbee, *A Study of History*, p 87-88.
[1022] Mexico City Declaration on Cultural Policies [MONDIACULT], 1982.
[1023] Mexico City Declaration on Cultural Policies, [MONDIACULT], 1982.
[1024] Jantsch, *The Self-Organizing Universe*, p. 257.

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[1025] Toynbee, *A Study of History*, p. 161
[1026] Both quoted phrases are from Jantsch, *The Self-Organizing Universe*, p. 257.
[1027] The Universal House of Justice, *The Promise of World Peace*, section 4, paragraph 3.
[1028] Baha'i International Community, *The Prosperity of Humankind*, section 4, paragraph 2.
[1029] Bronowski, *The Ascent of Man*, pp. 432.
[1030] Bronowski, *The Ascent of Man*, pp. 436.
[1031] Bronowski, *The Ascent of Man*, pp. 431-432.
[1032] Toynbee, *A Study of History*, p 137.
[1033] Toynbee, *A Study of History*, p 140.
[1034] Toynbee, *A Study of History*, p 87.
[1035] Toynbee, *A Study of History*, p 87.
[1036] Toynbee, *A Study of History*, p 87-88.
[1037] William S. Hatcher, The Unity of Religion and Science, *The Science of Religion*, Baha'i Studies (2), Ottawa, 1980, p. 26.
[1038] The Universal House of Justice, *The Promise of World Peace*, Haifa, 1985, section 1, paragraph 7.
[1039] The Universal House of Justice, *The Promise of World Peace*, section 2, paragraph 1.
[1040] The Universal House of Justice, *The Promise of World Peace*, section 3, paragraph 3
[1041] See, for example Bronowski, *The Ascent of Man*, pp 202-218.
[1042] Charles Coulston Gillispie, *The Edge of Objectivity*, Princeton University Press, Princeton, 1960, p. 48.
[1043] The Universal House of Justice, *The Promise of World Peace*.
[1044] These are discussed in a variety of sections in Whitehead, *Science and the Modern World*. Also see Gillispie, *The Edge of Objectivity*.
[1045] Morin and Kern, *Homeland Earth*, pp. 52-63; 82-83.
[1046] Baha'i International Community, *The Prosperity of Humankind*.
[1047] Whitehead, *Science and the Modern World*, pp. 98-99. Prigogine and Stengers, *Order Out of Chaos*.
[1048] Morin and Kern, *Homeland Earth*, p. 81.
[1049] Baha'i International Community, *The Prosperity of Humankind*, section 4, paragraph 6.
[1050] Baha'i International Community, *The Prosperity of Humankind*, section 4, paragraph 6.
[1051] Baha'i International Community, *The Prosperity of Humankind*, introduction, paragraph 11
[1052] Erich Jantsch, *The Self-Organizing Universe: Scientific and Human Implications of the New Paradigm of Evolution*, Pergamon Press, Oxford, 1980.
[1053] Jantsch, *The Self-organizing Universe*, pp. 262-263.
[1054] Jantsch, *The Self-organizing Universe*, pp. 262-263.
[1055] Jantsch uses the terms time- and space-binding. Jantsch, *The Self-organizing Universe*, p. 231.
[1056] The Evolution of Evolution: How Darwin's Theory Survives, Thrives and Reshapes the World, Special Issue on the Most Powerful Idea in Science, *Scientific American*, January 2009.
[1057] For a similar set of ideas see Jacque Monad, *Chance and Necessity*, Knopf, New York, 1971
[1058] *Scientific American*, The Evolution of Cooperation, July, 2012.
[1059] Baha'i International community, *The Prosperity of Humankind*, section 2, paragraph 9.
[1060] John Hatcher, *The Metaphorical Nature of Physical Reality*.
[1061] Laszlo, *The Systems View of the World.* Basarab Nicolescu, *Manifesto of Transdisciplinarity*.
[1062] Stephen Gould, The Evolution of Life on Earth, *Scientific American*, October, 1994. Also see Laszlo, *The Systems View of the World* and Nicolescu, *Manifesto of Transdisciplinarity*.
[1063] Swilling refers to the evolution of consciousness. Swilling, "*Two Cultures*". Taylor adopts a different stance, and holds that in reflecting on questions about our moral choices, the issue is not consciousness but significance. Taylor, *Human Agency and Language*, p. 200.
[1064] Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), Academic Press, 1992, pp. 371-385; Edgar Morin and Anne Bridgette Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999.
[1065] Edgar Morin and Anne Bridgette Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999.
[1066] Morin and Kern, *Homeland Earth*, p. 74.
[1067] The Universal House of Justice, *The Promise of World Peace*, Introduction.
[1068] The term, crisical, appearing in the quotation is the word used by Morin and Kern.
[1069] Morin and Kern, *Homeland Earth*, p. 76.

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[1070] Morin and Kern, *Homeland Earth*, p. 101.
[1071] Morin and Kern, *Homeland Earth*, pp. 93-97; 123-132.
[1072] Morin and Kern, *Homeland Earth*, p. 101.
[1073] Morin and Kern, *Homeland Earth*, p. 81.
[1074] Morin and Kern, *Homeland Earth*, p. 82.
[1075] Morin and Kern, *Homeland Earth*, p. 82.
[1076] Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), Academic Press, 1992, pp. 371-385
[1077] Morin, *Journal of Social and Evolutionary Systems*, p. 375.
[1078] Morin, *Journal of Social and Evolutionary Systems*, p. 378.
[1079] Morin and Kern, *Homeland Earth*, p. 114.
[1080] Morin, *Journal of Social and Evolutionary Systems*, p. 373.
[1081] Morin, *Journal of Social and Evolutionary Systems*, p. 373.
[1082] Morin, *Journal of Social and Evolutionary Systems*, p. 373.
[1083] Morin, *Journal of Social and Evolutionary Systems*, p. 377. The parentheses are Morin's.
[1084] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[1085] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1086] Morin and Kern, *Homeland Earth*, p. 129. Nicolescu uses a similar characterization. Nicolescu, *Manifesto of Transdisciplinarity*, p. 20.
[1087] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1088] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1089] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1090] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1091] Morin, *Journal of Social and Evolutionary Systems*, p. 374.
[1092] Morin, *Journal of Social and Evolutionary Systems*, p. 376.
[1093] Morin, *Journal of Social and Evolutionary Systems*, p. 376.
[1094] Morin, *Journal of Social and Evolutionary Systems*, p. 376. In this passage Morin is setting up a contrast between things that are as parts verses things that are as wholes. So, in writing that "...the concepts we have at our disposal are atomistic rather than molar...", he is referring to the concept of the mole, or molar concentration, used in chemistry. Briefly,, atoms are too small to be observed or counted. In order to make calculations with regards to, say, the amount of some element or molecule found in a solution, chemists speak of the mole of a substance, or the fractions of a mole. A mole is the number of atoms that go to make up 1 atomic mass, originally defined as the number of atoms in exactly 12 grams of carbon-12 and is equal to 6,022 x 10^{23}. In other words, 1 mole of any element or compound will have 6,022 x 10^{23} atoms of that element or compound. When doing experiments that involve chemical reactions one never calculates on the basis of the number of atoms or molecules involved in a reaction. Such a count is impossible to do. Instead, the calculation is done according to the proportional molar amounts of an element or compound.
[1095] Morin, *Journal of Social and Evolutionary Systems*, p. 370.
[1096] Morin, *Journal of Social and Evolutionary Systems*, p. 376.
[1097] Prigogine and Stengers, *Order Out of Chaos*, pp. 141-143.
[1098] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[1099] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[1100] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[1101] This connects with the ideas of Polanyi on tacit knowledge. See Polanyi, *Science Faith and Society*, University of Chicago Press, 1947.
[1102] Morin, *Journal of Social and Evolutionary Systems*, p. 377.
[1103] Morin, *Journal of Social and Evolutionary Systems*, pp. 378-379.
[1104] Morin, *Journal of Social and Evolutionary Systems*, p. 378.
[1105] Morin, *Journal of Social and Evolutionary Systems*, pp. 378-380.
[1106] Morin, *Journal of Social and Evolutionary Systems*, pp. 378-380.
[1107] Morin, *Journal of Social and Evolutionary Systems*, p. 379.
[1108] In the living systems Morin notes such factors as the transfer and transformation of energy, biochemistry, and ecological states. Morin, *Journal of Social and Evolutionary Systems*, p.377.
[1109] Morin, *Journal of Social and Evolutionary Systems*, p. 379.
[1110] Morin, *Journal of Social and Evolutionary Systems*, p, 379.

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[1111] Morin, *Journal of Social and Evolutionary Systems*, p, 379.
[1112] Morin, *Journal of Social and Evolutionary Systems*, p. 380.
[1113] Nicolescu, *Manifesto of Transdisciplinarity*, pp. 15-17.
[1114] Taylor, *Philosophical Arguments*, p. 39.
[1115] Morin, *Journal of Social and Evolutionary Systems*, p. 380.
[1116] Taylor, *Philosophical Arguments*, p. 39.
[1117] Morin, *Journal of Social and Evolutionary Systems*.
[1118] Morin, *Journal of Social and Evolutionary Systems*, p. 381.
[1119] Morin, *Journal of Social and Evolutionary Systems*, p. 381.
[1120] Morin, *Journal of Social and Evolutionary Systems*, p. 381.
[1121] Morin, *Journal of Social and Evolutionary Systems*, p. 383.
[1122] Morin, *Journal of Social and Evolutionary Systems*, p. 383.
[1123] Morin and Kern, *Homeland Earth*, p. 124.
[1124] Morin and Kern, *Homeland Earth*, pp.125-127.
[1125] Morin and Kern, *Homeland Earth*, p. 124.
[1126] Morin and Kern, *Homeland Earth*, p. 125.
[1127] Morin and Kern, *Homeland Earth*, p. 127.
[1128] Morin and Kern, *Homeland Earth*, pp. 127-128.
[1129] Morin and Kern, *Homeland Earth*, p. 128.
[1130] Morin and Kern, *Homeland Earth*, p. 81-85.
[1131] Morin and Kern, *Homeland Earth*, p. 128.
[1132] This observation in part fits in with Morin's characterization of mental underdevelopment. See Morin and Kern, *Homeland Earth*, p. 85. The notion of a rich community existence fits in with Taylor's ideas regarding the existence of community meaning. Taylor, *Philosophy and the Human Sciences*, pp. 37-40.
[1133] Morin and Kern, *Homeland Earth*, p. 129.
[1134] Morin and Kern, *Homeland Earth*, p. 129.
[1135] Morin and Kern, *Homeland Earth*, p. 130.
[1136] Morin and Kern, *Homeland Earth*, pp. 130-131.
[1137] Morin and Kern, *Homeland Earth*, p. 131.
[1138] Morin and Kern, *Homeland Earth*, p. 131.
[1139] Mexico City Declaration on Cultural Policies [MONDIACULT], 1982.
[1140] Baha'i International Community, *The Prosperity of Humankind*, section 2, paragraph 3.
[1141] Laszlo, *The Multi-cultural Planet*, p. 187.
[1142] Laszlo, *The Multi-cultural Planet*, p. 203.

Chapter Six: Practical reason and technology in a planetary age

[1143] Edgar Morin and Anne Brigitte Kern, *Homeland Earth: A Manifesto for the New Millennium*, Hampton Press, New Jersey, 1999, pp. 81-82.
[1144] Morin and Kern, *Homeland Earth*, p. 101.
[1145] Morin and Kern, Homeland Earth, p. 117.
[1146] See Ervin Laszlo (ed.), *The Multi-cultural Planet: The report of a UNESCO international expert group*, Oneworld, Oxford, 1993, pp. 1-8.
[1147] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, State University of New York Press, Albany, 2002. pp. 5-8; 49-56.
[1148] Taylor, *Philosophical Arguments*, pp. 48-49.
[1149] Whitehead, *Science and the Modern World*, p. 120.
[1150] Richard Rhodes' account of what he calls the World War I death machine is a noteworthy example. See Richard Rhodes, *The Making of the Atomic Bomb*, Simon and Schuster, 1995, pp. 90-95; 101-103; 778-781. As a point of emphasis, humankind does not currently act as if it is one race with earth its common homeland. This observed reality therefore makes it important to accept both a normative principle and an ontological assumption that points to humanity as a single race with earth as its homeland.
[1151] The Universal House of Justice, *The Promise of Wold Peace*, section 4 paragraph 2
[1152] The Universal House of Justice, *The Promise of World Peace*, section 1, paragraph 5.
[1153] Basarab Nicolescu, *Manifesto of Transdisciplinarity*, pp. 141-145.

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[1154] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1155] See, for example, Morin and Kern, *Homeland Earth*, pp. 47-49; 81-82.
[1156] Morin and Kern, *Homeland Earth*, pp. 59-63.
[1157] Taylor, *Philosophical Arguments*, pp. 58-59.
[1158] Morin and Kern, *Homeland Earth*, p. 12.
[1159] Baha'i International Community, *The Prosperity of Humankind*, introduction, paragraph 8; Morin and Kern, *Homeland Earth*, p. 12.
[1160] Morin and Kern discuss this in their *Homeland Earth*, pp. 93-97.
[1161] Morin and Kern, *Homeland Earth*, p. 81.
[1162] Morin and Kern, *Homeland Earth*, p. 12.
[1163] Laszlo, *The Multi-cultural Planet*, p. 198.
[1164] Jerome Bruner, *Towards a Theory of Instruction*, Oxford University Press, London, 1971, p. 25-29. For ideas related to extension theory see, for example, Marshall McLuhan, *Understanding Media: The Extensions of Man*. New York: McGraw-Hill Paperback edition, 1966; Phillip Brey, Technology as Extension of Human Faculties, *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology*, vol. 19. (ed.) C. Mitcham, London, Elsevier/JAI Press, 2000; Richard Heersmink, Defending Extension Theory: A Response to Kiran and Verbeek, *Philosophy and Technology*, Springer-Verlag, published on-line 14 June 2011, pp. 2-3.
[1165] H. Baughan, *Science, Society, Technology and Holistic Modes of Thought*, MPhil, University of Stellenbosch, 1999, p. 125.
[1166] Jacob Bronowski, *The Ascent of Man*, BBC Books, London, 1973.
[1167] These four aspects are taken from Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, pp. 44-49.
[1168] As in the case of extension theory. See footnote above.
[1169] For a discussion of attitudes that lead to mastery over nature see William S. Hatcher, The Unity of Religion and Science, in *The Science of Religion*, Baha'i Studies (2), Ottawa, 1980, p. 1.
[1170] Bruner, *Toward a Theory of Instruction*, p. 26.
[1171] These ideas are broadly based on the discussion in Bruner, *Toward a Theory of Instruction*, pp. 24-38.
[1172] Burner, *Toward a Theory of Instruction*, pp. 24-25.
[1173] Burner, *Toward a Theory of Instruction*, p. 25.
[1174] Burner, *Toward a Theory of Instruction*, p. 25.
[1175] Burner, *Toward a Theory of Instruction*, p. 26.
[1176] Burner, *Toward a Theory of Instruction*, p. 25.
[1177] Burner, *Toward a Theory of Instruction*, pp. 37-40.
[1178] Jacob Bronowski, *The Ascent of Man*, BBC Books, London 1973, p. 404.
[1179] Bronowski, *The Ascent of Man*, p. 404.
[1180] Bronowski, *The Ascent of Man*, p. 416.
[1181] William H. Calvin, The Emergence of Intelligence. *Scientific American*, October, 1994, pp. 100-107.
[1182] Fredric Ferré, *Philosophy of Technology*, University of Georgia Press, Athens, 1995,
[1183] Ferré, *Philosophy of Technology*,pp. 30-34. The discussion that follows is adapted from Baughan, *Science Society and Holistic Modes of Thought*, pp. 128-132.
[1184] Ferré, *Philosophy of Technology*, p. 36.
[1185] Ferré, *Philosophy of Technology*, p. 27.
[1186] Ferré, *Philosophy of Technology*, pp. 25-26; 37.
[1187] The phrasing of the above is from Baughan, *Science Society and Holistic Modes of Thought*, p. 130.
[1188] The above ideas are from from Baughan, *Science Society and Holistic Modes of Thought*, pp. 128-129.
[1189] Ferré, *Philosophy of Technology*, pp. 38-39. This section follows the discussion in Baughan, *Science Society and Holistic Modes of Thought*, pp. 130-132.
[1190] Ferré, *Philosophy of Technology*, pp. 38-39.
[1191] Ferré, *Philosophy of Technology*, pp. 41-48.
[1192] Whitehead, *Science and the Modern World*, p. 120.
[1193] Ferré, *Philosophy of Technology*, p. 40.
[1194] See Paul Drucker, *Post-capitalist Society*, Butterworth Heinemann, Oxford,1993, pp. 17-29.

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[1195] For a discussion of how scientific and technological research share the same methods see M. Gibbons and B. Wittrock (eds.), 1985. *Science as a Commodity*, Longman, 1985. Also see M. Gibbons, *The New Production of Knowledge*, Sage, 1994.
[1196] For an analysis of various models for policy and decision-making see William Dunn, *Public Policy Analysis*, Prentice Hall, New York, 1994, pp. 266-324.
[1197] See J. S. Wolvaardt, *Models for Strategic Decision Making*, University of South Africa, Pretoria, 2001, for a technical treatment of specific models involved in making rational choices, namely the analytical hierarchy process, zero-based budgets, utility theory, and goal programming.
[1198] Ferré, *Philosophy of Technology*, p. 40.
[1199] Jacob Bronowski, *The Ascent of Man*, BBC Books, London, 1973.
[1200] Bronowski, *The Ascent of Man*, p. 286.
[1201] Jacob Bronowski, *Science and Human Values*, Hutchinson of London, 1961, pp. 13-14.
[1202] Bruner, *Toward a Theory of Instruction*, p. 24.
[1203] See Ivor Armstrong Richards, *The Philosophy of Rhetoric*, Francis and Taylor, 2002.
[1204] In this regard John Thompson refers to a pre-interpreted domain, or doxa. John B. Thompson, Ideology and Modern Culture, Polity Press, Cambridge, 1990, p. 279-280.
[1205] Taylor, *Philosophical Arguments*, p. 48.
[1206] Taylor, *Philosophical Arguments*, p. 34.
[1207] W. H. Hatcher, *Science and Religion*, Association for Baha'i Studies, Ottawa, volume 2, April, 1980.
[1208] Baughan, *Science Society and Technology*, p. 131.
[1209] Taylor, *Philosophical Arguments*, p. 39.
[1210] See Taylor, *Human Agency and Language*, pp. 45-76, and Taylor, *Philosophical Arguments*, p. 39.
[1211] Thompson, *Ideology and Modern Cultur*e, pp. 135-145.
[1212] Thompson, *Ideology and Modern Culture*, pp. 135-145.
[1213] Thompson, *Ideology and Modern Culture*, pp. 135-145.
[1214] Thompson, *Ideology and Modern Culture*, pp. 135-145.
[1215] Thompson, *Ideology and Modern Culture*, pp. 5-11; 56-67; 291-294.
[1216] Thompson, *Ideology and Modern Culture*, pp. 122-162.
[1217] Taylor, *Philosophical Arguments*, pp. 39-40.
[1218] Taylor, *Human Agency and Language*, pp. 45-76.
[1219] Taylor, *Human Agency and Language*, pp. 45-76.
[1220] Whitehead, *Science and the Modern World*, p. 69.
[1221] Edgar Morin, From the Concept of System to the Paradigm of Complexity, *Journal of Social and Evolutionary Systems*, 15(4), Academic Press, 1992, pp. 383. Basarab Nicolescu, *Manifesto of Transdisciplinarity*, p. 15
[1222] Taylor, *Human Agency and Language*, p. 20.
[1223] Morin, *Journal of Social and Evolutionary Systems*, p. 378.
[1224] Morin and Kern, *Homeland Earth*, p. 131.
[1225] Nicolescu, *Manifesto of Transdiciplinarity*, p. 15; Laszlo, *The Systems View of the World*, pp. 104-120.
[1226] Baha'i International Community, *Valuing Spiritually in Development*, Baha'i Publishing Trust, 1998.
[1227] Baha'i International Community, *The Prosperity of Humankind*, introduction, paragraph 8.
[1228] Morin and Kern, *Homeland Earth*, pp. 129-131.
[1229] See, for example Morin and Kern, *Homeland Earth*, pp. 67-68.
[1230] Morin and Kern, *Homeland Earth*; Prigogine and Stengers, *Order Out of Chaos*; Jantsch, *The Self-organizing Universe*; Nicolescu, *Manifesto on Transdisciplinarity*; Laszlo, *The Systems View of the World*.
[1231] For example, the irrigation practices that led to the drying up of the Aral Sea. See Morin and Kern, *Homeland Earth*, pp. 127-128.
[1232] Morin and Kern, *Homeland Earth*, pp. 81.
[1233] Morin and Kern, *Homeland Earth*, pp. 67-68.
[1234] The Universal House of Justice, *One Common Faith*, paragraphs 10; 12.
[1235] Morin and Kern, *Homeland Earth*, p. 85.
[1236] Marzieh Gail, *Dawn Over Mount Hira*, George Ronald, London, 1976, pp. 121-127.
[1237] Laszlo, *The Multi-cultural Planet*, pp. 197-200.

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[1238] Mark Swilling, *'Two Cultures': an African perspective on the emerging intellectual basis for greater cooperation between natural and human sciences in the Twenty First Century*, Sustainability Institute, University of Stellenbosch, 2003.
[1239] Laszlo, *The Multi-cultural Planet*, p. 197.
[1240] Laszlo, *The Multi-cultural Planet*, p. 197.
[1241] Laszlo, *The Multi-cultural Planet*, p. 197-198.
[1242] Morin and Kern, *Homeland Earth*, p. 81.
[1243] Baha'i International Community, *The Prosperity of Humankind*, paragraph 8.
[1244] Morin and Kern, *Homeland Earth*, p.81-82.
[1245] Morin and Kern, *Homeland Earth*, p. 59.
[1246] Morin and Kern, *Homeland Earth*, p. 59.
[1247] Morin and Kern, *Homeland Earth*, p. 59.
[1248] Morin and Kern, *Homeland Earth*, p. 59.
[1249] Morin and Kern, *Homeland Earth*, pp. 67-68.
[1250] Morin and Kern, *Homeland Earth*, p. 60.
[1251] Morin and Kern, *Homeland Earth*, p. 60.
[1252] Morin and Kern, *Homeland Earth*, p. 60.
[1253] Morin and Kern, *Homeland Earth*, p. 60.
[1254] Morin and Kern, *Homeland Earth*, p. 60.
[1255] Morin and Kern, *Homeland Earth*, pp. 63-67.
[1256] Morin and Kern, *Homeland Earth*, pp. 64-65. All of these examples are taken from Morin and Kern
[1257] Baha'i International Community, *The Prosperity of Humankind*, paragraph 9
[1258] Morin and Kern, *Homeland Earth*, p. 82.
[1259] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1260] Morin and Kern, *Homeland Earth*, pp. 79-97; 117.
[1261] The Universal House of Justice, *The Promise of World Peace*, section 4, paragraph 2.
[1262] Shoghi Effendi, *Goal of a New World Order*, pp. 52-53.
[1263] Shoghi Effendi, *Goal of a New World Order*, pp. 48-49.
[1264] Shoghi Effendi, *Goal of a New World Order*, pp. 52-53.
[1265] Morin and Kern, *Homeland Earth*, p. 62. Morin and Kern's notion of a human Diaspora is based on the spreading out of the human species from its place of evolutionary origin some half million years ago.
[1266] Morin and Kern, *Homeland Earth*, p. 62.
[1267] Morin and Kern, *Homeland Earth*, p. 62.
[1268] Morin and Kern, *Homeland Earth*, pp 79-81.
[1269] Morin and Kern, *Homeland Earth*, pp. 79-81.
[1270] *Culture and the Future*, UNESCO Information Document, Paris, 1988, p. 48.
[1271] *Culture and the Future*, p. 27.
[1272] Morin and Kern, *Homeland Earth*, p. 79.
[1273] Morin and Kern, *Homeland Earth*, p. 80.
[1274] Thompson, *Ideology and Modern Culture*, p. 7.
[1275] Baha'i International Community, *The Prosperity of Humankind*, section 5, paragraph 1.
[1276] Jantsch, *The Self-organizing Universe*, p. 175; Laszlo, *The Systems View of the World*, pp. 67-74; 100-118.
[1277] Baha'i International Community, *The Prosperity of Humankind*, introduction, paragraph 7.
[1278] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1279] Morin and Kern, *Homeland Earth*, p. 83-84.
[1280] Morin and Kern, *Homeland Earth*, p. 84.
[1281] Morin and Kern, *Homeland Earth*, p. 84. See Morin and Kern's discussion on fragmented rationality in Morin and Kern, *Homeland Earth*, pp. 123-129.
[1282] Baha'i International Community, *The Prosperity of Humankind*, section 5, paragraph 1.
[1283] Morin and Kern, *Homeland Earth*, p. 84.
[1284] Morin and Kern, *Homeland Earth*, p. 81.
[1285] Baha'i International Community, *The Prosperity of Humankind*, introduction, paragraph 8.
[1286] Morin and Kern, *Homeland Earth*, p. 85. The italics are from Morin and Kern.
[1287] Nicolescu, *Manifesto of Transdisciplinarity*, pp. 15-22.

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[1288] Morin and Kern, *Homeland Earth*, p. 85. The italics are from Morin and Kern.
[1289] Morin and Kern, *Homeland Earth*, p. 85.
[1290] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8. Morin and Kern, *Homeland Earth*, p. 84.
[1291] Morin and Kern, *Homeland Earth*, p. 85. The italics are Morin and Kern's
[1292] Morin and Kern, *Homeland Earth*, p. 85; Laszlo, *The Systems View of the World*, pp. 67-74 and 100-118; Jantsch, *The Self-organizing Universe*, pp. 150-153; Taylor, *Human Agency and Language*, p. 98.
[1293] Morin and Kern, *Homeland Earth*, p. 85. The italics are Morin and Kern's
[1294] Nicolescu, *Manifesto of Transdisciplinarity*, pp. 15-22
[1295] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1296] The notion of time as involving creativity comes from Henri Bergson, *Creative Evolution* (1911), Greenwood Press, 1974.
[1297] Morin and Kern, Homeland Earth. 101.
[1298] Taylor, *Philosophy and the Human Sciences*, pp. 91-115. Taylor, *Philosophical Arguments*, pp. 42-43.
[1299] Morin and Kern, *Homeland Earth*, p. 117.
[1300] Laszlo, *The Systems View of the World*, pp. 117-118.
[1301] The phrase, the transformative potential of time, is from Morin and Kern, *Homeland Earth*, p. 101.
[1302] These ideas are related to Taylor's views regarding an expressive use of language. See Taylor, *Human Agency and Language*, pp. 215-247
[1303] *Gleanings from the Writings of Baha'u'llah*, Baha'i Publishing Trust, Wilmette Illinois, 1983, CVI.
[1304] Baha'i International Community, *Transforming Collective Deliberation: An NGO Statement to the 48th Commission for Social Development on the priority theme of "Social Integration"* , New York, 2010, paragraph 2.
[1305] Baha'i International Community, *Transforming Collective Deliberation*, paragraph 6.
[1306] Baha'i International Community, *Transforming Collective Deliberation*, paragraph 7.
[1307] Jantsch, *The Self-Organizing Universe*, pp. 236-238. This idea was discussed in thesis Chapter Three, Part B, Section 3.
[1308] Jantsch, *The Self-Organizing Universe*, p. 175. Bruner writes of evolution becoming "Lamarckian and reversible rather than Darwinian and irreversible". Bruner, *Towards a Theory of Instruction*, p. 25.
[1309] Arnold Toynbee and Jane Caplan, *A Study of History* (revised and abridged edition), Weathervane Books, New York, 1972, p. 137.
[1310] Bronowski, *The Ascent of Man*, p 435.
[1311] The notion of social contexts and fields of meaning-giving ideas is taken from John B. Thompson, *Ideology and Modern Culture*, Polity Press, Cambridge, 1990. pp. 272-282.
[1312] Thompson, *Ideology and Modern Culture*, pp. 272-282.
[1313] George Townshend, *The Genius of Ireland (and other essays)*, Talbot Press, Dublin and Cork, 1930.
[1314] Jantsch, *The Self-organizing Universe*, p. 175.
[1315] Morin and Kern, *Homeland Earth*, pp. 67-68.
[1316] Morin and Kern, *Homeland Earth*, pp. 67-68.
[1317] Taylor, *Human Agency and Language*, p. 98.
[1318] Taylor, *Human Agency and Language*, p. 109.
[1319] Taylor, *Human Agency and Language*, pp. 18-21.
[1320] Taylor, *Human Agency and Language*, pp 22; 27. See Chapter Four, Part D for a related discussion on the struggle of self-interpretations, and which interpretation of reality is the more illuminating.
[1321] Taylor, *Human Agency and Language*, p. 218-221.
[1322] Bronowski, *The Ascent of Man*, BBC Books, London,1973, p 364.
[1323] Bronowski, *The Ascent of Man*, p 364.
[1324] Taylor, *Philosophical Arguments*, p. 34.
[1325] Mouton, *Understanding Social Research*, p. 31.
[1326] Bronowski, *The Ascent of Man*, p. 435.
[1327] Morin and Kern, *Homeland Earth*, pp. 59-67; 81-88.
[1328] Taylor, *Philosophical Arguments*, p. 39.
[1329] Taylor, *Philosophical Arguments*, pp. 36; 42.
[1330] Taylor, *Language and Human Agency*, pp. 215-247.
[1331] Morin and Kern, *Homeland Earth*, pp. 82-83.

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[1332] Morin and Kern, *Homeland Earth*, p. 81-82.
[1333] Jantsch, *The Self-Organizing Universe.*
[1334] Laszlo, *The Multi-cultural Planet*, p. 2.
[1335] Laszlo, *The Multi-cultural Planet*, p. 5.
[1336] United Nations World Conference on Cultural Policies, *Declaration of Principles*, Article I, 3.
[1337] Morin and Kern, *Homeland Earth*, p. 81.
[1338] Institute for Studies in Global Prosperity, *Science, Religion and Development: Some initial considerations*, 2008.
[1339] Laszlo, *The Multi-cultural Planet*, p 3.
[1340] Laszlo, *The Multi-cultural Planet*, p. 3.
[1341] Laszlo, *The Multi-cultural Planet*, p. 3.
[1342] Laszlo, *The Multi-cultural Planet*, p. 1.
[1343] Laszlo, *The Multi-cultural Planet*, p. 1.
[1344] Taylor, *Philosophical Arguments*, p. 45.
[1345] Taylor, *Philosophical Arguments*, p. 59.
[1346] Taylor, *Human Agency and Language*, pp. 104-109.
[1347] Taylor, *Philosophical Arguments*, p. 39.
[1348] Morin and Kern, *Homeland Earth*, p. 117.
[1349] Morin and Kern, *Homeland Earth*, p. 117.
[1350] Morin and Kern, *Homeland Earth*, pp. 79-97; p. 117.
[1351] Morin and Kern, *Homeland Earth*, p. 94.
[1352] Morin and Kern, *Homeland Earth*, p. 117.
[1353] Morin and Kern, *Homeland Earth*, p. 94.
[1354] Laszlo, *The Multi-cultural Planet*, p. 1.
[1355] See Henri Bergson, *Creative Evolution* (1911), Greenwood Press, Westport Connecticut, 1977.
[1356] Alfred North Whitehead, *Symbolism: Its Meaning and Effect* (Barbour-Page Lectures, University of Virginia, 1927), Fordham University Press. The passage quoted is from Whitehead's closing paragraph.
[1357] Laszlo, *The Multi-cultural Planet*, p. 3.
[1358] James D. Watson, *The Double Helix*, Mentor Books, New York, 1968, p. 134
[1359] See thesis Chapter Five, Part A, Section 1.
[1360] Taylor, *Philosophical Arguments*, p. 42.
[1361] Morin and Kern, *Homeland Earth*, p. 117.
[1362] Watson, *The Double Helix*, p. 134. See Taylor, *Human Agency and Language*, pp. 15-21 for a discussion of qualitative contrasts
[1363] The Universal House of Justice, *The Promise of Wold Peace*, section 4 paragraph 2.
[1364] Laszlo, *The Multi-cultural Planet*, pp. 1-5.
[1365] Morin, *Journal of Social and Evolutionary Systems*, p. 378.
[1366] Laszlo, *The Multi-cultural Planet*, p. 3.
[1367] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1368] Taylor, *Human Agency and Language*, pp. 15-26
[1369] Taylor, *Human Agency and Language*, p. 98.
[1370] George Townshend, *The Genius of Ireland*
[1371] Morin and Kern, *Homeland Earth*, p. 117.
[1372] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1373] Taylor, *Philosophical Arguments*, p. 54.

Chapter Seven: Findings and conclusion

[1374] Many of these ideas are discussed at length in Charles Taylor, *Human Agency and Language; Philosophical Papers I*, Cambridge University Press, Cambridge, 1985 and in Charles Taylor, *Philosophy and the Human Sciences; Philosophical Papers II*, Cambridge University Press, Cambridge, 1985. A range of ideas regarding consultation that are apropos to the thesis discussion can be found in the Universal House of Justice, *Promise of World Peace*, Haifa, 1985; Baha'i International Community, *Prosperity of Humankind*, Haifa, 1995; Baha'i International Community, *Transforming Collective Deliberation: An NGO*

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[1375] Baha'i International Community, *Prosperity of Humankind*, introduction, paragraph 8.
[1376] Edgar Morin and Anne Brigitte Kern, *Homeland Earth*; Manifesto for the new Millennium, Hampton Press, Cresskill New Jersey, 1999, p. 117.
[1377] The Universal House of Justice, *The Promise of World Peace*, section 5 paragraphs 2-3.
[1378] The phrase, the embittering conflicts of the past, is an adaptation of a phrase "the embittering traditions of history". George Townshend, *The Genius of Ireland (and other essays)*, Dublin and Cork, Talbot Press, 1930.
[1379] Eric Jantsch, *The Self-organizing Universe*, Pergamon Press, Oxford, 1980, pp. 236-238.
[1380] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 1
[1381] The Universal House of Justice, *The Promise of World Peace*, section 4, paragraph 2.
[1382] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 1
[1383] Morin and Kern, *Homeland Earth*, p. 124.
[1384] The phrase, we think linguistically, is taken from David Hofman, *George Townshend*, George Ronald, Oxford, 1983, p. 239.
[1385] Taylor, *Human Agency and Language*, pp. 215-247.
[1386] Taylor, *Philosophical Arguments*, Harvard University Press, Cambridge Massachusetts, 1995, p. 39. The italics are Taylor's.
[1387] There may be links here to the notion of moral luck. See, for example, Bernard Williams, *Moral Luck*, Cambridge University Press, New York, 1981. Thomas Nagel, *Moral Questions*, Cambridge University Press, New York, 1979. Daniel Stratman (Ed), *Moral Luck*, State University of New York Press, Albany New York, 1993. Dana K. Nelkin, *Moral Luck*, Stanford Encyclopaedia of Philosophy, 2013.
[1388] Taylor, *Philosophical Arguments*, p. 39.
[1389] See Arnold Toynbee and Jane Caplan, *A Study of History* (revised and abridged edition), Weathervane Books, New York, 1972, pp. 137; 140.
[1390] For example, Whitehead tries to work out a position of organic mechanism. Whitehead, *Science and the Modern World*, Lowell Lectures 1925, Free Association Books, London, 1985, p 99; 133-134.
[1391] Stephen Weinberg, Life in the Universe, *Scientific American*, October, 1994, p. 47.
[1392] Taylor, *Philosophical Arguments*, p. 39. The italics are Taylor's.
[1393] Taylor, *Philosophy and the Human Sciences*, p. 40.
[1394] Morin and Kern, *Homeland Earth*, p. 117.
[1395] Morin and Kern, *Homeland Earth*, pp. 115-117.
[1396] Taylor, *Human Agency and Language*, pp. 215-247.
[1397] Toynbee, *A Study of History*, pp. 137; 140
[1398] Toynbee, *A Study of History*, p. 137.
[1399] Toynbee, *A Study of History*, pp. 137; 140
[1400] Jerome Bruner, *Towards a Theory of Instruction*, Oxford University Press, London, 1971, pp. 25-29.
[1401] Fredric Ferré, *Philosophy of Technology*, University of Georgia Press, Athens, 1995, pp. 33-34.
[1402] Bruner, Towards a Theory of Instruction, pp. 25-29.
[1403] Whitehead, *Science and the Modern World*, p. 120.
[1404] Morin and Kern, *Homeland Earth*, p. 60.
[1405] Morin and Kern, *Homeland Earth*, p. 84.
[1406] Morin and Kern, *Homeland Earth*, p. 59.
[1407] Morin and Kern, *Homeland Earth*, p. 59.
[1408] Morin and Kern, *Homeland Earth*, pp. 124-126.
[1409] Morin and Kern, *Homeland Earth*, pp. 79-97; p. 117.
[1410] The Universal House of Justice, *The Promise of World Peace*, introduction, paragraph 10.
[1411] Baha'i International Community, *Prosperity of Humankind*, pp. 2-3.
[1412] Baha'i International Community, *Prosperity of Humankind*, section 5, paragraph 6.
[1413] Taylor, *Human Agency and Language*, pp. 97-114.
[1414] Baha'i International Community, *Prosperity of Humankind*, paragraph 8.
[1415] James D. Watson, *The Double Helix*, Mentor Books, New York, 1968, p. 28.
[1416] Morin and Kern, *Homeland Earth*, p. 117.
[1417] Taylor, *Philosophical Arguments*, p. 34

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