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**THE LATE MODERN BODY AND SOUL:
CHARLES DARWIN AND KARL BARTH**

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DECLARATION

I, PHILIP INGRAM CHAPMAN

Declare that with respect to the thesis entitled

THE LATE MODERN BODY AND SOUL: CHARLES DARWIN AND KARL BARTH

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ABBREVIATIONS

CD: Karl Barth, *Church Dogmatics*, ET ed. by Geoffrey W. Bromiley and Thomas F. Torrance, 13 volumes (Edinburgh: T&T Clark, 1956-1977).

KD: Karl Barth, *Die Kirchliche Dogmatik III (2): Die Lehre von der Schöpfung* (Zollikon-Zurich: Evangelischer Verlag, 1948).

Darwin, Origin: Charles Darwin, *The Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life*, ed. with intro. by J. W. Burrow, reprint of the 1859 edition (London: Penguin, 1985).

Darwin, *Origin (1910)*: Charles Darwin, *The Origin of Species by Means of Natural Selection*. Popular Impression of the corrected copyright edition issued with the approval of the author's executors (London: John Murray, 1910), includes a table of additions and corrections to the fifth and sixth editions.

ODCC: *Oxford Dictionary of the Christian Church*, third edition revised, ed. by F. L. Cross and E. A. Livingstone (Oxford: Oxford University Press, 2005).

OED: *Oxford English Dictionary*, 2nd edition online 1989, updated Dec, 2012,

OCP: *Oxford Companion to Philosophy*, ed. by Ted Honderich (Oxford: Oxford University Press, 1995).

SREP: *The Shorter Routledge Encyclopedia of Philosophy*, ed. by Edward Craig, (London: Routledge, 2005).

SA: Scientific American.

Biographical dates are mostly from *The Cambridge Encyclopedia*, fourth edition, ed. by David Crystal (Cambridge: Cambridge University Press, 2000) or from ODCC.

PREFACE

THE ORIGIN OF THIS PROJECT

This project has its beginnings in my academic and personal interests going back over many years. My original studies were in chemistry. That turned out to demand meticulous practical skills well outside my capacity. In completing a first degree at Bristol University in 1957, I studied especially theoretical chemistry, including some elementary quantum mechanics, philosophy, and followed a short course in the history and philosophy of science under Paul Feyerabend (1924-1994), at that time a follower of Karl Popper. Military service, theological studies and forty years in the work of Methodist ministry in a number of different countries followed, alongside random reading in scientific and philosophical matters. The discipline of regular, biblically related preaching was significant throughout this time. It still continues. After a sabbatical which brought scientific and theological interests together I had the opportunity to work for a master's degree at Leeds University in the then Centre for the Study of Science and Theology. I began to see a fundamental question, "What is a human being?" Biological science, philosophy and theology ask and answer it in very different ways. Alongside that question is a different but closely connected one: "What justification can religious belief find in the face of a fundamentalist scientific totalitarianism?" The latter suggests that everything about the human person, including religious belief, is explicable in biological and ultimately in molecular terms. Some see human characteristics as emergent properties, different from and not explicable by the properties of the individual components. As I shall show that hardly changes the theological problem. Both types of explanation are naturalistic.

I was not satisfied with answers offered from my own background. Methodist theology is within the tradition arising from the Reformation, Lutheran rather than Calvinist at its source. It owes something to Wesley's understanding of the Moravian pietists of the eighteenth century. Usually there is some emphasis, typical of evangelicals, on personal assurance of salvation. A frequent response to sceptical questions would have been that the religious experiences of individuals trump all other arguments. Supported by reason, Scripture and tradition they provided a sufficient ground for Christian belief. However, naturalistic explanations are obvious. Pharmacological or physical interventions can bring about mental phenomena. Digital technology can examine them. Their basis as evidence reduces to zero. This is not necessarily to question the existential significance of such events to the believer. However, within the paradigms of Darwinian science religion as a human phenomenon is susceptible to an adaptive explanation.

At Leeds Alistair McFadyen and Jacqui Stewart introduced me to the work of the Swiss reformed theologian Karl Barth. Coincidentally, I had encountered him at a pastoral colloquium at

Bièvres in October 1963.¹ I began to think that Barth's theology might provide a way of approaching the question of human nature and the possibility of Christian belief in a way that was in no way hindered by the naturalistic denial of any evidential value for religious experience or by any concern about the status of the human person as an evolutionary artefact. This opened the way to the present study, in which I intend to explore the implications of a development of Barth's doctrine of the human person and to set beside it in dialogue a strictly naturalistic account, primarily that one offered by evolutionary biology and cognitive psychology. As I develop my argument, further reasons for my choice of a theological stance in the same stream as that of Karl Barth as one of the partners in the dialogue will appear.² While I was at Leeds Jacqui Stewart suggested to me the investigation of secular parables of the truth, one of the chosen modes of dialogue in this dissertation.

¹ This event is referred to in Eberhard Busch, *Karl Barth: His life from letters and autobiographical texts*, trans. by John Bowden (London: S.C.M., 1976), p. 464.

² See *inter alia*, Chapters 3 (2) (a) and 6 (2) (c).

INTRODUCTION

(1) What and how

What is a human being? We might take many possible routes as we try to answer that fundamental question. Biological science is one such. For our purposes that begins with the work of Charles Darwin. It understands human persons like all other animals and all life as physical without remainder. The same question is differently answered by different theologies. But theologies of many kinds sees humanity at least and, it may be, other living things, as possessing a non-physical “plus” that some name as spirit or soul. Its nature will be part of our investigation. Our approach chiefly through the theology of Karl Barth is one of the original features of this dissertation. For reasons we shall explain, his name rarely appears in the dialogue between religion and natural science.¹ However a number of other theologians will also come into view.

Theological work should relate to the communication of the good news of God’s intimate involvement with the world and the difference it makes to human life and conduct. It is a human enterprise. It is always in motion. It cannot reach finality. This present work is a stage in my own theological journey. Among other things it is an exercise in what Rowan Williams calls “communicative theology”. I describe it in that way because I hope, as he does, “to witness to the gospel’s capacity for being at home in more than one cultural environment and to display enough confidence to believe that this gospel can be rediscovered at the end of a long and exotic detour through strange idioms and structures of thought”.² In the present case the detour will pass through much in the way of science which is strange to theology, but increasingly familiar in the public arena.

Since so much theology has gone before, I must decide how to engage with what witnesses and thinkers have said and written. In other words, there must be a hermeneutic, a principle of interpretation. Even to name such, a requirement is to speak theologically. There is already the assumption that God speaks. There is revelation, “a concept which emerges from a questioning attention to our present life in the light of a particular past.”³ However, if there has already been speech each would-be theologian does not have to begin again from the beginning in any absolute sense. “A particular past,” that is to say ancestors, including those who speak through Scripture, as well as those who over the centuries have refined and elaborated Christian thinking, along with contemporaries whose own faith has also impelled them to seek understanding. All those witness concerning what they have heard and understood. Human limits prevent the theological worker from properly attending to

¹ See chapter 5 (1) (c).

² Rowan Williams, *On Christian Theology* (Oxford: Blackwell, 2000), p. xiii-xiv

³ Williams, *On Christian Theology*, p. 134.

more than a tiny part of the speech of that multitude. However, it is in listening attentively to those few that my own faith must seek understanding.

One convention in modernity has been that an academic dissertation should be concerned with understanding rather than with faith. However, as Rowan Williams implies (in the above quotation), the two cannot be separated. This has to be the case because without faith, however clouded and indefinite, received and sustained as a gift, the inquiry would not begin or continue. That faith will include selection principles reflecting the physical and intellectual circumstances and the purposes of the theologian. The assimilation of different witnesses will provoke changes in perspective over time. Faith formed by such a pilgrimage cannot be expressed in permanent propositional form. Ambiguity and paradox are compulsory. It cannot be reduced to a system. Therefore, there can be no meta-theology, no rigidly held theory founding and justifying theological statements or prescribing general criteria for their validity. Whatever conviction drives them, they can only be tentative. We shall see that this state of affairs is not peculiar to theology. It is a feature of the work of the natural scientist as well. It is an affirmation of the worker's humanity. However, the would-be theologian differs radically from the natural scientist. Although there are often consequences in the world of a given theological position, there is no point of empirical reference. The theologian must begin with the familiar and the local, with the tradition in which she or he has been raised. I have recounted in my preface what prompted a shift in my own position from that beginning and what led to a conscious decision to use the theology of Karl Barth as a given area of reference. I must try to do that critically, selectively and with attention to other witnesses. The result will be a theology in the same stream as his.

The relation to natural science formed only a small part of Barth's theology. A purpose of this dissertation is to repair that lack, especially where it concerns the doctrine of the human person. Barth is not an easy subject. He is not always consistent. One example is his vehemently expressed claim to reject natural theology. Yet that has usually been the bridge between theology and empirical science. However he suggests the use of "secular parables of the truth". Though he denies it they certainly are examples of natural theology. We shall use them to make connections between theology and science. There are other stumbling blocks. I have indicated a number of them. Hunsinger points out that, no single key nor a unique hermeneutical strategy can be applied in Barth's case⁴. That is not surprising. He disowns hermeneutics as an independent discipline.⁵ There should not be a theoretical scheme for interpreting either Scripture or his own writing. There is, nonetheless, at least one principle we can use to measure the witness. The witness itself contains that principle. God is absolutely sovereign but that

⁴ George Hunsinger, *How to Read Karl Barth: The Shape of his Theology* (New York: Oxford University Press, 1993). pp. vii-30.

⁵ See further on Barth's attitude to hermeneutics Chapter 3 (2) (d).

sovereignty is one of love exercised in freedom.⁶ The witness includes its own interpretation. We cannot avoid the hermeneutical circle.

Any theology that aspires to reach the pew and beyond must address some serious puzzles and dilemmas. I hope to ease some of them. Barth does not often do that directly. He does not licence complacency. He does encourage us to take seriously the fact that our problems are indeed ours and not God's. In particular, God has no trouble with evolution. We often do. However, in a work such as the present one I cannot attack all the difficulties. I shall have to omit the central themes of sin and salvation as well as a number of other important matters. My main concern now is with aspects of the theological status of humanity, particularly where it touches evolutionary biology.

Many contributors to the conversations between science and religion do not take the revelation in Jesus Christ to be the controlling category of the theological statements they make. Where they do, they are inclined to justify them as being consonant with, or even supported by, the categories, methods or findings of natural science.⁷ The result is that theology remains in debt to the human activity of a natural science whose conclusions, as we shall see, cannot be other than provisional.⁸ We must take that provisionality into account in any use of its resources for theological purposes. No science, including biology, is complete. In spite of that, I believe research has reached the stage when theology must accept a physicalist understanding of how the human person functions in the world.⁹ That is so, even supposing that it cannot be strictly justified empirically. Only in that way, can we rightly see the Darwinian science of the human person within a theological setting. For that reason I hope in this dissertation to set out an account of one Christian theological anthropology which can rationally engage with, illuminate and be illuminated by the Darwinian account of the origin and nature of humanity, seen, at least in one of its aspects, as a secular parable of revealed truth.

(2) The research questions

This is an interdisciplinary study; the potential subject matter is wider than can be grasped by one person. Therefore, the questions to be answered must be few in number and carefully targeted. They are:

⁶ §28, *CD II*(1) pp. 257-331, *CD III*(2) pp. 18, 41 and *passim*.

⁷ This conclusion is supported by a study of the abstracts of the seventy-two short papers presented at ECST, the 2010 Edinburgh Conference of the European Society for Science and Religion. None of them deals with this aspect of the science--religion dialogue.

⁸ The sense in which the term "natural science" is used will be explained in the first paragraph of Chapter 1.

⁹ I prefer the word "physicalist" rather than "materialist" because it is more comprehensive. Empirical science refers frequently to electromagnetic radiation (visible light, X-rays, microwaves, etc.) which is carried by energetic but massless particles called photons, these could therefore, in a sense, be thought of as immaterial though in fact their origin and effects are purely physical. Brian Cox & Jeff Forshaw, *The Quantum Universe: Everything that Can Happen Does Happen* (London: Allen Lane, 2011), p. 204.

(a) Integrity

Can a Christian theology maintain its integrity and in particular its doctrine of the human person alongside the thoroughly physicalist account of humanity to which the work of Charles Darwin and his successors has led? If it can, how should this be done?

(b) Form

What form or forms ought an interaction between the disciplines of natural science and theology to take?

(c) Resources

Does the theological anthropology of Karl Barth have any resources to contribute to this interaction? What might they be? What qualifications or additions may be needed for a fruitful dialogue between it and Darwinian natural science?

(d) Content

What might be the content of such an interaction?

(3) Outline of the task

The first chapter will define the scope of this work. It will explain my background assumptions about the nature of truth. Then as a step towards relating natural science to theology, it will put forward and justify my understanding of what kind of a human enterprise science is. Then it will critically examine some ways in which the possible relations between science and religion have been classified. I shall use Fergusson's five types of natural theology as a framework within which these relations will be discussed with historical and contemporary examples. That will largely establish the context of my proposals in chapter five. Chapter one will come to a conclusion about the most appropriate theological stance for an interdisciplinary debate.

Chapter 2 will set out a summary account of evolution by natural selection according to Charles Darwin, briefly outlining its development to the present day and accounting for the success of its explanatory framework. This involves some consideration of molecular biology. It summarizes a number of Darwinian perspectives on what it is to be a human person, especially in the aspect of mentality, assessing the challenges posed to Christian theology. It argues that a totally physicalist understanding of nature including the human person, though not yet demonstrated unequivocally, or providing an unambiguous definition of humanity, is one that must be assumed to be the case by any theology that wishes to enter into dialogue with Darwinian science.

In Chapter 3 I will examine the most prominent example of a theological anthropology based on revelation, that of Karl Barth. Very briefly, I shall place in its historical, cultural and theological contexts. Some reference will be made to the expositions of Hans Urs von Balthasar¹⁰, Thomas Torrance¹¹ and others but especially to George Hunsinger¹². Based mainly on *Church Dogmatics* III (2), I shall consider Barth's theological anthropology in the light of these understandings with special emphasis on topics, which might feature in a dialogue with Darwinian science. I shall evaluate a move proposed by David Clough to include "all flesh" in the doctrine of election.

The task of Chapter 4 will be to analyse and evaluate in more detail Barth's attitude to science including an assessment of the influence of the non-Darwinian biology of Adolph Portmann.¹³ I shall critically assess Barth's qualifications as a partner in the dialogue between theological anthropology and the Darwinian understanding of the human person and propose an appropriate theological stance for this.

Chapter 5 will clarify the notion of secular parables of the truth in the *Church Dogmatics*, referring particularly to *CD* IV(3.1), § 69.2, "The Light of life" including some consideration of gospel and other parables.¹⁴ It will also explain their relationship to some other modes in which science and religion might interact. I shall offer a number of examples of secular parables of the truth, the primary one of which is the way in which Darwinian biology not only grounds humanity as wholly of this Earth but also provides a secular eschatology. The chapter will offer reactions of Barth's anthropology to them, bearing in mind that, according to him, scientific findings are to be seen as commenting on "a text which must first be known and understood for itself".¹⁵

Chapter 6 will conclude the present study by summarizing the arguments, assessing the adequacy of the answers to the research questions, drawing conclusions and pointing to possible new questions.

¹⁰ Hans Urs von Balthasar, *The Theology of Karl Barth: Exposition and Interpretation*. Trans. by Edward T. Oakes, S. J. (San Francisco: Communio Books, Ignatius Press, 1992).

¹¹ Thomas F. Torrance, *Karl Barth: An Introduction to His Early Theology 1910-1931* (London: S.C.M., 1962).

¹² Hunsinger, *How to Read Karl Barth*.

¹³ Both "Adolphe" and "Adolph" are found in the literature.

¹⁴ Hunsinger, *How to Read Karl Barth*, pp. 234-280 referring to *CD* IV (3.1), pp. 38-165. "Again, such a true word may speak of the psychophysical determination of man." p. 123.

¹⁵ *CD* III(2), p. 122.

CHAPTER 1

WHAT SCIENCE? WHICH THEOLOGY?

(1) Some clarifications

(a) Definitions and scope

In this chapter, I want to explore aspects of the complex group of theological enterprises ambiguously called “natural theology”. The word “nature” is also multivalent: I shall use it comprehensively to signify everything that exists materially or happens physically. We shall be thinking about the natural sciences of physics, chemistry, biology, geology, psychology and the observational and theoretical sciences (including mathematics) that usually go with them. I am leaving out the social sciences and economics. This is only a statement about the scope of this dissertation. It does not judge the status of the two latter fields as knowledge nor define “science”.¹ Initially we can say that any intellectual interaction between natural science, whose field is nature including human nature, considered empirically, and theology which thinks about the divine, could be called “natural theology”. In this sense I will consider a Christian doctrine of humanity and how it can engage with the Darwinian account in a way which reflects the full integrity of both parties.

In this chapter, however, I shall explain what I think natural science is about. I shall then discuss some schemes for classifying the interactions between science and religion. Using Fergusson’s proposal for five types of natural theology as a framework I shall then examine some of the ways in which interaction has taken place from the beginning of the Enlightenment until the present day.

(b) The question of truth

Clarity about truth must be part of every intellectual context. I am not putting forward a new theory of truth. Rather, for the sake of that clarity, I must expose some presuppositions. There are three well known positions. A true proposition can be seen as one which corresponds to external facts. Secondly we can see a true proposition as one which coheres with a whole body of propositions. Lastly we can see a true proposition as the one which is most useful in the circumstances envisaged. Each one is subject to apparently decisive philosophical objections.² A close philosophical examination of them is beyond our scope. We might imagine a world where it is humanly possible to satisfy completely all three as criteria simultaneously. It is not the one we live in. In daily life we are likely to use an unacknowledged and shifting amalgam of those three notions. The result in the case of natural science

¹ We shall need to consider some sociological arguments when thinking about the epistemological status of natural science.

² Bertrand Russell, *The Problems of Philosophy* (London: Butterworth, 1912), pp.196-204. Simon Blackburn, *Think*, pp.193-232. Karl R. Popper, *Objective Knowledge* (London: Oxford University Press, 1972), pp.44-47.

is, as we shall explain, a provisional empirical working hypothesis. When such truth is claimed it must be intersubjective and independently testable. That understanding of truth has a very wide usefulness. It is what works, where the empirical matters considered by natural science are concerned. But it is not in itself ontological truth. It exposes the phenomena and places them as far as it is able in a logical or mathematical framework. Yet as we shall see science cannot, from its own resources, reveal how things are in themselves. We shall describe the truth expressed by the propositions of natural science as experimental or empirical. Science also speculates beyond observation and experiment or what can be deduced from them. We shall see that Karl Popper provocatively described the resulting propositions as “metaphysical”. They may be intellectually stimulating and therefore useful but they are not yet any kind of truth. Talk of other universes with different constants of nature falls into that category as does discussion of non carbon-based life forms. As Popper suggests we can call such talk “metaphysical” unless and until we have relevant empirical evidence or at any rate the prospect of gaining it.

Yet the above basic comments on propositional truth, hardly touch the surface of a discussion about truth as the key question in theology. Theologically, truth springs from revelation. It discloses how a thing is in itself. Many religious traditions make corresponding claims. Revelation is often not propositional. It may be a person. It may be an event. In the Christian tradition and in some others it is understood to arise when God chooses to make God’s self known by whatever means to humanity. Humans cannot grasp God by intellectual effort. Therefore there is no procedure that will guarantee truth. It cannot be physically measured nor statistically evaluated. The attempt to capture or control the vision may obscure or destroy its truth. God provides many paths to learn truth. The natural world, human suffering and rejoicing, encounter and action, a search for meaning in sacred or secular writings, poetry, art, music and drama of many kinds, reflection on those and the experience of life, together or separately, are among such paths. Yet truth can always be obscured by our own prejudice, mistake or misunderstanding. Ontological truth, the truth of how things are in themselves, has its only source in God.

George Hunsinger in his work on Karl Barth devotes more than two hundred pages of close argument to such revelatory truth. We can however capture something of his account by extracting some key notions.³ A kind of correspondence and coherence, are essential to the whole body.⁴ Truth has its origin in God and in encounter with God. No propositional form can tie it down. It is always in motion. Truth is the event of God’s action. It is self involving, that is to say the subject is contained in the predicate and the predicate in the subject. Truth is multilayered and multifaceted. It concerns particularities rather than generalities. Those are some of the qualities of revealed truth. According to Barth that is what theology deals in. That ontological truth is what we shall refer to in the context of

³ Hunsinger *Barth* pp. 67-280.

⁴ Hunsinger, *Barth*, p.64.

Barth's own theology. Barth first appears to restrict the source of truth to the witness in Scripture to the revelation in Jesus Christ. Anything else he describes as speculation. But later he allows for "other lights" in the world which may also witness to truth. To simplify somewhat his point of view, truth may be available from scripture, from within the circle of believers or from the secular world. It is always gift. Such an account of truth does not deny that phenomena, even empirical phenomena might disclose it. But there is no human procedure or technique for ensuring that this happens. The God who acts in revelation, is also the one who initiates disclosure of all ontological truth. There is a circularity in that notion of truth. "You would not seek me if you had not found me" was not said by Barth but by Pascal. It almost expresses the point. But in Barth's case and surely in many other theologies, the truth thus understood is held to be an objective one standing over and against the human subject. The above summary account of truth will frame subsequent discussions particularly that of "secular parables of the truth" in chapter five.

(2) Can natural science count as knowledge?

(a) The philosophy of science goes beyond that of physics

Natural science is a vast complex of human activities. It aims to understand the world as it is presented to the senses. It defies easy analysis. However, in order to discuss the possible relations between it and theology, I must first attempt an overall view of its status as knowledge. Much of the literature in the philosophy of science refers most directly to physics. Biology is a different case. Like archaeology but also (physical) cosmology and geology, it has a strong historical component in both its scope and its methodology. I shall give more detailed consideration at a later stage to some aspects of the philosophy of biology, especially that of human biology.⁵

(b) Does natural science need foundations?

There is no generally agreed foundation for the acquisition of any kind of knowledge. Extensive philosophizing from early times to the Enlightenment, through Locke, Descartes, Berkeley, Hume, Kant, Russell and their different successors, including the logical positivists with Ayer as well as Wittgenstein and his followers and the philosophers of science, has not discovered any undisputed basis for certainty about God, the world or the self. What has happened is that the natural sciences, without such a basis, have provided more and more successful frameworks for the physical understanding and manipulation of the world. Success has built on success in exponential fashion. No obvious limit is in sight. One of the results of this has been the progressive understanding of the human

⁵ See Chapters 2 (3) (b), 5 (4)(d) (2) and *passim*.

person as one item in the physical world, to be studied and explained like everything else. However, in spite of obvious success there is no agreement whatsoever about the epistemological basis of natural science. The philosopher Alan Chalmers suggests that this uncertainty is of no relevance to the day-to-day activities of science.⁶ Working scientists like Lewis Wolpert have come to a similar conclusion.⁷ However, an attempt to understand what the practice of natural science amounts to is vital for a theology wishing to engage with it.

(c) An attempt at an epistemology

I shall not try to recount the previous history of debates over the status of scientific knowledge. Neither will I detail all the more recent contributions to this field. One name however constantly recurs because of his own work and that of those who follow or reject him. In the mid-twentieth century Karl Popper, distinguishing himself from the Vienna Circle, focused the debate on the question of the falsifiability of assertions intended to qualify as scientific propositions.⁸ Popper does not intend this as a criterion of meaning. He refers to any conjecture or belief that is not falsifiable as “metaphysical”. I shall frequently refer to this unusual use of the word. In this special sense such propositions, for instance that of the uniformity of nature, play an important part in the practice of science.⁹ They are therefore meaningful. When and if a way of falsifying them is arrived at, they are, as it were, promoted to become scientific in themselves.¹⁰ He thus distinguishes the propositions of natural science from others. In his view the aim of the scientist should be not to prove such propositions but to make every effort to refute them. Proof in his view is impossible since, strictly speaking, as Hume showed, no empirical generalization can ever be proved.¹¹ Any proposed principle justifying such an inductive procedure would also need to be proved inductively, leading to an infinite regress.¹²

Popper’s use of “falsifiability” influences practising scientists and still provides an important criterion for assessing the worth of all kinds of theories.¹³ However, it is subject to the objection, arrived at by careful historical analysis, that much successful science has not worked that way. Chalmers’ account, of the ways in which discoveries were made by Copernicus, Galileo, Newton, Maxwell and

⁶ A. F. Chalmers, *What is this thing called Science?* 3rd edn (Milton Keynes: Open University Press, 1999), p. 252.

⁷ Lewis Wolpert, *The Unnatural Nature of Science* (London: Faber & Faber, 1992), pp. 101-123.

⁸ Karl R. Popper, *The Logic of Scientific Discovery*, revised edn (London: Hutchinson, 1968).

⁹ Popper, *Logic of Scientific Discovery*, p. 252. See further on the principle of the uniformity of nature at Chapter 5 (4) (g).

¹⁰ Karl R. Popper, *Unended Quest* (London: Fontana, 1977), pp. 41- 44. Popper, *Logic of Scientific Discovery*, p. 38 and *passim*.

¹¹ Popper, *Logic of Scientific Discovery*, p. 29 refers to the “Treatise”. Book i part iii section vi. See David Hume, *A Treatise of Human Nature*, ed. Peter Nidditch, 2nd edn (Oxford: Oxford University Press, 1978), pp. 86-94.

¹² Popper, *Logic of Scientific Discovery*, pp. 28-30.

¹³ Obituary by Rom Harré in the *Independent* 19/11/1994. There are frequent references to Popper and falsification in the writings of contemporary scientists. For the scope of falsification see Roger Penrose, *The Road to Reality: A Complete Guide to the Laws of the Universe* (London: Jonathan Cape, 2004), pp. 1014-1024. See also Cox & Forshaw, *Quantum Universe*, p. 14.

Bohr, demonstrates the point.¹⁴ None of those heroes of science were deterred from their views by evidence apparently falsifying their predictions. Sometimes this evidence arose because the apparatus was inadequate or the physical situation inappropriate.¹⁵ Vindication of such experimenters and theoreticians happened much later on. Analysis of many instances of the process of scientific work produces corresponding results. It is a fair conclusion that there is a range from meticulous honesty through subsequently justified optimism via unjustified optimism to some rare examples of proved fraud in the reporting of experimental results.¹⁶ Falsifiability itself must play a crucial role in the assessment of theories.

More interestingly from point of view of scientific progress, an apparent falsification of a theory may be due to factors not considered in the first place. A strict Popperian abandons a falsified theory. A worker less attached to dogma investigates what, other than a false theory, could have led to the wrong result. Exposing that could lead to a fruitful development. A particular example was that of a major advance in the science of materials making possible, among other things, the construction of lighter and stronger aircraft.¹⁷ But, in any case, apparently falsified instances of what turned out later to be genuine scientific theories are not hard to find, especially as there is no unambiguous definition of what counts as falsification.¹⁸ Interestingly, it appears that Mendel made a very fortunate choice in the experiments with peas: as happens very often in science the original hypothesis turned out to be an

¹⁴ Chalmers, *What is this thing called Science?*, pp. 71-73, 91-101.

¹⁵ Chalmers, *What is this thing called Science?*, pp. 31-37.

¹⁶ A list of those who “saved” theories by denying falsification or falsely blaming the instruments includes Faraday, Dirac and Oersted. It is quoted in Anthony O’Hear, *Karl Popper*, (London: Routledge & Keegan Paul, 1980), p. 98. O’Hear refers to Joseph Agassi, *Science in Flux*, (Dordrecht, Boston: D. Reidel, 1975), pp. 167,175-6. The examples cited were not “bad science” in the sense of wilful distortion of the evidence, indicated by Ben Goldacre, *Bad Science*, (London: Fourth Estate, 2008), but science conducted by persons who were known for their integrity. For Faraday’s Christian integrity, see John Brooke and Geoffrey Cantor, *Reconstructing Nature. The Engagement of Science and Religion*, (Edinburgh: T&T Clark, 1998), pp. 33-34. John Polkinghorne dedicates his *Very Short Introduction to Quantum Theory*, (Oxford: Oxford University Press, 2002) to Dirac whom he describes in the preface as a “scientific saint”. For an account of the way in which human factors, including the exercise of power, can enter negatively into the actual practice of science, including some extreme cases, see Brian Martin, ‘Scientific Fraud and the Power Structure of Science’, *Prometheus 10.1* (1992), pp. 83–98. Online at <<http://www.bmartin.cc/pubs/92prom.html>> accessed 04/07/11. Martin thinks that such “bad science” is endemic. Science nonetheless moves forward, whatever the human factors, as long as reproducible results are found. For a semi-popular, but referenced, account of science as confused but getting results, see further: Michael Brooks, *Free Radicals: The Secret Anarchy of Science* (London: Profile Books, 2011).

¹⁷ Mary Tiles and Hans Oberdiek, *Living in a Technological Culture: Human Tools and Human Values* (London: Routledge, 1995), pp. 84-85.

¹⁸ At its simplest, it is always possible to omit “abnormal” readings from the straight line or smooth curve of a graph or indeed to take averages of scattered results. For example, at the time (1918) the testing by observation in an eclipse of the bending of light as it passed by the Sun was counted as a success for Einstein’s theory of general relativity, great publicity was given to this. In fact, the results were between half and one half the Einstein value with an accuracy of 30%. Much more stringent tests have since been successfully applied to this theory. See Clifford Will, ‘The renaissance of general relativity’, *The New Physics*, ed. by Paul Davies (Cambridge: Cambridge University Press, 1989), p. 12. It is now essential for the accurate calculations of satellite navigation. See Lisa Randall, *Warped Passages: Unravelling the Universe’s Hidden Dimensions* (London: Penguin, 2005-6), p. 85.

oversimplification. It is possible that he rejected or neglected results which were inconsistent with it, or even that, as Ruse says, “the gardener was over-zealously trying to please his master”.¹⁹ In any case, falsifiability cannot be the sole criterion for a scientific theory: there are other kinds of falsifiable statements. We do not think of the imaginative activity of astrology as a science. Yet it does make falsifiable predictions which are indeed subsequently falsified.²⁰ However, irrespective of whether we call a statement scientific, accumulated empirical evidence will enable us to judge its practical worth.

In spite of its difficulties Popper’s demarcation proposal for scientific theories is clearly not useless. It is neither strictly necessary nor completely sufficient, yet paradoxically, and in spite of the cogent criticisms expressed by Chalmers, O’Hear and others, it remains very influential.²¹ It provides support for the current stress on evidence-based medicine, although in that case other factors are involved.²² Though it cannot be the only criterion, Popper’s test of falsifiability must indeed still come into play when assessing what we might call the research status of any theory: various proposals of physical cosmology have, so far, no testable consequences. In Popper’s terms they are “metaphysical.”²³ Only vulnerability to empirical tests can promote them to the status of scientific theories. In part this must be a question of definitions, it does not prevent string theories and the like and concepts such as dark matter or dark energy, even while largely speculative, from being useful and suggestive as thought experiments in a research process. They are, therefore, in some sense “scientific”. Clearly, and in spite of Popper, the distinction between scientific and non-scientific is not the same as the one between falsifiable and non-falsifiable: both distinctions have their important uses.²⁴

¹⁹ Michael Ruse, ‘The History of Evolutionary Thought’ in *Evolution, The First Four Billion Years*, edited by Michael Ruse and Joseph Travis (Cambridge, MA: The Belknap Press of Harvard University Press, 2009), p. 31. Ruse’s suspicion is not necessarily correct, although the rejection of results that appear out of line with an otherwise well-supported hypothesis is not so uncommon. Mendel was however lucky in the particular traits of peas that he chose to investigate, others might not have given such clear results. See, Plomin and others, *Behavioral Genetics*, fourth edn. (NY: Worth, 2001) p. 10.

²⁰ If it seems quite obvious to a scientifically educated twenty first-century person that astrology cannot be counted as a science this may be due to the different thought world we now inhabit. The question is connected with paradigms which will be referred to later. See Chalmers, *What is this thing called Science?*, pp. 120-121.

²¹ Chalmers, *What is this thing called Science?*, pp. 247-253. For a summary and criticism of all aspects of Popper’s views see O’Hear, *Karl Popper*, with a detailed discussion of falsifiability at pp. 96-111.

²² For discussion of evidence-based medicine, especially its ethical ramifications, see Neil Messer, *Respecting Life* (London: S.C.M. Press, 2011), pp. 149-153

²³ George R. Ellis, ‘Does the Multiverse Really Exist?’, *SA*, Aug. 2011, pp. 18-23. For a fuller, largely non-technical account, by an expert in the field of these theoretical explorations, see Brian Greene, *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos* (New York: Knopf, 2011).

²⁴ For further discussion of falsifiability with conclusions similar to those expressed here, but with some refinements derived from Mill and Lakatos, see George Couvalis, *The Philosophy of Science: Science and Objectivity* (London: Sage Publications, 1997), pp. 62-86. For the general importance of the falsifiability criterion, in spite of valid objections, see James T. Cushing, *Philosophical Concepts in Physics: The Historical Relation Between Philosophy and Scientific Theories* (Cambridge: Cambridge University Press, 1998), p. 366.

(d) Sociological and psychological approaches

Other proposals for a philosophy of science have concentrated on the sociological and psychological aspects of the problem rather than on the epistemology. Thomas Kuhn was a physicist who became dissatisfied with existing explanations of the nature of science and its success.²⁵ According to him, a given science operates for a time within a framework of supposed laws as well as theoretical and practical assumptions which he calls a paradigm.²⁶ The concept of “paradigm”, like Wittgenstein’s example of “game”, cannot be unequivocally specified.²⁷ Far from being a search for something called truth, scientific research is in Kuhn’s view “a strenuous and devoted attempt to force nature into conceptual boxes supplied by professional education”.²⁸ Eventually the science in question bursts out of the old paradigm and is carried forward with a new set of fundamental assumptions. According to Kuhn, the discovery of new data inconsistent with the paradigm may be a cause of discomfort. However, only when the accumulation of such data becomes overwhelming does it become one of the triggers for a paradigm shift. The shift can also be related to sociological, psychological or economic factors. It is by this succession of revolutions that natural science progresses. Kuhn’s proposals are historically illuminating. However, as Chalmers points out, they fail to distinguish between the way in which scientific theories correspond to states of affairs in the physical world and the way this correspondence comes to light in the thought processes of the researchers. Chalmers does not refer to truth at this point, preferring to distinguish between “subjective” and “objective” knowledge, that is to say between the contents of a given scientist’s mind and public or potentially public knowledge of states of affairs. He charges Kuhn with not making the distinction clear and with being too concerned with the former.²⁹ However, the truth status of scientific theories is indeed here in question. Kuhn, however, does not think “truth” a useful concept in this connection. He rebuts the charge of relativism: for him scientific

²⁵ Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2nd edition (Chicago: University of Chicago Press, 1970), page v.

²⁶ Kuhn, *Structure of Scientific Revolutions*, pp. 10-11, 43-51. Kuhn (p. 44) also acknowledges Michael Polanyi’s notion of “tacit knowledge” as partly characterizing paradigms shared among given communities of scientists. However, he sees this as a collection of shared craft secrets -- almost Masonic in character which the candidate scientist internalizes in the course of apprenticeship; these enable him or her to “see” what the initiated see. It is a case of the neural apparatus being appropriately programmed, p. 195.

²⁷ Kuhn, *Structure of Scientific Revolutions*, p. 45 gives a reference to Ludwig Wittgenstein, *Philosophical Investigations*, trans. by G. E. M. Anscombe, New York, 1953. It also appears in the preliminary studies for that: Ludwig Wittgenstein, *The Blue and Brown Books*, second edn. (Oxford: Blackwell, 1969), especially p. 17. This is an example of a “cluster concept”. In a postscript dated 1969 Kuhn acknowledges two senses in which he makes use of the word “paradigm”: (i) the entire constellation of beliefs, values, techniques and so on shared by members of a given community. (ii) An element in given constellation, namely “the concrete puzzle solutions” which can be employed as models for further work. This latter element contains corrigible material, p. 175.

²⁸ Kuhn, *Structure of Scientific Revolutions*, p. 5. For more on cluster classes, which will be used later in a different connection at Chapter 3 (4) (e) (i), see David N. Stamos, *The Species Problem: Biological Species, Ontology, and the Metaphysics of Biology* (Lanham, MD: Lexington Books, 2003), pp. 123-143.

²⁹ Chalmers, *What is this thing called Science?*, pp. 124-129.

activity involves finding better and better solutions to puzzles presented to us by the world around us.³⁰ The same reticence concerning truth applies to various explanations of scientific activity in terms of the sociology of knowledge.³¹

It is well documented that the thought processes of scientists and the choices of research open to them as well as the assessment and use of results are affected by all kinds of sociological, economic, political and psychological factors.³² Quite obviously, unlike research in the humanities, which can be done relatively cheaply, much scientific research must be financed by government or commercial interests. But funding even by well-intentioned foundations or charities may also have its difficulties.³³ Such problems affect the choice of programmes and whether outcomes are reported fully, partially or at all. This is especially the case for, say, pharmaceutical or defence-related research and that related to agricultural chemicals.³⁴ Big science as at CERN or NASA cannot be carried out except through governments whose interest may be in their own prestige. Nonetheless, even if allowance must be made for distortions which may be introduced when the choice of subjects, both studied and reported, must be influenced by such factors, the efficacy with which the technology based on natural science manipulates the physical world still cries out for explanation. Despite malpractices, errors of judgement, and all the usual human failings, the world continues to be changed in spectacular ways, both for good and for ill, as a consequence of the practice of empirical science. That points to a strong connection between its findings and genuine states of affairs in physical reality. This does not seem to

³⁰ Kuhn, *Structure of Scientific Revolutions*, p. 206.

³¹ Barry Barnes, 'Sociological Theories of Scientific Knowledge', chapter in R. C. Olby and others, *Companion to the History of Modern Science* (London: Routledge, 1996), pp. 60-73.

³² An old example, still relevant, is Jerome Ravetz, *Scientific Knowledge and its Social Problems* (Oxford: Oxford University Press, 1971), especially p. 57. He cites four overlapping abuses of science: shoddy, entrepreneurial, reckless and dirty -- and the situation has not improved since his day. See also: Tiles and Oberdiek, *Living in a Technological Culture*. From the point of view of a campaigning journalist with particular examples of shoddy science see Goldacre, *Bad Science*. For a polemical tract, starting more or less where Kuhn left off, stating an extreme version of relativism and utilizing the work of Feyerabend, Ravetz and others, see Ziauddin Sardar, *Thomas Kuhn and the Science Wars* (Cambridge: Icon Books, 2000). For a discussion of Charles Darwin's social and political context and its possible influence on the notions of natural selection and adaptation see Gregory Radick, 'Is the theory of natural selection independent of its history?' in *The Cambridge Companion to Darwin*, 2nd edition, ed. by Jonathan Hodge & Gregory Radick. (Cambridge, Cambridge University Press, 2009), pp. 147-172. Radick's essay leaves the question open. For general remarks on the way cosmology and the underlying mathematical physics go beyond the empirical evidence as well as the human, political and cultural background to work in those areas. See Penrose, *Road to Reality*, pp. 1010-1047.

³³ See, for example, Uffe Schjoedt, 'The Religious Brain: A General Introduction to the Experimental Neuroscience of Religion', *Method and Theory in the Study of Religion*, 21 (2009), 310-339, p. 315. The role of the Templeton Foundation is here in question. For case histories related to politics, as well as large pharmaceutical firms and issues around patents, see James D. Watson with Andrew Berry, *DNA The Secret of Life* (London: Arrow Books, 2003), especially pp. 108-133.

³⁴ Brian C. Martinson and others, 'Scientists Behaving Badly', *Nature* 435 (2005), pp. 737-8. Brian Martin, 'Scientific Fraud and the Power Structure of Science', *Prometheus* 10.1 (1992), pp. 83-98. Online at <<http://www.bmartin.cc/pubs/92prom.html>> accessed 18/03/2011.

be properly taken into account by Kuhn, by the sociological approach or by Feyerabend.³⁵ After initially following Popper, the latter proposed, under the slogan “anything goes”, that there was no such thing as scientific method, nothing to choose in their procedures between astrology and physics.

(e) Science and non-science distinguished

Chalmers agrees with the later Feyerabend up to a point, and is surely right in thinking that there is indeed no universal scientific method.³⁶ (This is also emphasized by Kuhn, the methodology being one element in a given paradigm.) Different sciences adopt procedures appropriate to the object of study; the results will then be judged not in terms of method but by their consistent applicability to the physical world. For the present purposes this provides a demarcation criterion between science and non-science ruling out the likes of astrology and homeopathy.³⁷ The failure of these latter two to conform to physical or chemical principles, which have shown their worth in numerous practical applications, would provide prior grounds for suspicion. However, it is the specific repeatable empirical test that is decisive. This does not however solve the epistemological problem, which relates to the logical relation between observation statements and general laws and how it is that supposed general laws come to be modified or replaced. The actual practice of science does not however wait for its philosophical difficulties to be resolved. Criteria other than those of logical purity must be applied.

(f) The test of fallible natural science

Reason, in the guise of common sense, would suggest that all the theories of natural science should cohere with each other: there should be no contradictions. This point was made by Aristotle; otherwise, he thinks, it is impossible to carry on any discussion. I shall have more to say on reason at a later stage.³⁸ There cannot be real states of affairs inconsistent with each other: yet it sometimes happens that established scientific theories imply that this is the case. Such apparent contradictions would be because we have access not to reality but to appearances. Famously quantum theory and Einstein’s theory of general relativity, which are both well tested and form the basis of modern physics, cannot, at this time, be reconciled. In the one matter-energy is grainy in nature, in the other it is continuous.³⁹ Just as famously, quantum theory itself contains unresolved contradictions.⁴⁰

³⁵ Paul K. Feyerabend, *Against Method: An Anarchistic Theory of Knowledge* (London: Verso, 2010).

³⁶ Chalmers, *What is this thing called Science?*, p. 162.

³⁷ For a discussion of the scientific credentials of homeopathy see Philip Ball, *H₂O: A Biography of Water* (London: Phoenix, 1999), pp. 289-303. For astrology see Chalmers, *What is this thing called Science?*, pp. 120-121. Countering Popper, Chalmers refers to Kuhn who argues that the practices of astronomers enable them to learn from their mistakes while those of astrologers do not.

³⁸ For a discussion of Aristotle’s views on the principle of non-contradiction and its relevance to quantum theory see Vasilis Politis, *Aristotle and the Metaphysics* (London: Routledge, 2004), pp. 122-156. For reason in general see Chapter 1 (4) (b) (ii) and 1 (4) (c) (i).

³⁹ The word “grainy” is probably from Penrose, *Road to Reality*.

⁴⁰ There will be further discussion, principally at Chapter 4 (2) (e) (i), also at Chapter 5 (2) (b).

Yet these dilemmas are at the heart of our understanding of the physical world and ways must be found of living with what, at this point at any rate, we simply do not understand. This is acknowledged by, among others, the evolutionary psychologist Stephen Pinker:

we are so-so scientists....our brains were shaped for fitness, not for truth. Sometimes the truth is adaptive, but sometimes it is not. Conflicts of interest are inherent in the human condition....and we are apt to want our version of the truth, rather than the truth itself, to prevail.⁴¹

Pinker is not on his own in this view, according to the biologist and author Lewis Wolpert “scientists are concerned, not with absolute truth, but with theories that provide understanding of the phenomena involved”.⁴² Perhaps this is the wrong kind of humility; scientists surely should be aspiring to something called “truth”, although the worth of a scientific theory indeed cannot be assessed by its “absolute truth”. This latter is humanly inaccessible, rather the theory must be judged by its conformity to the empirical world. We can speculate about what ultimately exists and lies behind what has been observed, ordered and perhaps calculated. However, the most important use of scientific propositions is in their organization and explanation of data obtained through the senses, usually through the interposition of a mediating apparatus. Of course, the apparatus is humanly designed and constructed according to pre-existing theories. The, inevitably provisional, information thus gained can be harnessed for human purposes. Yet however far it reaches, natural science cannot outgrow its origin in human finitude; invariably and inevitably, this implies the possibility of being mistaken.

We can sum up by saying that natural science begins with an examination of the world available to the human senses. It searches for explanations and proposes to test them by experiment and observation. Where the tests are successful, the explanatory theory arrived at can be applied to further aspects of the world of sense experience or what can be deduced from it. Scientific propositions are held to be true in some sense if they can be justified by observation of the world. Experiments must be reproducible. Different experimenters, in other times and places, must find unambiguously corresponding results. Yet there is no consistent scientific method: history does not display a recognizable path, invariably followed, between empirical results and a general theory considered to be justified. However, the propositions science arrives at, whether set out in natural languages, as physical models or diagrams, or as mathematical expressions, at least set in order the physical phenomena of the world. We can, on this basis, come to some pragmatic conclusions about natural science.

⁴¹ Stephen Pinker, *How the Mind Works* (London: Penguin, 1998), p.305.

⁴² Wolpert, *Unnatural Nature of Science*, p. 103.

(g) Natural science consists of working hypotheses

Whatever their practical utility, supposed general truths, or more exactly statements that such and such is always the case, arrived at through the natural sciences, are by their very nature corrigible and, as the history of science relates, frequently corrected. Moreover, correction takes place, empirically, in ways that are not available to other understandings of the world. Yet there is no absolute certainty about any of the propositions of natural science. Neither is there agreement that a number strictly representing the probability of the truth (or rather of the universal applicability) of a given general empirical proposition can be arrived at.⁴³ Probability is always on the basis of evidence. The investigator always has to make a judgement on whether all the relevant evidence has been taken into account. In any case more may turn up: thus the well-publicized problem of “unknown unknowns”.⁴⁴ Yet the process of continuous development carries on apace because “Science contains within itself the devices for correcting the illusions of science.”⁴⁵ In this way, however consistent with observations and theories considered to be well established, a scientific theory, that is to say a general, empirical proposition, remains a working hypothesis. The recognition of this leads to fallibilism, a position that insists not that scientific claims are false but rather that they are tentative.⁴⁶ I shall comment from a theological standpoint on the status of such working hypotheses at a later stage.⁴⁷

(h) A common factor between natural science and theology

To say that scientific claims are tentative does not make plausible the view of some postmodernists that as products of an institution “that masquerades as truth seeking” they are suspect or false.⁴⁸ The credibility of scientific claims does not depend on their source but on their consistent conformity to the empirical world. Enlightenment reason believed that a coherent theoretical framework of secure and indubitable first principles, prescribing and justifying the process of its acquisition must precede whatever is to count as knowledge. That belief is open to question, or perhaps wrong. It is certainly wrong where the empirical understanding of the world characteristic of natural science is concerned. If natural science, the most blatantly successful aspect of human endeavour, can

⁴³ Chalmers, *What is this thing called Science?*, pp. 191-192. Cushing, *Philosophical Concepts in Physics*, p. 361, referring to work by Hans Reichenbach and Rudolph Carnap.

⁴⁴ ‘Reports that say that something hasn’t happened are always interesting to me, because as we know, there are “known knowns”; there are things we know we know. We also know there are “known unknowns”; that is to say we know there are some things we do not know. But there are also “unknown unknowns” - the ones we don’t know we don’t know.’ Donald Rumsfeld so quoted by the BBC news website 30/11/2007.

⁴⁵ Brooke and Cantor, *Reconstructing Nature*, p. 45. Simon Blackburn, *Think* (Oxford: Oxford University Press, 1999), p. 232.

⁴⁶ A position, in this respect, like that of C. S. Peirce. See W. B. Gallie, *Peirce and Pragmatism* (London: Penguin, 1952), especially p. 72 and pp. 106-107.

⁴⁷ See Chapter 4(2) (d).

⁴⁸ Sharyn Clough, article ‘Science’ in *Encyclopedia of Post Modernism*, editors Victor E Taylor and Charles E. Winquist (Abingdon: Routledge, 2001), p. 356.

do without such principles, why should theology need them? If there is no meta-science, no generally agreed foundational justification for its practice, why should there be a meta-theology? Natural science could not therefore impugn theology for a lack (if that is the case) of a secure meta-theoretical foundation, since it lacks one itself. Both can manage without theorizing about theorizing.⁴⁹ However, a negative common stance of anti-foundationalism cannot of itself be a basis for interactive dialogue or any other relationship between two such different approaches to understanding reality. Is there a more positive one? If so, what forms has it taken and should it take?

(3) Interactions between science and religion

(a) Attempts at classification

A number of different typologies describing the interaction between Science and Religion have been suggested. The best known is the fourfold one of Ian Barbour set out in a number of his works, most recently in *Nature, Human Nature and God* (2002). He proposes a classification of conflict, independence, dialogue and integration. This is criticized by Geoffrey Cantor and Chris Kenny partly on the grounds that the word “conflict” was not used in this sense until J. W. Draper in the 1870s.⁵⁰ They also suggest that Barbour has oversimplified the interplay by reducing it “to cognitive content expressed through propositions”.⁵¹ In a response, Barbour concedes that although his classification has a useful pedagogical purpose, each instance of interaction needs to be examined in its specific historical context.⁵² This response seems to reduce a purported conceptual scheme to little more than a series of, admittedly useful, labels in a filing system. Ted Peters in a chapter in *The Modern Theologians* (1997) suggests eight categories: scientism, scientific imperialism, ecclesiastical authoritarianism, scientific creationism, the two-language theory, hypothetical consonance, ethical overlap and New Age spirituality.⁵³ The difficulty with this is the evident polemical intent of value-laden words like “imperialism” and “authoritarianism”. Such schemes do have the virtue of attempting to map a wide and diverse field; but they are in danger, as Cantor and Kenny’s criticism of Barbour suggests, of forcing their subject matter onto Procrustean beds and prejudging historical and theological issues. J. H. Brooke is non-judgemental, simpler and more realistic: he proposes three possible broad patterns: “isolation,

⁴⁹ As regards methodology in theology, see Williams, *On Christian Theology*, p. xii.

⁵⁰ Geoffrey Cantor and Chris Kenny, 'Barbour's Fourfold Way: Problems with His Taxonomy of Science--Religion Relationships', *Zygon* 36 (2001), 765-81. John William Draper, *History of the Conflict between Science and Religion* (London: King, 1875).

⁵¹ Lecture by Geoffrey Cantor at Leeds University, Centre for Science and Religion, c. 1999. (My personal notes.)

⁵² Ian Barbour, 'On Typologies for Relating Science and Religion' *Zygon*, Volume 37, Number 2, p. 345 (2002).

⁵³ Ted Peters, in *Modern Theologians: An Introduction to Christian Theology in the Twentieth Century*, second edition, edited by David Ford (Oxford: Blackwell, 1997), pp. 649-665.

integration and conflict".⁵⁴ Yet, as he points out, in historical reality things are much more complex than that and he enters into some of these subtleties and unravels a number of the simplistic narratives presupposed by much current popular discussion.⁵⁵ Brooke's extended bibliographic essay in 1991 does not claim comprehensiveness, yet illustrates the breadth and complexity of the whole field in which historical, sociological and philosophical perspectives inform the analysis of the religious and scientific themes.⁵⁶ Such multidimensionality would defy straightforward classification even if the subject matter were easy to define.

(b) Boundary problems and a confusion of terminology

One of the difficulties about classificatory schemes, as is indicated by Brooke and Cantor, is that the boundaries between science and religion have constantly shifted over time and neither can be understood apart from their social context.⁵⁷ Also emphasized in the work by Brooke are the varied rhetorical strategies employed in spoken and written discussion and debate. He points out that in some cases the argument is confused by an instability in the terminology: of central importance is the term "natural theology" which, since Kant (1724-1804), has been used to denote different programmes in Britain and continental Europe.⁵⁸ In the former, historically, a theology of nature or physico-theology as an auxiliary to the argument from design could be under consideration, often including detailed descriptions of the marvels of creation.⁵⁹ Kant's work convinced continental thinkers that this programme was not viable. Natural theology of a different kind was deployed by Schleiermacher (1768-1834) whose concern was to elaborate a theology with the consciousness of being human as its starting point. In the present discussion, analysis of the range of intellectual programmes coming under the umbrella of natural theology will be seen to provide some pointers to one theological framework within which the science-religion debate may be conducted. That is the focus of the following paragraphs. It will become clear that my approach is one of dialogue in which the full integrity of both natural science and theology is respected and that certain conclusions can be drawn for the discipline of theology itself.

(4) Natural theology: Fergusson's five types

Rather than the general definition with which this chapter began, the term "natural theology" is usually employed more specifically in a way suggested by David Fergusson to describe that

⁵⁴ Brooke, in a chapter 'Science and Religion' in *Companion to the History of Modern Science*, ed. R. C. Olby and others (London: Routledge, 1990), p. 764.

⁵⁵ John Hedley Brooke, *Science and Religion Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991), pp. 348-403.

⁵⁶ Brooke, *Perspectives*, pp. 348-403.

⁵⁷ Brooke and Cantor, *Reconstructing Nature*, especially pp. 44-72.

⁵⁸ Brooke, *Perspectives*, pp. 208-9.

⁵⁹ Physico-theology was also practised in Holland, see Brooke, *Perspectives*, p. 381.

branch of theology “that appeals to evidence for the existence and character of God from sources available to all rational beings”.⁶⁰ Following his definition Fergusson suggests that there are five ways in which natural theology might be done: it will be helpful to examine, expand and modify each of his headings, beyond the scope of Fergusson’s paper, so as to see what lessons might be drawn for the dialogue. Fergusson’s proposals provide the outline of an ordered scheme, but they are certainly not final, and in at least one case, the example chosen may be understood in more than one category.

(a) Deism and reasonable religion

(i) Tindal

In the first of Fergusson’s categories of natural theology, exemplified, he says, in the deist Matthew Tindal (1655-1733), the claims of reason concerning the existence of God and the ordering of the world have priority over and constitute a controlling and purifying function for the claims of revelation. They may therefore be used to correct Scripture. The use of Scripture is thus reinforced, where it can, what may be known in other ways.⁶¹ J. H. Brooke points out that Tindal was interested, not so much in natural science, but in the way in which many Christian claims, like those of the authenticity of accounts of miracles, could be paralleled in the religions of different cultures around the world.⁶² His assertion was that God’s wisdom could be demonstrated from the existence and regularity of natural laws.⁶³ Miracles did not fit into such a pattern. Reports of their occurrence could not be used as evidence for Christianity but rather of widespread credulity. Deism and other non-Trinitarian stances were favoured by other proponents of scientific rationalism and by Tindal’s contemporary, Isaac Newton (1642-1727).

(ii) Newton

Newton saw himself in part at any rate as a theologian. For him the *Principia*, which nowadays is most easily seen as a treatise in mathematical physics and is generally regarded as the foundation work of Enlightenment science, was, thinks Simon Oliver, “an exercise in natural theology and apologetics”.⁶⁴ This is certainly borne out by consideration of the scholium to Book Three where Newton is of the opinion that only God could have placed the fixed stars so far apart from each other

⁶⁰ David Fergusson, ‘Natural Theology after Darwin’, in *Darwinism and Natural Theology, Evolving Perspectives*, ed. by Andrew Robinson (Cambridge: Cambridge Scholars, 2012), pp. 78-95. I am particularly grateful to Professor Fergusson for kindly supplying me with a copy of this lecture, pre-publication.

⁶¹ In this respect, the views of Isaac Newton were not very different. He explains that Moses had given in Scripture a simplified account of the creation suitable for “the vulgar” and proceeds to correct it. See ‘Letter to Mr Thomas Burnet’ in Newton’s *Philosophy of Nature: Selections from his Writings*, edited by H. S. Thayer (New York: Hafner Press, 1953), pp. 60-65.

⁶² Brooke, *Perspectives*, p. 170.

⁶³ Brooke, *Perspectives*, pp. 170 -171.

⁶⁴ Simon Oliver, *Philosophy, God and Motion* (Abingdon: Routledge, 2005), p. 15.

that they did not collide⁶⁵. However, it would be more accurate to take note, as does John Brooke, that what Newton was practising was “natural philosophy” which saw no need to erect boundaries between these departments of knowledge.⁶⁶ For Newton, there was thus no possible enmity between what were later called “science” and religion. His natural philosophy comprised both. However, as theology it was not orthodox. Those of his contemporaries who were clergy kept heterodox, including deist, views to themselves; famously, Newton avoided ordination and in a deathbed gesture against the official theology of the establishment, refused communion.⁶⁷

However, Newton himself had a more complex understanding of the laws of nature than Tindal. He saw that regular laws did not necessarily produce regular motion over extended time; he allowed that the planets might need the occasional corrective nudge from God, who was in any case responsible for their initial movement, to keep them in orbit.⁶⁸

(iii) The mechanical philosophy and deism

Newton had need of the God hypothesis: he was by no means a physicalist, even a methodological one after the manner of Laplace (1749-1827) and other mathematical physicists. Their later and superior mathematical techniques enabled more refined predictive calculation.⁶⁹ Following them it became genuinely possible to understand the physical cosmos, and by extension other fields of empirical study as dealing with closed systems of cause and effect, though belief in the mechanical philosophy had preceded its practical realization in astronomy.⁷⁰ The non-interventionist God of deism now seemed to many the only possible object of a rational faith. Tindal and those in agreement with him seemed ultimately justified, rather than Newton.

Deism, after the manner of Tindal, or something like it, was a popular stance among practitioners of the scientific side of the Enlightenment in Britain like the pioneer geologist William Hutton (1726-1797).⁷¹ For such as him an understanding of the mechanical but providential ordering of the Earth not only superseded the Genesis account, but also provided a demonstration of the existence and purposes of a wise creator. Hutton stressed the purposeful drive towards an Earth appropriate for life, especially human life. As had been the case with Newton, the natural philosopher’s own theology in

⁶⁵ Thayer, *Newton’s Philosophy of Nature*, p. 42.

⁶⁶ Brooke and Cantor, *Reconstructing Nature*, p. 1.

⁶⁷ Richard Westfall, *The Life of Isaac Newton* (Cambridge: Cambridge University Press, 1993), pp. 310-311, see further Diarmaid MacCulloch, *A History of Christianity* (London, Penguin, 2010), pp. 770-804, especially p. 774.

⁶⁸ Cushing, *Philosophical Concepts in Physics*, p. 168-170.

⁶⁹ For Laplace see also Chapter 1 (4) (c) (ii).

⁷⁰ The relationship between astronomical prediction, observation and discovery is complex, see Cushing, *Philosophical Concepts in Physics*, p. 178.

⁷¹ Hutton himself believed that the processes of forming and reforming the Earth were cyclic, without beginning or end. David Goodman and Colin A Russell, *The Rise of Scientific Europe* (Milton Keynes: The Open University Press, 1991), pp. 290-295.

part regulated his theorizing, the same was true of the French *philosophe* Pierre-Louis Maupertuis (1698-1759) who put forward the principle of least action, which was later mathematically formalized by Euler and Lagrange.⁷² For anti-establishment nonconformists in Britain such as Joseph Priestley (1733-1804), Unitarianism, “laying gunpowder grain by grain, under the building of error and superstition”, was an alternative to establishment theology.⁷³ The common feature of these post-Newtonian stances was an understanding of the natural world as governed by divinely instituted laws, which admitted of no irregularities at all, in a strict procession of cause and effect. Inasmuch as deism is a coherent theological stance, its premise is that God is the ultimate other: such a God cannot become incarnate. He is the God of Joseph Addison’s hymn, knowledge of whom can be attained by observation of the ordered motion and splendid appearance of the stars and the planets, in reality silent but nonetheless heard by (human) reason to sing, “the hand that made us is divine”.⁷⁴ According to the contemporary opinion of John Wesley (1703-91), the distinguishing mark of deism was, in addition, its refusal to acknowledge Christ’s atoning work.⁷⁵ In such theology, a transcendent God is a remote monarch, uninvolved in human affairs. He is not likely to send his Son. However, he has not given up power. The God of the deists still judges and punishes.

(iv) The “Orrery”: an icon of the mechanistic world view

However, deism has its aesthetic and rational appeal. The icon, the image binding together the world view of the mechanical philosophers, deists among them, might be the orrery in the eponymous painting by Joseph Wright of Derby (1734 -1797).⁷⁶ It is shown with others by him in the Derby Museum and Art Gallery. In this candle-lit scene painted in 1766, children are gazing down in adoring wonder, not, as in a modern cliché Christmas-card image, at the baby in a manger, but at the rational ordering of the universe. The use of light in this and others of Wright’s paintings could be interpreted as a metaphor for the Enlightenment: the light of reason has superseded the Light of the World. Reason supplants revelation. Yet reason itself can turn into an idol and an ideology. In France, reason led to terror and a republic that had “no need of savants”.

⁷² Cushing, *Philosophical Concepts in Physics*, p. 166. For Newtonianism in France including Maupertuis, see Goodman and Russell, *Scientific Europe*, pp. 267-273.

⁷³ From a sermon of Priestley’s in Jenny Uglow, *The Lunar Men: The Friends who made the Future* (London: Faber and Faber, 2002), p. 408.

⁷⁴ Joseph Addison (1672-1719), ‘The spacious firmament on high’, *Hymns and Psalms* (London: Methodist Publishing House, 1983), no. 339.

⁷⁵ Quoted from John Wesley’s letter to Mary Bishop, 7 February 1778, by Geoffrey Wainwright in article, ‘Wesley, John and Charles’, *Oxford Companion to Christian Thought*, ed. by Adrian Hastings and others (Oxford: Oxford University Press, 2000), p. 750. See also Brooke, *Perspectives*, pp. 189-191.

⁷⁶ For a discussion of this and other senses of “icon” see Rowan Williams, *Lost Icons* (Edinburgh: T&T Clark, 2000), pp. 1-2.

The Orrery



Joseph Wright had connections with “the lunar men”. Children were indeed a familiar presence at their meetings. The circle included Matthew Boulton, James Watt, Josiah Wedgwood, Joseph Priestley and Erasmus Darwin -- grandfather of Charles -- all nonconformists or freethinkers. For background see Uglow, *The Lunar Men*, pp. 122-125. My copy of the painting is in John Hadfield, *The Book of Beauty* (London: Hulton Press, 1952), p. 180). See also Jane Wallis, *Joseph Wright of Derby* (Derby Museum and Art Gallery, 1997), especially pp. 11, 21.

(v) Some modern reactions to monarchical religion

A monarchical God eventually becomes a problem, especially for those who know the weight of a mostly male hierarchy pressing down on them. William Placher thinks that hostility to the God whose transcendence is misrepresented as remoteness is still at the heart of panentheistic, process and other theologies in the modern era, which either eliminate or make optional the Trinity.⁷⁷ Perhaps that is also the case for some expressions of feminism. “Transcendence” is misunderstood as though it were a metaphysical category, rather than an expression of sheer ignorance when an attempt is made to penetrate the otherness of God. Placher sees that misunderstanding as in a number of Enlightenment and postmodern theologies. It makes Placher’s point to say that the phrase “God’s relation to the world is no less intimate than my relation to my own body”,⁷⁸ used much more recently by Philip Clayton to characterize his self-declared panentheist theology, can equally well be uttered by an Augustine, a Thomas Aquinas or a Karl Barth. For Aquinas “Nothing is external to God”⁷⁹, while Barth thinks of the human body as the form of the soul, and the soul as the continuous result of the Spirit’s action in the body. Yet neither speaks of the world as “God’s body” as do Clayton and others including Sallie McFague.

(vi) Beatrice Bruteau

There is an important strand of natural theology which owes at least part of its inspiration to Pierre Teilhard de Chardin.⁸⁰ It attempts to take on science on its own ground. We shall look at one example, that of Beatrice Bruteau. She begins with a quotation from Albert Einstein, “Religion without science is lame.”⁸¹ That implies a question from science, “Can there be a religious expression that takes the language of science into its devotion and theology?” *God’s Ecstasy* (1997)⁸² is well informed, both on the state of physics and cosmology and also on evolutionary and molecular biology as well as the philosophy of such as Daniel Dennett. In particular the author approves at least partially of the non-empirical hypotheses of meme theory. Much has happened in all fields since this work was first published. But the broad outline of her thesis keeps its interest for spirituality within different

⁷⁷ William Placher, *The Domestication of Transcendence: How Modern Thinking about God Went Wrong* (Louisville: Westminster John Knox Press, 1996), pp. 7-10.

⁷⁸ Philip Clayton ‘God and the World’ in *The Cambridge Companion to Postmodern Theology*, ed. by Kevin J. Vanhoozer (Cambridge: Cambridge University Press, 2003), p. 212.

⁷⁹ Augustine, *Confessions*, translator E. B. Pusey, (London: Medici Society, 1930), Bk. III, [VI] 11 p.63. Aquinas is so quoted by Fergus Kerr referring to the *Summa Theologia* 1.11 -- see his *Thomas Aquinas: A Very Short Introduction* (Oxford: Oxford University Press, 2009), p. 43. For Barth on the soul see Chapter 3 (4) (e).

⁸⁰ Teilhard de Chardin, Pierre, *La Place de l’Homme dans la Nature, Le groupe zoologique humain* (Paris : Union Générale d’Editions, 1963). Michael Ruse, “Teilhard de Chardin, Pierre” Ruse and Travis, *Evolution*, pp. 881-883.

⁸¹ According to Elizabeth Knowles (ed.) *Oxford Book of Quotations* (Oxford University Press: Oxford,1999), 299:8, the full quotation is “Science without religion is lame, religion without science is blind”.

⁸² Beatrice Bruteau, *God’s Ecstasy: The Creation of a Self-Creating World*. (New York: Crossroad Classic, 1997).

Christian streams and therefore its importance. She re-describes molecular biology in what she takes to be an anti reductionist manner laying emphasis on systems and networks. She relates it to Trinitarian theology in a way that intends to expand the horizons of contemplatives in the Catholic tradition. However networks and systems are just as physical as the complex molecules that interact to form them. Neither is there any necessary connection between physical complexity and spirituality. She thinks that much in biology has theological relevance. In particular (as I will do) she notes that individual cells and larger units of organization exhibit interpenetrating dynamic life, in a way that illustrates the concept of circumincession (perichoresis) in the immanent Trinity. Such an illustration helps us understand the words we use but it remains that they refer to a being we cannot describe. God in God's self is not an object in this or any world. Human words cannot of themselves delineate the attributes of the divine reality. I shall later explain my contention that they may point parabolically to the ways of God in creation including human life and perhaps to God's own self.

Theology is prior to biology. But her elaborate Trinitarian theology is based on the phenomena of the natural world. She includes cosmology somewhat in the tradition of Teilhard de Chardin. She supposes the existence of many or an infinite number of universes. But that is still a hypothesis that cannot be empirically tested. Our theology ought to be neutral to the speculations of physical science. They are beyond its remit. She understands God as incarnate in the whole of creation. Her exposition is exciting and persuasive especially in its broad scientific vision. She finds Trinitarian theological reasons to support it. Yet, as is often the case in panentheistic theology, Bruteau (like Clayton and others) knows too much about God's interior thoughts and dispositions. Trinitarian theology must learn to live with much more agnosticism. Bruteau advocates a religion that makes wide and integral use of scientific insights. It is indeed a religious expression of natural science. However her portrayal of one who is incarnate in the whole of creation leaves us hungry for a God who shares in and understands our human finitude. Her project could well arise from the misunderstanding of transcendence that Placher points out.

There are many other examples which are important because of their connections with the ecology movement as well as creation spirituality. I simply mention the work of Matthew Fox for instance on the *Original Blessing* and *The Coming of the Cosmic Christ*.⁸³ All those can be counted within the very wide compass of natural theology. The likely failure of such efforts often results from taking the contemporary science as being a recital of permanent facts then making ontological deductions from them. The procedure is thus doubly uncertain.

⁸³ Matthew Fox, *Original Blessing*, (Santa Fe: Bear, 1983) Matthew Fox, *The Coming of the Cosmic Christ* (San Francisco: Harper and Row, 1988).

(vii) Panentheism, deism and ideology

As we have suggested, an outstanding defect of Clayton's panentheism like the different ones of McFague and others, though explicitly couched in metaphorical terms, is that they seem to assume a knowledge of God qua God and God's ways that is simply not available to humans.⁸⁴ Biblical revelation is discounted or devalued. Ideological constructions designed to name and counter perceived defects in the tradition and genuine deformation and injustice in the social fabric and gender relations displace it. Rowan Williams remarks that ideological discourse is deeply concerned with human power relationships. Theological talk of that kind is, he thinks, in danger of lacking in integrity unless it can enter into a dialogue that envisages the possibility of its own transmutation.⁸⁵ That implies that it must move on. It needs to discover that its own concerns can be met, not by a tailor-made ideology or religion, but by engagement with the self-emptying God. That God is the Trinity whose self-disclosure in the incarnation, the cross and the resurrection judges all forms of human power.

Both deism and panentheism are founded in an essentially anthropocentric rationalism. Each in their different ways, they affirm a God in a human image or a humanly conceived one. They make use of categories applicable within the world. Those and some other theologies take as their starting point perceived human intellectual possibilities, perceptions, needs or power relationships. They would have to plead guilty to the charge that religion is a projection of human wishes, qualities or concepts onto the screen of an indifferent cosmos. Ludwig Feuerbach, Karl Marx and Sigmund Freud are among the accusers.⁸⁶ Many authors have followed in the same stream posing questions to religion arising from scientific investigations of the human phenomenon. One of the latest is Jared Diamond who includes religion as one section within a comprehensive theory of the evolutionary origins of human culture. In his case much of the evidence is from surviving hunter-gatherer communities.⁸⁷ Like religion itself, anti-religion is frequently anthropocentric. Contemporary arguments like this one give further point to Barth's well known criticism of religion. It was not however a denial of religion's importance for faith.

viii) Failure of non-Trinitarian anthropologies

A further inadequacy of non-Trinitarian theologies, connected with the above and pointed out by Colin Gunton, is that they make for an intrinsically defective anthropology. He believes that there

⁸⁴ Sallie McFague, *Models of God: Theology for an Ecological, Nuclear Age* (Philadelphia: Fortress Press, 1987).

⁸⁵ Williams, *On Christian Theology*, p. 4.

⁸⁶ Ludwig Andreas Feuerbach (1804-1872), *Essence of Christianity*, second edn. trans. by George Eliot (Mineola N.Y.: Dover, 2008). See Hans-Martin Sass, 'Feuerbach', in *SREP*, p. 276. For Barth's analysis of Feuerbach see Karl Barth, *Protestant Theology in the Nineteenth Century*, new edition, translated by Brian Cozens and John Bowden, (Grand Rapids: Eerdmans, 2002), pp. 520-526.

⁸⁷ Jared Diamond, *The World Until Yesterday* (Penguin: London, 2012), pp. 323-368.

is a tendency to understand the realization of the *imago dei* as being the human capacity for reason so that human physicality both as bodily existence and in its dependence on and contribution to the natural world is downplayed.⁸⁸ He traces this mistake back fifteen hundred years to Boethius but also implicates Augustine and Descartes.⁸⁹ As we shall see below, the concept of “reason” is itself hard to nail down. Gunton’s further point is that God’s own Trinitarian being exemplifies relationship. It must therefore be a property of humanity made in the divine image. A person can only be a person in and through relationship with others.⁹⁰ Solitariness is a characteristic of the Unitarian, God. Such a deity exists in splendid isolation in a way conducive to the mechanical philosophy exemplified by the orrery. If that is how things are, there is no reason why God should be in any other relationship with the world than that of supreme lawgiver. Human beings could also be independent mechanisms, in no way constituted by their relationship to each other.⁹¹ Thus a mistake about God leads to an impoverished doctrine. It cannot lead to a theological anthropology fit for conversation with the natural science concerned with humans. As I shall later underline, the enfleshed Word must be at the core of any attempt to engage with the physicalist understanding of the human person.⁹² The doctrine of the Trinity is prior to such engagement and must provide a framework for it.

(b) Reason

In the second of Fergusson’s categories, natural theology retains a kind of epistemological priority, in that scriptural revelation needs justification from the pre-established truths of reason concerning the existence and attributes of God.

(i) John Locke: reason and revelation

John Locke (1632-1704) is his primary example here. In fact, for Locke, other than tautologies the only universal propositions that can be known with certainty are mathematical ones: the real essence of a triangle can for instance be known. This is not the case for objects in the physical world such as those which natural philosophy studies. Of particular propositions “we have knowledge of our own existence by intuition: of the existence of God by demonstration and of other things by sensation.”⁹³ Locke formally “proves” the existence of God but using premises which are by no means as self-

⁸⁸ Colin Gunton, *The Promise of Trinitarian Theology*, second edn. (Edinburgh: T&T Clark, 1997), pp. 83-117. For pantheism and deism, see p. 203.

⁸⁹ Gunton, *Promise*, p. 92. Boethius (c.480 - c.524).

⁹⁰ Later on in this study, reasons will be given for suggesting that, although the *imago dei* is an essential component of anthropology, the heart of the doctrine lies elsewhere.

⁹¹ Gunton, *Promise*, p. 202.

⁹² John 1:14. See Chapter 5 (4) (b) (i).

⁹³ D. J. O’Connor, *John Locke* (Harmondsworth: Penguin, 1952), p. 182, citing “Essay Concerning Human Understanding” IV.9.2.

evident as he seems to think.⁹⁴ Yet, for Locke, God exists with a certainty second to that of the thinking subject which as for Descartes needs no demonstration.⁹⁵ Scriptural revelation is partially acknowledged, its truth needs to be established as conforming to the prior dictates of reason: the Messiahship of Jesus and the forgiveness of sins fall into this category though the resurrection is “above” reason. It is the reasonableness of Christ’s ethical teaching that makes it acceptable, especially for those with no leisure to follow the arguments which flow from the natural law.⁹⁶ Reason is seen as the innate human capacity for the attainment of knowledge: it is that faculty which distinguishes human persons from animals.

For Locke the ability to reason is a God-given propensity, humanity can, within the limits assigned by the Creator, attain to truths without further reference beyond itself. Locke’s project for the attainment of knowledge is therefore an anthropocentric one, human reason tests and if necessary corrects supposed revelation, whether scriptural or from some other source. Locke was at the beginning of what became the Enlightenment and the modern philosophical agenda. Preoccupied with the justification of putative knowledge, it attempted to seek the routes by which it is acquired. In fact, none of a long succession of epistemologies has produced a satisfactory account of how knowledge becomes available to the knowing subject.⁹⁷

Late modern cognitive and evolutionary psychologies have bypassed the problem of knowledge, calling into question the existence of the knowing subject. This latter is nothing other than a fabrication of human physicality. The theory of knowledge then becomes the detailing of sensory and neurobiological processes. Reason seems to lead to the abolition of reason or at least its restriction to the formulation of empirically justifiable propositions. However, within the stream of physicalist psychology, the philosopher Daniel Dennett does want to save reason, or at any rate to replace it, by a capacity to rank ideas and sensations in order of their importance for human life. He urges the abandonment of “Locke’s Mind-first vision and its replacement by a vision in which *importance itself*, like everything else that we treasure, evolves from nothingness”.⁹⁸ However, the possibility that “reason” could be an evolved product of the “mechanical mind”⁹⁹ is only one of the motives for carefully explaining what we are talking about when we use the word.

⁹⁴ O’Connor, *Locke*, pp. 178-182.

⁹⁵ William Ugali, Article ‘John Locke’ in *The Stanford Encyclopedia of Philosophy* (ed. by Edward N. Zalta) 2010. <<http://plato.stanford.edu/archives/sum2010/entries/locke/>> downloaded 2/12/10.

⁹⁶ Michael Ayers, ‘John Locke’ in *SREP*, Sec. 7, pp. 595ff.

⁹⁷ For the way in which the construction of “space and time”, which includes epistemologies, has been central to the projects of modernity see D. Stephen Long, chapter ‘Radical Orthodoxy’ in *Post Modern Theology*, ed. by Kevin J. Vanhoozer, (Cambridge: Cambridge University Press, 2003), p. 127.

⁹⁸ Daniel C. Dennett, *Darwin’s Dangerous Idea: Evolution and the Meanings of Life* (London: Penguin, 1995), p. 184; this is Dennett’s solution of the “frame problem”. See Chapter 2 (5) (f).

⁹⁹ Tim Crane, , *The Mechanical Mind* (London: Penguin,1995)

(ii) Reason: an ambiguous concept

As we have seen, classical theology often presents reason, even if fallen, as being the way in which humanity most resembles the Creator. However, the view of reasoned arguments and reasonable assumptions changes across different periods of history and from one culture to another. MacIntyre argues that, for instance, what we commonly understand as a person coming to a decision is an alien concept if applied in the Homeric epics.¹⁰⁰ For Homer's characters lack "a coherent psychology of the self".¹⁰¹ Aquinas was an inheritor of the Greek tradition, most especially of Aristotle. Like Aristotle, Aquinas' own concept of reason does include much more than orderly and consistent intellectual discussion. For him, human rationality includes the proper ordering of society and knowing the truth about God.¹⁰² However, there can be important differences of logic, style and content for reasoned discussion even among people who are closely connected by geography, social grouping or intellectual inheritance. MacIntyre mentions five different traditions of rational justification arising from the Enlightenment. Their combined outcome is "liberalism", a liberal tradition that begins to value much more the continuation of the debate rather than the arrival at a conclusion.¹⁰³

According to MacIntyre, what all Western traditions and some others have in common is their acceptance that the laws of Aristotelian logic are a necessary (but not sufficient) criterion for rational discussion. Those would include the principle of non-contradiction.¹⁰⁴ However, MacIntyre may be overstating his case. In the work under discussion he has very little to say about Hegel and, as far as I can trace, nothing about dialectic. We shall see that the style of theological anthropology I am considering makes use of this latter feature of rationality and in particular the concept of *Aufhebung*.¹⁰⁵ Moreover, the principle of non-contradiction does not hold in some branches of mathematics. Quantum theory appears to violate it. This latter applies to the whole of the physical world considered on a small scale.¹⁰⁶ We should conclude from MacIntyre, Hegel and physics, taken together, that "reason" is a multivalent concept. In order to be useful to the conduct of life, reason needs an anchor in the empirical world. Quantum theory does have that. It follows that a reasoned theology, derived from revelation, ought to have consequences in the world. Karl Barth and theology in the same stream understand that

¹⁰⁰ Alasdair MacIntyre, *Whose Justice? Which rationality?* (London: Duckworth, 1988), pp. 12-29.

¹⁰¹ MacIntyre, *Justice*, p. 22.

¹⁰² Thomas Aquinas ST 1a2ae found at <<http://www.newadvent.org/summa/1001.htm#article1>> q. 94 a 2. In addition, at <<http://www.newadvent.org/summa/1094.html>> on 15 June 2012.

¹⁰³ MacIntyre, *Justice*, p. 344.

¹⁰⁴ MacIntyre, *Justice*, p. 4.

¹⁰⁵ See Chapter 3, (2) (b) and (5) (f).

¹⁰⁶ See Chapter 4 (2) (e). See footnote 38

the proper ordering of human life in the empirical world must follow from hearing and obeying the command of God.¹⁰⁷

However, a tradition of natural theology is on shaky ground when it relies on something called “reason” along with the evidence of the physical world to arrive at the existence or attributes of God. Different styles of “reason” may well produce different results. The version of natural theology adopted in some animist or polytheist societies would correspond to their style of reason. They might well argue that different supernatural beings must be responsible for the variety of natural phenomena or contrasting features of the world. Polytheism is just as easily argued for as monotheism.¹⁰⁸ We may conclude, like Karl Barth, that God’s self-revealing action is materially necessary to trigger and accompany the human reasoning process. When that happens in a particular way, our faith arrives at understanding, that is to say at knowledge of such truth as we can for the moment bear. “For now we see as through a glass darkly, but then face to face...”.¹⁰⁹

In Chapter 5, I shall more fully explain my belief that God may use our reasoned, but limited and provisional, understandings of the empirical to point to certain realities of the human condition.¹¹⁰ These realities are accessible to a theology from revelation, but often not sufficiently stressed in theological accounts of humankind.

(c) The clarifying function of natural theology

(i) Truth through natural reason?

David Fergusson’s third category of natural theology takes as an example Thomas Aquinas who, he says, may hold that there are some truths about God which can be attained by natural reason, although they are already known through Scripture. This amounts to saying, Fergusson thinks, that the human mind has the possibility of reasoning from the world to God. However, he points out that this may not be a correct reading of Aquinas. For instance, some think that the latter’s five ways are not an attempt to prove God’s existence. They suggest that Aquinas would not have understood the need for such an operation. They may be rather an accommodation appropriate to human mental capacities. Thus, they point to a God whose own self is unknowable, unless made independently known to faith in the Christian revelation. They are in fact an attempt of faith to understand itself.¹¹¹ Therefore, only faith

¹⁰⁷ For discussions of Barth’s ethics, see Nigel Biggar, *The Hastening that Waits* (Oxford: Clarendon, 1993) and John Webster, *Barth’s Moral Theology: Human Action in Barth’s Thought* (Grand Rapids: Eerdmans, 1998).

¹⁰⁸ Of course, an atheist can argue in a similar way to ridicule Christian belief as I heard Anthony Flew do in a lecture on Pascal’s wager at Birmingham University c.1963.

¹⁰⁹ I Cor. 13:2 (KJV).

¹¹⁰ See Chapter 5 (4). For Barth’s rejection of reason as a possible defining characteristic of humans see Chapter 3 (3) (a).

¹¹¹ Kerr, *Aquinas Introduction*, p. 38. For a summary of various views of Aquinas’ purposes in the *Summa* and a nuanced evaluation of the five ways see: Rudi A. Te Velde, ‘Understanding the Scientia of Faith: Reason and Faith in Aquinas’s *Summa Theologiae*’, in *Contemplating Aquinas: On the Varieties of Interpretation*, ed. by Fergus Kerr

can understand them. For Aquinas revelation has absolute priority over reason. He concludes, for instance, that reason allows us to suppose that the universe is eternal with no beginning. Whether or not it has a beginning, it depends utterly on God for its existence. However, revelation tells us about a beginning of the universe. Therefore, that must be so.¹¹² Scripture, rather than philosophy, thus has the epistemological priority, a not surprising point of view for one whose daily task as Professor of Sacred Scripture was presiding over disputations concerning its exegesis.¹¹³

Natural theology may thus be useful in clarifying the relevance of belief to nature. We need to know the difference our beliefs should make to our understanding of the world. It may thus help to define some of our problems, for instance, those surrounding attempts to set out a theodicy.¹¹⁴ However, in another case, suppose that the first of Aquinas' five ways really is an attempt to demonstrate the existence of an unmoved mover. Such a mover would be responsible both for initiating motion and then by continuing that action causing it to remain in motion. If the action stopped so would the movement. But according to Newton's empirically successful theory, once impelled from rest a body needs no external force (or mover) to remain in motion. Only initiation is needed.¹¹⁵ If that is the case then Aquinas' conclusion from natural theology was wrong. More exactly, a powerful, empirically justified working hypothesis later defeated the conclusion from natural theology derived originally from Aristotle. I am not here trying to offer a detailed interpretation of Aquinas.¹¹⁶ Rather I am re-emphasizing that we cannot argue from theology (or philosophy) to how the empirical world must be.

(ii) The parting of the ways

For Aquinas *scientia* gathered all knowledge under the superior rule of sacred doctrine.¹¹⁷ Newton even in his unorthodox theology found it impossible to imagine a physical universe in which God did not intervene. However, from that time theology and empirical science began to go their separate ways. Laplace (1749-1827) found he had no need of the God hypothesis.¹¹⁸ From the time of

(London: S.C.M., 2003), pp. 55-74. His conclusions are broadly similar to those of Kerr. However, Wippel thinks otherwise - he also points out the Five Ways can only be understood within the broad framework of Aquinas' metaphysical thought (p. 442). Moreover, he argues that in Aquinas' other works "Thomas takes it as given that he has already (in the five ways) proved that God exists." John F. Wippel, *The Metaphysical Thought of Thomas Aquinas: from Finite Being to Uncreated Being* (Washington DC: The Catholic University of America Press, 2000), p. 459.

¹¹² Kerr, *Aquinas Introduction*, pp. 23-24.

¹¹³ Kerr, *Aquinas Introduction*, pp. 20-21.

¹¹⁴ As deployed in, for instance, Christopher Southgate, *The Groaning of Creation. God, Evolution, and the Problem of Evil* (Louisville: Westminster John Knox Press, 2008).

¹¹⁵ Newton's first law: "Every body continues in its state of rest or of uniform motion in a right line unless it is compelled to change that state by forces impressed upon it." See Thayer, *Newton's Philosophy* p. 25, also standard works on dynamics.

¹¹⁶ For exhaustive analysis see Wippel, *Aquinas* pp. 413-431.

¹¹⁷ Te Velde, *Scientia*, p. 68.

¹¹⁸ For Laplace see also Chapter 1 (4) (a) (iii).

Wöhler (1800-82), who in 1828 had synthesized organic urea from inorganic ammonium cyanate, life itself began to be understood, in more and more detail, as a chemical phenomenon. Darwin found it possible to remove the deity from all biological explanation. Such names are placeholders for many participants in philosophical, social and cultural currents from the seventeenth to the twentieth centuries flowing in different ways in Britain, the United States and continental Europe. From the middle of the nineteenth century, the word “science”¹¹⁹ entered the English language in its modern sense. “Scientists” first appear in print in 1840, so described by William Whewell (1794-1866), and begin to establish themselves as independent professionals. Previously those who had leisure to do these things were often clergy. With the development of empirical science, there arose the schism between theology and natural science which was one symptom of the Enlightenment and which has been characteristic of modernity. In fact not only theology was concerned. There was and is a chasm between the natural sciences and the humanities in general as witnessed by the “two cultures” debate of the 1960s. That has twenty first-century echoes and for some, especially in the United States, a theological dimension.¹²⁰

(iii) Theology and physics

However, our chief concern is with twentieth-century attempts at healing the divide by attempting a measure of integration between science and Christian theology. Did these in fact clarify the relationship? We begin this consideration with Thomas Torrance and Wolfhart Pannenberg. We shall confine our brief examination to that aspect of their work without trying to appraise their wider achievements.¹²¹ These two theologians wanted to incorporate scientific accounts of things into expositions of Christian doctrine. Torrance’s was heavily influenced by the theology of Karl Barth and consistent with the historic creeds. Torrance¹²² tries to appropriate the language of physics for theology using such concepts as “field” to characterize the work of the Holy Spirit. He bases this, he says, on the unity of space-time rediscovered by Einstein after Newton’s mistaken attribution of space as the sensorium of God. Polkinghorne criticizes this from the point of view of a physicist: fields do not have the continuity that Torrance supposes. The former gives an elaborate semi-technical description in words of what a physicist understands by the concept of field. It becomes obvious that he believes the concept to be theologically unusable. Cox and Forshaw explain “field”: an array of simple or complex numbers indicating the value of some physical quantity at a particular place in space-time. It is not a

¹¹⁹ “Science”, definition 5b in *OED* online.

¹²⁰ For one American and anti-theological view of the calamitous consequences of all of this, see Lawrence M. Krauss, ‘C. P. Snow in New York’, in *SA*, Sept. 2009, p. 20.

¹²¹ For a positive evaluation of Torrance’s view of science see David Munchin ‘Is theology a science? -- Paul Feyerabend’s anarchic epistemology as a challenge test to T. F. Torrance’s scientific theology’, *Scottish Journal of Theology* Sept 2011, pp. 439 – 455.

¹²² Thomas F. Torrance, *Space Time and Incarnation* (London: Oxford University Press, 1969).

thing in itself. According to Michio Kaku: “a field is a collection of numbers defined at every point in space that completely describes a force at that point”.¹²³ It must also be pointed out that Einstein’s General Relativity is not, as Torrance seems to think, the final physical theory, just the best so far and there are in fact a large number of other candidates.¹²⁴ Torrance goes on to posit a hierarchy of languages in which “theological formulations cannot be without their empirical correlates”.¹²⁵ With uncertain justification, he asserts also the metaphysical significance of Gödel’s theorem in structuring this hierarchy.¹²⁶ It is doubtful if this attempt at the integration of theology with science and, in this case, mathematical logic succeeds. One reason for this is that Torrance gives unequivocal priority to gravitational field theory, not referring, at this point, to the equally empirically successful quantum description of matter-energy with which it is not compatible. The science was (and still is) incomplete.¹²⁷ Some light is thrown on this in a paper published by Torrance a year later.¹²⁸ He suggests that geometry can no longer be pursued as an abstract science prior to physics but is now a central component of the interpretation of nature.¹²⁹ In the same way, he thinks, natural theology cannot be pursued in the abstract but must be integrated into theology proper. It is to be carried out in the light of the genuine revealed knowledge of God with which it is now integrated and which will make it intelligible. Torrance cites a conversation with Barth himself in support of these theses. However, Barth’s pragmatic or instrumentalist (possibly fallibilist) view of natural science as the work of observing and setting in order of natural phenomena rather than engaging with the noumenal casts doubt on this interpretation.¹³⁰ In any case, Torrance’s attempt to characterize theology at least partly in terms of physics moves far away from his starting point of revelation.

Torrance does not have a great deal to say about biological science though he does assert that there is resemblance between the logic of inquiry in biology and that of theology. Thus, he thinks

¹²³ John Polkinghorne, *Reason and Reality: The relationship between science and theology* (London: S.P.C.K., 1991), p. 93. Cox & Forshaw, *Quantum Universe*, p. 40. Michio Kaku, *Hyperspace* (Oxford: Oxford University Press, 1994), p. 25.

¹²⁴ Randall, *Warped Passages*, pp. 1-63 and 334-433.

¹²⁵ Torrance, *Space, Time and Incarnation*, p. 89.

¹²⁶ According to Gödel who showed that no axiomatic system rich enough to include arithmetic can be proved to be both complete and consistent. Stephan Körner, *The Philosophy of Mathematics* (London: Hutchinson, 1968), pp. 72-97.

¹²⁷ For an experiment hoping to throw more light on realities beyond those delineated by quantum mechanics and general relativity, see Michael Moyer, ‘Is Space Digital?’ *SA*, Feb. 2012, pp. 20-27. See also Lee Smolin, ‘Atoms of Space and Time’, *SA*, Jan. 2004, pp. 56-65

¹²⁸ Thomas F. Torrance, ‘Natural Theology in the Thought of Karl Barth’ *Religious Studies* 1970, volume 6, pp. 121-135.

¹²⁹ Thomas F. Torrance, *Karl Barth Biblical and Evangelical Theologian* (Edinburgh: T&T Clark, 1990), p. 148, but it simply does not work to bring geometry into theology, even by way of analogy. Barth himself abandoned the attempt. See Herbert Hartwell, *The Theology of Karl Barth: an Introduction* (London: Duckworth, 1964), p. 11, cf. Karl Barth, *The Humanity of God*, translated by John Newton Thomas and Thomas Wieser (Louisville, KY: John Knox Press, 1960), p. 42.

¹³⁰ Barth’s attitude to science will be considered in more detail in Chapter 4.

that we cannot reduce the objective knowledge of an organism to objective knowledge of its components. In the same way, we cannot pursue theological research with analytical methods like those of physics for “the Truth of God in its wholeness and uniqueness” cannot be perceived in this way.¹³¹ This is surely the case as regards theology, but it hardly needs the misplaced analogy with the relationship between biology and physics to make the point. Torrance is arguing that we cannot derive statements about an organism from statements about its components. No doubt in the case of complex assemblies of interactive components such as organisms, it is difficult and perhaps most often impossible in practice to proceed from the part to the whole; but there must be causal links between the one and the other. Sometimes there may be a feedback from the whole to one or more of the parts. This does add to the difficulties of making predictions based on components, however difficult, this does not amount to an ontological impossibility or a different kind of logic, as Torrance seems to suggest.¹³² The grounds for the analogy are therefore weak.

Torrance suggests that there is no generalized scientific method. Here he is in tune with more recent philosophy of science.¹³³ He thinks that what qualifies an area of study as a science is that it deploys rigorous methods appropriate to, and dictated by, its subject matter. Theology passes this test for admission to the academy. However, he points out that academic rigour is not enough. We are studying the Word. The Word questions us concerning Truth. Torrance is right about theology. Perhaps, however, discussion about whether or not or in what sense it is a science is a side issue. It is an argument concerning words rather than what they are about. Importing physics, or any other science, cannot change the nature of a theology that refers to and derives from a transcendent reality. That reality is beyond the empirical. Certainly, revelation might happen through Torrance’s “time and space structures of the universe”, but also, and according to Barth, “God may speak to us through Russian Communism, a flute concerto, a blossoming shrub, or a dead dog.” and “We do well to listen to him if he really does.”¹³⁴

Like Torrance, Pannenberg wants to use the physical concept of “field”. In his *Systematic Theology* (1994) he argues, in a paragraph entitled “Space and Time as Aspects of the Spirit’s Working”, that the concept of field is a metaphysical one, coming “by way of the Stoics to pre Socratic

¹³¹ Torrance, *Theological Science*, p. 301.

¹³² See arguments in this chapter at 1 (4) (e). It has also been argued, based on the multiple realization of concepts, such as for instance that of “cell” in complex organisms, that the vocabulary of cell biology does not map onto that of physics. Such arguments seem to be based purely on semantic considerations rather than physical ones. See Samir Okasha, *Philosophy of Science: A Very Short Introduction* (Oxford: Oxford University Press, 2002), p. 57.

¹³³ See Chalmers, *What is this thing called Science?* Chalmers mainly deals with physics and chemistry -- but there is no reason not to apply this general conclusion to biology and other sciences as well. I consider Darwinian biology as history in Chapter 3 of this present dissertation.

¹³⁴ CD I(1) p. 55. I shall discuss theology as a science at Chapter 4 (3) (g).

philosophy".¹³⁵ However, whatever early philosophers may have thought, in the context of empirical physics, as we have just seen, the term "field" refers to a calculating device. Therefore, Pannenberg is wrong here. His conflation of metaphysics with physics is a surprising confusion of categories. Physicists as experimental and calculating scientists do not deal in metaphysics. Hume's injunction to burn all books of metaphysics may be too sweeping. But natural science only makes progress when it is in a position to weigh and measure and to describe carefully what it observes.¹³⁶ Speculation is in order: it should point to future empirical investigation. While we intend metaphysical language to be about the way things or processes are in themselves, the propositions of natural science are about how things appear to be after empirical investigation. More exactly, as we have seen, they are working hypotheses.¹³⁷

In *The Oxford Handbook of Religion and Science* (2006), Pannenberg again takes up Torrance's use of the physical concept of field pointing out that "field effects can be superimposed on one another" so that there is no contradiction in supposing that "God's Spirit permeates all natural forces".¹³⁸ This is evidently subject to similar criticism to that above.¹³⁹ It is a confusion of the precise and generalized language of physics with language about the unique activity of the Trinity. Barth might have made a similar point. Further, if Pannenberg means that God subtly and undetectably influences natural processes this is a discussable hypothesis that is not in any way made more or less plausible by talk of fields. It might indeed be the case that God influences natural processes, but if the influence is undetectable no empirical truth claim can proceed. If we think the claim arguable, it must be for reasons other than those of physics, presumably on *a priori* theological grounds.¹⁴⁰

I do not attempt here a comprehensive appraisal of the wider positions and achievements of either of these theologians. However, on the above evidence neither Torrance nor Pannenberg are able to fulfil their intention of appropriating scientific language or concepts for the body of Christian theology. The overall strategy of maintaining the claims of Christian theology while critically making use of scientific findings is right: and for this reason their work might well have been considered under Section five of Fergusson's classification. These failures to integrate the two are both heroic and instructive, demonstrating, as they do, the gulf in purpose, tactics, strategy and language between natural science and theology, even as human endeavours. The confusion of categories of physics with

¹³⁵ Wolfhart Pannenberg, *Systematic Theology* (three volumes), trans. by Geoffrey W. Bromiley (Edinburgh: T&T Clark, 1994), volume 2, pp. 79-84. See the discussion earlier on in this section.

¹³⁶ Hume, *Enquiry*, p. 149 [Section XII part III]. For Barth, for instance, the only proper metaphysics is that which deals with the way that God relates to the world in Jesus Christ. This is thus not a scheme or a system. See Hunsinger, *How to Read Karl Barth*, p. 237.

¹³⁷ See Chapter 1 (2) (g).

¹³⁸ Wolfhart Pannenberg, 'Contributions from Systematic Theology', *Oxford Handbook of Religion and Science*, edited by Philip Clayton and Zachary Simpson (Oxford: Oxford University Press, 2006), p. 369.

¹³⁹ Polkinghorne, *Reason and Reality*, p. 93.

¹⁴⁰ See the discussion of miracles at Chapter 4 (3) (c).

those of theology means that their attempts to clarify the latter are not successful. They cannot contribute in the way hoped for to a discussion about the scientific understanding of the human person and its relationship to theological anthropology.

A different attempt to bring together physics and theology is that of Lee Wyatt and Jim Neidhardt.¹⁴¹ They think that although theology and natural science are asking very different questions they can both be understood as “faith seeking understanding”, in the one case as pointed out by Karl Barth and in the other by Michael Polanyi. Unlike Barth, they think that this ensures that there is an epistemological congruence between the two activities. Both, inspired by the Spirit, proceed from data, scriptural in the one case, empirical in the other, to conclusions. In the first case, the Word provides the data to the believer in self-involving fashion. In the second case, a contingent intelligibility, inherent in the physical world, indwells the believer. Revelation, following Torrance, supplies word intelligibility while mathematics, corresponding to a structure of the human mind, provides number intelligibility. There is a particular and disputed philosophical view of the nature of mathematics also a failure to connect with large swathes of the biological and other natural sciences for which mathematics is an occasional helpful tool rather than a structural feature of the discipline.¹⁴² This view suggests that natural science discloses realities underlying the empirical world. As we have seen, it is unsustainable. I am not competent to offer any opinion about the merits of different understandings of the foundations of mathematics, but any theology that has to decide between them joins a dispute that has nothing at all to do with its proper subject matter. Many have pointed out the surprising way in which mathematics illuminates features of the physical but as we have already noticed, it is no sure guide to how things are in themselves. Even the most fruitful, mathematically based theories, like the non-mathematical ones of biology, are provisional working hypotheses.

Another attempt to unify theology with the natural sciences, again principally physics, in a single *scientia* is that of John Polkinghorne.¹⁴³ From the perspective of an expert in the field of quantum mechanics with a second vocation as a theologian he argues that both science and theology may justifiably make claim to a programme of “critical realism.” This is a term that has been used in a great variety of ways.¹⁴⁴ In his case, it sets out a strategy that he believes is common to the study of both science and theology:

¹⁴¹ Lee Wyatt and Jim Neidhart, ‘Judeo-Christian Theology and Natural Science: an Agenda for Future Research’, *Perspectives on Science and Christian Faith* 43 (March 1991), found at <<http://www.asa3.org/ASA/PSCF/1991/PSCF3-91Wyatt.html>> downloaded 17/02/2012.

¹⁴² Torrance seems to have adopted the second of these, following Kant.

¹⁴³ Polkinghorne, *Reason and Reality*.

¹⁴⁴ See Andreas Losch, ‘On the Origins of Critical Realism’, *Theology and Science*, Feb. 2009, pp. 85-100. He offers a careful genealogical analysis of various stances going by that name. He discovers five types including three

“Each demands commitment to a corrigible point of view as a necessary starting point in the search for truth. Each has to be open to the way things are and each must conform its mode of inquiry to the nature of the reality it encounters.”¹⁴⁵

In his view, therefore, scientific theories and religious doctrines are always provisional but in both cases the object under study has its own independent reality. That is right. However, the corrigibility in each case is different in kind. Corrigibility by the observation of empirical phenomena is one thing. Corrigibility by attention to the divine self-disclosure in revelation is quite a different thing. Only their repetition by others will give credibility to a scientist's observations. There must be a way of controlling the surrounding circumstances so that there can be consistency. For revelation, nothing can be under the control of the recipient. There is no guarantee of reception. It is pure gift. Only the “self bestowing” giver commands it.¹⁴⁶ Polkinghorne holds that the entities studied by science have their own reality, even though not sensed directly by the observer. Further, he thinks that our metaphors, models and the theories about them are our best attempts to characterize that reality and that the same applies to theology. This is borne out by remarks in his own semi-popular short work on quantum mechanics: “It is *intelligibility* rather than objectivity that is the clue to reality”.¹⁴⁷ This might work as a possible description of an aim of scientific activity. It is not necessarily achieved or achievable. However, this proposal does not seem right for theology. The mathematical and natural languages appropriate to physical things are inappropriate for the description of an entity which has no physical qualities whatsoever, a subject who is never object.¹⁴⁸ In fact, as Polkinghorne himself points out, we already stretch words and symbols beyond their limits by quantum theory, and theology is likely to be at least as hard to capture. Indeed, human concepts and words will not, in themselves, be enough. Polkinghorne seems to want to find a way of seeing scientific findings as expressing the same kind of truth as theology about how things are in themselves. His intention seems to be to assimilate the findings of science to the truth disclosed in revelation.

Yet, as human enterprises, what natural science and theology have in common is that they have to find ways of living with an unavoidable ignorance of how things are in themselves. However, they are not commensurable: the subject matter of the one is the created world, the empirical world, insofar as humans can know it. The subject matter of the other is the one who can never be object and

subtypes, none of which corresponds to that of Bruce McCormack in *Karl Barth's Critically Realistic Dialectical Theology: Its Genesis and Development 1909-1936* (Oxford: Oxford University Press, 1995), p. 67

¹⁴⁵ Polkinghorne, *Reason and Reality*, p. 1.

¹⁴⁶ Webster, *Barth's Moral Theology*, p. 9.

¹⁴⁷ John Polkinghorne, *Quantum Theory: A Very Short Introduction* (Oxford: Oxford University Press, 2002), p. 86

This is an entirely secular work.

¹⁴⁸ For “a subject who is never object” see James A. Brown, *Subject and Object in Modern Theology* (London: S.C.M., 1955), pp. 140 -167, and references to *CD* there cited. For more on the intelligibility or otherwise of scientific findings see Chapter 4(2) (e).

is therefore beyond knowledge unless there is self-disclosure.¹⁴⁹ The hope that the two inquiries can become one is illusory. We do however learn an important lesson as we attempt to bring together physics and theology: in both disciplines, the subject matter eludes our best human effort to grasp it at the most fundamental level.

(iv) Simon Oliver - a new scientia?

A quite different attempt to bring to light a new *scientia* (or rather the old one reprinted) is that of the theological sensibility known as Radical Orthodoxy. This refuses to recognize any independence of natural science from theology, referring to a doctrine of “participation” originating in Plato so that “every discipline must be framed by a theological perspective”.¹⁵⁰ This clearly follows in the tradition of Aquinas referred to above. It implies a radical questioning of all aspects of the way in which the world of modernity functions including science. It will not be content with the empirical, for being is always transcended: “all there is only is because it is more than it is.”¹⁵¹ Simon Oliver’s *Philosophy, God and Motion* is a step towards the realization of this programme. He traces the development of concepts of motion from Plato through Aristotle, Aquinas and Newton. It is this use of the concept of motion in different intellectual contexts that draws together the various components of *scientia* including natural science. Newton’s false move, made necessary by his non-Trinitarian theology (i.e. excluding relationality) was the concept of space as being the *sensorium* of God so that absolute space takes on the role of Christ “eternally begotten of God”.¹⁵² God is the efficient cause of motion but himself remains unmoved. Newton’s mistake has in some way, thinks Oliver, been reversed by quantum physics, he speaks of “a collapse of the mechanistic view of the universe”: this has opened a perspective of interpenetrating ontological realms so that a genuine *scientia* becomes viable in which the idea of motion plays a key role.¹⁵³ Oliver’s thesis deserves respect as an intellectual *tour de force*. However, inasmuch as he predicates his thesis on the notion that mechanism has disappeared, from natural science, it must fail because that is far from being the case.

¹⁴⁹ For a pre-Jüngel careful exposition of this in relation to the work of Kierkegaard, Buber and Barth with reference also to Heidegger, Tillich and Bultmann, see Brown, *Subject and Object*, especially pp. 140-211. For further development see Eberhard Jüngel, *God’s Being Is in Becoming: The Trinitarian Being of God in the Theology of Karl Barth*, second English edn, translated by John Webster (Edinburgh: T&T Clark, 2001).

¹⁵⁰ Preface to *Radical Orthodoxy*, edited by John Milbank, Catherine Pickstock and Graham Ward (London: Routledge, 1999), p. 3.

¹⁵¹ Milbank and others, *Radical Orthodoxy*, p. 4.

¹⁵² Oliver, *Philosophy, God and Motion*, p. 189; this false move was, as we saw, noted by Torrance. See Chapter 1 (4) (c).

¹⁵³ Oliver, *Philosophy, God and Motion*, p. 190.

It is true that, in real situations, even Newtonian mechanics leads to long-term unpredictability which however has nothing to do with quantum theory.¹⁵⁴ Although quantum mechanics, with its corollary of Heisenberg's uncertainty principle, is indispensable for understanding the behaviour of matter--energy on the small scale, on the engineering scale it does not enter into practical calculations: large swathes of physics and chemistry manage without it.¹⁵⁵ There is also an important but not always appreciated distinction between determinism and predictability. Well-understood physical laws that can neglect quantum mechanics completely determine the gross motions of the planets and other large bodies. In that sense, we can describe their behaviour mechanistically. However, because each one interacts with every other one, according to those laws, predicting the path of a given body over a sufficiently long time will be difficult and finally impossible.¹⁵⁶ The mechanism is determined but the result is in the end unpredictable.¹⁵⁷ Even though the behaviour of living organisms may be unpredictable, this does not prevent them from following fully deterministic laws. Biochemistry and molecular biology routinely characterize the behaviour of the constituents of living cells in terms of mechanism, refined, ingenious and complex, but still mechanism.¹⁵⁸ On the face of it, mechanism has reappeared in cognitive science and is gaining ground in better understanding of neurobiology.¹⁵⁹ Mind as mechanism is of central importance to the understanding of the human person in what still is modernity. Its programmes continue unabated. We will look at it again in more detail.¹⁶⁰ Clearly, we cannot yet declare mechanism extinct as a scientific category. It follows from all the above that a proposed *scientia* must be very cautious in its evaluations of natural science.

A comprehensive *scientia*, corresponding, as we shall see, to what Barth calls a "cosmology", must be in any case a problematical enterprise. It is rejected both by him and by Kant.¹⁶¹ I

¹⁵⁴ Cushing, *Philosophical Concepts in Physics*, pp. 164-179. In certain situations, Newtonian mechanics has to be corrected via Einsteinian General Relativity.

¹⁵⁵ "Moreover quantum mechanics is also deterministic on the large scale, because, here again, present system state uniquely determines past and future state." From Joseph Ford, 'What is chaos and why should we be mindful of it?' in *The New Physics*, ed. Paul Davies (Cambridge: The Cambridge University Press, 1989), p. 348.

¹⁵⁶ Hence chaos theory: see among many examples James Gleick, *Chaos* (London: Heinemann, 1988).

¹⁵⁷ "...a simple and perfectly deterministic equation can produce behaviour that is random to the point of unpredictability." Polkinghorne, *Reason and Reality*, p. 36.

¹⁵⁸ See, among many, many instances one paragraph heading in a recent undergraduate text: "Many proteins are molecular machines". William H. Elliott and Daphne C. Elliott, *Biochemistry and Molecular Biology*, 4th edition (Oxford: Oxford University Press, 2009), p. 9. There are a number of references to "mechanism" throughout and a key phrase on the same page is "Life is self assembling due to molecular recognition by proteins". For criticism of the notion that a certain level of mechanistic complexity might confer a spiritual capacity, see Chapter 1 (4) (e) (i).

¹⁵⁹ For instance in the introduction to one undergraduate text, there is the following programmatic statement: "Mind and hence the basis of intelligent action in the world is viewed in terms of computations or information processes": David W. Green and others, *Cognitive Science: An Introduction* (Oxford: Blackwell, 1996-1998), p. 5. For a philosophical point of view see Crane, *Mechanical Mind* (London: Penguin, 1995), especially pp. 83-162.

¹⁶⁰ See Chapter 2 (5), (d), (e), (h), (i).

¹⁶¹ For Kant's reasons, connected with his antinomies, see Stephan Körner, *Kant* (Harmondsworth: Penguin, 1955), pp. 113-118 with references to Kant there cited. For Barth's rejection of all embracing cosmologies, see Chapter 4 (2) (b) and (c).

have previously argued that the propositions of natural science, no matter how well supported, are not truths but working hypotheses.¹⁶² Following what we have earlier said about reason it is clear that we cannot expect it to deliver final answers.¹⁶³ If these things are the case, there can be no prospect of attaining a comprehensive understanding even of the created world. The divine knowledge of all created things must indeed be a unity but this does not mean that human understanding can arrive at even a faint outline of how things are in themselves. Truth is from revelation that is not propositional but the result of the Word made flesh acting in the world and on us within our finitude. From it, we learn only what we need to know in the here and now, that is to say saving truth. For its fullness, we await the eschaton.

(v) The place of religious experience: Nancey Murphy

There have many other attempts to bring about a rapprochement between the thinking of natural science and religion, a number of these relate to religious experience: one example (within a work of much wider scope) is that of Nancey Murphy.¹⁶⁴ She examines in particular the evidential status of the reports by mystics in the Catholic tradition. Briefly, her argument is that there can be criticism of reports on the one hand, because of their inward nature that precludes empirical verification (or indeed falsification). On the other hand, their attempted justification uses a circular argument when it claims that a subject can justifiably recognize the true origin of the sense impression in question. This may be because the experience is supposedly self-authenticating or it may enable the subject to credibly witness to the truth in a changed life. However, in neither case is there an independent criterion of truth. She argues that similar criticism may equally be levelled at the empirical judgements of natural science. The criteria for admitting evidence is provided by the evidence itself or from beyond it, thus leading either to circularity or to an infinite regress. She then argues that cast-iron guarantees are impossible for both scientific theories and religious doctrines. Their justification is by networks of mutually consistent evidential statements as well as the judgements made on them by a discerning community, scientific or churchly.¹⁶⁵ We need more, however, than the demonstration of a formal similarity between two very different enterprises. Murphy has captured a likeness between the truth-seeking operations of natural science and of the theology of experience. In an environment in which Enlightenment foundationalism has been discounted, she expresses the provisionality of both. What she has not done in this chapter is to indicate the entirely different kinds of the truth they are intending to seek. On the one hand, there is that truth which can only be approached empirically through the

¹⁶² See Chapter 1 (2) (g).

¹⁶³ See Chapter 1 (4) (b) (ii). For reason see Chapter 1 (4) (b) (ii).

¹⁶⁴ Chapter, 'Theology and Postmodern Philosophy of Science' in Nancey Murphy, *Anglo-American Post Modernity: Philosophical Perspectives on Science, Religion and Ethics* (Boulder, CO: Westview, 1997), pp. 155-171.

¹⁶⁵ Murphy, 'Anglo-American Post Modernity', p. 167.

phenomena of the physical world. On the other hand is that which depends on the self-disclosure of the living God and which consequently is not under human control. This latter and its relation to the human activity of natural science is the subject of our argument in this dissertation.

(vi) Rowan Williams: what is needed

All theorizing is subject to the limitations of human reason. All sciences are human ones, even in their most spectacular success. They struggle, not always successfully, to free themselves from ideological taint and the distorting effects of the market economy. Some perceptive remarks of Rowan Williams are relevant:

Theology should be equipping us for the recognition of and the response to the parabolic in the world -- all that resists the control of capital and administration and hints at or struggles to a true sharing of human understanding, in art, science and politics.¹⁶⁶

I shall explore further Williams' suggestion when we consider "secular parables of the truth".¹⁶⁷

Our discussion in this section may seem to have moved us some way from the starting point that was to consider the clarifying function of natural theology. Nevertheless, there is a connecting thread in that authors, each in their own way, are trying to justify what was for Aquinas the foundational assumption of the unity of knowledge. Their failure is not surprising. Their efforts flow from a belief that this unity of knowledge must be accessible to human rationalities. Yet skill in the manipulation even of the empirical world far exceeds the human ability to understand it. We shall now see if there are other ways in which natural theology can achieve the success it hopes for.

(d) Natural theology as apologetics

(i) The argument from design and its successors

A fourth possible function of natural theology, according to Fergusson, is the apologetic one of countering the arguments advanced against the Christian faith. A historical example of this is the argument from design that in the modified and more sophisticated form of the anthropic argument is still current. William Paley (1743-1805)¹⁶⁸ fully stated the classic argument. Others developed it. For them only the existence of a designer God could explain the many exquisite contrivances, which sustained life including that of the human race. The argument was extremely convincing in its time and for long afterwards. It was inconceivable that that the eye, for instance, could be the product of

¹⁶⁶ Williams, *On Christian Theology*, p. 42.

¹⁶⁷ See Chapter 5 (2) (f).

¹⁶⁸ Brooke, *Perspectives*, pp. 192-193, referring to William Paley, *Natural theology, or, Evidences of the existence and attributes of the deity collected from the appearances of nature*.

anything but the most intricate forethought. Darwin began the demolition of such arguments by planting the powerful working hypothesis of natural selection. It was many years in taking root and was perhaps only completed in the popular mind by such as Dennett and Dawkins.¹⁶⁹ However, Darwin's understanding of natural selection did not in any case make Christian belief impossible for many of his contemporaries. It was still possible to envisage, as Charles Kingsley,¹⁷⁰ Frederick Temple and others did, a God who was ingenious enough to design a system that ensured that living things would create themselves. "He did not make the things, we may say; no, but He made them make themselves":¹⁷¹ such an argument was entirely consistent with the empirical evidence.¹⁷²

Writers often advance that argument. It favours the remote God of deism, who starts the mechanism and leaves it to function according to laws he provides. Such considerations lead on to the anthropic principle. In its weaker form it points out that there are a number of physical constants, whose values are not determined by known physical laws which have to be, within very narrow ("fine tuned") limits, as they are. Otherwise there can be no life in the universe or, more strongly, no universe.¹⁷³ From one point of view, there is no surprise. They are simply a necessary condition of our situation as observers. There are no further implications. Others see this as an opportunity for an improved version of the argument from design. They point to the existence of a creator God who has so arranged matters that humanity and its history can enter on the stage of the universe. Such arguments might have an apologetic value. Stating and acknowledging these points, George Coyne suggests that, in whatever way we take them, examples of "fine tuning" provide matter for reflection at the interface between science and theology.¹⁷⁴ We shall see that McGrath's arguments, now to be considered, make use of similar material. He does not attempt a formal proof of the existence of God but to characterize a relationship, or rather a selection of relationships he calls "resonance" between certain aspects of science and theology.¹⁷⁵

(ii) McGrath

Alister McGrath, like Pannenberg, acknowledges his teacher Torrance, but follows in a rather different direction in *A Fine-tuned Universe*. As with previous authors, I intend to appraise

¹⁶⁹ e.g. Richard Dawkins, *River out of Eden* (London: Weidenfeld & Nicolson, 1995), pp. 76-84.

¹⁷⁰ Brooke, *Perspectives*, pp. 293-4.

¹⁷¹ Frederick Temple, *Apparent Conflict between Religion and the Doctrine of Evolution*, Bampton Lectures, 1884, Lecture IV. Found at <<http://anglicanhistory.org/england/ftemple/bampton/04.html>> accessed 09/02/2012. Temple was then the Bishop of Exeter and subsequently became Archbishop of Canterbury.

¹⁷² Brooke, *Perspectives*, pp. 293-4.

¹⁷³ These remarks follow Coyne's explanations: George V. Coyne, 'Some Theological Reflections on the Anthropic Principle', in *The Anthropic Principle*, ed. by F. Bertola and U. Curi (Cambridge: Cambridge University Press, 1993), pp. 161-162.

¹⁷⁴ Coyne, 'Theological Reflections on the Anthropic Principle', p. 162.

¹⁷⁵ Alister E. McGrath, *A Fine-Tuned Universe: The Quest for God in Science and Theology* (Louisville: Westminster John Knox Press, 2009).

particular arguments rather than a total body of work.¹⁷⁶ We can think of McGrath's enterprise here as one of apologetics. It makes extensive use of arguments, anthropic in style, though intended to illuminate and inform rather than necessarily persuading the reader to convert from atheistic to a theistic position. However, I might also have placed the work in Fergusson's fifth category since its premise is that revelation and empirical science can coexist positively. McGrath explains that the argument from design has long been abandoned. In this more recent version, there is an assumption of a primary Christian theology given by revelation alongside an account of the natural world as disclosed by science. The scientific account, though independently arrived at, is coherent with the revelatory one. The intention of such theology is, in part, to counter the atheist rhetoric of Richard Dawkins, Daniel Dennett and the like. McGrath says that his aim is to re-establish natural theology. He thinks that Karl Barth saw it as "an autonomous form of theology detached from the Christian tradition".¹⁷⁷ McGrath proposes a natural theology in which tradition itself provides a way of approaching nature. However, Barth's more fundamental objection to natural theology is that it consciously proceeds precisely in the wrong direction. It travels from the creation to the Creator rather than finding its origin in God's self-revelation in Jesus Christ. The danger in the theology McGrath advocates is that it sees things from the human point of view. It becomes radically anthropocentric. When it identifies itself with a particular culture, it can even become demonic. Because of that, Barth saw a straight line between turn-of-the-century German cultural Christianity and National Socialism. Nonetheless, although Barth only fully develops it in relation to the human person, there should still be room for a Christocentric theology. The physical creation, that is to say, "nature", would be the subject matter. However, it would put aside the temptation to construct a panentheistic God in its image or to lapse into deism. McGrath intends to develop such a Christocentric theology. The aim is right but the methodology unsatisfactory. I shall explain why I think that is so.

According to McGrath, "nature" is not in fact a determinate concept: we are entitled to interpret it from our own standpoint, which in his case is the Trinitarian Christian faith. The purpose of natural theology, as he sees it, is not to deduce the existence of God or the content of revelation from nature; rather to see natural science as a kind of partner in a theological enterprise, that of "engaging and interpreting nature on the basis of the fundamental beliefs of the Christian tradition."¹⁷⁸ Such a perspective is, as McGrath points out, already theory laden, but in that way, he thinks, it is similar to the natural scientist's own way of approaching the data. Certainly, it is an inevitable feature of scientific

¹⁷⁶ For McGrath's own summary of his theological project in relation to science, see Alister E. McGrath, *The Science of God* (London, T&T Clark, 2004).

¹⁷⁷ McGrath, *Fine-tuned Universe*, p. 27.

¹⁷⁸ McGrath, *Fine-Tuned Universe*, p. 20.

work that there is always a principle of selection at work whereby attention focuses on a particular problem or facet of the physical world and then on data supposed to be relevant to its solution.

However, prior to that, the question asked of nature itself presupposes a given world view. Agassi points out that we select questions within given metaphysical frameworks.¹⁷⁹ We then handle the data in a way we think appropriate according to the initial theory and other relevant ones. This is a complex area of discussion in natural science. Many factors need considering.¹⁸⁰ However, as Agassi goes on to suggest, the point of the scientific question is that the answer may change our view of the world. In contrast to this McGrath's programme involves selecting aspects of science that make congenial theological points. Later we shall look more closely at some of them. McGrath is keen to point out that this is not a way of proving the existence of God. He wants to underline the qualities of a creator God whose existence we apprehend in quite a different way. However, there is always a possibility that we have loaded the questions. A different selection would (to use McGrath's terminology) resonate differently. At worst, it might produce a fatal disharmony with the theological project. There are therefore problems with this approach.

Famously, Darwin saw no goodness, or at any rate, no reflection of possible divine goodness in the behaviour of the ichneumon fly.¹⁸¹ Dawkins relishes such natural history. He uses it to counter any view of a benevolent Creator. Nature, Dawkins says, is not kind nor cruel, but indifferent. Moreover, he can find plenty of evidence. Any "resonance" we have spoken of between theology and observation of this kind, not only falls short of proving the existence of God, it fails to confirm that the "fundamental themes of the Christian faith offer the best explanation of what is seen".¹⁸²

Yet, following in the Platonic tradition, McGrath links goodness, truth and beauty.¹⁸³ He evidently hopes to discover them in the phenomena brought to light by natural science. His argument is that they will be in harmony with the qualities of God made known through revelation. However, in the Platonic tradition goodness itself is wider than what we should now call "the ethical". It includes practical efficiency and fitness for purpose.¹⁸⁴ In the Darwinian tradition features of a given organism are, metaphorically, "fit for purpose" if they favour survival and continuation of the gene line. We might multiply examples, like the above, of nature's "fitness for purpose" as repulsive to human ethical

¹⁷⁹ Agassi, *Science in Flux*, p. 244.

¹⁸⁰ See Section 2 in the first part of this chapter. For science as "theory laden", see George Couvalis, *The Philosophy of Science: Science and Objectivity*, pp. 11-35.

¹⁸¹ "I cannot persuade myself that a beneficent and omnipotent God would have designedly created the *Ichneumonidae* with the express intention of their feeding within the living bodies of Caterpillars", Charles Darwin in a letter to Asa Gray in 1860, quoted by Richard Dawkins, *A Devil's Chaplain* (London: Orion Books, 2004), p. 10-11. See also other remarks and quotations on those two pages.

¹⁸² McGrath, *Fine-Tuned Universe*, p. 47.

¹⁸³ McGrath, *Fine-Tuned Universe*, p. 31.

¹⁸⁴ Plato, *Republic*, trans. with intro. by Robin Waterfield (Oxford: Oxford University Press, 1998). See page Iv referring to p. 203: 484c-d, p. 224: 500d, p. 246-7: 519a-e. The knowledge of the good is what philosophers require for ruling.

sensibility. They pose no problem to fundamentalist Darwinism or to Plato. They certainly pose a problem for Christian theology which McGrath, like other theologians, fails to solve although he does in fact recognize the shadow side, or rather “the shadowy side” of nature.¹⁸⁵ Nevertheless, if such data do indeed resonate with the qualities of the divine, they suggest an ethic incommensurate with the gospel of love. Perhaps others might have seen the evolutionary processes as well as the exquisite molecular operations that brought about these, humanly speaking, repulsive, even evil phenomena, as beautiful in themselves. Nevertheless, it does remain an obstacle even for mature Christian faith. Only in artificially constraining the selection of examples from nature will McGrath avoid arriving at a kind of Platonic deism, a distancing of God, rather than resonance with the Trinitarian theology that he intends. There are problems as well with the connection of beauty and truth. Sir William Hamilton (1805-1865) discovered or invented mathematical objects called quaternions. Roger Penrose says that they were beautiful examples of mathematics but turned out to have no application to the problems of spatial geometry they were originally designed to solve.¹⁸⁶ We might produce many other examples of the beauty that fails to connect with empirical data. They are true only in the restricted, though interesting, sense of mathematical or logical truth.

Much genuine empirical science certainly does seem beautiful: my own instance might be the exquisite way in which the many thousands of dynamic chemical processes in human and other living cells dovetail together and for the lifetime of the organism conspire to postpone the consequences of the second law of thermodynamics. There is no simplicity here. The total complexity is more than a single imagination can handle. On the other hand, consider also the popular impression that there must be a one-to-one correlation between genes and features of the phenotype.¹⁸⁷ Because of its simplicity, this could have a great aesthetic appeal. It played a part in the early investigations of genetics. However, it is usually wrong.¹⁸⁸ McGrath’s notion of the aesthetic might in some cases be relevant to the metaphysical preliminaries to theory formation. However, it is an uncertain guide to the assessment of the mature working hypotheses of empirical science.¹⁸⁹ However, McGrath, in his previous career an academic scientist (a molecular biophysicist), must be well aware of this: there must be more to his argument.¹⁹⁰ And so there is. He talks about an iterative process, that is to say a cycle of learning in which we apply a theological insight to an object of study, and it returns modified to its

¹⁸⁵ McGrath, *Fine-Tuned Universe*, p. 82.

¹⁸⁶ Penrose, *Road to Reality*, pp. 198-203 and 1014-1016. For the limited sense in which aesthetic considerations might apply as a criterion for scientific theories, see Cushing, *Philosophical Concepts in Physics*, pp. 166, 361.

¹⁸⁷ The word “phenotype” is used for the bodily manifestation of the ensemble of genes (the genotype) in the organism: Richard Dawkins, *The Selfish Gene*, 2nd edn (Oxford: Oxford University Press, 1989), p. 235.

¹⁸⁸ Stephen S. Hall, ‘Revolution Postponed’, *SA*, Oct. 2010, pp. 42-49.

¹⁸⁹ “Metaphysical” in Popper’s use of the term. See Chapter 1 (2) (c).

¹⁹⁰ McGrath’s CV is at <<http://users.ox.ac.uk/~mcgrath/biography.html>> noted 10/03/2011.

origin, enriching the theology.¹⁹¹ We then repeat the process until we have honed the concept in question to a precision and cogency it would not otherwise possess. As an example, he thinks that our observation of transcendence in the natural world will deepen our understanding of God's Trinitarian transcendence.¹⁹² The difficulty is that it is indeed God's otherness that created things cannot model. They are not "other". Yet McGrath finds room to modify the theology. I shall later consider a way in which we might use scientific findings in a different way not to second-guess revelation but to underline some previously underplayed aspects of it. I shall there try to use large pictures, from empirical science rather than selected minutiae.¹⁹³

For McGrath's approach, as we have seen, the scientific material must first be theologically selected so that the theology chosen can indeed resonate with it. He holds that natural theology is what results from thus seeing the natural world as disclosed by science; in the light of the Trinitarian theological outlook it enables the theologian to "see things as they are". This is an important claim. However, the aspect of theology that McGrath chooses is in fact derived, as he points out, from the Platonic tradition of goodness, truth and beauty. Obviously, this is not specifically Christian and, in fact, not all Trinitarian theological streams have adopted it. It is subject to the dangers and constraints we have previously underlined. There are other theological possibilities. For instance, in commenting on his early theology, Christopher Schwöbel remarks that for Barth, "the place where God and the world come together is not the harmony of the experience of God with the experience of Truth, Beauty and Goodness. God and the world come together in the cross of Christ, they come together as they clash."¹⁹⁴ Such a judgement need not be attributed solely to Barth or theologies in the Reformed tradition or to any other that puts forward an objective theology of the atonement. Any theology where the cross of Christ is central might say something similar. Further doubts creep in concerning the possible application of McGrath's methodology. The truth in question in scientific explanation is not the kind of truth which theology supplies. Theology can tell us nothing about the Higgs boson. As I contend, even the empirical data have not decided the absolute truth about whether this supposed particle exists.¹⁹⁵ They can and do indicate that its existence is a productive working hypothesis.¹⁹⁶ In any case, neither goodness nor beauty should enter into the calculations. We shall return briefly to some of the above arguments¹⁹⁷ when we come to discuss secular parables of the truth in Chapter 5.

¹⁹¹ McGrath, *Fine-Tuned Universe*, p. 32.

¹⁹² McGrath, *Fine-Tuned Universe*, p. 33.

¹⁹³ See Chapter 5 (4).

¹⁹⁴ Christopher Schwöbel, 'Theology', *The Cambridge Companion to Karl Barth*, ed. by John Webster (Cambridge: Cambridge University Press, 2000), pp. 23-24.

¹⁹⁵ "We have discovered a new particle *consistent with a Higgs boson*." (My italics.) Rolf-Dieter Heuer announced at CERN July 4, 2012. From Michael Riordan, Guido Tonelli and San Lan Wu, 'The Higgs at Last', *SA*, Oct. 2012.

¹⁹⁶ See Chapter 1 (2) (g).

¹⁹⁷ See Chapter 5 (2) (f).

Whenever theology tries to draw conclusions for its own purposes from the current findings of natural science, it is vulnerable unless it treats them as provisional working hypotheses. Only in that way can it enter into an appropriate dialogue. McGrath's strength is his mastery of scientific detail; for apologetic purposes this is a powerful weapon in that it helps to convince the reader of the intellectual integrity of his Christian position. However, he does not raise questions about what we might see as negative features of the creation, including suffering and waste.¹⁹⁸ As apologetics, it is therefore incomplete and its highly selective use of natural science makes it less than convincing. These criticisms will have to be borne in mind when we come to a discussion of my own proposals, which also intend to give full value to both science and theology.¹⁹⁹

(iii) Arthur Peacocke

A different strategy for apologetics is one in which theistic religion, Christian in the sense of taking Jesus as its central focus and approaching the Nicene norm, seeks to tailor theology to fit what it takes to be the intellectual requirements of the modern truth seeker. Instead of Anselm's "faith seeking understanding", Arthur Peacocke looks for a believable God, one who can be accommodated to the current working hypotheses of natural science. Understanding is seeking faith.²⁰⁰ Thus, in one instance, he mentions information theory (without its key theoretical concepts such as "channel", "redundancy" or "signal to noise ratio") in an attempt to understand the incarnation.²⁰¹ He quotes approvingly John Bowker: "it is credible and conceptually possible to regard Jesus as a wholly God-informed person, who retrieved the theistic inputs coded in... brain processes for the scan of every situation, and for every utterance, verbal and non-verbal."²⁰² This particular attempt to appropriate empirical language for a theological purpose does not point us towards the Godness of God, but rather to the failure in principle of such an enterprise. Understood as a metaphor it seems to point to God as a computer. It tries unsuccessfully to eliminate the mystery without contributing to understanding.

More interestingly, in part following other authors, he proposes an elaborate two-dimensional hierarchical table of (largely academic) areas of interest, relevant to the understanding of humanity, seeking to show their logical relationships. There are four subdivided levels: the physical world, living organisms, behaviour of living organisms and human culture. I shall later highlight the immense difficulty and likely failure of such schemes in connection with a related though simpler

¹⁹⁸ For a treatment of animal suffering from the point of view of a Trinitarian theology, see Southgate, *The Groaning of Creation*.

¹⁹⁹ See Chapter 5 (4).

²⁰⁰ Arthur Peacocke, *God and Science: A Quest for Christian Credibility* (London: S.C.M., 1996).

²⁰¹ For information theory in a biological context, using these concepts, see Kim Sterelny and Paul E. Griffiths, *Sex and Death: An Introduction to Philosophy of Biology* (Chicago: University of Chicago Press, 1999), pp. 102-104.

²⁰² Peacocke, *God and Science*, p. 80, referring to John Bowker, *Religious Imagination and the Sense of God* (Oxford: Oxford University Press, 1978), pp. 187-8.

suggestion due to Karl Barth.²⁰³ Peacocke is however making a different point from Barth's, namely that there are layers of complexity in humanity, reflected by this table, which make reductive science less plausible. He thinks that they open the way to a more holistic understanding of what a human being is. However, an understanding of the complex relationships between phenomena across different levels of organization is no more than a necessary refinement of the empirical understanding of the human person and of the natural world. As we shall see later, it does not take us as far as the thing in itself.²⁰⁴

(iv) More on physics: Philip Clayton

Philip Clayton adopts a different point of view. His intention in what he describes as a work in "Constructive Theology" is to mount a dialogue. He will "proceed to the task of integrating" a version of Trinitarian Christian faith "with the best that we can know about the world through science and philosophy".²⁰⁵ As previously mentioned, his theological stance is in fact one of panentheism.²⁰⁶ The world is in some sense contained in God, though there is also that in God that is not the world. He arrives at this by making certain scientific and philosophical assumptions. He asserts that, following Newton (and Moltmann), space must be seen as an attribute (the *sensorium*) of God. He notes that, according to Einstein, space is curved by the objects it contains. However, Einstein himself says, "The concept of space as something existing objectively and independent of things belongs to pre-scientific thought, but not so the concept of an infinite number of spaces in motion relatively to each other."²⁰⁷ Thus in Einstein's understanding, physically speaking, space is an attribute of individual material objects, rather than of God. Clayton appears here to be in an unfortunate confusion of physics and theology. Further, in his 1952 preface Einstein says, "I wished to show that space--time is not necessarily something to which one can ascribe separate existence, independently of the objects of physical reality. Physical objects are not in space but these objects are spatially extended."²⁰⁸ Thus conceived, space indeed cannot be, as Clayton thinks, an attribute of God. Even when correctly interpreted, both Einstein's theories of relativity are empirically corrigible working hypotheses; applying them to the God who is not empirically discernible is a mistake. This attempt to assimilate theology to physics leads to a fatal confusion of concepts. This of course does not quite dispose of panentheism as theology, but if there are arguments for it they do need to be strictly theological. As we saw earlier they might be based on the misunderstanding of God's transcendence (pointed out by Placher) as being opposed to

²⁰³ See Chapter 4 (3) (b).

²⁰⁴ See this chapter 1 (4) (b).

²⁰⁵ Philip Clayton, *God and Contemporary Science* (Edinburgh: Edinburgh University Press, 1997).

²⁰⁶ See Chapter 1 (4) (a) (5).

²⁰⁷ Philip Clayton, *God and Contemporary Science* p.90. Albert Einstein, *Relativity: The Special and the General Theory*, trans. by Robert Lawson (London: Methuen, 1954). p.139

²⁰⁸ Einstein, *Special and General Theory*, page vi.

immanence.²⁰⁹ Clayton does offer a helpful survey in terms of metaphysics of a whole range of topics within the science--religion field including divine and human causality, the relation between divine and human agency, and the possibility of mind as supervenient to the physicality of the brain, without coming to definite conclusions about this. However, Clayton's approach does not fully recognize the disparity in both subject matter and method between natural science and theology. That recognition is compulsory for a proper dialogue.

(e) The claims of revelation and natural science can coexist

(i) Whatever happened to the soul?

Fergusson's fourth and fifth categories shade into one another. The fifth attempts to show that the claims of revelation can be maintained in positive coexistence with those of secular knowledge. The self-described, non-reductive physicalism adopted by the contributors to the symposium *Whatever Happened to the Soul?* is an attempt to take seriously the implications of cognitive and evolutionary psychology.²¹⁰ Under this umbrella, these colleagues from different academic specialities and religious perspectives aim to show that they can do this without any negation of the theological characteristics of the human person.

From one point of view this is thus a project of apologetics, a ground-clearing exercise so that the fullest version of the Christian faith continues to be available to the scientifically sophisticated person in the 21st century. However, I shall consider it in this fifth section of Fergusson's classification since it is an attempt to give both natural science and theology a similar standing in a dialogue. For the authors the knowing subject, the human soul, is materially grounded: "a functional capacity of a complex physical organism, rather than a separate spiritual essence that somehow inhabits a body".²¹¹ The position of non-reductive physicalism Murphy defines as: "The person is a physical organism whose complex functioning, both in society and in relation to God, gives rise to "higher" human capacities such as morality and spirituality."²¹² One difficulty concerns those we think of as human but who may lack the capacities in question. Do we stop being human when disease, perhaps related to ageing, prevents us from exercising "higher capacities" or even having them at all? What about the case of those born of human parents who either because of genetic defect or birth trauma or other accident do not have, or have lost, "higher capacities" such as might be enabled by particular neurobiological configurations? What indeed about the case of newborn infants? In this volume, Warren S. Brown deals with such

²⁰⁹ See Chapter 1 (4) (a) (iv).

²¹⁰ *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature*, ed. by Warren S. Brown, Nancey Murphy and H. Newton Maloney (Augsburg: Fortress Press, 1998).

²¹¹ Quoted from the unattributed preface to *Whatever Happened to the Soul?* page xiii.

²¹² Nancey Murphy, 'Human Nature: Historical, Scientific, and Religious Issues' in *Whatever Happened to the Soul?* p. 25.

matters, allowing that for persons who lack the capacities in question, God in God's sovereignty can determine a fitting relationship. If that is the case, as indeed it should be, is there any necessity for "higher capacities" to come into the discussion at all?²¹³ The ontological distinction between the not-human and the human would not then be a function of any "higher capacity" but of the decision of the Trinitarian God "who loves in freedom".²¹⁴ In Chapter 3 we shall consider a theological anthropology, in the stream of Karl Barth, in which that is an essential element.

According to Francisco Ayala, in the same volume, the capacity for moral decision is indeed an evolved property of the human organism although the moral rules that form the context of such decisions are a feature of the surrounding culture, which has also evolved.²¹⁵ On these physicalist assumptions, cultural evolution (which must also refer to all behaviours and beliefs including religious ones, of human collectivities), has to be derived ultimately from the same physical processes. Human nature in all its individual and collective manifestations has a capacity for flowing purely from that physicality for moral decision and relationship with God. In principle, a human person can be specified uniquely in physical terms. The implication is that sufficiently complex machines (including human persons considered as machines), if capable of interacting with other machines, would have a natural capacity for moral decision and relationship to God. The physical properties of the constituents of the ensemble in question would be the sole source of that potential. We shall see if this can be the case.

Certain machines or assemblies of machines can and do interact with other machines without human intervention. We can see them as rudimentary organisms which exist singly or in societies. Consider teams of previously programmed computer-guided machines playing football against each other.²¹⁶ Individually the machines function like organisms related to their environment and relating to the other players. It is hard to see how whatever can be said of a complex biological system cannot also be said of any sufficiently complex, electromechanical one.²¹⁷ Can such a machine possess an ontologically distinct "higher capacity" specifically for relationship with God, solely because of its mechanical, electrical or biological conformation which enables it to relate to other players in the game? Could it be capable of "moral decision" on any other basis than rule-based calculation? There is no ontological discontinuity between different levels of a complex machine's functioning. We would like to know at what level of complexity a "higher" capacity arises, capable in itself of (spiritual) interaction with God.

²¹³ Warren S. Brown, 'Cognitive Contributions to Soul', *Whatever Happened to the Soul?* pp. 123-125.

²¹⁴ *CD II(1)*, pp. 257-321.

²¹⁵ Francisco J. Ayala, 'Human Nature: One Evolutionist's View', *Whatever Happened to the Soul?* p. 41.

²¹⁶ Rolf Pfeifer and Josh Bongard, *How the Body Shapes the Way We Think: A New View of Intelligence* (Cambridge, MA: M. I.T. Press, 2007), p. 52.

²¹⁷ But see arguments in Nancey Murphy, *Bodies and Souls, or Spirited Bodies* (Cambridge: Cambridge University Press, 2006), p. 84. Murphy points out that systems like that of the aircraft, an example she uses for a slightly different purpose, have their goals determined from the outside.

There might be a parallel between the non-transparent way a computer produces its results and the functioning of a multicellular organism. In the case of a computer, each individual step in its functioning is well comprehended (as electronically determined) at least by its designer. Once the ways in which the components are connected and the workings of the (perhaps several thousand) programs involved are understood, there is no problem about analysing a given behaviour and explaining how it came about. That is the case in principle. In practice, things may be more difficult. However, the difficulty is not an ontological one, but one of correctly understanding a humanly designed mechanism and the operating rules embodied in the hardware and the software. There could be a lack of transparency, that is to say a puzzle, but no mystery here at all. There is no room for an ontological gap.

On physicalist assumptions, the same should apply to a complex biological organism with cerebral activity, designed by natural selection. This is not to say that the brain is some kind of computer though many physicalists might do so. It is surely more complicated than that. Things happen at different organizational levels, with multiple interactions between levels: this is complexity raised to a very high order. It may be impossible to explain precisely what is going on but the problem is physical and empirical rather than an ontological one. There would be no space in the hierarchy of purely physical processes, causes and effects for an ontologically “higher capacity” to arise as their consequence. We are not relying on any gap in our physical knowledge here. The direct action of the Spirit supplies the capacity for relationship with God. It needs no particular physical conformation.

What can we say from the standpoint of Scripture about the non-reductive but physicalist, theological anthropology envisaged? In the same volume, Joel Green surveys different understandings of the human person that he finds in both the Old and New Testaments. Green’s careful exegesis includes a consideration of the cultural background in the Hebrew and Graeco-Roman worlds. From this scriptural overview, he concludes that human identity as the image of God does not consist in the possession of something called a soul. Rather, it includes “the human capacity to relate to God as his partner in covenant, and to join in companionship within the human family and in relation to the whole cosmos, in ways that reflect the covenant love of God.” “Humanness, in this sense, is realized in and modelled by Jesus Christ.”²¹⁸

This is stimulating symposium. It contains much that I have not dealt with. The overall argument, differing in detail for each contributor, begins with a proposal that empirical criteria specify the nature of humanity. I shall later suggest that there are problems with such an understanding. They rightly argue that there is no such distinctive entity as soul. However, their proposal of an emergent natural capacity to have a particular kind of relationship with God does not work. The notion of

²¹⁸ Joel B. Green, ‘Bodies -- That Is Human Lives: A Re-Examination of Human Nature in the Bible’, *Whatever Happened to the Soul?* p. 157.

“capacity” itself does not arise from Scripture and the implied assumption is that scientific reasoning has priority over the revelatory content of Scripture. This point of view (not as we have seen a uniform one in all the contributors), is subject to criticisms similar to those of any theology which begins with the human and on that basis searches for knowledge of God. Theology is thus surrendered to the conclusions of the natural sciences. That allows the subordination of its truth to working hypotheses about the physical world. Such criticism does not target the physicalist understanding of humanity. Brown rightly says that “a physicalist mapping of human nature need not contradict the fundamental truths of the Christian faith”.²¹⁹ There is however a failure to envisage an appropriate relationship between it and the doctrine of the human person. However, Joel Green takes substantial steps in that direction. I shall later argue that, assuming the truth of something like non-reductive physicalism, there is a theological stance which without answering all the possible questions has more promise for an anthropology than the one suggested in this volume.²²⁰

(ii) Sarah Coakley

Sarah Coakley in her 2012 Gifford lectures aims at a thorough going reconstruction of natural theology taking it in a different direction from the examples we have considered. Her theological assumptions are Trinitarian and her scientific material is from genetics.²²¹ Three years work alongside both mathematical and empirical researchers in the field of evolutionary dynamics have motivated her in a hermeneutical enterprise. She attempts to discover the metaphysical assumptions behind contesting research programmes. Physicalist science asks for a proof of the existence of God, but does not expect to hear of one. Coakley aims to harness her findings to contribute to the sketch of such a proof. She notes that even at biological level it is impossible to rid attempted empirical hypotheses of a penumbra of teleology that goes deeper than pure figure of speech. Whether it concerns a structure in an organism or a feature of its behaviour the question “What’s it for?” keeps arising.

She takes account of recent work in mathematical genetics alongside elements from Thomas Aquinas and Immanuel Kant. Using that material she suggests the outline of a proof for the

²¹⁹ Warren S. Brown, ‘Conclusion: Reconciling Scientific and Biblical Portraits of Human Nature’, *Whatever Happened to the Soul?* p. 215.

²¹⁰ Non-reductive physicalism has also been criticized from a philosophical point of view by, among others, Jaegwon Kim. See Messer, *Selfish Genes and Christian Ethics*, pp. 153-154 and references there cited. I have not dealt with for instance the question of “supervenience”, Donald Davison and the like. See also Jaegwon Kim, article ‘Supervenience’ in Samuel Guttenplan, *A Companion to the Philosophy of Mind* (Oxford: Blackwell, pp. 575-588).

²²¹ See chapter 2 (2) (b)

existence of God. Summarized and simplified, it suggests that the course of evolution is in large part the development of cooperation at all levels. Cooperation between cells forms organisms and between organisms forms communities. Such cooperation involves loss for the individual. It is often described as altruism. However she thinks that the term is better reserved for the conscious neglect of self interest for the benefit of others which may sometimes be evident in human life. We can explain such cooperation in terms of the selfish gene.²²² But it can also be characterized, according to Coakley, in elaborate mathematical ways. She speaks of “loss for the sake of Christological gain so powerfully at the heart of the New Testament, and to which even secular evolutionary biology now in some fashion is recalling us with its mathematical modelling of ‘cooperation’ “. ²²³ However she thinks that none of this explains the case where self sacrifice means that a person’s genes will not be transmitted to a next generation.²²⁴ She calls this a “supernormative” act, one well beyond that which is needed for human flourishing. Here she moves towards a possible argument for the existence of a God who motivates such conduct and in the person of Jesus Christ exemplifies sacrifice. She argues that this kind of voluntary self surrender of which the sacrifice of Christ is the prototype has no discernible advantage for evolutionary fitness. I have only outlined the general direction of her arguments. She does however need to do more to distinguish moral sacrifice like that of a Bonhoeffer or a Gandhi, or martyrdom in a number of religious traditions from the moral and human disaster of, for instance, attempts to promote a version of Islam by mass murder involving self destruction. Her elaborate philosophical and theological arguments are also vulnerable to further developments perhaps involving neuroscience which might explain the super altruism of the two heroes mentioned above and those like them. A gain to group biological fitness might be shown to be the consequence . That would be problematic in view of Coakley’s intention to suggest an argument for belief in God. However Coakley draws attention to the interplay in evolutionary biology between cooperation, altruism and sacrifice which is theologically relevant. But her strategy is a risky one. She has an authoritative grasp of current day to day science in which she has been closely involved. But if the science changes, which it could, the theology will have to readjust. It might have to decide where, among new developments, it should place its bet. It might also have to consider how much a theology can change and still be recognizably Christian. She uses fallible empirical evidence is thus used to govern ontology. But the ultimate source of ontology is revelation. I intend to show how a different strategy can avoid the difficulties inherent in responding to a science which is always subject to change.

²²² Chapter 2 (2) (b)

²²³ Gifford Lecture 6, p.4.

²²⁴ Dawkin’s theory of memes, which Coakley does not mention here attempts to deal with this point. He proposes a “meme” for celibacy which might account for some such occurrences. The theory falls well short of being an empirical working hypothesis. See chapter 2 (6) (c).

(iii) Richard Bell

We can understand Richard Bell as attempting to answer a question about the creation accounts in Genesis. Can they really relate to the world disclosed by natural science? This author's²²⁵ metaphysical position is similar to mine but not the same. It is related to Kant and, in his case, Schopenhauer as well. We agree that the findings of natural science do not expose the noumenal world (what I have called ontological reality or the thing in itself). Science and theology are both autonomous disciplines. Science, he thinks, deals with surface reality. Theology deals with depths. The book of Genesis does not deal with "history" but with ultimate realities. God does speak to us through such texts by accommodating to our finite human knowledge. Human authors use a special language, that of myth to speak of God and of ultimate realities. The myth maker is not inventing a story but discovering noumena, reality "already there in the world".²²⁶ We find from the myth "Adam fallen and unfallen, written into the deepest fabric of the universe"²²⁷ We understand something related to this through the anthropic principle. Bell does not see that as proof for the existence of God. Nonetheless he finds it surprising that the universe is in any way accessible to the human mind. There should therefore be some kind of ontological relation between the human mind and the universe. Accordingly, he thinks that the human brain/ mind constructs the world we perceive. In one sense that is the case.²²⁸ However it is our perception of the world that brain/mind constructs not the world itself as it is.

What Bell does not point out is that there is a distinction between the unconscious mechanisms of perception employed by the human brain/mind and the studied and conscious procedures of natural science. I cannot strictly tell if the mental impression I have of a thing is the same as another person's. I think I am having the same visual experience as you are when looking at the same blue sky. There is no way of checking it. That must still be the case even if neuroscience can demonstrate that the reacting neurons involved in my brain and yours are in exactly corresponding states. Inter-subjectivity is absent. The empirical working hypotheses of natural science refer to phenomena. They can be put to the test by other people. Yet they do not necessarily correspond with our perceptions. Numerous cases of optical and other kinds of illusion demonstrate that. Another example is from physics. Seemingly solid objects consist overwhelmingly of empty space. The appearances constructed by the brain/ mind and the data observed and processed by natural science are both "phenomena" but different in kind. Their separate relations to the ontological reality that gives rise to them must be different again.

²²⁵ Bell, Richard H., 'Science and the Bible: Adam and his Fall as a Case Study', in Neil Messer and Angus Paddison, *The Bible: Culture, Community, Society* (London: T&T Clark International, 2012).

²²⁶ Bell, p.40

²²⁷ Bell. p.43

²²⁸ See Frith *Making up the Mind*.

The above raises difficult epistemological questions. But the main problem is the theological anthropology. Bell thinks that his neo-Kantian approach can bring these two together. God has designed the universe but he has designed it indirectly: the mediating entity is the human mind which organizes the stuff of the universe. Genesis 1, which places the human being at the pinnacle of creation, expresses the key role of the human mind in the very structures of our universe.²²⁹

Bell over promotes the human race. Our minds are responsible for our own picture of the universe. They do not design the universe. It exists independently of our understanding of it. It is what it is. Whether or not we see humanity as elect, we cannot escape from physical and intellectual finitude. Both are unavoidably part of our destiny as we shall later discuss.

(iv) David Clough

David Clough's comprehensive work²³⁰ can be understood as an attempt to answer a question posed by science, "Can there be a Christian theology that takes fully into account the continuity of human life with the rest of the animal creation demonstrated by Darwinian biology?" Clough's answer elaborates a theology within the stream of Karl Barth but with one further and decisive move. He extends election to at least the whole of the animal creation. Anthropology, our original concern, cannot therefore be separated from the theology of the creature. The incarnation must be understood primarily as God's enfleshment, rather than the more specific "made man". Soteriology must take in the salvation of all creatures brought about by the life, death and resurrection of Jesus Christ. Clough finds considerable biblical arguments to support a radical departure not only from Karl Barth but from what has been until now the majority Christian position. We shall discuss further Clough's proposition of a pan-species election in Christ.²³¹ Our worry is it might shade into the panentheism we have already rejected.²³²

One of Clough's aims here is to address a lack of coherence that he finds in Barth's theology. We can relate that to our previous discussion about truth. Coherence could be taken to be a vital quality in body of true propositions. Each one is formally consistent with every other one, rather like the geometry of Euclid. But even in natural science things are not like that. We shall notice examples in physics. Barth's supposed incoherence is the product of his dialectical imagination. We have to do the best we can with human language concerning God and the things of God, aware that it is not in itself adequate for what if possible ought to be said. Such are human attempts at expressing truth. In the case of election we might ask why Barth should restrict flesh to human flesh. Perhaps the

²²⁹ Bell p.45.

²³⁰ David Clough, *On Animals, Volume 1, Systematic Theology* (London: T&T Clark, 2012).

²³¹ See chapter 3 (4) (a) and (b).

²³² See chapter 1 (4) (a) (vi).

answer is that the other half of the dialectic is missing for epistemic reasons. There could be different divine action that we cannot know, corresponding dialectically to election, not just for each species, but for each creature. Clough acknowledges the species option but finds it incoherent since there are several million. He also points out, as we shall do, that biology cannot exactly define “species”. Biologically, any attempt to define strictly “species” and even “individual” must fail. Further the qualities, the phenomena they exhibit, change over time. Election works as a theological notion if we recognize that God does the distinguishing and not us. Only God is able to discern the thing in itself that God has made. If we accept God’s love for the good creation, we have to trust God for that. I have not here fully discussed Clough’s position. I shall say more when I come to discuss Barth’s anthropology. There can be a systematic theology of nature, including human nature, but as Clough acknowledges there is more work to be done.

(5) The argument of this chapter

Neither the dream of a cosmology as a universal account of what exists nor the more limited one of a common framework for philosophy, theology and empirical science are realizable.²³³ The best we can hope for is a dialogue between aspects of these two latter. Further, as we have noted through this chapter in spite of its success in setting in order the phenomena of the physical world and exploiting them, natural science does not deliver truths but working hypotheses.²³⁴ Among those that are both powerful and useful is the physicalist account of human life. Theology must reckon with it. We have looked at some examples, both historical and contemporary, of the way in which this reckoning has taken place. I have explained why I think deist, panentheist and, by implication, pantheist theologies are unsatisfactory.²³⁵ We should conduct the dialogue between science and theology from a standpoint close to that of the central Trinitarian Christian position in relation to a science given full rights in the empirical sphere. That is to say we must respect the boundaries of each enterprise.

However, even within those presuppositions we saw that attempts to introduce the categories of physical science into theology have not been successful.²³⁶ We also discussed four accounts of the human person we could interpret as attempts to introduce biology into theology. For various reasons we found all of them unsatisfactory. In chapter five I shall, offer another possible relation between the scientific and theological understandings of the human person. Its purpose is to overcome some of the difficulties of the accounts I have mentioned. Before that, the next chapter will now offer a brief outline of human identity as understood by physicalist empirical science.

²³³ Chapter 1 (4) (c) (iv).

²³⁴ Chapter 1 (2) (g).

²³⁵ Chapter 1 (4) (a).

²³⁶ Chapter 1 (4) (c) (iii) and (4) (d) (iv).

CHAPTER 2

DARWINIAN BIOLOGY: THE PHYSICALIST MASTER

NARRATIVE OF THE HUMAN STORY

(1) Introduction

(a) Scope and limits of Darwinian biology

Darwin rules! The adaptive forces of natural selection drive evolution. That paradigm frames twenty first-century self-understanding. I shall deal later with the theological implications of the proposition that a minute twig on the burgeoning tree of natural life bears *Homo sapiens*, including Jesus the Son of Mary.¹ In this chapter I shall show how the concept of the tree of life, as now understood, arises. Darwinian biology explains features humans have physically in common with other living things, as well as the much smaller number, many of them mental, that set us apart. Like theology it is a hermeneutical activity; one applied to the natural world. As we shall see, it has a comprehensive interpretive principle, applied to the phenomena of organized life, namely, evolution by natural selection. Unlike theology and indeed philosophy, evolutionary theory is grounded in empirical observation. It thus is able to claim territory previously held by those two disciplines where they relate to what it is to be human. Darwinian working hypotheses, however powerful and well-founded in the empirical, remain humanly formulated. In one respect, they are like theological propositions: provisional and open to correction.²

(b) Questions to answer

A double question will always be in our minds: “What is a human being and what distinguishes human beings from other living creatures?” Humanity declares itself in both the physical and the mental. Relationship with God, if God is believed to exist, is often thought of as a function of human mentality. God’s self is known through thoughts, feelings, hopes, fears, dreams and visions. Through such mental events and states, God may influence our perceptions, judgements, decisions and actions in relation to our lives, other people and the world around us. In this relationship, we may well think that our mentality is in some sense primary. However, as we shall see, according to evolutionary

¹ At Chapter 5 (4) (b).

² For my understanding of how science proceeds see Chapter 1 (2), especially Section (g).

psychology, which follows in the stream of Darwinian biology, human mentality is fully explicable in physical terms. Some think that still allows the existence of a kind of natural, but presumably non-physical, conscious self whose existence is a puzzle or mystery impossible to resolve within the scope of human intellectual powers.³ Yet some new Darwinian development could deliver a death blow against that aspect of mentality seen as an irreducible entity. It might understand it unequivocally as something that is, without remainder, constructed and delivered by so far unknown physical mechanisms and with no other existence. That would not of course dispose of the human self, but it would locate it exclusively in the sphere of the physical. In continuing into the next chapters, I shall make it my working assumption that, as far as empirical science is concerned, a thoroughgoing physicalism is already a “good enough” working hypothesis.⁴ I shall now try to justify that stance as I offer a summary account of the Darwinian project up to the present time. However, as I have already explained, my physicalism differs from that of some other theological thinkers in that I do not believe that even the most complex physicality can possess in itself a capacity for relationship with God.⁵

(2) The basis of human physicality

(a) Darwin and the origin of the human species

Isaac Newton consciously understood his project as part of a theological world picture.⁶ Charles Darwin (1809-1882) made only the occasional nod in the direction of the deity. We shall follow something of the careful observation and close argument over a century and a half, by which the ever-expanding Darwinian programme has occupied more and more intellectual space within humanity’s understanding of itself, much of it previously occupied by theology.

Darwin was well aware of the disturbing theological implications of his proposals. No doubt, this was one reason why he had no wish to go beyond any empirical evidence towards metaphysical speculation about the beginnings of life. Rather, in the *Origin of Species* (1859), he aimed to give a coherent, worldly explanation of how species came to differentiate over time. At least from 1837, his notebooks tell us, his theorizing took in all living things including “man and his mental life”.⁷ In the *Origin*, he did not stress it. But towards the end he made clear the secular revelation implicit in his

³ The mysterian hypothesis is referred to at Chapter 2 (6) (a). It is a speculative philosophical position rather than a theological one.

⁴ For “good enough” see also Chapter 4 (2) (e) (i) and Chapter 5 (2) (f).

⁵ See Chapter 1 (4) (e) (i).

⁶ For Darwin’s intellectual and philosophical development and his belief, earlier in life, in a non-interventionist God see Philip R. Sloan, ‘The Making of a Philosophical Naturalist’, Hodge & Radick, *Darwin*, pp. 21-43.

⁷ M. J. S. Hodge, ‘Origins and Species before and after Darwin’ in Olby and others, *Companion*, p. 385. For Darwin’s motivations relating to his conviction of the common origin of the whole human race in the context of his abhorrence of slavery see Adrian Desmond and James Moore, *Darwin’s Sacred Cause: Race, Slavery and the Quest for Human Origins* (London: Penguin, 2010).

proposals: "...Light will be thrown on the origin of man and his history".⁸ Some legitimate theological uses of these programmatic statements will be considered at a later stage.⁹ However, the question staring Darwin in the face was already, in the context of his time, a theological one. The fossil record already had made clear to him and to many of his predecessors and contemporaries that living creatures had changed. Evolution had taken place.¹⁰ Could the myriad species and varieties have come about by God's detailed design, or was there another explanation? Darwin's answer arose from his own meticulous observations, beginning with those on the voyage on the *Beagle*. A multitude of correspondents provided further material. He armed the *Origin* with persuasive evidence. Yet it was only intended as a taster for the general public of a much larger and more rigorous work for the scholarly community. He did not need the sequel.¹¹

His arguments were empirical. He noted that a human breeder looks for the form of creature that will best suit his purposes and selects those which most nearly approach it. Successive interbreeding between the most useful forms brings the animal or plant closer and closer to the ideal desired.¹² In nature there is no conscious selector, and, judging by the observed data, no need to suppose divine intervention.

An organism even slightly different from its parents, in a way that makes it fitter for its surroundings and better able to compete for resources, will be more likely to survive and reproduce. Tiny inherited variations, even minutely advantageous, would become more and more salient over successive generations: Darwin was fond of repeating that nature proceeded smoothly.¹³ These variations would lead eventually to new varieties of living creatures better adapted to their environment and then to new species. It was objected that few traces of expected linking forms could be found. Darwin agreed. Gaps in the fossil record there certainly were; the intermediate forms might have left no trace. They could have been effaced by the Earth's upheavals but, in any case, geological exploration had a long way to go. It was clear to him that species were not independently created, they were simply varieties transformed by the process of natural selection until they became distinct.¹⁴ If species had been individually created, there would not be those with almost identical physical form but happily living in utterly different environments. Neither would there be such prominent vestigial

⁸ Darwin, *Origin*, p. 458.

⁹ See Chapter 5.

¹⁰ For Darwin's own survey of twenty or more precursors or contemporaries with evolutionary views see Darwin, *Origin* (1910), pp. xiii–xxi.

¹¹ Editor's introduction to Darwin, *Origin*, p. 34.

¹² Darwin, *Origin*, pp. 99 and 441. Also Darwin, *Origin* (1910), p. 4

¹³ "*Natura non facit saltum*", repeated eight times in the *Origin* according to the concordance at <http://darwin-online.org.uk/> on 16/02/2010.

¹⁴ Darwin repeats and summarizes his main arguments in Chapter XIV of the *Origin*.

features as the wings of flightless birds.¹⁵ Darwin held that natural selection was the chief, though not the only, mechanism by which species and varieties within species came into existence.¹⁶ Such a conclusion must apply equally to the human species.

The mechanism of natural selection is not well summarized by Herbert Spencer's phrase "the survival of the fittest" which appears in later editions of the *Origin*. It misleadingly suggests a tautology: "It is the fittest to survive that survive."¹⁷ However, "fittest" has a well-specified, non-trivial meaning and a mechanism can be detailed by which the probability of survival of any organism is increased.¹⁸ Fitness applies equally to mentality, whether animal or human. A powerful and flexible mentality is what above all enables our species to adapt to a wide variety of environments and to readapt when conditions change. In the *Origin* however Darwin's immediate point was that, contrary to some previous suppositions, among them those based on readings of Genesis, species do change and that this change is driven by a specific mechanism, that of natural selection. Evolutionary ideas were also part of Darwin's intellectual environment. But there were also objections like those of Cuvier (1769-1832), not religious but ideological, grounded in a dislike of progress and a fear of revolution.¹⁹ Contrary to those, Darwin noted numerous instances of change in the fossil record. The explanation was that

all parts of the organization and instincts offer, at least individual differences -- that there is a struggle for existence leading to the preservation of profitable deviations of structure or instinct -- and lastly, that gradations in the state of perfection of each organ may have existed, each good of its kind.²⁰

Natural selection is now thought of as being in contrast to the then widely accepted hypothesis of Lamarck (1744-1829), namely the inheritance of acquired characteristics. Useful traits, that is to say adaptive ones, acquired in a parent would be passed on directly to offspring. On this view, the long neck of the giraffe was acquired by successive generations of giraffes stretching to reach higher foliage. In fact, Darwin did not abandon this notion.²¹ It was only with Weismann's work on inheritance in the 1880s that it began to be set aside. However, it has not quite left the scene.²² A vital aspect of Darwin's theory was that of sexual selection, that is the competition for the opportunity to reproduce.

¹⁵ Darwin, *Origin*, p. 216.

¹⁶ Darwin, *Origin*, p. 69.

¹⁷ The phrase appears without attribution in Darwin, *Origin* (1910), pp. 157-8.

¹⁸ Sterelny and Griffiths, *Sex and Death*, p. 84.

¹⁹ Michael Ruse, 'The History of Evolutionary Thought' in Ruse and Travis, *Evolution*, pp. 5-6. But note the more complex account of Cuvier's views by M. J. S. Hodge in 'Origins and Species before and after Darwin', chapter in R. C. Olby and others, *Companion*, pp. 374-395.

²⁰ Darwin, *Origin* (1910), p. 380.

²¹ J. W. Burrow, editor's introduction, Darwin, *Origin*, p. 37.

²² R. W. Burkhardt, 'Jean-Baptiste Lamarck', article in Ruse and Travis, *Evolution*, pp. 672-675. For evidence of quasi-Lamarckian inheritance of acquired characteristics in a microorganism, see Eugene V. Koonin and Yuri I. Wolf, 'Is evolution Darwinian or/and Lamarckian?', *Biology Direct* 2009, 4:42doi:10.1186/1745-6150-4-42, downloaded 27/11/2009. See also Stephen S. Hall, 'Revolution Postponed', *SA*, Oct. 2010, pp. 42-49, especially p. 49, referring particularly to humans.

He treated this more fully in *The Descent of Man*.²³ Among human beings, Darwin thought, there was conscious selection for the most admired characteristics, leading among other things to the progressive loss of hair from the body in both sexes. This finding aroused particular opposition: “Hardly any view advanced in this work has met with so much disfavour”, he noted.²⁴ Darwin eventually became certain that all extant animals had descended from at the most only four or five progenitor species and plants from four. He strongly suspected that all living things, including human beings, had but one ancestor.²⁵

Darwin made humanity the subject of explicit public consideration only in 1871, in *The Descent*. However, much of the relevance of evolution and natural selection to the human species was already implicit in the *Origin* and widely and controversially recognized as such.²⁶ However, there were also objections based on the Newtonian model of science where precisely calculated numerical predictions were seen as being the norm. Those could not at that time be delivered by Darwin’s proposals.²⁷

According to Darwin himself, the account in the *Origin* ran contrary to much, though not all, contemporary opinion among naturalists, many of whom were clerics. They insisted that species, and most importantly humankind, were separately created by divine action. Sometimes they did allow that varieties within species might have arisen later.²⁸ The force of Darwin’s arguments dealt a heavy blow to the contemporary rhetoric of natural theology. They enforced drastic shifting of its arguments, away from a providential oversight of each detail in the direction of a less specific divine involvement in the creative process. *Kenosis*, God’s self-emptying, was even mentioned.²⁹ It is still prominent in the discussion.³⁰

Darwin’s theory aroused conflict, but the picture is far from the simplistic one of universal bitter antagonism sometimes suggested. The impact on the world of ideas in the second half of the nineteenth century was immense. Humanity need no longer be distinguished as the crown of God’s creation. As we shall later see, theology has yet to come fully to terms with this insight.³¹ In parallel to this advancing change of perspective, the secularization of science progressed and the “exclusion of God talk from technical and scientific texts” became the standard practice it is today.³²

²³ Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, 2nd edition (London: Penguin, 2004), see footnote on page 671.

²⁴ Darwin, *Descent*, p. 671.(footnote)

²⁵ Darwin, *Origin*, pp. 454-5.

²⁶ Darwin, *Descent*, introduction page xxxiv.

²⁷ See M. J. S. Hodge in ‘Origins and Species before and after Darwin’, chapter in Olby and others, *Companion*, pp. 374-395, especially p. 388

²⁸ Darwin, *Origin*, p. 53.

²⁹ Brooke and Cantor, *Reconstructing Nature*, pp. 142-167. For *kenosis* see p. 165,

³⁰ e.g. Southgate, *Groaning of Creation*, pp. 58-9, in connection with theodicy.

³¹ See Chapter 5 (4) (e) and (f).

³² Brooke in Hodge and Radick, *Darwin*, p. 216.

(b) Evolution and natural selection further vindicated

Among other things, this and the following sections will illustrate the complex paths by which human and other kinds of life have become better understood. Darwin's original hypothesis was that, over extended time, tiny heritable variations could produce descendants so different from their ancestors that they would have to be described as a new species. Each feature of the evolving organism would be liable to change over time. The age of fossils could be deduced from stratigraphical data; this did not conform to the current theory about the age of the planet. Results became plausible when it was realized that the earth's interior heat was in fact maintained by radioactive decay.

August Weismann was more successful than was Darwin in suggesting a mechanism for transmission of the organism's characteristics. He rejected Lamarckian inheritance and recognized that hereditary material was contained in the bodies known as chromosomes in the living cell. He first suggested something like the mechanisms we now call mitosis and the meiosis reduction division, and reassembly in daughter cells of the elements from each sex.³³

Unknown to Darwin and Weismann, a further contribution towards the viable explanation had been provided independently by the work of the Austrian monk, Gregor Mendel (1822-1884). In 1865, he published a paper considering the variations in generations of peas he had carefully chosen for external consistency, with one difference only, such as flower colour, in the plants to be crossed. His results were the basis for a more complete understanding of inheritance.³⁴ He suggested that the characteristics were carried by what he described as "atoms of inheritance", roughly corresponding to what are now called "genes". In sexual organisms, they would be passed by fertilization from one generation to the next. Later work by others confirmed that each male or female fertilizing element or gamete carries half the genetic material responsible for the inheritance of the characteristics of its originating organism, distributed among units of approximately equal size known as chromosomes. This half is itself a random assortment of heritable components from each parent of the originating organism. At fertilization, the two combine so that the cells of the new organism now contain their full complement, in pairs of homologous genes (or alleles), one of each pair carrying heritable characteristics of the male, the other of the female gamete.

Complex mechanisms now govern the expression of these genes in the resultant organism, the phenotype. Slight variations, in the chemical or physical make-up of the gene, usually occurring through chance transmission errors known as mutations, are responsible for offspring with characteristics possessed by neither parents nor grandparents. They are in large part responsible for the

³³ Manfred D. Laubichler, 'Weismann, August Friedrich Leopold (1844-1914)' in Ruse and Travis, *Evolution*, pp. 909-910.

³⁴ See note on Mendel's experiments in Chapter 1 (2) (c).

variation occurring in sexual organisms including human beings. The differential success in survival and the production of offspring is the basis of the process of natural selection.

However, it took elaborate statistical investigations of the consequences of the Mendelian laws of inheritance in the first half of the twentieth century by, among others, R. A. Fisher (1890-1962), J. B. S Haldane (1892-1964) and Sewell Wright (1889–1988) to establish that the scale of evolution through natural selection proposed was indeed a possibility within likely time frames.³⁵ Since then many other examples have been noted of evolution, fully explicable by natural selection and taking place sufficiently quickly to be observed in much less than one human generation both in the laboratory and in the wild. Natural selection may not be the only motor for evolution. However, there is powerful evidence for it through observation in present (as opposed to historic) time. Detailed study of the fast reproducing fruit fly (*Drosophila*) is one example.³⁶ The way that some pathogenic organisms rapidly evolve to become resistant to one antibiotic after another is an only too familiar illustration.³⁷ Natural selection has been demonstrated in a multitude of laboratory and natural situations.³⁸ Such examples are in the main from what might be called “microevolution”. The origin of whole species over a long time and a large geographical area is much more difficult to study directly. Darwin assumed that the explanation of the phenomena at the local level in time and space applied also for macroevolution. However, Eldredge and Gould (in 1972 and 1977) argued that small increments in fitness could never account for the actual dramatic changes in phenotypes. Great leaps forward, punctuated equilibrium should be part of the picture. In fact, a number of different investigations have shown that natural selection can account for quite large changes in the genotype over a short time and in a natural setting.³⁹

The working hypothesis of natural selection is not always easily applied. Some apparently non-adaptive features, bad design we might call it, persist. However, the balance of favourable and unfavourable features in a gene-linked package might be adaptively positive. Moreover, a coherent account of certain less than obvious features can often be constructed in terms of evolutionary history. Once evolution has taken a particular path the cost in terms of reduced fitness (even if transitory) of a regression and “redesign” would be too great. It is obliged to work with what it has inherited. It cannot

³⁵ Michael Ruse, ‘The History of Evolutionary Thought’ in Ruse and Travis, *Evolution*, p. 31.

³⁶ See among many, many examples Amy E. Sanders, and others, ‘Evolutionary Change In Parasitoid Resistance Under Crowded Conditions In *Drosophila melanogaster*’, *Evolution*, 2005, Volume 59 Issue 6, pp. 1292-1299, Wiley Interscience Journals.

³⁷ For the continued evolution of antibiotic-resistant bacteria and its consequences see Maryn McKenna, ‘The Enemy Within’, *SA*, April 2011, pp. 26-33.

³⁸ See Dawkins, *Selfish Gene*.

³⁹ Joseph Travis and David N. Reznick, chapter ‘Adaptation’ in Ruse and Travis, *Evolution*, pp. 105-131 with literature there cited.

look to the future.⁴⁰ The path that leads from the fertilized egg to the mature organism also evolves. The study of the evolution of development has only recently begun to be integrated with the rest of evolutionary biology. It adds a further dimension to the already complex understanding of adaptation and natural selection.⁴¹

There are still controversies, “What are the replicators?” According to Dawkins and his followers, “exclusively genes”, according to others, “the organism itself”, that is to say the phenotype. Still others suggest that a much larger population is the unit of selection. Dawkins holds that the form of an organism results from competitive selection, not at the level of the species or other social grouping nor even the individual but that of the gene.

Although the precise path of evolution is a matter of constant discussion, the overall working hypothesis of evolution largely by natural selection has become more and more secure. We can see from the previous paragraphs that it is fully applicable to the origin of *Homo sapiens* as it is now being unravelled.⁴² However, the manner and extent of its application to human mentality and culture is, as will be seen, controversial.⁴³

Darwin’s own hypotheses were largely justified by observation but, as we saw, had no basis in any understanding of the underlying mechanisms of inheritance. Only later were the genetic processes which ensure the transmission of characteristics of an organism to its progeny made clear, first by the work of Mendel and his successors, previously mentioned, and then by the detailed work in molecular biology still proceeding. This work has become of much more than academic interest: the “gene” is significant but also significantly misunderstood in popular culture. If only for that reason, molecular biology does have relevance for a theological understanding of the human person. More than that, as we shall now see, its development promises the full assimilation of biological humanity within the Darwinian story.

(c) Molecular Biology

The twenty fifth of April 1953 marked a new epoch in biology. Much was already known about genetics and the overall chemistry of life, including human life. However, the two were not well integrated. Now with the publication, on that date, of a short paper giving the conclusions of researches by Francis Crick, Rosalind Franklin, James Watson and Maurice Wilkins and their associates, the

⁴⁰ For examples (including those of the drastically deviated recurrent laryngeal nerve of the giraffe and the human *vas deferens*) vividly explained and illustrated see Richard Dawkins, *The Greatest Show on Earth* (London: Transworld Publishers, 2010), pp. 360-366.

⁴¹ Gregory A. Wray, ‘Evolution and Development’ in Ruse and Travis, *Evolution*, pp. 208-236.

⁴² Chapter 2 (2) (b).

⁴³ Chapter 2 (5) and (6), culture at 2 (6) (c).

disciplines began to be understood as one.⁴⁴ Deoxyribose nucleic acid (DNA) is present in all independently living organisms. It is what makes up the chromosome. Now these workers showed that DNA consists of two separable, almost identical, interlocking helices. It functions at one remove, as the series of templates against which the many thousands of proteins that are active in the living cell are synthesized. The templates form a code, largely identical in all organisms. We shall see later how this feature can contribute to a parable with a theological reference.⁴⁵ The DNA is thought of as being divided into joined parts called genes, different in each organism. It was supposed that the genes were strung, as it were, like separate beads on the very long string of the chromosome. They were believed to be definable chemical units forming segments of the chromosome and each responsible for a given feature of the organism. That however is not the case; they split and rearrange themselves in different ways. The DNA is elaborately arranged in ordered loops and skeins. Thus, sections many units apart in the long sequence may be close in space and can influence each other or act in concert in promoting protein synthesis.⁴⁶

Further research and especially the detailed sequencing of the human and other genomes have indeed revealed a very complicated picture. One trait, say height, may be influenced by more than fifty genes.⁴⁷ The term “gene” becomes itself very hard to define.⁴⁸ Research in the last decade has led to the discovery of entities called “micro RNAs” which may orchestrate the expression of protein-coding genes. Indeed the molecular basis of inheritance is more complex than the passing on of information by purely copying DNA from parent to offspring. There may be other factors involved as well: “symbiotic micro organisms, chemicals in cell cytoplasm, food traces in maternal milk transmitting the mother’s preferences, behavioural imprinting on the natal site” and many possible interactions between all these.⁴⁹ Nonetheless, the phenotype remains susceptible to modification from generation to generation through the processes of natural selection. That total complexity has been brought into existence through natural selection. It is the overarching narrative of the story of life including that of the human person.

⁴⁴ J. D. Watson and F. H. C. Crick, ‘Molecular Structure of Nucleic Acids: Structure for Deoxyribose Nucleic Acid’, *Nature* 4356, 25 April 1953. Facsimile in Carina Dennis and Richard Gallagher, *The Human Genome* (Basingstoke: Nature- Palgrave, 2001), p. 15.

⁴⁵ Dawkins, *Greatest Show on Earth*, p. 315.

⁴⁶ Tom Misteli, ‘The Inner Life of the Genome’, *SA*, Feb. 2011, pp. 46-53.

⁴⁷ Jonathan K. Pritchard, ‘How We Are Evolving’, in *SA*, Oct. 2010, p. 28.

⁴⁸ *Biology Direct* (2009), <<http://www.biology-direct.com/content/4/September/2009>> downloaded 27/11/2009. See also Stephen S. Hall, ‘Revolution Postponed’, *SA*, Oct. 2010, pp. 42-49, especially p. 49; see also Sterelny and Griffiths, *Sex and Death*, pp. 132-133.

⁴⁹ Kim Sterelny, ‘Philosophy of Evolutionary Thought’ in Ruse and Travis, *Evolution*, p. 320. See examples in S. Zaina and G. Lund, ‘Epigenetics: a tool to understand diet-related cardiovascular risk?’ *J Nutrigenetic Nutrigenomics* 2011; 4(5):261-74. Epub. 2012, Feb. 22. Downloaded 23/02/12. Also K. A. Lillycrop, G. C. Burdge, ‘The Effect of Nutrition during Early Life on the Epigenetic Regulation of Transcription and Implications for Human Diseases’, *J Nutrigenetic Nutrigenomics* 2011; 4(5):248-60. Epub. 2012, Feb. 22. Downloaded 23/02/2012.

(d) Common mechanisms in very different organisms

Mendel's work led to twentieth-century genetics. Alongside that was the discovery and deciphering of the chemical mechanisms that pass on characteristics of an organism to its offspring. They provide a powerful, theoretical backing to the empirical theory of natural selection, and additional objective correlation and expansion for Darwin's related concept of the tree of life, a development of which we shall make use of later.⁵⁰ Further reinforcement, if it were needed, is provided by the discovery of "a shared tool kit of animal development".⁵¹ The mechanisms responsible for the development of functionally related, though anatomically very different, organs across species with dissimilar body plans are often regulated by closely similar genes. These must therefore have a common origin. This is the case for the wings of insects and the limbs of mammals as well as for their very differently constructed eyes.⁵² That has led to the speculation that the outline body plans of complex creatures were determined very early in evolutionary history and cannot be altered by adaptive mechanisms.⁵³ It is certainly the case that the chemical mechanisms associated with the molecular biology of unicellular organisms are very closely replicated across the whole spectrum of living creatures including humans.⁵⁴ All the above factors contribute to our understanding of the unity of life that will be a feature of our arguments in the next section as well as in Chapter 5.⁵⁵

(3) The unity of physical life

(a) The tree of life

Chemistry is only one of the factors that anchor humanity within the complexity of planetary life. Without all the above wealth of more recent information Darwin, by his arguments concerning the transformation of species, gave weight and coherence to an already current opinion. Living creatures, both contemporary and extinct, could be classified according to their physical relatedness and assigned, in ascending complexity, to branches of a family tree, or "great chain of being", culminating in humanity. Such a classification was based on a hierarchical inventory, due to Carl Linnaeus (1707-78). His system did not necessarily lead to any historical conclusions: many of his followers held that species were individually created. Linnaeus himself came to believe that God created

⁵⁰ See Chapter 5 (4) (a) (iv). Darwin's first reference to this is in an 1837 notebook. See Ruse and Travis, *Evolution*, p. 12.

⁵¹ George A. Wray, 'Evolution and Development', Ruse and Travis, *Evolution*, p. 222 with references there cited.

⁵² Walter Gehring, *Master Control Genes and the Evolution of the Eye*, question and answer session at <http://www.pbs.org/wgbh/evolution/library/04/4/text_pop/l_044_01.html> (11/01/2010)

⁵³ Melanie Mitchell, *Complexity a Guided Tour* (Oxford: Oxford University Press, 2009) p. 281.

⁵⁴ Elliott and Elliott, *Biochemistry and Molecular Biology*, pp. 3-4.

⁵⁵ See Chapter 2 (7) and especially Chapter 5 (4) (a) (iv).

only the original species of each genus from which the other species and varieties developed without further intervention.⁵⁶ I shall refer later to the tree of life in the context of the incarnation.⁵⁷

What Darwin showed was that this tree of life could be explained as a development over time due to natural selection. Places in the tree of life were first assigned from comparative anatomy. There were apparent inconsistencies in this system caused by the similarity of species in what are now widely differing geographical locations. They were cleared up by the theory of continental drift, developed by Alfred Wegener (1880-1930) and his successors.⁵⁸ More recently, studies in the biochemistry of various contemporary species including humans have revealed previously unsuspected relationships, which were not clear from outside appearances. Most striking are those related to the DNA in the nucleus of the cell and the mitochondria. These latter are inclusions in the cell responsible for energy production. They are now understood to be descendants of originally independently living microorganisms.⁵⁹ Their DNA is not shuffled as it is passed on from parent to offspring; in sexual creatures it is transferred almost entirely through the female line. Small variations in it from one individual to another enable various lineages to be traced, thus female lines over a number of generations can be established. The rate of mutation allows a time scale to be estimated. This is a vital part of the evidence for the anchoring of human evolution within time.

(b) Genes, the history of life and human history

Heredity and natural selection operate not just at the physical but at the behavioural level as well. In human beings we might think of four categories of evolution: genetic, epigenetic, behavioural and symbolic.⁶⁰ (There will be further discussion of the two latter of these.⁶¹) They can interact in various ways, some of them little understood. It has also been proposed that it would be more logical to speak of “fundamental units of evolution”. These would be ensembles which can be traced through succeeding generations and which may be, or may include, genes or cohorts of genes.⁶² The history of life could thus be described by a number of different but associated and interconnected trees according to which heritable units were under consideration. We shall find later that the tree of biological life has

⁵⁶ Mary P. Winsor, ‘Linnaeus’ in Ruse and Travis, *Evolution*, pp. 686-7.

⁵⁷ See Chapter 5 (4) (b).

⁵⁸ For a survey of this and other matters related to the distribution of species and fossils see Joseph Travis and Michael Ruse, ‘Biogeography’, in Ruse and Travis, *Evolution*, pp. 447-452.

⁵⁹ Brian and Deborah Charlesworth, ‘Evolution of the Genome’ in Ruse and Travis, *Evolution*, p. 160. See also Michael Ruse, ‘Lynn Margulis’, in Ruse and Travis, *Evolution*, pp. 712-713.

⁶⁰ Eve Jablonka and Marion Lamb, *Evolution in Four Dimensions* (Cambridge MA: M.I.T. Press, 2005). Epigenetics here refers to the study of inherited changes in the cell not transmitted by DNA.

⁶¹ For behaviour as culture see Chapter 2 (6) (c), for discussion of symbols see Chapter 2 (5) (e).

⁶² Eugene V. Koonin and Yuri I. Wolf, ‘The fundamental units, processes and patterns of evolution, and the Tree of Life conundrum’, *Biology Direct* 2009, 4:33doi:10.1186/1745-6150-4-33, downloaded 29/11/2009.

an important parabolic significance.⁶³ Changing the metaphor, we might talk about multidimensional networks or, more poetically, webs changing over time. Humanity and its history thus have their place in this complex interaction of natural cause and effect. It is clear that in spite of the great attention that has been paid to genes by Dawkins and others, they are by no means the only physical causative factor in the history of life in general or human life in particular.⁶⁴

Evolutionary biology is indeed sometimes thought of as a historical study.⁶⁵ Hempel finds in history a recourse to explanations based on law-like generalizations -- just as in science.⁶⁶ He adduces “genetic explanations” in which one stage of an historical sequence of events follows another in a law-like manner. There are clearly parallels to explanations based on the theory of natural selection. One structural similarity between the two types of explanation is that the historical sometimes invoke theories about the motives and intentions of given actors in the story. This corresponds, formally, to frequent use of teleological metaphors in biology. However, speculations about the surrounding circumstances in any given evolutionary or historical event, leading sometimes to a conclusion of contingency or “happenstance”, must also play a part.⁶⁷

In those, as in other respects, Darwinian biology, including ecology, is related to different kinds of history. Family trees stand alongside a multitude of other genealogies of institutions, nations, tribes, political movements, religions and cultures. In general, these are traceable, by documents, monuments, and human and other archaeological remains. However, there are always questions about the ways in which separate elements arose, influenced or even intertwined with each other or fused as they moved through time. Darwinian biology also enters into the wider historical realm: witness the popular, evidence-based, sketch of global human development by Jared Diamond.⁶⁸ He makes use of adaptive explanations. Those include how the co-evolution of food crops, domesticable animals and human culture took place even before deliberate selection by humans. Alongside these were dominant geographical factors. The interaction of all these, rather than the minimal differences in human genetic make-up, have led to diversity in technological development and consequent uneven distribution of wealth and power across the planet. Such efforts, though certainly not final, show some of the ways in which Darwinian evolutionary threads must be woven into any defensible story of the one human race. This is the case even though changes in the human genome over historic time may be unimportant. Yet,

⁶³ See Chapter 5 (4) (b).

⁶⁴ See Sterelny and Griffiths, *Sex and Death*, pp. 94-111, also Dupré, *Human Nature*, pp. 25-31.

⁶⁵ See for instance Jerry Fodor and Massimo Piattelli-Palmarini, *What Darwin Got Wrong* (London: Profile Books, 2010), pp. 132-135.

⁶⁶ For parallels and connections between scientific and historical method see Carl G. Hempel, ‘Explanation in Science and in History’, *The Philosophy of Science*, ed. by P. R. Nidditch (London: Oxford University Press, 1968), pp. 54-79.

⁶⁷ For analysis of the role of contingency at several different levels, see Sterelny and Griffiths, *Sex and Death*, pp. 296-302.

⁶⁸ Jared Diamond, *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W. W. Norton, 1999).

in spite of its wide applicability, Darwinian theory should not be understood as a dogma. Following what I have already said about science in general, we are to think of Darwinian biology as a network of corrigible, empirical, working hypotheses. Their subject matter is the origin and functioning of living things as, individually and collectively and in their relations with each other, they change through time. Within that, the biological story of the human species firmly has its place. Thus, in Chapter 5 we shall have more to say from a theological standpoint, about the time-bounded nature of human and every other kind of biological existence.⁶⁹

(c) The species *Homo sapiens*

Humanity has thus its place, temporary though it may be, within the life of the planet. However, what exactly is a human being and what more precisely is this place? Many different sources of genetic and palaeoanthropological information now reinforce each other. They point to a probable answer. The branch of the evolutionary tree (the subfamily *Homininae*) of which *Homo sapiens* is one member separated from that which includes the great apes between five and ten million years ago. In geological terms, that is a very short time. All living members of the species *Homo sapiens*, in all its superficially different varieties, are thought to descend from a few thousand individuals somewhere in East Africa. Migration of *Homo sapiens* out of Africa took place possibly 130,000 years ago, perhaps as recently as 50,000 years ago, perhaps in successive waves.⁷⁰

It appears that Africa is the source of most of the one tenth of one per cent of inherited genetic variation in the one human species across the planet. It was pointed out by Richard Lewontin that the proportion of genetic variation within a given so-called “race” was ten times that between races as a whole. His interpretation of the data was and is controversial. His conclusion was that “race” is not a biological concept. There ought to be no argument about this, although there is at least one dissenting voice in the academic community, that of Ruse. He argues that the use of word is unavoidable. Lewontin was indeed concerned to make a political point, namely that genetic data should not be used to determine social policy, and however that does not make him wrong. I shall deal with this vital question from a different perspective in Chapter 5.⁷¹

One of these few thousand East African ancestors was the hypothetical “mitochondrial Eve” who would be an ancestor of, at the most 130,000 years ago, of every human person now alive.

⁶⁹ See Chapter 5 (4) (d).

⁷⁰ Bernard Wood, *Human Evolution: A Very Short Introduction* (Oxford: Oxford University Press, 2005), p. 108. For a more comprehensive and detailed survey of human prehistory see *The Human Past*, ed. by Chris Scarre (London: Thames and Hudson, 2005), especially pp. 1-173. It includes reference to other working hypotheses of human origins than the “Out of Africa” one. See pp. 124-157.

⁷¹ See Chapter 5 (4) (c) (i). The controversy is dealt with in Richard Lewontin, ‘The Apportionment of Human Diversity’, *Evolutionary Biology* 6; pp. 381-398 (cited in Ruse and Travis, *Evolution*, p. 684.) See Ruse, *Darwinism and its Discontents*, p. 185. Also Richard Dawkins, *A Devil’s Chaplain* (London: Phoenix, 2003), pp. 88-90.

She was not the one original human person, but one of a genetic community differentiated from other hominids.⁷² That might be called the founding tribe, but their origins might stretch perhaps 70,000 years before her birth. They might have been the survivors from a much larger population of genetically similar individuals whose numbers were drastically reduced by a period of glaciation.⁷³ Were the members of this tribe the first of a new species? What do we mean, conceptually, by the term “species”?⁷⁴ There is a multitude of definitions.⁷⁵ What distinguishes one species from another is not always clear. For organisms that reproduce sexually, the most obvious criterion is reproductive isolation arising not simply from geographical or social factors but inherent in the organism itself. However, whichever definition is used, speciation remains a process: the difficulty is to discover exactly where in the process a given variety is. It appears from the remarks of Ptacek and Hankison that a century and a half after the publication of *The Origin of Species*, speciation is not yet well understood.

Any attempt to produce such a definition of humanity would be further complicated by the fact that the exact relationships among the various hominid species and their connection as ancestors of or collateral branches to the lineage of *Homo sapiens* are also controversial. In particular, the place in all this of *Homo neanderthalensis* remains in doubt. It shares some of the characteristics of modern human beings, including the use of symbolic objects.⁷⁶ Mitochondrial data seem to suggest a different lineage.⁷⁷ It appears that modern human DNA, from outside Africa, contains between 1% and 4% whose origin is Neanderthal.⁷⁸ There appears to be no simple story about human origins, no agreement on a single working hypothesis.

(4) Human distinctiveness

(a) What might we mean by human genetic distinctiveness?

The first drafts of the comprehensive human gene sequence were published in February 2001. They enabled a much deeper understanding of the genetic history of the human race. They revealed even more clearly than before its kinships to, and differences from, other organisms, both simple and complex. The genome turned out not to be the straightforward instruction manual for

⁷² Ruse, *Discontents*, pp. 170-71, referring to Cann and Wilson, ‘The recent African Genesis of Humans’, *SA* 13, No. 2, pp. 54-61.

⁷³ Curtis W. Marean, ‘When the Sea Saved Humanity’, *SA*, August 2010, pp. 41-47.

⁷⁴ John Maynard Smith, *The Theory of Evolution* (Harmondsworth: Penguin, 1958), pp. 152-165. David N. Stamos, *The Species Problem: Biological Species, Ontology and the Metaphysics of Biology* (Lanham MD: Lexington, 2003).

⁷⁵ Margaret B. Ptacek and Shala J. Hankison ‘The Pattern and Process of Speciation’ in Ruse and Travis, *Evolution*, pp. 178, 180 but C. Zimmer, *SA*, June 2008, pp. 48-55 notes at least twenty six definitions of “species”.

⁷⁶ Marean ‘When the Sea Saved Humanity’. An evaluation of the importance of this work is contained in Erik Trinkaus, ‘Human Evolution: Neanderthal Gene Speaks out’, *Current Biology*, Volume 17, Issue 21, 6 November 2007, pages R917-R919; Wood, *Human Evolution*, p. 97.

⁷⁷ Kate Wong, ‘Twilight of the Neanderthals’, *SA*, Aug. 2009, pp. 34-39.

⁷⁸ Richard E. Green and others, ‘A Draft Sequence of the Neanderthal Genome’, *Science*, 7 May 2010, pp. 710-722.

humanity that some had imagined. There are fewer genes than expected, less than 30,000. A number of simpler organisms have many more.⁷⁹ Many genes are multifunctional, encoding for a number of different proteins. Can humanity be genetically specified?

One obvious difficulty about an easy affirmative is that sequences have been analysed for particular individuals. There is no standard human genetic profile. We have already noted that there is variation in human genome content of approximately one tenth of one per cent.⁸⁰ This statement implies that the humanity of the individuals who were studied had been decided on other grounds, that is according to features of the phenotype rather than the genotype. In any case, the difficulty of strictly deciding whether a given organism is human is not solved by genetics. Consider the case of autism and autistic spectrum disorders, conditions in which individuals may have very great difficulty forming relationships and react very badly to changes in their environment. Typically, they seem to lack the insight into other people's mental states that is a fundamental property, we might think, of the mature human person, and have to undergo prolonged education to acquire it. Sometimes they are unable to distinguish between biological organisms and mechanical objects.⁸¹ There is a well-specified genetic basis for this disability.⁸² Yet we would certainly not turn to genetics to decide if a person, even at the far end of the autistic spectrum, lacking all communication skills, counted as human, and neither should we. A proposal to specify humanity, without ambiguity, purely on the basis of genetics simply does not work. We shall have to look at other possibilities.⁸³

(b) Is humanity distinguished by a “mind substance”?

As we have seen, the thinkers of the Enlightenment characteristically thought of reason as being the property that defines humanity. We found problems about the notion of reason. However, in whatever sense we take it, reasoning should be an activity of the mind. Can the concept of “mind” help us?⁸⁴ Is possessing it what defines an organism as human? What could mind be? René Descartes (1596-1650) thought that the mind was a unitary indivisible immaterial thinking substance, without extension, entirely to be distinguished from the physical brain in which it resided.⁸⁵ Descartes was thus a “substance dualist”, who equated “mind” with “soul” and who held that the soul was immortal.⁸⁶ He

⁷⁹ J. D. Watson, ‘The Human Genome Revealed’, in Dennis and Gallagher, *Human Genome*, p. 6.

⁸⁰ See Chapter 2 (3) (c).

⁸¹ Uta Frith and Chris Frith, ‘The social brain: allowing humans to go where no other species has been’, *Philosophical Transactions of the Royal Society*, B 2010 365, pp. 165-176.

⁸² Uta Frith, ‘Mind Blindness and the Brain in Autism’, *Neuron*, Vol. 32, pp. 969-979, December 20, 2001.

⁸³ ‘In reality there is no such thing as the “genetic essence” of a species.’ Sterelny and Griffiths, *Sex and Death*, p. 7, with connected arguments on the following two pages. See also the extended discussions of these topics in Stamos, *Species Problem*.

⁸⁴ See Chapter 1 (4) (b) (i), (ii) and 1 (4) (c) (i).

⁸⁵ René Descartes, *Discourse on Method and Meditations on First Philosophy*. Trans. by Donald A. Cress (Indianapolis: Hackett Publishing Company, 1998), See Daniel Garber in *SREP*, pp. 174-190.

⁸⁶ Blackburn, *Think*, p. 51.

held that soul and body continuously interacted with each other. Others have held that the interaction is all in one direction. The physical body (including the brain) affects the mind, but the converse cannot happen. That is epiphenomenalism. A third possibility of substance dualism is that mind and body work in parallel, set at their beginning like clocks in perfect agreement.⁸⁷ According to Andy Clark, dualism has generally been abandoned by science and philosophy, mainly because mental life is so obviously altered by such things as physical disease, drugs and surgery. It is also the case that certain types of mental activity can be physically located in the brain. It is further the case, thinks Clark, that such items of human experience as falling in love and appreciating music are on their way to being fully dealt with by neuroscience and other physicalist explanatory strategies. A related argument that Clark does not specifically mention, but which is important for our purposes, is that substance dualism simply does not fit into a physicalist evolutionary account of human origins. Although the ability to think certainly has adaptive advantages, a non-physical thinking substance would be difficult to insert into this empirical scheme that envisages adaptation bringing about changes in physical components of an organism. The only thing in favour of dualism that looks anything like evidence is that from introspection: we imagine that we know that our thoughts and feelings simply cannot be bodily states. However, of course, thinks Clark, we could be mistaken about this, as about so many other things concerning ourselves. Mental substance is simply an unnecessary hypothesis. The arguments against it, which we have not explained in full detail, seem in the twenty first century very convincing. Earlier we noticed independent theological reasons expounded by Joel Green and based on biblical exegesis for supposing that this conclusion against dualism, though not necessarily Clark's arguments, may well be correct.⁸⁸ We shall come back to the theology later.⁸⁹ However, we need to consider other ways of thinking about mind.

(c) In spite of Ryle, “mind” is a genuine problem

According to a famous argument advanced by the “ordinary language” philosopher Gilbert Ryle (1900-1971), the problem is simply one of inaccurate or inappropriate use of language. When we use the term “mind”, implying dualism, as though it were the name of an identifiable thing, as it were “the ghost in the machine”, we are like a tourist visiting the different colleges in Oxford or Cambridge who is puzzled because no one can point out the university.⁹⁰ A category mistake has been made. Cataloguing and correlating the ways people behave will solve any problems. However, Clark, who has no more use for dualism than does Ryle, holds that dismissing real problems as though they were nothing but the incorrect use of words is a mistake.⁹¹ We can agree in the sense that any understanding

⁸⁷ Three dualistic points of view are thus distinguished by Clark, *Mindware*, p. 163.

⁸⁸ See Chapter 1 (4) (e) (i).

⁸⁹ See Chapter 3 (4) (e).

⁹⁰ Gilbert Ryle, *The Concept of Mind* (London: Penguin, 1963), pp. 17-19.

⁹¹ Clark, *Mindware*, p. 166.

of the human person, whether philosophical, theological or even one of physicalist science, must find a place for mind and consciousness of self as aspects of mentality.

(5) The basis of mind is exclusively physical

In this section (5) and the following one I summarize various understandings of mind which assume that the brain and other workings of the physical body are responsible for whatever mind is. This is a complex and controversial group of interrelated and sometimes competing fields. Certain of them, in particular cognitive neuroscience, where the workings of the brains of living people can be examined by digital imaging, are moving very quickly. None of them leaves any room for any mind substance or for any other than natural processes. Like other scientific programmes, they are concerned with empirical working hypotheses. Some appear more persuasive than others do. The result of this cumulative weight is that theology must make the methodological assumption that a physicalist understanding of the basis of mind will turn out to be well grounded. It would be unwise, however, to commit itself to any one version of that understanding.

(a) What could mind be, if not a substance?

Theories of mind need to account for actual experience of both mental and physical phenomena, not just for our language relating to them. After all, the language is about something. We humans are, or think we are, subjects, aware of thoughts, feelings, desires, intentions and memories and so on. We receive impressions from the senses relating to the world around us and to our own bodies. On the other hand, there is that world around us, the world of objects, separate from our own impressions but which, we must assume, gives rise to them. In that world we act and with it, we interact. It has many kinds of things that can be weighed or measured in other ways. There are also other people. We think we have some understanding of their status as subjects like ourselves. We can investigate the external world by the methods of empirical science without making any conscious philosophical assumptions about what the objects in it may be in themselves. We can then form working hypotheses which try to account for their effects on us and each other and test them empirically.⁹² The status of the mental is more problematical. There are multitudes of philosophical theories that try to make sense of it and of its relationship with the physical.⁹³ Partly for my own theological reasons, I find one of them, dualism, to be unsatisfactory.⁹⁴ The great majority of

⁹² See Chapter 1 (2) (g).

⁹³ For a sketch of some of the chief problems see Samuel Guttenplan (ed.), *A Companion to the Philosophy of Mind* (Oxford: Blackwell, 1995), pp. 76-107.

⁹⁴ In general terms I accept Karl Barth's account, as presented at Chapter 3 (4) (e), which he describes as "concrete monism".

contemporary philosophers are agreed.⁹⁵ It is however entirely possible to study mental phenomena without necessarily being committed to any one fully worked-out philosophical view about their relation to the physical. There is a constellation of research programmes with that objective.

We shall look at several of these programmes, all of them consistent with Darwin's belief that mentality, whether in humans or other organisms, is an adaptive feature. Each has a burgeoning literature. We shall summarize a number of key points of discussion but before that we mention sociobiology (which has become, according to E. O. Wilson, evolutionary psychology)⁹⁶, an all-embracing project for the understanding of human life and culture, which remains influential.⁹⁷

(b) E. O. Wilson: sociobiology and comprehensive Darwinism

Edward O. Wilson proposed that social interaction in all its forms had evolved through natural selection and was genetically based, not only in insects such as bees, wasps and ants, but in mammals and indeed in humans as well.⁹⁸ The result was a vituperative controversy with political dimensions, still echoing a generation later. The Wilson line of succession includes Richard Dawkins and Steven Pinker, although they differ in various ways from Wilson himself. The opposing camp, which argues that culture and human mentality are not functions of biology, includes the contributors to *Alas Poor Darwin*, notably Steven Rose, Mary Midgley and Steven Jay Gould.⁹⁹ We shall not enter any further into this controversy as our main engagement is with the broad physicalist understanding of humanity that has gained very wide acceptance among scientifically educated people. Wilson's own picture of humanity according to Darwin goes far beyond biology. He thinks that to discover human nature would be to discover the suite of programs under which human life operates as well as their adaptive origin. He claims that the result will be a unified characterization, diagnosis and eventually effective remedial programmes for the human condition. However, in his desire to offer a comprehensive explanation of humanity by means of one theory, Wilson goes beyond the frontiers of empirical science. I shall not attempt to analyse it further here.¹⁰⁰

⁹⁵ For a famous exception, see Karl R. Popper and John C. Eccles, *The Self and its Brain, an argument for interactionism* (London: Routledge & Keegan Paul, 1983).

⁹⁶ For an attempt to define the distinction between the two see Pinker, *How the Mind Works*, pp. 41-42. The term "sociobiology" does not appear in the index of Louise Barrett, Robin Dunbar, and John Lycett, *Human Evolutionary Psychology* (Basingstoke: Palgrave Macmillan, 2002).

⁹⁷ Edward O. Wilson, *Sociobiology, The New Synthesis* (Cambridge MA: The Belknap Press, 2000), page viii.

⁹⁸ Wilson, *Sociobiology*.

⁹⁹ *Alas Poor Darwin*, ed. by Hilary Rose and Steven Rose (London, Vintage, 2000); Dawkins, *Selfish Gene*; Pinker, *How the Mind Works*.

¹⁰⁰ Edward O. Wilson, *Consilience: The Unity of Knowledge* (London: Abacus, 1999).

(c) Is mind computational?

All computers are devices for carrying out instructions to transform input data and use it in some way.¹⁰¹ Evolutionary psychology proposes that the phenomenon of mind is the outcome of such a formalizable process, that is to say computation.¹⁰² In other words, thinking and all other mental activities, conscious or unconscious, are properties of the physical brain working according to rule-based procedures. The procedures may be algorithms or more generally, heuristic strategies. Such processes can be carried out by diverse physical systems made of different materials. The most familiar ones are electronic. There is no reason in principle why biological materials should not be used. The first laboratory attempts have been made involving DNA.¹⁰³

Thus, the assumption about the mind common to all the Darwinian research programmes is that physical brains, including human brains, are devices like the humanly designed and fabricated electronic machines just mentioned, though not necessarily internally organized in any way like them. The origin of these biological computers, as well as the procedures by which they function, is the adaptive design of natural selection. This could be a philosophical proposition, in Popper's sense a metaphysical proposal.¹⁰⁴ If it is seen as working hypothesis, it should be judged according to its fruitfulness in explaining empirical situations.

(d) Steven Pinker

Steven Pinker expounds evolutionary psychology, detailing a thoroughgoing naturalistic view of the mind.¹⁰⁵ "The mind is what the brain does."¹⁰⁶ The founding assumption of this part of this Darwinian enterprise is that "the mind is a system of organs of computation designed by natural selection to solve the problems faced by our evolutionary ancestors in their foraging ways of life."¹⁰⁷ Not only behaviour but also emotions, language, memory and thinking are adaptively designed computational processes. Understanding how the brain is put together physically, in terms of neuroanatomy or physiology or how it functions in a biochemical sense, tells us little about mentality. What we have said about the different substrates with which programmes operate, demonstrates that entirely different physical brains could conceivably exhibit the same mentality. The term "module" is frequently used by Pinker and other authors. It is not always obvious whether a specific physical brain structure is under consideration or whether they are talking about a program unit, a group of coded

¹⁰¹ Martin Campbell-Kelly, 'Computing', *SA*, Sept.2009,p. 53, including references.

¹⁰² Pinker, *How the Mind Works*, p. 67.

¹⁰³ Maya Kahan and others, 'Towards molecular computers that operate in a biological environment', *Science Direct, Physica D237(2008)*, pp. 1165-1172. Found online at <<http://www.sciencedirect.com>> 28 Sept. 2012.

¹⁰⁴ See Chapter 1 (2) (c).

¹⁰⁵ For comment on the change from "sociobiology" to "evolutionary psychology" see Pinker, *How the Mind Works*, p. 41. See also Sterelny and Griffiths, *Sex and Death*, pp. 313-336.

¹⁰⁶ Pinker, *How the Mind Works*, p. 24.

¹⁰⁷ Pinker, *How the Mind Works*, p. 21.

instructions that even in an electronic computer cannot be tied to a physical location. In either of these cases the operations of the brain/mind are designed by natural selection. Pinker does devote some discussion to the way in which assemblies of neurons with particular functions, different sensory inputs and motor functions might be realized, and this enables him to relate his theories to artificial intelligence. The ability to learn is one of the most important evolved capacities. He and other authors think that a learning module would physically consist of a large number of multiple interconnections and with variable inputs and outputs. Authors acknowledge that this does not amount to a theory of mind. It is rather a hypothesis about how a very simplified physical model might be made to work as a rudimentary intelligent system. However, Pinker's main point is the assertion that what the brain does is computation in ways analogous to what a computer does. That is to say, the brain is a machine for manipulating or rather processing symbols representing items of information. In the case of an electronic computer, the symbols are physical states of its various elements. He thinks that in the case of the brain, the physical states of neurons or collections of them are in the same way symbols, which stand for items of information. Those include beliefs and desires but also numerous other inputs and outputs of which the human organism is the source, receptor, place of storage or of processing.

(e) Symbols

Consideration of symbols is part of a philosophical debate on the topic of representation, which might very roughly be said to be the attempt to explain how one thing can stand for another thing.¹⁰⁸ Whatever may be the case for human minds, computers certainly operate by processing symbols which represent something in the outside world. We shall only here mention the aspects relevant to the ontological status of human beings.

Following the thought of C. S. Peirce (1831-1914), Deacon proposes that symbols are one of the class of signs, the other two being icons and indices.¹⁰⁹ These three are all modes of reference. Only humans have evolved the ability, without tuition, to make use of symbols. Symbols and, following them, human languages, have evolved from the other two because of the adaptive advantages for protohumans of being able to communicate, negotiate, form contracts (in particular, marriage, whether monogamous or polygamous) and so aggregate into stable bands and tribes. There is a nuanced discussion. I have no space here to expound it in detail. Use of symbols is, he thinks, a diagnostic test of humanity. His proposals have been heavily criticized.¹¹⁰

¹⁰⁸ For a full discussion see Crane, *Mechanical Mind*, including comments on Searle's parable at pp. 124-129. See further later discussion on the influence of the body in behaviour, Chapter 2 (6) (b).

¹⁰⁹ Terence Deacon, *The Symbolic Species: The co-evolution of language and the human brain* (London: Penguin, 1998), pp. 70-71. For Peirce's philosophy see Gallie, *Peirce*, especially pp. 115-116.

¹¹⁰ Barrett, Dunbar and Lycett, *Human Evolutionary Psychology* pp. 338-339.

The validity of symbols hypothesis has been strongly contested by the philosopher John Searle, himself also a physicalist. In a thought experiment, he considers the case of an operator who knows only English enclosed and isolated in a room and provided with a look-up table of all the rules necessary for manipulating Chinese characters. If questions in Chinese are written on slips of paper and posted in, he can post out correct answers in Chinese without ever having understood the meaning of the symbols. Hence, mental activity, which is concerned with understanding and meaning, must be more than the processing of symbols. It is intentional, that is, about something. Clark argues that Searle is intending to demonstrate an unbridgeable gap between syntax and semantics, but that in fact what is needed is “a finer grained specification of the relevant computational and syntactic structure”.¹¹¹ That suggests that meaning will come about as the system becomes more discriminating and elaborate. Dennett advances a similar proposal.¹¹² That sounds like the thesis that if the word processor on which this is being written were sufficiently advanced, that is to say more complex, it would write the dissertation (which, we hope, is “about something”) automatically without a human person at the keyboard. Clark suggests that although his thesis may seem improbable it is no more improbable than the reality: biological material does indeed perform in this way.¹¹³ Such an argument is circular: it depends on assuming the truth of its conclusion. However, as we shall see, before discounting it, theologians need to remember that much theology is of the same kind.¹¹⁴ It does however move the argument beyond purely physical considerations.

We can see that what is in question here as stated by certain evolutionary psychologists and philosophers is that evolutionary psychology is a non-negotiable dogma which can take various forms but whose essence is that thinking is computation. (Deacon’s views are rather different.) In Pinker’s view, it is equivalent to the statement that thinking is the processing of information. What could possibly falsify these propositions? What would be the equivalent of finding “fossilized rabbits in the Precambrian”, a discovery that would falsify the empirical working hypotheses of evolution?¹¹⁵ There does not yet seem to be any answer to that question. That puts evolutionary psychology on the speculative edge of natural science. It may be “metaphysical”, in Popper’s sense of the term. We can grant that some thinking may well be computation. However, as we have seen from the Chinese Room argument, there may be reasons for saying that human mental activity does not consist in the manipulation of symbols. Further, when we come to consider the thinking body, we will see that

¹¹¹ Clark, *Mindware*, p. 35.

¹¹² Dennett, *Consciousness*, pp. 438-440.

¹¹³ The version of the Chinese Room parable cited is from D. W. Green and others, *Cognitive Science, An Introduction* (Oxford, Blackwell, 1998), p. 10. It is further discussed in Clark, *Mindware*, pp.34-37.

¹¹⁴ For some discussion about this, see Chapter 3 (2) (d).

¹¹⁵ The phrase has been attributed to J. B. S. Haldane.

computation itself is not necessarily symbolic or performed by neurons.¹¹⁶ In accordance with the conclusions of Chapter 1 it would be better to understand evolutionary psychology not as a dogma, but as a research hypothesis.¹¹⁷ It is influential and we shall need to consider it further. However, it is not yet well founded and needs more empirical support than it has so far received. There are in any case formidable obstacles in the way of seeing the mind as, without remainder, computations carried out by the physical brain. The problem of relevance, sometimes known as the frame problem, is one example.

(f) The frame problem

Alan Turing (1912–1954) argued that if a machine could not be distinguished by its conversation from a human it must be considered as an intelligent agent, irrespective of its internal workings.¹¹⁸ The ultimate goal of artificial intelligence programmes should therefore be to realize such a device physically. One of the chief difficulties in the way of this is the frame problem. We all have access to an immense body of knowledge and understanding without which it would be impossible to negotiate our way through the world. Roughly speaking we call it common sense. It turns out to be impossible to formulate computationally, other than simply listing a series of propositions; attempts have been made and then abandoned after several million have been counted.¹¹⁹ Pinker gives some amusing examples and then adds, “An intelligent being has to deduce the implications of what it knows but only the *relevant* implications.” (Pinker’s italics.)¹²⁰ Jerry Fodor, the originator of the modular theory of mind, postulates a (non-computable) general-purpose intelligence dealing with, among other things, matters of relevance. A large number of special purpose functional units accompany it.¹²¹ The discussion, still current, cannot be fully dealt with here, but we shall make the methodological assumption that it is a problem to be solved empirically; perhaps progress has already been made.¹²²

(g) What the brain does

Pinker emphasizes that the brain is not in fact an electronic computer, though perhaps some features of it may be understood by analogy with one. However, as we have said, the physical basis of mentality is not what chiefly concerns an evolutionary psychologist. In the case of the computer an engineer could indicate the nature and location of the electronic processes at a given moment in a computational sequence as well as what they stand for. The interesting questions about computer

¹¹⁶ See Chapter 2 (6) (b).

¹¹⁷ See Chapter 1 (2) (g).

¹¹⁸ Clark, *Mindware*, p. 21.

¹¹⁹ Crane, *Mechanical Mind*, pp. 119-124.

¹²⁰ Pinker, *How the Mind Works*, pp. 13-15

¹²¹ For a general account of the frame problem and the modular mind, see Green and others, *Cognitive Science*, pp. 70-83. For Dennett’s solution, see Chapter 1 (4) (b) (i).

¹²² Pinker, *How the Mind Works*, pp. 12-15. For instance, what kind of a computational device would it take to handle puns, jokes, metaphors and so on? An attempted partial solution to the problem is a program to make analogies described in Mitchell, *Complexity*, pp. 186-208.

programs and program modules do not centre on the construction of the machine, or where the electronic states that correspond to and symbolize them reside in it. They can move around or be replicated in several places at once. The interest lies in what they do and the internal logic they use. In the same way, neuroanatomy and physiology are not Pinker's main concern. He does however devote space to discussing the configuration of elements in a computer which might enable it to imitate brain function in a rudimentary way, but his main purpose is to discover what the brain does, rather than how it accomplishes it physically. That purpose, in his view, amounts to a search for the mind.¹²³ The computational theory of the mind is disputable and disputed. However, the distinction between the human and the not-human does not depend on it, since on evolutionary and physicalist assumptions it would be a feature of at least some non-human mental processes. The nature of mind, on this view, is that it is a process, something happening to matter, rather than matter itself or indeed any kind of substance. We shall see later a possible significance of that as a parable.¹²⁴

(h) How and when were the programs programmed?

Another question interests the evolutionary psychologist. How did the brain's programs, or program modules, come to be the way they are? The evolutionary biologist asks a like question about whole organisms. She or he gives a like answer. Natural selection designs them. In other words, the DNA (or any other mechanism for ensuring the inheritance of features of the phenotype) carries the instructions not only for the purely physical form but for those physical configurations that give rise to mental capacities as well. Among the most important capacities is that for learning which, of course, as in motor and language skills, can have a physical content. Such capacities may or may not flower into particular properties, physical or mental, depending on the circumstances in which the human or other organism finds itself. Self-evidently, being able to learn (and unlearn) alongside the capacity for flexible behaviour would confer powerful selective advantages. That would particularly be so if environments were rapidly changing.¹²⁵

Natural selection fits its products for their environments. Evolutionary psychology, according to Pinker, assumes that what the human brain does is the consequence of adaptation for the life of a hunter-gatherer in the Pleistocene era. According to him, physically based genetic evolution has not taken place since then. There is little direct evidence about the life of Pleistocene hunter-gatherers. Perhaps Pinker relies on doubtful historical assumptions. Observations of modern ones are his basis. Are

¹²³ Pinker, *How the Mind Works*, p. 21.

¹²⁴ See Chapter 5 (4) (a) (iii).

¹²⁵ Pinker, *How the Mind Works*, pp. 177-179.

such societies continuous with those of the Pleistocene? They could be independent developments related to much later, even recent, environmental or historical conditions.¹²⁶

There is another question: has no significant evolutionary change taken place since the Pleistocene? Many workers contest that assumption.¹²⁷ There is significant criticism of Pinker's approach from "Human Behavioural Ecology". This is a different discipline. It concentrates on the empirical study of contemporary human behaviour, preferably outside the laboratory. In the undergraduate text referred to, Barrett, Dunbar and Lycett assume that such behaviour is adaptive until shown otherwise. That approach wishes to distinguish itself from Darwinian evolutionary psychology since it involves no assumptions about the mechanisms of inheritance.

Pinker believes he can neglect natural selection as a current driving force. Of course if cultural evolution is included, the pace of change can vary from near stasis over millennia to the weeks or even days in the contemporary era of multiple and mass electronically enabled communications. However, it may often be maladaptive, as witness, for instance, present-day Western nutritional habits. Pinker believes that it is cultural evolution which accounts for the differences between present-day humanity and that of the Pleistocene.¹²⁸ He does not however take into account the more recent understanding of how physically inheritable traits, not carried by the genes themselves but by a cellular mechanism which is responsible for switching them on and off, may be modified by the environment and transmitted.¹²⁹

(i) Cognitive science

Thus, there is more than one possibility for a complex feedback between cultural and genetic evolution, thus speeding up natural selection. A beneficial change would cause its own selection. For instance, there might be an accidental trait, say an enhanced capacity to digest cow's milk. It would then be selected in a society that had already begun to rely on it for nutrition. It would thus be part of particular culture. Some people of African descent lack this capacity. Thus, cultural change might anticipate genetic change leading to genetic-cultural co-evolution.¹³⁰ This of course would particularly be the case for humans in the evolution of language. The adaptation for this capacity would have an obvious selective advantage.¹³¹

An important feature of evolutionary psychology is its use of arguments from adaptation to explain human behaviour. Darwin's *Descent of Man* with its emphasis on sexual selection was the

¹²⁶ In some cases the hypothesis is indeed that certain peoples have reverted to a hunter-gatherer lifestyle from one of settled agriculture. See Diamond, *Guns, Germs, and Steel*, e.g. pp. 352-353.

¹²⁷ Barrett, Dunbar, Lycett, *Evolutionary Psychology*, pp. 8-9.

¹²⁸ Pinker, *How the Mind Works*, pp. 206-210.

¹²⁹ See Chapter 2 (2) (c), including footnotes citing original studies.

¹³⁰ Barrett, Dunbar, Lycett, *Evolutionary Psychology*, p. 372.

¹³¹ Jablonka and Lamb, *Evolution in Four Dimensions*, pp. 306-310.

pioneer in this. More recently, adaptive explanations have been provided for major features of human life like altruism. They form a part of evolutionary psychology and human behavioural ecology.¹³² They offer plausible explanations, many of which may well be correct, for important features of human mentality and to a lesser extent for culture. What is lacking in evolutionary psychology is a fully coherent justification for its historical procedures as well as for its understanding that the mind is modular. Nor can it explain how mind, which was simply the product of what Marvin Minsky called a “meat machine”,¹³³ could generate the phenomenon of consciousness of self, whether or not this is, as Blackmore and others previously mentioned think, an illusion.¹³⁴ Pinker in fact believes that any explanation must be physicalist but beyond current or indeed future science. For “our thoroughgoing perplexity about the enigmas of consciousness, self, will, and knowledge may come from a mismatch between the very nature of these problems and the computational apparatus that natural selection has fitted us with.” Oddly, he thinks it a relatively trivial matter that we cannot explain consciousness. He says that it is on the same level of importance as our not knowing why cats are colour blind.¹³⁵

This fast changing field includes a variety of overlapping disciplines. David Green characterizes one area, related to evolutionary psychology, as follows:

It aims to provide an explicit account of our capacity to act intelligently in the world. It does so by treating the mind as a machine consisting of different parts. Research is guided by a fundamental question: what problems is the mind designed to solve?¹³⁶

In this work, an undergraduate text, the typical procedure is to specify, dissect conceptually certain common events and the actions comprised by them and attempt to represent diagrammatically a possible computational process for their performance. This is an attempt to delineate in mechanistic terms, without specifying the actual physical procedures, the mental processes of human persons. It does not attempt to account for them in specific evolutionary or in cultural terms. It does however assert that evolutionary explanations of different capacities favour the modular mind. There would be two different possible kinds of modules. The first would be based on particular neuron structures (which might be termed “hard wired” by the adaptive process, that is to say innate). The second would be those arising in the course of development, that is to say acquired by the processing of interactions between the organism, other organisms and the outside world in general. These latter are analogous to

¹³² Dealt with by many authors including Barrett, Dunbar, Lycett, *Evolutionary Psychology*, pp. 29-34. See also Dawkins, *Selfish Gene*, pp. 166-188.

¹³³ Cited by Clark, *Mindware*, p. 7.

¹³⁴ Susan Blackmore, *The Meme Machine* (New York: Oxford University Press, 1999), p. 236.

¹³⁵ Pinker, *How the Mind Works*, pp. 563 -565.

¹³⁶ David W. Green and others, *Cognitive Science, an Introduction* (Oxford: Blackwell, 1996), p. 21.

computer programs, though evidently not generated in the same way.¹³⁷ Although the ostensible subject of this introduction to cognitive psychology is that of interactions within a family, the work is about individuals rather than human groups. The word “culture” is not in the index.

The above assumes that mental processes are computable. I suggested earlier that it sometimes might be the case. Many things we do are like this, among them acting accurately without previous foresight by what seems to be an instantaneous calculation, thus avoiding an accident when driving. But computation can only happen inasmuch as a brain state represents something.¹³⁸ There are other cases, which cannot be computation. For instance, the feeling of being in pain is not a representation of anything. It is itself.¹³⁹

It is assumed in much of the methodology of cognitive science that the adaptive process of evolution has designed certain computational mental procedures which will enable the human organism to survive and reproduce. Supposing we concede that as a possibility. If so, can we deduce what these mental procedures are from common human skills and their deployment in daily life? That would be like trying to deduce the inner workings of a PC or Apple Mac from an analysis of what appears on the screen, a rough idea of the connections between the various components and no other information. To complete the analogy, such an operation would have to be conducted with no knowledge of the machine’s various internal languages, even of the binary code which is at their base. The investigator would be ignorant of the thousands of programs and subprograms available to it. She or he would know nothing about the central processing unit or even if there were one. Even a detailed knowledge of the machine’s physical anatomy would not enable the investigator to decode the electronic messages by which it functions. The human brain is several orders of magnitude more complex than the personal computer. If cognitive science intends a detailed and comprehensive explanation of how the brain functions, giving rise to all the phenomena of mentality, it is obvious that it must be a long way from success.

The different, but related, discipline of cognitive neuroscience has however claimed significant progress. There is a concise account of this by one of the contributors to the field, Chris Frith.¹⁴⁰ It is a discipline in which scans demonstrate physical brain activity such as increased blood flow at given locations when the person is engaged in different tasks or even in thinking. An important feature is that it does not depend on identifiable brain injury, but is able to study normal functioning in more detail. It turns out that imagining doing something is correlated with similar activity in the same part of the brain as when actually performing it. Three-dimensional maps of brain function (and

¹³⁷ Green and others, *Cognitive Science*, p. 82.

¹³⁸ Green and others, *Cognitive Science*, p. 7.

¹³⁹ Crane, *Mechanical Mind*, p. 132. The words “pain” and “feeling” do not appear in the index to Green and others, *Cognitive Science*.

¹⁴⁰ Christopher D. Frith, *Making up the Mind: How the Brain Creates Our Mental World*, (Oxford: Blackwell, 2007).

dysfunction), in ever increasing detail, are being compiled. Connections and functional interrelations are beginning to be understood. It was already well known that much of what the brain does is concealed from the conscious mind. The work in question makes that quite explicit by physical correlations. The discipline suggests that every mental event has its corresponding occurrence in the brain but that the converse is not true. For the purposes of easy explanation, Frith does indeed use language implying the existence of a self, but offers no theory of consciousness. He believes that looking for one is fruitless. In this work, he says nothing of any continued existence of the subject through sleep. Although computation is mentioned, it is not offered as a theory of mental functioning.

The cognitive science of religion has a burgeoning literature.¹⁴¹ I illustrate it by a sketch from two summaries by practitioners. The programme deals with hypotheses about how religious concepts and rituals arise. It searches for empirically testable and therefore naturalistic explanations. How do children and adults ascribe agency and purposiveness to real or imagined entities outside themselves? Pascal Boyer refers to interacting but “functionally distinct mental systems, present also in non-religious contexts”. He discounts wish fulfilment explanations, but nonetheless suggests that the “relevant mental machinery”, which leads to religious belief, “is not consciously accessible”. Consequently neither conscious thinking and feeling, nor theology, play much part in the formation of beliefs. Religion is a reaction, often by hidden mental mechanisms, to events and situations; its subject is not a transcendent God but imagined agents: ghosts, spirits, ancestors and so on. On the other hand, Justin Barrett and Emily Burdett, while advocating the empiricist methodology, insist that its findings cannot be used to justify eliminativist or indeed any other metaphysical conclusions: the question of the truth or falsity of religious beliefs does not enter into their understanding of the research field.

These programmes within cognitive science either explicitly deny any transcendent understanding of the human person or deal purely with the phenomena of religion. Boyer seems to be proceeding from dogmatic belief that there can be no “thing in itself” behind the phenomena of religion. Their explanation must be naturalistic. They are a by-product of the way evolution has designed brains to function. As far as that goes his diagnosis could be correct. The functionally distinct mental systems mentioned above might be identified by the physical methods of cognitive neuroscience, like those considered above by Frith.¹⁴² However, understanding even mechanistically how we arrive at our beliefs does not tell us whether they are true. Barrett and Burdett rightly suggest that the scope of the questions dictates that of the answers. The only conclusions that we can draw

¹⁴¹ Pascal Boyer, ‘Religious thought and behaviour as by-products of brain function’, *Trends in Cognitive Sciences*, Vol. 7 No. 3., March 2003, pp. 119 -123. Justin Barrett and Emily Reed Burdett, ‘The Cognitive Science of Religion’, *The Psychologist*, April 2011, pp. 252-255.

¹⁴² See, for example, Uffe Schjoedt, ‘The Religious Brain: A General Introduction to the Experimental Neuroscience of Religion’, *Method and Theory in the Study of Religion* 21 (2009), pp. 310-339.

from such investigations are about the physical world. While such working hypotheses may advance our understanding of behaviour and performance, they throw no light on what humans are in themselves.

Empirical theories do help us to understand something about perception, thought and action and their grounding in the physical brain. However, they do not answer the question, “What is a human being?” However, there is a distinction here between theoretical investigations and the highly convincing empirical ones. The latter show that our beliefs about how we are acting are sometimes contradicted by physical findings, which are independent of any particular theory of mind. The different disciplines of cognitive science each necessarily constrain the range of data to be considered. The danger is that a research methodology easily becomes a belief about the unimportance or even the non-existence of matters not disclosed by the selected evidence or amenable to the treatment chosen. To be fully convincing, cognitive science would have to find a way of approaching the understanding of the conscious self.

(6) Further considerations

(a) The mind and the self

Is there any way then of reaching the human subject, the conscious self? Whatever the arguments, the impression remains that there is something there, a first person, if it is an illusion, that illusion still needs an explanation. What then is the self? Is the consciousness of self, whether or not it reflects a reality, a defining characteristic of humans? Like Chris Frith, philosophical and scientific writers often seem embarrassed by this phenomenon: Andy Clark, in his introduction to the philosophy of cognitive science, relegates it to an appendix.¹⁴³ Clark is confident that the problem is not beyond the scope of empirical science. He dismisses the views of such as Pinker¹⁴⁴ following McGinn¹⁴⁵, who suggest that there must indeed be a naturalistic solution, but simply one which natural selection has not programmed humans to discover. This latter view has been dubbed the “mysterian” position.

Clark, like other authors, divides the consciousness problem into two parts: those aspects of self-consciousness concerning information and those about “raw feels” or “qualia”, i.e. what it is like to be such and such, or to have such and such an experience, being aware of the scent of the rose for instance. He believes that neuroscience is in the process of providing solutions to problems of the first kind and offers some technical details of this. The “raw feels” question he allows is more difficult. He offers two possibilities for it. One of them he calls representationalism, which seems to amount simply to a denial that a problem exists; “raw feels” are simply information, and that’s that. The other is one he

¹⁴³ Clark, *Mindware*, pp. 171-188.

¹⁴⁴ Pinker, *How the Mind Works*, pp. 561-564.

¹⁴⁵ Colin McGinn, *The Character of Mind: An Introduction to the Philosophy of Mind*, 2nd edition (Oxford: Oxford University Press, 1996).

attributes to Dennett, namely that consciousness is something constructed by mind tools in reaction to the environment. It is a cultural artefact, the propensity to tell a story about oneself.¹⁴⁶ Indeed, Dennett himself, rejecting qualia and raw feels, recommends that personal accounts of mental content be never taken at their face value. We often preface such stories of self-examination by “we” but, in fact, we get wildly different accounts. One possible deduction is that we are all different. This Dennett rejects. Rather, we are often wrong. That is to say each one of us individually is wrong. Therefore, we need to find a way of standing back from those introspections. He therefore offers a detailed technique to ensure neutrality. He calls it “heterophenomenalism”. The experiment must take the story seriously and record it with great attention to accuracy, but the valid explanation of the story will not be that of the teller. This goes beyond any hermeneutical suspicion. Dennett says that such stories are not even evidence for a state of mind. Dennett’s methodology amounts to saying, “You may be giving an accurate account of what you are thinking on a conscious level or, rather what you think you are thinking, however the real process of thinking which supplies these thoughts is not accessible to you.” Thus, the investigator already has a hypothesis to test about an unconscious mechanism of thought generation. That explanation must supply a common basis for the wildly different accounts of their mental processes offered by different subjects. Perhaps such theory might be like those of Freud. Dennett, however, characterizes Freudian accounts as about dramatic productions by a homunculus, a little man residing in the brain. He rejects them.¹⁴⁷ However, Dennett’s accounts, though in a mechanistic dress, are not much better. They might well provide coherent stories about different systems and subsystems embodied in the brain. That is what he attempts to do tentatively. However, we need more than coherence.¹⁴⁸ There must be empirical correlation. In practice, workers have not reached the stage when they can give fully coherent explanations in terms of experimental neurophysiology. Even when they do, they might still leave out a vital factor. They seem to entail for the experimenter the adoption of what Jacques Ellul (1912-94) called “the technical-experimental state of mind”. That does not imply that the scientific results will necessarily be invalid. However, the means of obtaining them is in danger of neglecting the actual humanity of the human person.¹⁴⁹ Ellul’s point is a very general one. Legitimate scientific work may lose focus and forget that inevitably it deals with a subject as well as an object. As McGinn proposes, any proper account of mind needs to pay attention not only to the third-person

¹⁴⁶ Nancey Murphy and Brad J. Kallenberg, ‘Anglo American Post-Modernity’, in *Cambridge Companion to Post Modern Theology*, ed. by Kevin J. Vanhoozer (Cambridge: Cambridge University Press, 2003), p. 35, cite an apparently very similar suggestion by Nicolas Lash.

¹⁴⁷ Dennett, *Consciousness*, p. 14.

¹⁴⁸ For philosophical criticism of coherentism see Blackburn, *Think*, pp. 44-45.

¹⁴⁹ Dennett, *Consciousness*, pp. 66-98. The quotation is from Jacques Ellul, *The Technological Society*, trans. by John Wilkinson (New York: Vintage Books, 1964), page 342. Like all techniques, heterophenomenalism is subject to Ellul’s analysis although it would comprise only a tiny part of his massive critique of technological culture.

perspective but to the first person as well.¹⁵⁰ That would surely be the way to safeguard the proper humanity of the human person. McGinn has no theological agenda but his worry is a proper one. It might well apply to other research programmes dealing with mind. Hofstadter's metaphysical proposal, mentioned below, brings a more human dimension into the sphere of artificial intelligence. However, all theoretical accounts of mind need to be based on some paradigm. Must that paradigm only include whatever can be schematized and modelled computationally as Clark, Dennett and workers in the field propose? Reality, even on purely physicalist hypotheses, might be much more complicated than that. Indeed Fodor suggests so with regard to the frame problem.¹⁵¹

Dennett's arguments, concerning the conscious mind, partly hinge on experiments in perception and neurophysiology which demonstrate that the subjective awareness of sequences of events in time is not always the same as the objective (external) registration of the same events. Frith's work just considered underlines such results. If there were a centre of consciousness spatially located at a given place inside the skull, this could not be the case.¹⁵² Therefore, there is no centre of consciousness, no watcher presiding over events or directing them.¹⁵³ Consciousness is not a unitary phenomenon. There are what Dennett calls "multiple drafts", that is to say specific pieces of edited information reside in different parts of the brain and there is no need to pass them on to any (imaginary) Cartesian theatre, and no reason for settling on one of the edited versions as the final one: some persist and others are discarded. Rather there is a collection of memes, which is a story that assembles itself.¹⁵⁴ Sufferers from multiple personality disorder will tell several stories. A fundamental dissonance within the original has precipitated the differentiation into different, self-consistent personalities. Dennett even offers the possibility that there may be cases of identical twins, in possession of only one overarching story between them and therefore amounting to one person. Hofstadter refers to and develops these ideas in more detail. He tells a moving story about the death of his own wife, the mother of their young children.¹⁵⁵ He suggests that part of the collection of thoughts and memories which was her now resides in him. He is much consoled by this. That goes beyond empirical science and amounts to the attempt to erect a new (humanist) metaphysic. Dennett does not understand the ability to tell a story about oneself as diagnostic of humanity. He thinks it possible that other animals, and also machines, having artificial intelligence may be persons.

¹⁵⁰ McGinn, *Character of Mind*, p. 8.

¹⁵¹ See Chapter 2 (5) (g).

¹⁵² e.g. A pioneer experiment in the field, frequently cited, is Benjamin Libet, and others, 'Time of Conscious Intention to Act in Relation to Onset of Cerebral Activity (Readiness Potential): The Unconscious Initiation of a Freely Voluntary Act', *Brain* (1983), 106, 623-642. See Jürgen Habermas, *Between Naturalism and Religion*, trans. by Ciaran Cronin (Cambridge: Polity Press, 2008), pp. 154-156.

¹⁵³ Dennett, *Consciousness Explained*, pp. 101-170.

¹⁵⁴ Memes will be further considered under "culture" at Chapter 2 (6) (c).

¹⁵⁵ Hofstadter, *I am a Strange Loop* (New York: Basic Books, 2007), pp. 211-223,

However, Ryle, Clark, Dennett and popular writers on this topic including Blackmore fall victim to their own rhetoric: even on their physicalist assumptions, there remains a problem about the consciousness of self; human persons cannot avoid seeing each other as well as their own existence as that of selves.¹⁵⁶

If the conscious self is an illusion, the illusion itself still needs explaining. As Frith points out, nobody has done this. Physicalists would do better to follow the view of McGinn on this subject: the solution could be beyond human understanding even if it is not other than physical. Further, there is a generalized paradox of self-reference which we remarked on earlier, unconvincingly denied by Dennett. Ultimately, the only tools for investigating it are mentalistic ones.

Our conclusion to this section is that in the investigation of consciousness the experimenter is just as likely to be a source of bias or mistake as is the subject. We need intelligent scepticism, including that of scepticism itself in this case as in many others. The basis of “self” whether in human persons and (if and where it exists) in animals could be either a puzzle, in principle soluble by the methods of empirical science or one which humans do not have the capacity to solve: we do not know which. The ambiguities underlined by the naturalistic approach ensure that the possession of something called “self” is no use as a unique criterion of humanity. However, the further possibility is that the human self is an ontologically unique kind of thing, intimately related to the body and distinct from other kinds of self, if they exist. That is the view of the theological anthropology we shall explore in a later chapter. Now, we must consider that embodiment of the self.

(b) The thinking body

The sense of embodiment is central to the consciousness of the self when awake. The “brain in a vat” thought experiment, and the *cogito ergo sum* refer to situations that we can imagine, but it is difficult to attach a meaning to them. It is obvious on reflection that not only physical action but also the processes of thinking, deciding and remembering connect intimately not just with the brain but also with the whole of the body.¹⁵⁷ The brain/mind relies on information received through the sensory organs of the body to gain understanding of its surroundings. Much of what it does to initiate and regulate bodily processes and actions is on this basis. The relationship of the physical act of speech to thought is a close one. On some theories, it is prior to it. Thus, the origin of conscious thought is in silent speech.¹⁵⁸ Indeed, human, reflective sequential thought not expressed in speech may be a relatively

¹⁵⁶ Blackmore, *Meme Machine*.

¹⁵⁷ Barth considers these matters at *CD III(2)*, p. 408; willing and desiring are functions of both the body and the soul.

¹⁵⁸ Dennett, *Consciousness*, pp. 193-196.

recent development. Saint Augustine was astonished to observe Saint Ambrose reading silently.¹⁵⁹ Written speech has been common for philosophical and theological reflection and other kinds of teaching, especially in ancient times. Plato's dialogues and Augustine's *Confessions* are among many examples.

However, the great majority of bodily processes, certainly at cellular level, have no mental component. Further, memory itself, enabling the performance of physical actions, say those of a highly trained athlete, dancer or of a musician, is at least partially embodied in the conformation of the limbs, joints and muscles and often lungs. The thesis of *How the Body Shapes the Way we Think* is that there is a subtle and complex interplay between the nervous system, including the brain, and the rest of the physical body and that modelling this by electromechanical systems is an essential component of programmes which aim to simulate human intelligence.¹⁶⁰ Andy Clark deals with related matters in a discussion which includes the development in humans of motor skills. He also considers a physical device, the Watt governor, which regulates the speed of a steam engine to that required. The living organism contains a multitude of such homeostatic devices to keep equilibrium, most of them dynamic rather than static.¹⁶¹ Examples Clark does not specifically mention include the maintenance of bodily posture and the biochemical mechanisms, some of them hormonal, for the regulation of many different physical parameters. It is difficult to see such bodily features in terms of manipulation of symbols. Yet in practice, we cannot separate the mental and the physical: witness our awareness of physical posture, performance and position as well as the effect of hormones on mental conditions. In view of all this, Clark introduces the possibility of integrating the study of mental and the physical aspects of human expression and performance in general into one discipline.¹⁶² In this way, Clark thinks he can preserve the concept of representation. We can extend the computational understanding of mind so that dynamic physical systems can also be seen as bearers of representational content.¹⁶³ This certainly complicates cognitive studies but it does not seem for our purposes to be a great difference in principle. If the mental is the physical, which is surely the physicalist position, it is of no ontological importance whether the physical in question is the movement of a muscle or the ebb and flow of chemical potentials between neurons. If this is the case, the human body really does think.

Yet the thinking body must also be a feature of animal life, as was intuitively glimpsed, in my case, by watching a cheetah poised on a grassy mound, half on its haunches, recovering perhaps from previous exertions, conning a herd of deer, calculating and choosing its moment, chasing and

¹⁵⁹ As C. S. Lewis pointed out. The reference is to Augustine, translator E. B. Pusey, *The Confessions* (London: Medici Society, 1930), Book VI 2, p. 130.

¹⁶⁰ Pfeifer and Bongard, *Body Shapes the Way We Think*.

¹⁶¹ Clark, *Mindware*, pp. 120-139.

¹⁶² See earlier discussion on symbols Chapter 2 (5) (f).

¹⁶³ Clark, *Mindware*, pp. 120-139. For an enthusiastic guide to complex systems see Mitchell, *Complexity*.

securing its prey.¹⁶⁴ Therefore, the notion of the thinking body may be a resource for theological anthropology. Yet it does not of itself provide a criterion of humanity. We now consider one further possible distinguishing feature of human life.

(c) Can the possession of culture define humanity?

Are there collective properties that provide a distinctive criterion of humanity? Dennett makes the case for culture.¹⁶⁵ This is a move beyond Dennett's basic stance of mindfulness as computation. Other species exhibit behaviours which are passed on, not by a physical process but by imitation from one generation to another; but only in humans are there such elaborate patterns of symbolic language, including speech, bodily posture and facial expression, to name the most obvious. However, chimpanzees (*Pan troglodytes*) observed in nine different sites across Africa exhibited different behaviours in similar circumstances, so that it seemed likely that genetic explanations could be eliminated. These were learned traditions, including tool use, in different communities. The authors observe that "an overall picture of rich cultural complexity is becoming apparent."¹⁶⁶ In the human species, artefacts also play a large part. Culture is self-reinforcing, its ability to spread and multiply and, in the human case, is only limited where distance or language are factors. Eventually the many-faceted contents of cultural systems are encoded, preserved and elaborated in writing and later in a multitude of electronic forms. Sharing and transformation of the content of the symbols takes place within and across cultures. This capacity enables the growth of understanding and custom within communities and globally, as well as the transmission of knowledge gained by experience from one generation to another within and across boundaries.

With a view to the above considerations, Dennett, following Dawkins, proposes that cultures consist of mobile assemblies of unitary non-physical elements analogous to genes that they call "memes".¹⁶⁷ This is in line with Dennett's multiple drafts theory of mental content. Memes reside in the human brain or some other physical means of storage and can be transmitted by all human means of communication. The memes are self-multiplying. They are subject to a kind of natural selection, surviving or perishing in relation to their compatibility or otherwise with those complexes of memes which make up human minds. Blackmore even speaks of competition between genes and memes for instance in the social behaviour surrounding sex and reproduction.¹⁶⁸ A number of authors, including

¹⁶⁴ Partly based on my personal observation in the *Masai Mara* in Kenya in 2007.

¹⁶⁵ Dennett, *Dangerous Idea*, pp. 340-369.

¹⁶⁶ Jablonka and Lamb, *Evolution in Four Dimensions*, pp. 176-180, referring to chimpanzee culture among which 39 cultural traditions have been identified. The original paper is, A. Whitten and others, 'Charting Cultural Variation in Chimpanzees' in *Behaviour* No. 138 (2001), pp. 1481-1516. (Downloaded 14/03/2012.)

¹⁶⁷ Richard Dawkins, *The Selfish Gene* (London: Paladin, 1978), pp. 203-215, where Dawkins appears to regard non-human cultures as unimportant.

¹⁶⁸ Blackmore, *Meme Machine*, pp. 133-146.

Crowe, have however pointed out that, unlike genes, memes cannot be discrete units.¹⁶⁹ Ideas contributing to cultures are fluid entities interacting in ever changing patterns. In his reply, in the same volume as Crowe's critique, Dennett fails to deal with this critically important objection. Nonetheless, cultural evolution can be analysed in terms of the adaptation of cultural phenomena for the environment in which human groups find themselves. Quite obviously, cultures and particular features of them do arise, develop, interact, fuse, metamorphose into something different and in the end die out. The cultural phenomena of fantasy and storytelling are a nearly universal human trait. Barrett *et al.* suggest that the ability to envisage things being other than they are is unique to human persons.¹⁷⁰ This however is not compatible with the findings like those of Jane Goodall who notes that chimpanzees apparently planned future actions together. Startlingly in one case, these included what she calls "genocide."¹⁷¹ The elaboration and wide-ranging diffusion of ever changing cultures is certainly a human characteristic. However, it is impossible to say where exactly we should place the dividing line between human and non-human cultures. In any case, the word "meme" does not help to explain the complex of processes involved. Neither does it help in discovering what a human person is. The phenomena it sees as characteristic of humans are present among a number of animals and even birds. Memeology, as it is called, does not have sufficient empirical or theoretical basis to contribute to any deep understanding of culture.¹⁷² It appears to be one step too far in the Darwinian programme. However, the study of the kaleidoscopic variety of cultures as well as their evolution is central to any full understanding of the phenomena of human life. We cannot even begin to enter into it here. However, bearing in mind the existence of differing collective features of animal behaviour not genetically transmitted, even within the same species, it will provide no sharp distinction between humanity and animality.

(7) The unity of life

One thing that emerges from the Darwinian picture of human origins and existence is the total integration of *Homo sapiens* within the biology of planetary life and its evolutionary history. We have no space for the ecological considerations that would strengthen that conclusion even more. There may be aspects of mentality that do not fit into this picture but we cannot distinguish it uniquely as a

¹⁶⁹ e.g. Timothy M. Crowe, 'Daniel Dennett's Views on the Power and Pervasiveness of Natural Selection: An Evolutionary Biologist's Perspective', *Dennett's Philosophy: A Comprehensive Assessment*, ed. by Don Ross, Andrew Brook and David Thompson (Cambridge, MA: M.I.T. Press, 2000), pp. 31-32. Dennett's response to Crowe is on pages 332-6 of the same volume. Similar criticisms are voiced by Mary Midgley 'Why Memes?', Rose and Rose, *Alas Poor Darwin*, pp. 67-8.

¹⁷⁰ Barrett, Dunbar and Lycett, *Human Evolutionary Psychology*, p. 362.

¹⁷¹ Jane Goodall, 'Learning from the Chimpanzees: A Message Humans Can Understand', *Science*, New Series, Vol. 282, No. 5397 (Dec. 18, 1998), pp. 2184-2185. See also Jane Goodall, *The chimpanzees of Gombe: patterns of behavior* (Cambridge, MA: Belknap Press of Harvard University Press, 1986).

¹⁷² For further criticism of meme theory, see Sterelny and Griffiths, *Sex and Death*, pp. 332-334.

property of humans. It is in some way grounded physically. Further, biological anthropology including genetic science has made it clear that other species or even subspecies of our own kind have existed. Some might, for all we can tell, have become in other circumstances what we are. I shall examine such questions in more detail in Chapter 5.¹⁷³

(8) Challenges to Christian theology

A steady progression of increasing knowledge is not what has led to the present dominance of Darwinian thought. Progress all along has been epicyclic. Plausible theories have needed to retreat in order to better advance more comprehensive ones. Difficulties, including those of time scales and geographical separation of species, have had to be set to one side. Sometimes they have waited decades for their resolution. Considerations like the definition of the replicators¹⁷⁴ and the evolution of development as well as others I have mentioned, complicate the story.¹⁷⁵ The present state of understanding cannot be a final one. Nevertheless, as this present chapter has recounted, Darwinian biology already provides far-reaching and powerful empirical explanations of large aspects of what it is to be human. In spite of advances in empirical understanding, there remain deep conceptual problems relating to human mentality. Nonetheless, the result has been that biology has expanded into much of the intellectual space previously occupied by theology.

(a) Human physicality

The Genesis account of human origins had occupied a large part of the territory soon lost to natural science. Natural processes pointed to explanations of human physicality. They did not require divine intervention. As far as the body was concerned, nothing unequivocally distinguished humans from other animals. A fierce and continuing rearguard action by the creationists and their allies has not succeeded in recapturing that ground.¹⁷⁶ The startling success of technologies and medical advances driven by Darwinian understandings makes it unlikely that it ever will. Further, it is now increasingly obvious that the physical grounds human mental life. Christian theology must now live with that state of affairs. The challenge then is to provide a theological account that relates to present understandings and that further developments will not undermine. We shall see in what way that relates to the incarnation.¹⁷⁷

¹⁷³ See Chapter 5 (4) (a), (b) and (c).

¹⁷⁴ Chapter 2 (2) (b).

¹⁷⁵ Chapter 2 (2) (c).

¹⁷⁶ Ronald L. Numbers, *The Creationists: The Evolution of Scientific Creationism* (Berkeley, University of California Press, 1992), brought up to the present by Eugenie C. Scott, 'American 'Anti-evolutionism: Retrospect and Prospect', in Ruse and Travis, *Evolution*, pp. 370-399.

¹⁷⁷ See Chapter 5 (4) (b).

(b) The soul

Another part of the intellectual space where theology has been obliged to cede ground has been that of human mentality and for the entity or function we call “the soul”. As we have seen, evolutionary and cognitive psychologies and the complex of disciplines and theories associated with them offer plausible Darwinian explanations for mentality. They are often related to the notion of computation and always grounded physically.

Clearly, a Christian theology that insists on a Cartesian substance dualism would not find any such physicalist points of view congenial. Popular theology as articulated through hymns and often from the pulpit seems to imply such a belief in soul as a thinking substance, which constitutes the self, centred in the brain. Through it, it interacts with the world, controls the body as best it can and, when the body ceases to function, departs elsewhere.¹⁷⁸ Atheistic polemic often attributes this belief to Christians. A number of evangelical writers do hold it. Yet as Joel Green points out, Scripture does not support such a doctrine. Official Roman Catholic teaching is more nuanced and cannot be understood as unqualified substance dualism. That was certainly not Aquinas’ understanding.¹⁷⁹ More common among Christians is a kind of hopeful agnosticism about such matters. Many seem to assume that the orthodox Christian belief is in an immortal soul, but find such a concept too much to swallow. A thoroughgoing supernaturalist theology, holding to the belief in the resurrection of the body, is consonant with Pauline eschatology and fully orthodox in all branches of the Church. Such a theology should have no problems with a totally physicalist understanding of the human person. However, that position does not quite do justice to the nature of human (and perhaps animal) existence within time, which is evident in Scripture. I shall consider that in some detail in the following chapter.¹⁸⁰

(c) The image of God

Classical theologians often saw reason, even if fallen, as the way in which humanity images the Creator. Darwinian evolution, which roots humanity among the non-rational animals, thus makes even more problematical the use of the *imago dei* as a starting point for theological anthropology. We

¹⁷⁸ This generalization is supported by the author’s general pastoral conversation and examination of the first eighty hymns in *Hymns and Psalms*, an authorized modern hymn book of the Methodist Church. The word “soul” appears in it at least eight times. See also Joel Green, ‘Bodies -- that is human lives: A Re-examination of Human nature in the Bible’, *Whatever Happened to the Soul?*, pp. 149-173 and citations there.

¹⁷⁹ “But the fact is that these two beings (soul and body) are united so closely that they constitute one person, one subsistent operative thing.” p. 276, see also pp. 111-112, 276-277, 246-248. F. J. Sheed, *Theology and Sanity* (London: Sheed and Ward, 1947). For Aquinas: “echoing Aristotle, Aquinas will say that the soul is not other than the body, but simply one with it as its form, one, as act to potency are one. So according to Aquinas, while it is true that the activities of intellect and will are not the actualities of any physical organs, they are nonetheless the activities of the living human animal. It is Socrates the animal who knows and wills, not his mind interacting with his body.” Ralph McInerny, and John O’Callaghan, ‘Saint Thomas Aquinas’, *The Stanford Encyclopedia of Philosophy*, ed. by Edward N. Zalta, (Winter 2010 Edition) at <<http://plato.stanford.edu/archives/win2010/entries/aquinas/>> downloaded 21/05/2012.

¹⁸⁰ See Chapter 3 (4) (e).

saw earlier that the concept “reason” can cover many different kinds of argument and other intellectual processes as well, depending as it does on the historical epoch and the particular culture that is in question.¹⁸¹ From our conclusions there, it follows that human persons have no easily definable faculty we could call “reason” so that it is in any case hard to see what way it can constitute the image of God. Moreover, however envisaged, human intellectual capacity can be supposed to have evolved by Darwinian processes.¹⁸² “Reason” must thus be part of the physicalist, “mechanical mind”, as understood by cognitive psychology and its allies. A developed interpretation of the *imago dei* adopted by mid- twentieth-century and later biblical commentators sees it not as constituted by reason in a limited sense, but by a sort of viceroyship. Humanity stands in for God in the ordering (but not the destructive exploitation) of nature.¹⁸³ The use of such understandings of reason as constituting the divine image can amount to the construction of God from a problematical human image. Incautiously treated, they could tend towards idolatry. We shall later explain our anthropology in the stream of Karl Barth that uses the notion of the image of God in quite a different way.¹⁸⁴

(d) Ethical foundations

Evolutionary psychology and sociobiology envisage ways in which the ability to make judgements of an ethical kind, in particular demonstrating qualities like altruism, can be a product of natural selection. They tend towards advantageous cooperation in human groups. Frequently (though not always) such practical judgements will coincide with those thought by Christians to have a foundation in the will of God. However, from the Darwinian standpoint no further justification, no foundation of any kind is necessary.¹⁸⁵ That poses a challenge to any version of Christian ethics. I shall not however pursue that large and fundamental question.¹⁸⁶

(e) Nature and nurture

Emotions and feelings are alike formed by adaptive processes. Culture, including religion in all its manifestations, interacts with genetically controlled behaviour so that their joint product has selective advantage. Genes are affected by culture: culture, as generalized behaviour, is formed by genes. “Nature” and “nurture” are not mutually exclusive but rather cooperating and perhaps

¹⁸¹ See Chapter 1 (4) (b).

¹⁸² Crane, *Mechanical Mind*.

¹⁸³ For commentary on Genesis 1:26-27, see Gerhard von Rad, *Genesis*, trans. John R. Marks (London: S.C.M., 1963), *ad loc.*, also Walter Brueggemann, *Genesis* (Atlanta: John Knox Press, 1982), *ad loc.* The latter talks of “creative use of power”.

¹⁸⁴ See Chapter 3 (3) and (4).

¹⁸⁵ Ruse, *Discontents*, pp. 254-257.

¹⁸⁶ Central though it is to the interactions between science and religion, the relationship between Darwinian science and Christian ethics is beyond my chosen scope for this dissertation.

coalescing determinants of the human phenomenon.¹⁸⁷ There are different views as to whether this mutual feedback can have had significant effects on human genetic constitution, in the time since the Pleistocene era. On one hand, the human genome was substantially constituted at that time. On the other hand, whether culture, according to some as memes, is now the only important vehicle of change in the human phenotype. However, in either case human nature, including religion and religious faith, are seen to be without remainder the products of natural processes. Biology points out that human life is thus anchored on and in the physical earth and thus suggests that any “spiritual” dimension must be a purely metaphorical one. The thoroughgoing understanding of the human person as without remainder a physical entity is a radical challenge not simply to Christian theology but to any kind of faith, which wishes to recognize a transcendent dimension to human existence.

(9) Resources to reply to the challenges

The thesis I want to defend in the present work is that the theological anthropology of Karl Barth which I shall give an account of in the next chapter, can be developed in a way which offers most effective resources not only to counter the above challenges but to turn them to positive advantage. In Chapter 4, I shall closely examine Barth’s own understanding of and attitude to the natural sciences. This will be a step towards placing in constructive juxtaposition a perspective similar to his, with that of the Darwinian science of the human person.

¹⁸⁷ Wilson, *Consilience*, especially pp. 182- 185.

CHAPTER 3

HUMAN REALITY ACCORDING TO BARTH

(1) Introduction

The present chapter will be chiefly concerned with an exposition of topics from the *Church Dogmatics* III (2) selected for their relevance to the dialogue with the Darwinian science of the human person which will be the subject of Chapter 5. *Church Dogmatics* III (2) does in fact contain the greater part of Barth's theological anthropology. There will however be mention of material from other volumes where it clarifies understanding. Immense scholarship has been devoted to the development of Barth's thought over his long career and to its exegesis. I have often benefited from it; reasons of space usually prevent detailed consideration of such things. Further, as Hunsinger notes,¹ Barth constantly reiterates and interweaves his chief themes. He examines them in different perspectives. Everything is connected with everything else; so that although something may be lost in my restriction of scope, enough of the core of his thinking will remain to be the basis of an engagement with the natural science of the human person, broadly though not exclusively in his terms.

The first part of the chapter will briefly offer some aids to the understanding of Barth's thought. We shall then deal with how Barth clears the ground of what he sees as misunderstandings about what a human person is. There will then be an examination of some topics arising from his anthropology including how Barth understands humanity as set apart and called in Jesus Christ. The particular nature of this vocation will be explored and humanity's primary distinctions from other living creatures, the nature of whose call we cannot, according to him, know. We shall find how the human calling is expressed in the covenant relationship, its origin being in Jesus Christ, the pioneer human person. How this covenant is enacted and lived within the created time that is the locus of what we call "history" will be explored, emphasizing the relational nature of the human calling. There will then be an exploration of the complex temporal relationship between that history and the history of salvation and its connection with human destiny. The chapter will conclude with an examination of Barth's understanding of what he takes to be the core of the human person, namely the soul, and we shall see how it differs from both classical and popular notions. This chapter and the subsequent one on Barth's understanding of the natural science of his day will prepare for Chapter 5 in which we shall see how working hypotheses in the succession of those of Charles Darwin will, as parables, point to a better understanding of certain theological realities.

¹ Hunsinger, *How to Read Karl Barth*, pp. 28-29.

(2) Understanding Barth

(a) Foundations²

It is not possible in a multidisciplinary dissertation like the present one to offer an extended critique of Barth's theology as a whole. However I shall mention in due course some key areas of vulnerability relevant to my purpose. I have postponed the question about his understanding of and relation to natural science until a later stage³.

There is a sense in which anthropology is at the heart of Barth's theological project.⁴ Humanity takes centre stage, because God makes God's self known uniquely in and through the particular human being, Jesus Christ. No matter how far Barth's thought may go, its chief motif the quest to understand what it means that God, before all time, set apart this man as the pioneer human person. Jesus Christ is the Word, God's speech in human form, to whom the Scriptures bear witness. Everything flows from that.

(b) Preaching

One of the points of sympathy that I find with Karl Barth is his conviction that the Word must be heard. His aim in the *Church Dogmatics* is to set out in the fullest possible way what the Church ought to be preaching in its existence defined by this Word. For him, as he wrote to his former teacher von Harnack in 1923, "The task of theology is at one with the task of preaching".⁵ Yet from the pulpit at Safenwil in rural Switzerland, against the background of a devastating war in the rest of Europe, he had found nothing, measuring up to this Word, to say to his congregation. In this crisis he discovered in the "Strange New World within the Bible",⁶ a different God: not the polite, liberally inclined deity known by Harnack himself and others of his teachers in Germany.⁷ By contrast, Barth discovered an impolite, interfering, paradoxical God, revealed to the apostle Paul and other scriptural witnesses, one who had little interest in religion. Harnack thought that such a God should be kept clear of the academy. Barth

² Barth's story is told, largely from his own point of view, in Busch, *Karl Barth: His life from letters*. Frei reviews this biography in Hans W. Frei, *Types of Christian Theology* (New Haven: Yale University Press, 1992), pp. 147-163. There is some further biographical information in Timothy Gorringer, *Karl Barth against Hegemony* (Oxford: Oxford University Press, 1999), where the political and personal contexts of Barth's theology are considered.

³ See chapter 4 (3).

⁴ Hunsinger, *How to Read Karl Barth*, p. 16, approvingly quotes Jenson to this effect.

⁵ 'Barth to Harnack -- Fifteen answers to Professor Adolph Von Harnack', *Revelation and Theology: An analysis of the Barth--Harnack correspondence of 1923*, ed. H. Martin Rumscheidt (Cambridge: Cambridge University Press, 1972). The quotation is taken from p. 32 -- repeated also at p. 42 where Barth describes this unity as "inevitable".

⁶ 'The Strange New World within the Bible' in Karl Barth, *The Word of God and the Word of Man*, trans. by D. Horton (London: Hodder and Stoughton, 1935), pp. 28-50. This is from an address given in the church in Lentwil in 1916.

⁷ In 1926 Barth wrote, "Harnack manifestly spoke for neo-Protestantism, for which the real object of faith was not God in his revelation but the man who believes in the divine", Busch, *Karl Barth: His life from letters*, p. 106.

disagreed. To illuminate his parishioners' lived realities by the Word of God was his passionate concern as, in his study, "he sat down before the Bible each day of the week and in his own new way ploughed it like a farmer who goes out into the fields each morning and makes furrow after furrow."⁸ The celebrated commentary on Romans in its two different versions was the fruit of this engagement. There followed, on his later call to Göttingen, careful attention to the Reformers.⁹ Only a little later, Barth, as von Balthasar noted, was moving away from the existentialism he had learned from Wilhelm Herrmann (1846-1922) and "moving toward Anselm and Thomas Aquinas, unexpectedly finding affinities with scholastic theology".¹⁰ However, Barth's theology in the *Church Dogmatics* was neither eclectic nor the result of a tug of war between a limited number of opponents. Its originality was the product of a complicated and continuing engagement over several decades with many forces, historical and contemporary, both in academia and beyond. Ever present, occasionally wholly predominant, but rarely or never mentioned, by him these also included the political and military turmoil in Europe of the first half of the twentieth century and its counterpoint, a hardly tranquil academic or personal life.¹¹ His theology reflects that sense of movement. That the *Church Dogmatics* remained unfinished is consistent with Barth's view that theology must always be work in progress. For him theology was above all a matter of faith and prayer.¹² Like one of his theological heroes, Saint Anselm of Canterbury, he would have thus addressed God: "I long to understand thy truth, which my heart believes and loves. For I do not seek to understand that I may believe, but believe in order to understand."¹³

(c) Dialectic

An obstacle to getting a clear view of Barth is the spiralling form of argument of the *Church Dogmatics*. Often it returns and appears to negate itself in a procedure known as dialectic. Commentators understand that feature differently. Von Balthasar says that dialectic can follow two patterns: that of Hegel where the thesis and antithesis find their resolution in a final synthesis, and the other adopted by Barth, following Kierkegaard, which remains twofold in form.¹⁴ This latter, von Balthasar says, is a process of moving constantly back and forth from question to answer and never arriving at a final resting place. It is necessary to speak in this way because God has made God's self known in the God-man Jesus Christ. There is thus in Barth the dialectic of "veiling and unveiling" in

⁸ Karl Barth and Eduard Thurneysen, *Revolutionary Theology in the Making: Barth-Thurneysen Correspondence 1914-25*, trans. by James D. Smart (London: Epworth Press, 1964), p. 12.

⁹ Heinrich Hepp, *Reformed Dogmatics Set Out and Illustrated from the Sources*, trans. by G. T. Thomson, forward by Karl Barth, rev. and ed. by Ernest Bizer (London: George Allen and Unwin, 1950). See especially Barth's foreword, pages vi-vii.

¹⁰ Hans Urs von Balthasar, *The Theology of Karl Barth -- Exposition and Interpretation*, trans. by Edward T. Oakes S. J., (San Francisco: Ignatius Press, 1991), p. 40.

¹¹ Much of it detailed in Busch, *Karl Barth: His life from letters*.

¹² Karl Barth, *Evangelical Theology*, trans. by Grover Foley (London: Weidenfeld and Nicolson, 1963), pp. 159-170.

¹³ Cited by Brian Davies O. P. in the foreword to G. R. Evans, *Anselm* (London: Continuum, 2001), page vii.

¹⁴ von Balthasar, *Barth*, p. 73.

which God simultaneously makes himself known in the man Jesus Christ but in which event the mystery of God becomes even deeper and more impenetrable. It is not simply that human language is necessarily incompetent in the face of God; even in the case of the empirical world, it can be no more than good enough; it is that what God is in God's own self that simply cannot be known by creatures but only by God. It might be said that dialectic is a form of rhetoric, though rhetoric with a serious purpose, but it is also a function, as Barth famously expressed it, of the "infinite qualitative distinction", the yawning chasm between earth and heaven, time and eternity, humanity and God.¹⁵ Barth was later to qualify such hyperbolic expression because, as he wrote in 1956: "His deity *encloses humanity in itself*" (translator's italics) and "God's high freedom in Jesus Christ is a freedom to love"¹⁶. Yet it remains that no strictly logical nor poetic human discourse can pin down a reality that takes the initiative in leaping over this gap. Apophatic theology will not help either. By implication, rejecting silence, Barth understands that God annexes human language and endows it with a capacity that it does not possess in its own right: "by grace it is made to transcend itself".¹⁷

McCormack notes four different uses by Barth of the term dialectic: (i) the noetic, this came to be known as the dialectic method in Barth. Every statement has a counter statement. There is no resolution in a higher synthesis. (This is the form identified above by von Balthasar.) (ii) "*Realdialektik*" -- dialectic in objectively real relations. This resolves into two forms where the concept of dialectic between time and eternity bears witness to a soteriological theme. (iia) focuses on an eschatologically conceived revelation in relation to the events which occurred in AD 1-30 in the life of Christ. (iib) focuses on an eschatologically conceived new humanity in relation to the believer who exists in time. (iii) The contradictory nature of existence, for instance the continuous tension between the human experiences of pleasure and suffering.¹⁸

This partly coincides, especially in (ii) above, with the procedure Hunsinger names as the Hegelian pattern of *Aufhebung*. In it, the ordinary terms are included, cancelled and transcended when used of God.¹⁹ It is evident from his examples that Hunsinger wishes to employ the notion of *Aufhebung* in two distinct senses: on the one hand as referring to an ontological change effected by the grace of God, on the other referring to a shift in the meaning of words when they are used in the context of the divine action. We note here a significant misleading translation of this word in the

¹⁵ Barth quotes Kierkegaard to this effect: Karl Barth, *The Epistle to the Romans*, 6th edn., trans. by Edwyn C. Hoskyns (London: Oxford University Press, 1968), p. 10.

¹⁶ See Karl Barth, *The Humanity of God*, trans. J. N. Thomas and T. Weiser (Louisville: John Knox Press, 1960), p. 48 and p. 50, especially pp. 37-38.

¹⁷ Hunsinger, *How to Read Karl Barth*, p. 5.

¹⁸ McCormack, *Karl Barth's Critically Realistic Dialectical Theology*, pp. 11-12.

¹⁹ Hunsinger, *How to Read Karl Barth*, pp. 85-86, 200.

standard English text when Barth refers to religion: like the rest of human life, it must be subject to *Aufhebung*, not to abolition, but to redemptive transformation.²⁰

Hunsinger finds “*Aufhebung*” applicable to Barth’s notion of causality. The terms “cause”, “operation” and “effect” so far as the relation between God and the human person is concerned, are to be defined as they are implicated in the act of the “One who loves in freedom”,²¹ and not as they might be understood, say in pre-quantum physics. (What Barth “calls godless notions of causality”.²²) Such terms are thus, Hunsinger thinks, subjected to this same schema of *Aufhebung* in which the ordinary terms are “included, cancelled and transcended when used of God”²³ “Causality” is to be defined by the operations of the one who loves in freedom. Hunsinger further elaborates his discussion of Barth’s understanding of causality in this section “Double Agency as a Test Case”.²⁴ Here he relies heavily on the Chalcedonian pattern for its exposition. In fact, further to six motifs he has already expounded, Hunsinger also finds three larger formal patterns in the *Church Dogmatics*: the Chalcedonian, the Trinitarian and the Hegelian. He depicts the Chalcedonian pattern, which is here in question, as that of unity (without separation or division), differentiation (without confusion or change) and asymmetry (the unqualified conceptual precedence of the divine over the human nature in Jesus Christ).²⁵

In any case, the notion of dialectic in Barth is thus a wider one than resolution of conflicting notions in a higher synthesis: the form can be used to rhetorical effect but it can also reflect humanity’s incapacity to grasp in a coherent way what God is and what God does. Human intellect that stumbles when it tries to handle even some very common features of the physical world cannot but fail when confronted by the revelation in time of the eternal God. In Barth’s understanding, language only gains the capacity it needs for human talk of this God when so endowed by God’s own gracious action. Nonetheless, careful use of the words we do have is of the greatest importance, for fear of misleading references to what cannot be captured by words.

(d) God the source of meaning

One facet of this careful use of words when referring to God is clarity about the constraints surrounding attempts at definition. For Barth theological concepts cannot be defined abstractly, apart from their revelatory context. Thus, Barth chooses to refer to predicates applied to God as “perfections”

²⁰ Mangina points out that Barth, while a severe critic of “religion”, did not advocate its abolition as the English title of §17 *CD* I(2) p. 280 suggests. He wrote “*Aufhebung*”, grace redeems religion, as the rest of Barth’s heading at this point makes clear. See Joseph L. Mangina, *Karl Barth: Theologian of Christian Witness* (Aldershot: Ashgate, 2004), pp. 44-45. See also, footnote Chapter 3 (1) (a).

²¹ *CD* II(1), pp. 257-321.

²² *CD* III(3) p. 118.

²³ Hunsinger, *How to Read Karl Barth*, p. 200.

²⁴ Hunsinger, *How to Read Karl Barth*, p. 223.

²⁵ The use of the Chalcedonian paradigm has been severely criticized: Paul T. Nimmo, ‘Karl Barth and the concursus Dei: A Chalcedonianism Too Far?’ *International Journal of Systematic Theology*, Vol. 9, No. 1, Jan. 2007, pp. 58-71.

rather than “attributes”.²⁶ They do not denote a quality which might be evident elsewhere, but have a particularity peculiar to the God who reveals himself to be “the God who loves in freedom.”²⁷ Both “freedom” and “omnipotence” have their specific meanings not defined as in ordinary discourse but by their origin and context in the mystery of God’s own being. The noetic must follow the ontic “for the order of cognition cannot be disobedient to and must follow the actual order of things”.²⁸ Genuine human freedom itself, in the same way as God’s omnipotence, can only be defined as it exists, or takes place, in the reality of the self-offering in Jesus Christ. God’s omnipotence is actualized and evidenced in this free self-surrender of the God-man to the will of the Father. In any case all such talk must, in Barth’s view, be rooted and grounded in the witness of Holy Scripture to Jesus Christ. Intended explanation of the possibility or impossibility of free will in terms of quantum indeterminacy, chaos theory or the random firing of neurons would be, for Barth, simply irrelevant, as would talk in philosophical terms.²⁹

(e) Barth’s use of the Bible

In his “swan song”, the *Evangelical Theology* of 1962, Barth explains what he believes should be the stance of the exegete and theologian in respect of the Bible.³⁰ The concentration of his “ploughing” the Scripture at Safenwil remains. What changes, as Jeanrond and others suggest, is the movement from the “God is God” of *Romans* to being increasingly guided by the axiom that “God did reveal himself in Jesus Christ, in order ultimately to show his eternal love for human beings.”³¹ For Barth the Bible contains the record of those who have been called by the Word of God to be its primary witnesses: they are the prophets of the Old Testament and the apostles of the New.³² They report what they have seen and heard of that history in which God has made his covenant with human beings and communicated his Word to them. In reality, it is the Word that theology must concern itself with, so their witness must be considered as indirect. They are permitted and commanded to be “the echo” of the Word.³³ It follows that the Christian theologian must pay attention to the Old Testament, not simply as a prelude to the New, but because the two cannot rightly be understood without each other: they

²⁶ As does Kant, who however makes different use of “perfections” from Barth. See Körner, *Kant*, pp. 118-121 and references there cited.

²⁷ *CD* II(1), pp. 257-321.

²⁸ Hunsinger, *How to Read Karl Barth*, see the whole chapter on “Double Agency as a Test Case” pp. 185-233. *CD* IV(1) p. 45.

²⁹ Roger Penrose, *Shadows of the Mind: a search for the missing science of consciousness* (Oxford: Oxford University Press, 1994), p. 376.

³⁰ Karl Barth, *Evangelical Theology*, especially pp. 26-36. The phrase “swan song” is from Barth’s foreword.

³¹ Werner G. Jeanrond, ‘Karl Barth’s Hermeneutics’, *Reckoning with Barth*, ed. by Nigel Biggar (London: Mowbray, 1988), p. 90. According to Busch, *Karl Barth: His life from letters*, p. 90. Barth first used the phrase “God is God” in an address to students at Aarau in 1916.

³² I prefer the term “Old Testament” to “Hebrew Bible” for reasons related to the discussion by Francis Watson. See Francis Watson, *Text and Truth: Redefining Biblical Theology* (Edinburgh: T&T Clark, 1997), pp. 4-6. Certainly Barth makes no sense if we are only allowed to look at the Old Testament from a Jewish perspective. See also *CD* IV(3.1).

³³ Barth, *Evangelical Theology*, p. 26.

both bear witness to the Word. However, it is in the New Testament that we find specific witness that this Word is in fact Jesus himself. Moreover there is no history of Jesus from a neutral standpoint, unaware or independent of the saving acts of God in him. Further, any suggestion of a distinction between a Jesus of history and a Christ of faith is foreign to the understanding of the witnesses: it deprives them of their subject. The reality of God's action in Jesus Christ is the presupposition of the New Testament witness.³⁴ These witnesses were all theologians, very different, but focused on the same subject, and we are of their company, like them conditioned by our own human intellectual, historical and social context. Nonetheless, the theologian's task is a human reflection on the divine Word, although today he or she only has it at second hand. The contemporary theologian may well have a greater knowledge, say, of natural science, than the Bible witnesses but cannot be better informed than even the humblest of them about the Word of God and must not claim to be in a better position to understand it. The essential is to understand that the Bible witnesses speak of the God of the gospel and to know him is to know Jesus Christ. Theological science is obliged therefore to give the greatest attention to the words of Scripture. The witnesses, even within each Testament are diverse, each speaking from inside their own psychological, social, cultural and linguistic circumstance. Thus the Word of God gives to each witness a particular character, one always in movement, responding in diverse ways to the Word of the covenant God.³⁵ This Word is an event that needs to be brought to light again and again. Theological work is like trying to climb a vast and complicated mountain. Interrogating the texts, theology responds to the Logos, never knowing in advance in what way, in their very humanity, they will reflect back the question.³⁶ It is never enough simply to translate the text of Scripture or to attempt a paraphrase for modern readers. No verse that can be immediately grasped: all the resources of modern scholarship are needed. However, he is very clear that the Bible is not primarily a historical document "but first and supremely is testimony to the one and only revelation of God the Word of God himself".³⁷ Exegesis must "allow the text to speak for itself, in the sense that it will give full scope to its controlling object."³⁸ In the 1921 preface to *Romans* Barth had asserted, with great emphasis and intensity, that the would-be expositor needs to inhabit the text, to allow himself almost to be merged with it, absorbed into it, to make it his own, or rather to be owned by it. Interpretation can never be finished as though it were an academic exercise. Texts need constantly to be understood and re-understood, they are the witness of the Word of God and the Word of God is in their witness. In spite of all this complexity beyond definition, we should remember that Barth is, as Francis Watson point outs,

³⁴ Not as according to Bultmann simply the preaching of the man Jesus, see Rudolph Bultmann, *Theology of the New Testament*, two volumes, trans. by Kendrick Grobel (London: S.C.M., 1952), vol. one, p. 3.

³⁵ Barth, *Evangelical Theology*, p. 31-32.

³⁶ Jeanrond, 'Barth's Hermeneutics', p. 89.

³⁷ Karl Barth, *Homiletics*, trans. G. W. Bromiley and Donald E. Daniels (Louisville, KY: Westminster John Knox Press, 1991).

³⁸ Barth, *Romans*, pp. 8-11.

always able to speak naively about the Bible.³⁹ He may be referring to a possibly apocryphal story. When asked to sum up message in one sentence, he replied, “Jesus loves me, this I know, for the Bible tells me so”.⁴⁰

The above stance does not, in Barth’s understanding, amount to a hermeneutic in the sense of an interpretive strategy arising from outside the text in question and it certainly does not supply any kind of simple rule for extracting the sense from any given passage of Scripture. Indeed some of Barth’s exegeses have been heavily criticized by Barr and others.⁴¹ Barth in fact had no use for any independent discipline called “hermeneutics”. The point for him is not how we encounter the witness of Scripture but of “our encountering the one to whom the Scriptures bear witness.”⁴² Clearly, this does not authorize arbitrary interpretations. The Holy Spirit is not directly mentioned in the chapter of *Evangelical Theology* referred to where the emphasis is on the communicative action of the Word. The Spirit has however a role to play, equivalent to the Word, active both for the writer and the reader, as Barth makes clear in the 1921 *Göttingen Dogmatics*. The inspiration that attends the reading of Scripture is an act of God in which “the Spirit speaks to spirit and spirit receives the Spirit.”⁴³ This is completed in the *Church Dogmatics’* first volume of 1932, where it becomes clear that the Trinity, not simply the doctrine which is itself inherent in Scripture, but the objective but ungraspable reality to which that doctrine refers, is the inescapable context in which holy Scripture is read. For God is in “unimpaired unity”, “the Revealer, the Revelation and the Revealedness”.⁴⁴ An epistemological circle is unavoidable: truth cannot be grasped and pinned down; it can only be received in its living reality.⁴⁵ The possibility of knowing it cannot be understood until it is known. It cannot be known until its reception is known to be possible. Understanding the Bible, that is to say receiving communicated truth, happens because of the gracious action of the triune God.⁴⁶ It is sheer giftedness. In this way, Barth’s hermeneutical stance is neither literalist nor liberal. Yet the theology that issues from his reading of it is nothing but “a sustained meditation on the texts of Holy Scripture in all its richness and diversity”.⁴⁷ Jeanrond is not himself happy with Barth’s position and compares it unfavourably to that of Bultmann.

³⁹ Francis Watson, ‘The Bible’ in *The Cambridge Companion to Karl Barth*, ed. by John Webster (Cambridge: Cambridge University Press, 2000), p. 58.

⁴⁰ See Martin Rumscheidt, ‘Epilogue’ in Karl Barth, *Fragments Grave and Gay*, (London: Fontana, 1971) p.124.

⁴¹ See a (qualified) defence of Barth in Watson, *Text and Truth*, pp. 242-248.

⁴² Busch, *Karl Barth, His life from letters*, p. 466, quotes Barth in 1964 as mocking the “short lived talk about hermeneutics” and comparing those who promoted “the language event” to “the international union of garden gnomes”.

⁴³ Karl Barth, *The Göttingen Dogmatics: Instruction in the Christian Religion*, ed. by Hannelotte Reiffen, trans. by Geoffrey W. Bromiley (Grand Rapids: MI, Eerdmans, 1991), p. 225.

⁴⁴ *CD I(1)* e.g. p. 295-6.

⁴⁵ cf. Hans-Georg Gadamer, *Truth and Method*, 2nd edition, translation edited by Garrett Barden and John Cumming (London: Sheed and Ward, 1981) p. 261. Hunsinger, *How to Read Karl Barth*, pp.55-57.

⁴⁶ For a discussion of grace in this context see Hunsinger, *How to Read Karl Barth*, pp. 172-173.

⁴⁷ Watson, Francis, ‘The Bible’ in, *The Cambridge Companion to Karl Barth*, ed. John Webster (Cambridge: Cambridge University Press, 2000), p. 57.

For him Barth's axioms would predetermine too much of the outcome.⁴⁸ Yet Jeanrond himself can, in practice, do no more than Barth and so he prays "to God's Spirit for the grace of guidance".⁴⁹ Thus, he acknowledges, as Barth does, the gifted origin of faithful biblical interpretation.

We have to add that, for Barth, as Jeanrond points out, there is a sense in which there is nothing unique about a scriptural hermeneutic. All literature and in fact, all the phenomena the sciences investigate, are subject to the same procedure of disclosure under the Word: it is simply that other fields of study refuse to recognize this subjection.⁵⁰ Consequently, the methodology of the natural sciences as they are does not disclose the reality of the human person. They deal with the phenomena, rather than what the Word of God in Holy Scripture reveals. That is where we must look to discover the true created nature of humanity.

(3) What human beings are not⁵¹

(a) The possession of reason does not define humanity

Barth tells us that philosophers are even less able than are scientists to give an account of real humanity as created. They are "speaking only about knives without edges, or handles without pots, or predicates without subjects".⁵² Barth here refers to Polanus, a seventeenth-century theologian, who, in this respect, Barth says, follows in the tradition of Aristotle. Describing the human, as the animal endowed with reason, as Polanus along with many others does, is not wrong; however, it ignores the particularity of human history with God. This agrees with our earlier conclusion that "reason" must be preceded and accompanied by God's mysterious and particular action in each creature if it is to point to truth.⁵³ Neither the potential for reasoning nor the ability to reason nor even the capacity to have experiences can be the defining characteristics of a human person for nothing is known in this respect of other creatures.⁵⁴ According to Barth, our ignorance on this point is radical. On Barth's premises, it follows that if there are animals or machines with highly developed reasoning abilities closely resembling those of humans or even greatly superior; they do not on that account qualify. Infants and even adults of the species *Homo sapiens*, but with no intellectual powers, must nonetheless be human.⁵⁵ The notion of "species" is, as we have seen, fraught with problems.⁵⁶ As Barth develops his

⁴⁸ Jeanrond, *Barth's Hermeneutics*, p. 96.

⁴⁹ Jeanrond, *Barth's Hermeneutics*, p. 97.

⁵⁰ Jeanrond, *Barth's Hermeneutics*, pp. 89-90 referring to CD I(2), pp. 725-727. Barth's attitude to natural science will be discussed in Chapter 4.

⁵¹ For a summary of the core of Barth's teaching on anthropology see Wolf Krötke, 'The humanity of the human person in Karl Barth's anthropology', in *The Cambridge Companion to Karl Barth* pp. 159-176.

⁵² CD III(2), p. 76.

⁵³ See Chapter 1 (b) and (c) (i).

⁵⁴ See chapter 'What is it like to be a bat?' in Thomas Nagel, *Mortal Questions* (Cambridge: Cambridge University Press, 1991), pp. 165-180.

⁵⁵ To be discussed more fully at Chapter 5 (4) (b).

argument, we understand humanness as both a gift from the one “who loves in freedom”,⁵⁷ and a special vocation for certain creatures. Humanity can be defined in no other way than by the divine action and call.

Other living beings are, like us, part of God’s good creation, each with their own vocation. As such, they must receive our respect. What we do not know about other creatures is what they are in themselves, that is to say their precise relationship with God. Nor do we know fully the nature of God’s gracious provision for them suggested by Jesus’ parabolic comparisons involving birds and flowers.⁵⁸ We can, and do, discover much about the individual and communal lives of other living things. Our empirical working hypotheses must inform what “respect” is to mean in practice. Those will tell us something of their needs. However, being “objective” is not enough. Creatures’ relations to other lives including our own must also be part of our concern. We must also adopt a precautionary principle, perhaps guided by our intuitions about their possible emotions and feelings. In Chapter 5 we shall say more about our relationship to other living creatures; it is a necessary aspect of our primary topic of humanity itself.⁵⁹

(b) Natural science cannot define humanity

We have already noticed there is no agreed scientific definition of what counts as a species.⁶⁰ Neither is there yet agreement among palaeontologists about the exact relationship of *Homo sapiens* to Neanderthal man and a number of other extinct hominids.⁶¹ In fact it is clear from our discussion in Chapter 2 that empirically there is no way of defining humanity. None of this affects Barth’s position since he makes no *a priori* judgement at all about the physical or intellectual limits of what counts as human. Humanity must therefore be defined theologically.⁶² This is consistent with Barth’s view that empirical scientific investigation cannot settle ontological questions.

(c) Can philosophical investigation do better?

Do we do better if we abandon the scientific procedure and consider humanity idealistically or, rather, ethically? Barth now says that a human person moves “freely in and out of the world around him, united to it, yet not belonging to it primarily nor ultimately, but only to himself”.⁶³ Humanity is thus able consciously to inhabit itself but also to see itself as part of the empirical world: there is the thinking self and the self that relates to the outside world. Humanity thus exists in two spheres: that of being and

⁵⁶ See Chapter 2 (3) (c).

⁵⁷ CD II(1), pp. 257-321.

⁵⁸ Matthew 6:25-33, 10:26-31, Luke 12:4-7, 22-31.

⁵⁹ See Chapter 5 (4) (b) and (e).

⁶⁰ See Chapter 2 (3) (c).

⁶¹ See again Chapter 2 (3) (c).

⁶² These points will be further developed in Chapter 4.

⁶³ CD III(2), p. 93.

that of relationship to other beings. However, in advancing, as may be thought, from “the narrowness of naturalism to the breadth of the ethical approach”⁶⁴ we have not arrived at discovery of the real human person who can only be understood in relationship to God. Examination of the phenomena does not even tell us that God exists. It casts very little light on real humanity. Naturalistic views of human nature, like those from the perspective of an ethical system, see a self-contained reality, a subject considered as an object. Such standpoints fail to consider human existence: known and self-actualized, stepping forward, as it thinks, into freedom.⁶⁵ Even at this further step, seeking after it the self becomes trapped in an infinite regress of self-involving questions and answers: the question of human existence is genuine and unavoidable but unanswered. Barth may be thinking of phenomenologists like Husserl. He, after many years and many pages of philosophical labour in an attempt to find the relation between the self and the empirical world, uttered the despairing cry: “Philosophy as science, the dream is over”. However, the self-involving questions are equally characteristic of McGinn's more recent philosophy of mind. The latter says that the self from its own point of view is an irreducible simple substance and from another point of view is embodied without remainder in the brain which is certainly not simple.⁶⁶ Barth has no interest in such philosophical conundrums. Jaspers' existentialist anthropology is more convincing than these idealistic or naturalistic attempts.⁶⁷ Yet, Jaspers sees transcendence in his frontier situations. There is no reason for this. Combatants and victims in two world wars have not. “The Lord was not in the storm, the earthquake or the fire. He really was not.”⁶⁸ Special experiences involving sin, misery and perhaps death offer no guarantee that transcendence can be encountered in them: rather than God it might just well be the Devil or any of the principalities and powers. Barth rejects all philosophical constructions as incapable of understanding what humanity is. We shall now consider his own account of the human person.

(4) The true ground of humanity

(a) Humanity elect in Christ

As we have noted anthropology is at the core of Barth's theology. But he does not start his account of human nature with an exploration of what it means to be made in the image of God. The prior ontological question is answered through the revelation of God in Jesus Christ. “For as the man Jesus is Himself the revealing Word of God, He is the source of our knowledge of the nature of man as

⁶⁴ *CD III(2)*, p. 94.

⁶⁵ *CD III(2)*, p. 109.

⁶⁶ McGinn, *Character of Mind*, pp. 161-2.

⁶⁷ Karl Jaspers (1883-1969), existentialist philosopher—the self and its relation to the transcendent are “starkly revealed in ‘limit situations’ such as death, suffering, conflict, and guilt, requiring decisions perplexed by uncertainty and antimony.” from J. M. Inwood article, ‘Karl Jaspers’, in the *OCP* p. 428.

⁶⁸ *CD III(2)*, p. 115. Barth is referring to 1Kings 19:11.

created by God”.⁶⁹ This is embedded in the doctrine of election. Election means: “a special decision with a special intention in relation to a special object.”⁷⁰ Barth says that Jesus’ service of his fellows, assigned by God, is “the concrete form of his humanity”.⁷¹ In him God elects one who will spearhead a campaign against the monstrous kingdom of nothingness and chaos which God did not create but which, inexplicably, we have chosen. Humanly speaking Jesus chooses and accepts this election and the task given to him by the one who sent him: thus the eternal counsel of God is made known in time and God’s final purpose, yet to be revealed, will be achieved. Antecedent to creation, God, with no compulsion, elected Jesus to be the pioneer and prototype human person; foreseeing the possibility of humanity’s choice of what he rejected, so that Jesus might do God’s will as representative of God’s uniqueness and transcendence.⁷²

Election is the way Jean Calvin characterizes God’s free eternal decision in respect of humanity. It is the counterpart to the sovereignty of the God whose will cannot but be put into effect. In Calvin, God’s election, his unchangeable decree, consigns one part of the human race to eternal damnation, the other part to salvation in Jesus Christ. Barth’s different doctrine, which nonetheless has the sovereignty and freedom of God at its heart, understands this election as universal in Jesus Christ, electing God and elected human. Commentators disagree about whether this implies universal salvation or whether this freedom under God’s omnipotence allows human persons to refuse salvation, the actual outcome for any given person being hidden in God’s knowledge.⁷³

(b) Humanity and other creatures

In Barth, the electing God and the elected one coincide in the person of the God-man. Jesus is both the subject and the object of that event in which all humanity is elected. The election in that special sense does not extend to other created things.⁷⁴ There is however a general sense which is another way of emphasizing that every created thing comes into existence *ex nihilo*, neither from some independent substance (dualism) or as an emanation from God (monism).⁷⁵ “Election” in his special sense is Barth’s non-negotiable basic statement that governs human ontology. We must consider David Clough’s objection to Barth’s position on election here, since it directly touches the concerns of this study.⁷⁶ In general agreement with Barth and, just as we have done earlier, he argues that humans

⁶⁹ CD III(2), p. 41.

⁷⁰ CD III(2), p. 142.

⁷¹ CD III(2), p. 214.

⁷² CD III(2), p. 155.

⁷³ Biggar, *Hastening*, pp. 148-151.

⁷⁴ CD III(4), p. 339.

⁷⁵ CD III(2), p. 155.

⁷⁶ David Clough, ‘All God’s Creatures: Reading Genesis on Human and Non-human Animals’ in *Reading Genesis after Darwin*, ed. by Stephen C. Barton and David Wilkinson (Oxford: Oxford University Press, 2009), pp. 145-161.

cannot be unambiguously distinguished from proto-humans or from other animals. There are no uniquely specifiable biological, psychological, linguistic or social characteristics that separate one from the others. Nor can “reason” be defined unequivocally in a way that will indicate which species possesses it and which does not.⁷⁷ However, he then suggests that this implies that there is no qualitative theological difference between humanity and other creatures. He thinks that the point of the incarnation is not that God became human but that God became a creature.⁷⁸ However, the characteristics of created entities referred to are purely those deduced from observed phenomena. Human science does not have access to ontological realities, so such conclusions simply cannot be drawn. Scientific conclusions might be used as parables as I shall later do. They suggest but they do not compel. The scriptural witnesses have an epistemological priority. However, it is precisely the exegesis of Scripture that Clough questions. He argues that just as, according to Acts 15 the significance of the incarnation is extended from Israel to the whole of the human race it should as suggested by Colossians⁷⁹ be further extended to include all created things.⁸⁰ Clough sees a further precedent for this extension in the modern biblical exegesis that understands slavery, although taken for granted in the ancient world, as illegitimate and similarly women as in no way subordinate to men. (Genesis 1:27 and Galatian 3:28)

Barth himself has some complicated observations about the relative status of men and women. There is no space to examine them here in any detail.⁸¹ In brief, he understands that there is a distinction between the two sexes, expressed as subordination in some sense of women to men. Nonetheless, that does not affect their position as elect in Christ. Neither does it govern their position in political or public life. Moreover, it allows and encourages a free interplay of human relationships in which roles are not predetermined. Yet the particularities of male and female are both necessary for full humanity. His demotion of women, if that is what he intends, is unacceptable. Barth has a serious blindness, where matters of gender, sexuality and family relationships are concerned. Although he was theologically an internationalist, culturally he was a largely unreconstructed Swiss male of his generation.⁸² The culture sometimes trumps the theology. But the two are deeply entangled in ways that we do not have space to consider here.

For further comprehensive discussion of Barth with a reconstructed and widened doctrine of election see David Clough, *On Animals, Volume 1, Systematic Theology* (London: T&T Clark, 2012).

⁷⁷ See Chapter 2 (4), (5), (6).

⁷⁸ Clough, *Reading Genesis*, pp. 152-159.

⁷⁹ Colossians 1:13-20.

⁸⁰ Clough, *Reading Genesis*, p. 155.

⁸¹ See especially *CD III(4)*, pp. 116-240.

⁸² As to culture, Barth was actually ahead of many Swiss when he supported votes for women. The last Swiss community to allow women the vote was Appenzell, in 1990. Concerning Barth's relationship with his secretary and companion Charlotte von Kirschbaum, a character in a novel by one who attended his seminars is made to say: “most of the hypocrites from the so called good families in Basel snicker (*sic*) about this. None of them dares

However, the point for our argument is that Barth's theology envisages individual realities for each created entity. They cannot be deduced from their phenomenal presentation, nor always be inferred from those of another. Nothing can be said about the deliverances of a gracious God other than those to which Scripture witnesses. Barth's undoubted concentration on humanity in his doctrine of creation tells us nothing, according to him, about the place of other things in God's scheme. We simply do not know.⁸³ We are however entitled to assume that in the incarnation God has done "everything necessary" for other creatures.⁸⁴ Anything beyond this is, in Barth's terms, speculation. That is to say that it is not grounded in the revelation in Jesus Christ. "Respect for life"⁸⁵ is however high on his agenda. A full working out of that would correct any theology which envisaged God's good creation as important only in relation to human needs or wants. Each created thing has its own quality of giftedness, irrespective of what humans may make of it. God's command forbids heedless exploitation.

(c) Is Barth's theology of creation anthropocentric?

Perhaps Clough does not give sufficient weight to Barth's qualifications of the anthropocentrism attributed to him. They do imply radical difference from other creatures in ways which cannot be specified from the phenomena. They do not imply human superiority. Except where corrected by revelation our knowledge is inevitably from our own point of view. However, the potential defects of an ethic flowing from this human-centred epistemology can be avoided. We do not need to widen the doctrine of the incarnation in the sense Clough advocates. Barth has in fact pointed the way in his calling for "respect for life". I shall say more about that later. I shall include including something about what counts as "life" and why. I shall offer pointers to an ethical theology of nature. However we shall now consider further questions concerning Barth's theology of creation.

His anthropology can be interpreted as suggesting that the whole created universe has no other function than that of a stage for acting out the drama of human salvation. That includes two of his connected themes: Creation "is the external basis of the covenant".⁸⁶ The covenant is "the internal basis of creation".⁸⁷ Further: "It is by Him, Jesus Christ, and for Him and in Him that the universe is created as a theatre for God's dealings with man and man's dealings with God."⁸⁸ But does that make

admit that the heads of their families have always kept a girl friend in Geneva or a mistress in Paris..." Paul Erdman, *The Swiss Account* (London: Warner, 1992), p. 302. See also Busch, *Karl Barth* pp. 185-6.

⁸³ See especially CD III(4) pp. 332-333, CD III(2), pp. 137-138.

⁸⁴ CD III(2), p. 138.

⁸⁵ See Chapters 3 (3) (a) and 5 (4) (b) (ii) and (iii). For Barth's discussion about what an ethical attitude might be, especially towards the animals that people use, see CD III(4), pp. 324-397. Barth's call for "respect for life" echoes while criticizing Albert Schweitzer (1875-1965) for basing an ethic on "reverence for life". See also Eberhard Busch, *The Great Passion: An Introduction to Karl Barth's Theology*, trans. by G. W. Bromiley, edited and annotated by Darell L. Guder and Judith J. Guder (Grand Rapids: Eerdmans, 2004), pp. 191-194.

⁸⁶ CD III(1), pp. 94-226.

⁸⁷ CD III(1), pp. 228-329.

⁸⁸ CD II(2), p.94.

sense? Could one hundred billion stars in each of one hundred billion galaxies have no other purpose? Planets, some of which might support life are being discovered on almost a daily basis.⁸⁹ According to the working hypotheses of empirical science the human species occupies no more than an infinitesimal fraction of the space- time in which the universe we call ours exists. Even on our planet it is only one among several million species.

Yet for Barth the covenant relationship between God and humanity is a key element of theology. He appears to relegate the rest of creation, animal, vegetable and mineral in this world and in worlds and times unknown, to the role of the supporting actors or stage scenery. It might seem incurably anthropocentric and speciesist.⁹⁰ But we have just pointed out Barth's ethical concerns for other creatures. In view of those we should read what looks like a radical human centring as one facet only of an incomplete dialectical doctrine of creation. It could certainly take into account possible life in other parts of the universe. Considering what we have noticed above about the use of dialectic and also the complex notion of ontological truth, that is a possibility. That second and non-human facet of the doctrine must be reticent about many things. As we shall later see we have growing knowledge of the phenomena of life other than our own. But unless mandated by revelation we can say nothing about what other forms of life, even on this planet, may be in themselves.

In any case anthropocentricity was a long way from the stance Barth intended. It had been his chief charge against the style of liberal theology he sought to combat. As we shall he points out, how, even in the 16th century, that misplacement of humanity was understood as a consequence of Copernicus' displacement of the earth from the centre of the universe.⁹¹ Human beings were no longer seen to be at the lower end of the scale of created things. From a new and elevated vantage point we were now able to grasp the creation. We could comprehend it intellectually. That perception was in fact inherent in the Enlightenment project in which humanity was the measure of all things, including the rest of nature. Barth was no friend of such hubris. Schleiermacher's theology began with human religious experience. It was a particular target for his disapproval. Sequels of that theology were recruited with disastrous effect by the German nationalistic ideology that Barth deplored. To avoid that, the doctrine of creation, including that of humankind, had to be approached through the doctrine of God. Knowledge of the acts of the God who is, comes from biblical revelation. Only in that way can we understand the real nature of humanity. Covenant theology cannot rightly be understood as an anthropocentric exercise. The perceived anthropocentricity arises from the concentration on God's

⁸⁹ David Wilkinson, *Science, Religion and the Search for Extraterrestrial Intelligence* (Oxford: Oxford University Press, 2013). *passim*

⁹⁰ By analogy with "racist" and so on. See Peter Singer, *Animal Liberation* (London: Pimlico, 1995)

⁹¹ See chapter 4 (b) and (c).

being and acts in and through Jesus Christ. It is a function of the realist Christology of “True God and true man”.

But Is such a theology anthropocentric in the sense of an assumption that human status and destiny are God’s chief concern? Darwinian biology, as we have seen tells us that humanity, as a phenomenon cannot be unambiguously distinguished from other living creatures. If there is a distinction it must be an ontological one. But that does not mean that theology can only recognize two kinds of created reality, human and non human. Each living creature is “after its kind”.⁹² Not only humanity, but every created thing has its own secret reality. Each has its particular ontological status as an object of God’s concern. The reality is not decided by the phenomena. They are only the empirically ascertainable symptoms of creatureliness. The creator’s act determines the reality. That is what scripture recounts. We may understand the creation stories as myth or parable or, according to Barth, “saga”.⁹³ In any case they tell in narrative form the ontological truth of the origin of the creation, including humanity uniquely in God’s image. “Image” in the present case, according to different views may be viceroyship, rationality, sociality or servanthood. Viceroyship indicates standing in for God. It implies ruling over and ordering the lives other creatures. It is the view, of many commentators including Gerhard von Rad and Walter Breuggemann.⁹⁴ That may well be a statement of current, not necessarily desirable human aims and-practices. It is not consistent with the labour and sorrow, the humble struggle for life, which are the human lot according to Genesis.⁹⁵ Rationality, is a frequent position among older and classical commentators. But, as we have seen, it much too ambiguous and unstable a term to characterize a divine attribute to be shared with humans.⁹⁶ Sociality modelled from and originating in the Trinity together with servanthood⁹⁷ as part of the gift of being “in Christ” are the best pointers to the meaning of “image” for a Christian understanding of humanity according to scripture. Indeed Nathan MacDonald finds a close connection between the image bearing quality of humanity that Genesis specifies and Jesus as “the image of the invisible God”.⁹⁸ Consequently, he says, “For Barth *the* elect one and *the* image of God are one and the same, Jesus Christ”.⁹⁹

Whatever the interpretation, all that is the outcome of a theocentric or more exactly, a Christocentric incarnational theology. It cannot at the same time be creation centred. Creation is ex

⁹² Genesis 1:24-25.

⁹³ See chapter 3 (4) (g).

⁹⁴ Breuggemann, *Genesis*, p.32. Von Rad, *Genesis* p.58.

⁹⁵ Genesis 3: 16-19.

⁹⁶ See chapter 1 (4) (b) (ii).

⁹⁷ Philippians 2:1-11

⁹⁸ Colossians 1:15.

⁹⁹ Nathan MacDonald’ ‘The *Imago Dei* and Election: Reading the Old Testament and Its Scholarship with Karl Barth’, *International Journal of Systematic Theology* 10 (2008), p. 327. (author’s italics) For extended analysis of the *imago dei* and a slightly different conclusions see Watson, *Text and Truth* pp.277-304.

nihilo, by divine fiat. It is not self originating. Genesis has something to say about the function that animals and plants might have in relation to humans. There is however little evidence about their own status in the economy of salvation. Paul raises the issue in Romans. It is unclear what he can mean by “an eager longing of the creation as it waits for the revealing of the children of God.”¹⁰⁰ That however does not mean that nothing can be said. This Romans passage has been considered by a number of authors in the last hundred years and before. All find it puzzling. Sanday and Headlam, meticulous and thorough commentators at the end of the nineteenth century are reduced to a seemingly anthropomorphic sentimentalism that one might have thought completely foreign to the author of Romans. They say that for Paul,

There runs through his words an intense sympathy for nature in and for itself. He is one of those (like St. Francis of Assisi) to whom it is given to read as it were the thoughts of plants and animals. He seems to lay his ear to the earth and the confused murmur which he hears has a meaning for him: it is creation’s yearning for that happier state intended for it and of which it has been defrauded.

These commentators further indicate that the movement of the saved towards Jerusalem appears in the Old Testament but

On the other hand, with St Paul the movement is truly cosmic. The ‘sons of God’ are not selected for their own sakes alone, but their redemption means the redemption of a world of being beside themselves.¹⁰¹

On that view there is a close link between the fate of humanity and that of other living creatures. Christopher Southgate in his exegesis of this passage quotes Lukas Vischer to the effect that there is a distinction to be made between an anthropocentrism that sees humanity God’s sole concern around whom the creation centres and an anthropocentrism that understands human beings as fulfilling a special role in the world.¹⁰² In any case the creation is “good”. According to Brendan Byrne, Paul’s argument then “rests upon a biblical and post-biblical tradition, stemming ultimately from Gen. 1.26-28, that sees creation in this sense as intimately bound up with the fate of human beings for good and for ill”.¹⁰³ Humanity and other living things are thus joined together. But from Romans 8 we cannot discover in what ways their respective roles and fates might be related in the fulfilment of God’s purposes. There are therefore good grounds for, with Barth and the majority of theological thinkers,

¹⁰⁰ Romans 8:21-22

¹⁰¹ William Sanday and Arthur C. Headlam, *The Epistle to the Romans* (Edinburgh: T&T Clark, 1907), p.212.

¹⁰² Christopher Southgate, *The Groaning of Creation: God, Evolution and the Problem of Evil* (Louisville: Westminster John Knox Press, 2008), p.93

¹⁰³ Brendan Byrne, chapter, ‘An Ecological Reading of Romans 8:19-22 Possibilities and Hesitations.’ in David G. Horrell; Francesca Stavrakopoulou; Cheryl Hunt and Christopher Southgate.(editors) *Ecological Hermeneutics: Biblical, Historical and Theological Perspectives* (Kindle Edition.) Kindle Locations 1453-1454).

restricting the primary significance of the incarnation (and the election) to human beings. However its effect radiates through humanity for other creatures.

There remains unanswered a charge of incoherence against Barth's theology and all Christian theologies, (the majority until recent years) which place humanity at the centre of God's concerns. It might be argued that given the sort of creatures humans are and their intimate and interdependent relationships with other animals, a theology which has at its heart such a version of anthropology is like an upside down pyramid. It may be self-consistent which is one definition of coherence, but it is radically unbalanced. It ignores the physical context in which humanity functions. It gives to humanity and its needs an unjustifiable automatic priority. We can recognize and understand that argument without however being convinced. Creation is no kind of hierarchy of power or value. It is better to think of it as a complex many dimensioned network of ontologically interrelated and physically interdependent creatures. We shall understand better and better the continuities that humans have with the natural world, but also human particularity. The latter does not have to be an empirical matter. Theologically, the proposed change in theological focus is a paradigm shift too far. That is the case whether or not we follow Barth's theology.

Concerning Barth himself, we cannot as Clough does totally reconfigure his doctrine of election to include creatures other than human. That would strain it to breaking point. Would not a pan specific election combined with the incarnation mean that the whole of creation was *en Christo*? Would that not skirt on the edge of a pantheism or, more likely, panentheism? We rejected such doctrines in chapter one.¹⁰⁴ To avoid that risk, a totally reconfigured theology would have to dispense with election altogether. Yet according to Bruce McCormack that is the doctrine which allows "the church to speak authoritatively about what God was doing – and indeed who God was/ is—" "before the foundation of the world' *without engaging in speculation.*" (McCormack's italics).¹⁰⁵ Admittedly McCormack then has some major modifications of his own that he wishes to make to the doctrine of the Trinity. They are not relevant here. The remark stands. Retaining election we have to accept a qualified anthropocentrism as essential to theology. But humanity is an integral part of the living world. A large sympathy for that and an empathy with it must go alongside an epistemological anthropocentrism. That will be like the attitude that Sanday and Headlam attribute to Paul. But it will be informed by scientific findings. Further, there is a created ontological quality, called "life". It underlies the mechanistic working hypotheses of Darwinian biology. That understanding strengthens our attitude. It must be given full value in any discussion of ethics by theology. However, theology can be agnostic about many things including the precise ontological status of other creatures. As I have pointed

¹⁰⁴ See chapter 1 (4) (a) (vi).

¹⁰⁵ Bruce McCormack 'Grace and Being' in Webster, John (Ed.), *The Cambridge Companion to Karl Barth* (Cambridge: Cambridge University Press, 2000), p.92.

out Barth's theology has no place for a speculative cosmology or universal system. We retain the setting apart of humanity in Jesus Christ which Barth names as election. However there is a compulsory awareness more emphatic than Barth's that humanity's status in respect of the creation is much more that of servanthood than lordship. We shall have more to say on the issue of human beings in relation to the rest of creation at a later stage.¹⁰⁶

(d) Humanity en Christo

As regards humans, each one, not merely mystically, nor merely eschatologically, but in ontological existence is *en Christo*. Any other interpretation is what Barth calls an abstraction that cannot refer to reality. Other accounts including the scientific (naturalistic) ones must be read as "commentary on a text which must first be known."¹⁰⁷ Perhaps correct as far as these go in their examination of human phenomena, they do not grasp the reality: only God the creator through his Word can tell humans what they are. It is of the essence of the human person that he has Jesus, the divine other, as Neighbour, Companion and Brother; for he is objectively and inescapably the divine counterpart of each one: to be human is to be with God. For: "the fact that Jesus lives as attested in the biblical testimony to this history means that there is this union between God and each of us men and that it is indestructible."¹⁰⁸

(e) The humanity of Jesus

If the above is the case only the Word of God, delineating the human person of Jesus, "one whole man, embodied soul and besouled body", can tell us what humanity is.¹⁰⁹ In life, death and resurrection, in his saving work, his heavenly session and reign, there is no separation between inner, spiritual, outward and corporeal. A number of scriptural passages attest Jesus' susceptibility to pain and emotion. They and the witness to the Word genuinely made flesh with a human mother. Given the way in which this whole humanity, *soma* and *psychē*, is the hope of the Christian community and of the whole world, there must be no question of Docetism. Jesus in his humanity, like and unlike others (in whom the Spirit merely operates), has the Holy Spirit as his permanent possession. For Jesus is the new man in the event of the totality of his human existence. There is in his reality no element of chaos for it is ordered in a sense true of no other human being. In him, Barth thinks, there is more than harmony, rather a perfectly reciprocal union of being and action between soul and body by the action of the Spirit.¹¹⁰ In this way Jesus is "whole man, a meaningfully ordered unity of soul and body."¹¹¹ There is an

¹⁰⁶ See Chapter 5 (4) (a).

¹⁰⁷ CD III(2), p. 122.

¹⁰⁸ CD IV(3.1), p. 41.

¹⁰⁹ CD III(2), p. 327.

¹¹⁰ CD III(2), p. 339.

¹¹¹ CD III(2), p. 340.

analogy in the relation between soul and body in the man Jesus that corresponds to the relation between the Logos and the humanity of Jesus. However, to avoid misunderstanding we must consider in more detail what for Barth is the connotation of the term “soul”.

(f) “Soul” and “life”: revelation, not philosophy

Commentators offer very little insight into what Barth means by the term “soul”.¹¹² This is unexpected because, as we shall see, Barth’s understanding of this word is not a usual one: there is for instance no question of qualifying it with the word “immortal”. He rejects Cartesian dualism. However, we must remember that Barth cannot be interpreted as though he were elaborating a philosophical scheme. Body and soul are not two separable things. He makes it explicit that the human person consists of one substance. He is intending to expound the content of revelation; he describes his position as one of “concrete monism”.¹¹³ However, this is not materialism neither is it what he calls spiritualism. “Concrete” signifies that this is a concept to be understood by analogy to Jesus Christ whose divine and human natures according to the Chalcedonian definition subsist in one undivided person. For Jesus is the source and pioneer of human reality. Hunsinger argues that, for Barth, concepts derived from revelation are incapable of being formally analysed. They cannot be generalized or fitted into a system: they each refer to their own particularity. Barth does believe that previous theologies have paid too little attention to the body, for the soul cannot exist without it. “Soul” and “life” are for Barth nearly if not equivalent terms. He says:

“The organic body is distinguished from the purely material body by the fact that as animal or at all events human body -- we hardly speak of the organic body of a stone or a plant -- it is besouled and filled and controlled by independent life.”¹¹⁴

(i) The difference between life and non-life

Is the above a version of vitalism? Does Barth mean that life is maintained and defined by the presence of some intangible thing, perhaps life force, an *élan vital*? Such a thing might be present in all living entities, and otherwise absent.¹¹⁵ However, no such principle is needed to explain life as an empirical phenomenon. A living cell is extraordinarily complex, but there is nothing to suggest any

¹¹² The exception is Stuart D. McClean, *Humanity in the Thought of Karl Barth*, (Edinburgh: T&T Clark, 1981), especially pp. 43-51. The indexes to Busch, Torrance, Mangina, Hartwell, Price and Hunsinger contain no references to “soul” and von Balthasar one only. In fact, however, Price does discuss Barth’s understanding of “soul” quite extensively. Barth’s principal exposition of this topic is in *CD III(2) §46 ‘Man as Soul and Body’*.

¹¹³ *CD III(2)*, p. 393.

¹¹⁴ *CD III(2)*, p. 378.

¹¹⁵ “*élan vital*”: life as an independent, ever striving force leading living things to fulfil a cosmic destiny. The idea is due to Henri Bergson (1859-1941). See John Macquarrie, *Twentieth Century Religious Thought* (London: S.C.M. Press, 1963), pp. 170-173. According to the index to *CD*, Barth makes only one reference to Bergson and that a negative one in connection with his ethical standpoint. See *CD III(4)*, p. 326.

process which cannot be accounted for in chemical and molecular terms.¹¹⁶ This of course does not mean there is no scientific distinction between life and non-life. Perhaps the word “life” refers to a cluster concept.¹¹⁷ Each member of the cluster is characterized by a selection from properties, e.g. “moves”, “exchanges molecules with its environment”, “grows”, “reproduces”, etc. Apparently then, “life” can be characterized in purely physicalist terms. However, that would be purely a cataloguing of phenomena. A physical body may well have these symptoms of being alive, but they are not the core of its existence. Barth holds that the difference between life and non-life is in fact an ontological one. It is not empirically specifiable: it is in the nature of the thing in itself. It is best understood using the notion of “form”.

(ii) What does Barth mean by “form”?

According to Barth, “Man’s being exists, and is therefore soul, and it exists in a certain form and is therefore body”.¹¹⁸ That seems to suggest that the body is the form of the soul. So what is “form”? There are two senses that can be excluded. Bodies change, so this is not the Platonic notion of forms as the unchanging heavenly prototypes of earthly related concepts and material things. Barth was a serious student of Kant. We might perhaps expect to find the origin of Barth’s notion there. He wrote about him in *Protestant Theology in the Nineteenth Century*.¹¹⁹ According to the index of the *Church Dogmatics*, he refers to Kant at least forty five times. James Brown says he was “the remains of a good Kantian”.¹²⁰ Barth takes into his theology the Kantian notion of “the thing in itself”. However, Barth’s use of the word “form” does not correspond with that of Kant.¹²¹ “The thing in itself” is what Kant calls “the noumenal”. Stephan Körner explains Kant’s conception of the noumenal in this way:

an unknown and unknowable X which ‘affects’ our senses with something which is ‘transformed’ into objective and scientific reality by being ‘subjected’ to certain forms -- on the one hand the forms of perception, and on the other to the form of the understanding, the latter being the sum total of synthetic *a priori* principles.¹²²

¹¹⁶ See the explanations in Elliott and Elliott, *Biochemistry and Molecular Biology*, in particular, “Living cells obey the laws of physics and chemistry”, p.4.

¹¹⁷ See Chapter (1) (2) (d) and references there cited. See also Clark, *Mindware*, pp. 117-118. A definition, cited by Nancey Murphy, ‘Human Nature: Historical, Scientific and Religious Issues’ in *Whatever Happened to the Soul?*, p. 18, as “self-boundedness, self-generation, and self-perpetuation of an entity as a consequence of its dynamic interchange with its surroundings”, deals only with the physical phenomena characteristic of life. See further on following pages.

¹¹⁸ *CD III(2)*, p. 325.

¹¹⁹ Barth, *Protestant Theology*, pp. 252-298.

¹²⁰ Brown, *Subject and Object*, p. 141.

¹²¹ According to OED, “in the usage of Kant and the Kantians form is “That factor of knowledge which gives reality and objectivity to the thing known”. *ad loc.* Section 4 d.

¹²² Körner, *Kant*, p. 91. For Kant’s own explanations, see for instance Immanuel Kant, *Critique of Pure Reason*, tr. and ed Vasilis Politis (London: J. M. Dent, 1993), pp. 210-212 [A427/B304] [B306] [B308].

Evidently, for Kant, form relates to the theory of knowledge. However, for Barth it is an ontological concept. We can best understand it through Aristotle, for whom “the form of a changing material thing is an explanation and cause: it explains why the matter of that particular thing constitutes -- or forms that very thing”.¹²³

(iii) Aristotle’s distinction between life and non-life

Thus for Aristotle that which makes a living thing what it is, its particular form, *morphē* (μορφή), is its *psychē*, (ψυχή). The latter term is often translated as “soul” but this is misleading since this must not be understood in the sense often attributed to Descartes. *Psychē* is not what Ryle called the “the Ghost in the Machine”.¹²⁴ It is not an entity in itself, inhabiting a body, “principle of life” would be more accurate. However, for Aristotle, form is not a something acting over the mass of living things but the principle belonging to each individual living thing”.¹²⁵ Further, as Everson points out, “the individual body is composite of its form and matter and is not to be identified with either”.¹²⁶ If we could remove the form of the thing, it would no longer be what it was. For a very simple inanimate example: a bronze sphere that was no longer rounded would not be a sphere, though the matter would be unchanged. Fergus Kerr provides a further gloss on this which he says applies both to Aristotle and subsequently to Thomas Aquinas: the soul is “how the creature is alive, interacting with the things around”.¹²⁷ However, Barth’s notion is different from Aristotle’s. It is not just how the creature is alive; it is why it is alive.

(iv) The soul in humans and others

We saw above that according to Barth, the living body is the form of the soul. It is perhaps best to interpret this as saying that the body has some kind of non-temporal priority. The living creature, human or some other one, is constituted on the basis of the body. However, the body is not a living creature unless God acts on it. The soul is not the result of the action, it is itself the activity of the Spirit in a particular body. What else is Barth intending here? He is arguing for an ontological, rather than a phenomenological, difference between plants (and stones) on the one hand and animals on the other, based on the presence of “the breath of life” in the latter. This puts the boundary between life and non-life in the same place as Genesis 1 and 2; it does not correspond either to scientific or normal

¹²³ Vasilis Politis, *Aristotle and the Metaphysics* (London: Routledge, 2004), p. 53. David Ross, *Aristotle*, 5th edition (London: Methuen, 1964), p. 134. Barth refers to this Aristotelian doctrine at *CD III(2)*, p. 383: “*anima forma corporis*”.

¹²⁴ Ryle, *The Concept of Mind*, p. 17.

¹²⁵ Stephen Everson, chapter ‘Psychology’ in *The Cambridge Companion to Aristotle*, ed. by Jonathan Barnes (Cambridge: Cambridge University Press, 1995), pp. 168-169.

¹²⁶ Everson, ‘Psychology’, p. 172.

¹²⁷ Kerr, *Aquinas Introduction*, p. 58.

English usage.¹²⁸ Thus for Barth, humans, like animals, have ensouled bodies, each with their own particularity. What the empirical (in his terms phenomenological) difference may be between life and non-life is not his concern. An understanding of revelation is here Barth's controlling category, rather than scientific observation and theory, semantics or anything called "common sense". In view of the evidence from molecular biology showing close similarities between plant and animal life, an ontological distinction seems implausible. We shall think further about that in Chapter 5.¹²⁹ However, Barth tells us nothing more about the particular life, which constitutes that of animals or their relationship to God. His subject here is the human person.

(v) The covenant distinguishes humans from other animals

In addition, the human person has spirit. This is not a separate entity belonging to the human constitution but the basis of the unity of body and soul and its always active enabler.¹³⁰ A person is bound, centred on and encircled and limited by spirit, and is therefore human. Spirit in this latter sense, according to Barth, is not to be identified with the Holy Spirit: it is what the Holy Spirit does. It is an act or operation by the Trinity but exterior to it. "Spirit in His being *ab extra* is neither a divine nor a created something, but an action and attitude of the Creator in relation to His creation".¹³¹ It is the Spirit who enables the distinctive covenant relation between God and humanity. It is that which ensures that "Man is the soul of his body (*Leib*)".¹³²

(vi) The human soul

The Holy Spirit instigates and maintains the soul in the body by a direct and particular action. We could call that a spiritual process. However, it does not operate except in the body. Barth is not intending to offer an empirically testable scientific hypothesis. Nor is he offering a metaphysical doctrine which could be attacked and defended according to some contemporary or historical, philosophical stance. The human person's soul is, then, the body's Spirit enabled capacity for certain kinds of action, reflection and experience. We cannot see it simply as "consciousness", though self-

¹²⁸ See von Rad, *Genesis*, p. 53.

¹²⁹ This will be further considered in Chapter 5 (4).

¹³⁰ In spite of 1 Thessalonians 5.23 -- Barth's exegesis of this passage at *CD III (3)*, p. 83, takes it as referring primarily to the preservation of the entire existence of the Christian person in an eschatological context and not as a definitive statement of what a person is.

¹³¹ *CD III(2)*, p. 356 at the *KD III (2)*, p. 428, the German says "*ad extra*".

¹³² *CD III(2)*, p. 418 and *passim*. There are two German words for body, the purely material body (*Körper*) and the organic body (*Leib*), both of which Barth uses. See Wolf Krötke, 'Karl Barth's Anthropology' in *The Cambridge Companion to Karl Barth*, ed. by John Webster (Cambridge: Cambridge University Press, 2000), p. 170. The distinction is not always made explicitly in the translation. Barth himself refers to the superiority in this respect of German over English, Greek, French and Latin at *CD III(2)*, p. 377. Henceforth "body" will be used to refer to organic living body unless otherwise indicated.

awareness is one of its aspects. Neither is it the unique seat of anything called reason.¹³³ Body is the way in which the soul exists. “Soul” for Barth has no special ontological priority. It is not the unique ground of existence. It is together that the organic body and soul constitute the particular divinely given being of a living entity. Together they make up its individuality. In humans, we can understand the soul as subject and the body object. The body desires and the soul wills. However, it is more accurate to talk of one indivisible subject, body and soul, together and inseparable. Barth speaks of them as “being two moments of the indivisibly one human nature”. Body and soul are certainly not two substances.¹³⁴ For human persons the quality of being alive is constituted by their Spirit-enabled relationship with God and therefore with other people. “Therefore” is vital in Barth’s scheme of things. Humans are capable of a particular quality of relationship as a direct consequence of the relational being of God in the Trinity. That is the way that Barth interprets the image of God in humankind. The soul cannot be separated from the organic body and it therefore exists finitely in time. Yet it does have a “heavenly aspect”, in that it belongs also to the “higher, upper, inapprehensible side of the whole of created reality”.¹³⁵ Barth speaks in actualistic terms, thus “soul”, rather than being a substance, is the name given to the dynamic result of continuous and particular operations of the Spirit on the material body, Matter is given life. *Körper* becomes *Leib*. Soul is not some property possessed or owned as of right by a particular collection of complex molecules, but a gracious gift. However, complexity clearly plays a part in creating the material circumstances for its operation. From the point of view of physics or chemistry the human body is an assembly of interacting molecules. As for every physical object a quantum-mechanical wave function must exist, specifying it and changing through time. Only through the unique action of the Holy Spirit can this thing be or become a human self. That happens through the Holy Spirit, in an activity like that of the Spirit in the man Jesus, the pioneer human person. Barth asserts revelatory knowledge, biblical knowledge, of the life of the human person. Alongside this, he declares himself agnostic about the case of other physical entities we might want to call living... We can illustrate this by considering what might be the status of a robot.

(vii) Could a robot have a soul?

This is a connected question to the philosophical conundrum of the zombie. That is a thing physically identical to, and behaving and communicating exactly like, a human person but with no consciousness of self, no inner life.¹³⁶ Perhaps such a thing might be constructed by the chemical

¹³³ It cannot be possible to enumerate the thoughts and actions which might result from particular properties of the soul - we run into the same difficulties as we do in all attempts to use human language to specify any divine action.

¹³⁴ CD III(2), pp. 393, 397-398.

¹³⁵ CD III(2), pp. 350-351.

¹³⁶ See the discussion in Clark, *Mindware*, pp. 180-183.

synthesis of a human genome and other components of a fertilized egg and then allowing it to develop in an artificial womb. What would be its ontological status? What would it be in itself? What would be the case of a well-constructed but inorganic robot, like the R. Daneel Olivaw of Isaac Asimov's novels whose appearance, conversation and behaviour perfectly imitated a human person? That is presumably the ultimate goal of the artificial intelligence community. Biblical revelation says nothing about such human fabrications and neither does Barth. From his standpoint we are not in a position to speculate.

Revelation does tell us about the unpredictable, undeserved and unrestrained gifts of the God "who loves in freedom".¹³⁷ According to that, there is a grace-given or, what comes to the same thing, a Spirit-enabled, ontological property called "soul", otherwise "life". The soul's individuality is a function of the uniqueness of the associated body, at least in part. Barth sees it as a feature of animals but not plants. We shall have more to say about those later.¹³⁸ However, only for the human person, God's covenant partner, does revelation give us further understanding. That is theologically what indicates what Barth thinks humanity is. Only grace can determine the ontological properties of the humanly constructed entities above mentioned. From a strictly physicalist point of view, the notion of life as gift might seem implausible, except perhaps as a metaphor expressing its contingency. It fills no gaps among our empirical working hypotheses. If there are such gaps, even if they appear permanent, it cannot be theology's business to fill them.

Theology in the stream of Barth is well aware of its fallibility. It is not in a position to construct an all-embracing metaphysic. Nonetheless, informed by revelation, it gives us some notion of ontology, that is to say it points towards reality. It must have the courage of its convictions and say so. Sometimes such convictions, even when they arise from one theological stance, may look like contradictions. In that case, their rationality may be expressed in that dialectic which we have already discussed.¹³⁹ The relation of soul and body we have been considering is one example of this.

(g) Rationality

(i) Reason

We have already commented on reason as an intellectual faculty. According to Barth, the Bible is not primarily concerned with any human power of abstract reasoning. Biblically, humans do not generally perceive God directly: knowledge of God is mediated through entities in the created world, not by means of reasoning power. Humanity's general capacity to perceive the world is a consequence of God's will to be known through the world. Barth thinks that this capacity is what human rationality consists of. A perceived natural general capacity for knowledge which sees knowledge of God as a

¹³⁷ CD II(1), pp. 257-321.

¹³⁸ The status of plant life will be reconsidered at Chapter 5 (4) (a) (ii) and 5 (4) (b) (iii).

¹³⁹ See Chapter 3 (2) (b).

special case is an improper abstraction, a sinful perversion of rationality; for there is no natural knowledge of God.¹⁴⁰ Though influenced by both of them in different ways, Barth rejected large-scale intellectual constructions including those of Kant and of Hegel.¹⁴¹ God is always the initiator of knowledge of God. Barth emphasizes that the Bible, especially the Old Testament, is very little concerned with ratiocination. The human person is summoned by God to perception, knowledge, responsibility, decision and action. In a passage that it is tempting to see in an autobiographical context, Barth offers a phenomenological analysis of the complicated interplay between body and a soul in the process of desiring and willing. The conscious self has the power to make decisions. According to Barth, it is the soul that does this.:

It is I who decide and determine in relation to my desiring, not without parallel physical phenomena and conditions, but in such a way that I elevate myself above myself, above my physico-psychical desiring and therefore above my body, so that I am my own master and the master of my body.¹⁴²

Barth suggests that it is an unfortunate human characteristic to attempt to place all this in a neutral context, apart from God and simultaneously indulge in unrelated religious activity. The Bible condemns all such attempts to separate human willing and desiring from the command of God. In the end God is the only right and possible context for these. Awakened by the Spirit, the soul commands the body, a situation only ended by the separation of death. In life the joined activity of soul and body are one and coherent, God's call is to the whole, in ruling and in serving they are "a likeness of the fellowship of God and man."¹⁴³ Christ and the community is equally a relevant analogy and so, less obvious from a contemporary view, is the relation between man and woman. These are analogies of relations not analogies of being: there is for Barth no commonality of being between God and humanity.

(ii) The source of true rationality

In all this, the human person is indeed a rational being, Barth emphasizes, and both body and soul share in this, the soul ruling. We know this from the inside, he thinks, studying other people from the outside tells us nothing about it. This rationality is an event in the divine action of the Spirit. Its existence can only be justified and asserted theologically. How animals are in all this, we really cannot know. Human rationality, like every other aspect of the human person, can only be known and understood within the context of the claim and command of God: therefore, for Barth it is necessarily bound up with ethics. Yet human phenomena may indeed validly be studied from the standpoint of the

¹⁴⁰ CD III(2), p. 207 and *passim*.

¹⁴¹ Price, *Karl Barth's Anthropology*, p. 60; Barth, *Protestant Theology*, pp.252-298 and 370-407.

¹⁴² CD III(2), p. 409.

¹⁴³ CD III(2), p. 427.

natural sciences, thinks Barth: contrary both to materialism and what he, according to the translation, calls “spiritualism” they agree with the biblical and therefore theological picture of the unity of body and soul, rather than the Greek idea of opposition between them.

(h) Humankind summoned into existence

It is in the Word, addressed by the Logos, in which God speaks with God’s self, that humanity has its being. This is not what a human person becomes; it is what a human person is: a being summoned into existence by the Word now of creation. Nothing but God and his Word are prior to the existence of humanity.¹⁴⁴ Using the vivid depiction of the creation of Adam by Michelangelo, Barth portrays humanity as being created in action, and without existence prior to that, he has some reservations about this image but it enables him to assert that:

In and with its creation the being of this Adam is an actual and historical being, grounded in and related to the action of God in his Word. It is the unmistakable answer to a summons in the very act and moment of the divine creating and its own creation, and in such a way that there can be no question of any preceding being.¹⁴⁵

“Historical” does not here denote any formal correspondence with something that happened on the plains of Africa some hundreds of thousands of years ago. We are in the realm of saga. Barth’s use of that word is complex and subtle.¹⁴⁶ Saga arises from two elements: it is “divinatory and poetical”.¹⁴⁷ It is thus a discernment and a depiction of what lies behind the events that might be recounted by history, understood as an intended recital of straightforward facts by a chronicler, a genre that the Bible also contains. For that latter “history”, we can also read “natural science”, including the accounts, still incomplete, which present-day physical cosmology and evolutionary biology give of the beginnings of the universe and the origin of human life on Earth.¹⁴⁸ “Saga” for Barth is also the history behind history, that of the covenant of grace.¹⁴⁹ It is “salvation history”, though he wishes to use this term with some caution since it could lead to an illegitimate “history of religions”. Emphatically, saga is not timeless because it deals with events in the created realm, but it does seem to involve a dislocation of time. The Genesis accounts give temporal priority to the cosmos and the Earth. There is a lack of

¹⁴⁴ CD III(2), p. 151.

¹⁴⁵ CD III(2), p. 150.

¹⁴⁶ Not to be confused with the use of the term “saga” by some biblical commentators to denote the connected, almost novelistic, accounts in the Pentateuch of the lives of the patriarchs. They supposed them to reflect clan histories and cultural traditions conflated by the different editors of Scripture to contribute to a theological history of Israel. See S. H. Hooke, ‘Genesis’, *Peake’s Commentary on the Bible*, ed. by M. Black and H. H. Rowley (London: Nelson, 1962), pp. 186-207.

¹⁴⁷ CD III(1), pp. 81-83.

¹⁴⁸ For biological science as history see Chapter 2 (3) (b).

¹⁴⁹ For instance CD III(1), p. 240.

correspondence with the various scientific accounts of the beginning of things.¹⁵⁰ Saga does indeed refer to this physicality, yet its logic is not constrained by it, for in taking it as the basis for a doctrine of creation we are in the realm of faith. Indeed, for Barth the key to a Christian doctrine of creation, flowing from the saga related in the Genesis account, is “By faith we understand that the worlds were prepared by the word of God, so that what is seen was made from things that are not visible”.¹⁵¹ Apart from faith, we cannot know that God created the world and neither, consequently, that the world around us is indeed real. This text might be interpreted in the context of a Platonic (perhaps via Philo) understanding of the background of Hebrews as a whole, in which earthly and impermanent things reflect heavenly realities but is better understood in the sense that the things we see are made by God out of things we do not see.¹⁵² This latter is in any case Barth’s view, for God’s self-witness asserts his own reality and that he is the creator of the world; that same witness asserts the world’s distinct and different reality. There can be no confusion between creation and creator.

The material point is, as we shall see, that the boundary for the history of human persons, whether collectively or individually, is God’s own self. For Barth the being of humanity, in correspondence to that of God, is being in actuality. That is to say, it is constituted not by any static essence but by its activity, given to it by the God whose intra-Trinitarian activity is to love in freedom.¹⁵³ It is in this respect that the being of the human person is historical. It is something that God is doing in space-time. Genesis 1 tells of God’s decision to create as expressed in the second person plural.¹⁵⁴ It thus indicates that the nature of God is one of being in relationship. It is in that image that the human person is to be formed.¹⁵⁵ There is no pre-existent or potential human-like entity. There is Jesus Christ the pioneer. Barth does not at this point refer to the descent of humanity from pre-human creatures. He does suggest that humanity can see the rest of the animal creation as “distant friends and relatives”.¹⁵⁶ In that way, he points to a physical continuity between humans and other creatures and a readiness to accept the Darwinian account of things.

It would thus seem also that the physical and what Barth calls the phenomenological accounts (i.e. accounts of empirical observations of other people, rather than self-analysis of phenomena within the consciousness) of a genuine human and a pre-human might be indistinguishable. However, the former would be a subject of God’s special summons, a covenant partner of God and thus

¹⁵⁰ CD III(2), p. 438, though perhaps Barth is here referring to Jesus, “the Contemporary of all men whether they have lived, live or will live”, CD III(2), p. 440.

¹⁵¹ CD III(1), p. 6, quoting Hebrews 11:3. I quote from the NRSV.

¹⁵² e.g. James Moffat, *International Critical Commentary: Hebrews* (Edinburgh: T&T Clark, 1924), *ad loc.* p. 162.

¹⁵³ See also von Balthasar, *Barth*, pp. 190-197.

¹⁵⁴ “Let us make humankind in our image”, Genesis 1:26, NRSV.

¹⁵⁵ For a further discussion of actualism see Paul T. Nimmo, *Being in Action: The Theological Shape of Barth’s Ethical Vision* (London: T&T Clark, 2007), pp. 4-12. Also Hunsinger, *How to Read Karl Barth*, pp. 30-35.

¹⁵⁶ CD III(1), p. 169.

a real human. The latter could even be, in Barth's terms, a rational animal but still not qualify as human. We could take this to imply that at some point in the evolutionary story, genuine humanity, whose prototype is in the humanity of the Logos, is inserted into the series and becomes (collectively?) the genetic ancestor of the human race. Perhaps that is the unstated assumption in, for instance, the Roman Catholic Church's catechesis.¹⁵⁷ In any case Barth is saying something different. This is not an event in a humanly recounted story. It is not a Darwinian correction of Genesis, retelling of the first days of the human species. As we saw, Barth understands the Genesis creation stories as "saga", not as attempts at literal descriptions of the Creator at work in the empirical world.¹⁵⁸ They do not need correction. Revelation discloses a specific vocation for humans. Humanity is what it is because of its calling and election, that is what distinguishes it from non-human animals. The phenomenological distinctions are relevant but cannot determine reality. However, they may sometimes be symptomatic of it. Especially that is the case with the beginnings and ends of human life. Researchers into the human past point to grave furnishings as symptoms of belief in some kind of post-mortal existence.¹⁵⁹ We take them as evidence of a humanity like ours.

Barth argues that the fact that there was a time before we came into existence is just as much a problem as that at some future moment we shall cease to exist. In a section entitled "Beginning Time", he rejects various notions of the origin of the soul, both patristic and those of Luther.¹⁶⁰ We can say nothing more about our origin than that it is the gracious God in all his Trinitarian existence who precedes our own finite being. Yet we attempt to reach back in time in this way, as well as by the study of history (and we now might add popular genealogy), because we cannot accept that our past as well as our future is in non-being. However, we cannot defeat our finiteness for its boundary is the infinity of God. Barth adds that the history of Israel, a particular human community whose members are bound to each other in natural relation, has a specific meaning as the history of the covenant. This answers for an Israelite the question, "Where do we come from?" In fact, God extends this blessing to the whole human race because the covenant history begins with the first humans.

(i) The complete humanity in Jesus Christ

The complete human reality we find only in the person of Jesus Christ who acts according to the covenant history. He is definitively the man for God and also the man for his fellow human beings. That fact is ontologically connected with his divinity in that this is the way in which the

¹⁵⁷ Interdicasterial Commission, *Catechism of the Catholic Church* (New York: Doubleday, 1995), paragraphs 355-361, pp. 102-103.

¹⁵⁸ "Saga" is discussed in a later section, "Saga and time", Chapter 3 (5) (d).

¹⁵⁹ The discipline of cognitive archaeology studies this, Scarre, *Human Past*, p. 26.

¹⁶⁰ CD III(2), pp. 572-587, mostly in small print.

relationship internal to the Trinity is expressed externally.¹⁶¹ Here we have one of Barth's most characteristic ways of emphasizing that what God is in God's own triune self, is also what God is and reveals God's self to be in relation to what is not God. The immanent Trinity and the economic Trinity coincide.¹⁶² There is therefore an analogy of relations, which, however, Barth says, has nothing to do with any supposed analogy of being. Thus, the relationship between the persons of the Trinity is analogous to that between Jesus and his disciples and indeed the rest of humankind, so that Jesus is "for his fellow men".¹⁶³ According to Barth, it is because of this we can say that human Jesus is the image of God. Here however he issues a note of caution: this image of God is nonetheless a creature, not God's own self but God's work. This is an analogy not an identical repeat of what is internal to the Trinity. But it is also this which makes possible the fact that Jesus is in genuine, not just empathetic, solidarity with, and at no distance from, his fellow women and men and with them "in the most comprehensive and radical sense".¹⁶⁴ This solidarity implies the absolute necessity of his self-giving, substitutionary, once and for all sacrifice for the sins of each human person without exception.

(j) Humans together

Theological anthropology is not Christology, yet in spite of obvious differences, we can only specify humanity in relation to that of Jesus. He is definitively and prototypically the "man for his fellows"¹⁶⁵ in a way that no one else can be. It follows that the essential and primary characteristic of a human person is to be in positive relationship with others. We must utterly reject the thinking about self that projects our own image onto other people and sees our fellow humans as "ultimately elements in our own myth or history".¹⁶⁶ Barth illustrates this with an analysis of the life and thought of Friedrich Nietzsche (1844-1900) who he says was "the most consistent champion and prophet of humanity without the fellow-man".¹⁶⁷ Likewise, Barth explicitly contradicts certain literary perspectives on humanity including that of Jean-Paul Sartre (1905-1980) in "*Huis Clos*".¹⁶⁸ Sartre, who was a prominent figure in European culture at the time Barth was writing, seems to be suggesting that it is impossible to realize one's personal project except in isolation from other human beings. Such a perspective is completely alien to Barth. He utterly contradicts this philosophy of life in his belief that the genuine human person exists in fellowship: the man Jesus reveals to us that that is how God means it to be.

¹⁶¹ CD III(2), p. 218.

¹⁶² CD III(2), pp. 220-221.

¹⁶³ CD III(2), p. 219.

¹⁶⁴ CD III(2), p. 212.

¹⁶⁵ CD III(2), p. 222.

¹⁶⁶ CD III(2), p. 230.

¹⁶⁷ CD III(2), p. 242.

¹⁶⁸ Jean-Paul Sartre, *Huis-Clos* with *Les Mouches* (Paris, Editions Gallimard, 1947). See *Huis Clos* Scene 5 (p. 75): "*Pas besoin de gril, L'Enfer c'est les autres*". -- "No need of the grid iron: Hell is other people." See also article on Sartre by T. R. Baldwin in *OCC*, p. 793, Col. A, where Baldwin quotes Sartre from *Being and Nothingness*, p. 410: "We are always *de trop* in relation to others."

Further, it is clear that for Barth a human being is in some sense an event, a reality in motion that cannot be grasped or pinned down. The motif of actualism, described by Hunsinger, thus continues to appear. This is consistent with Barth's understanding of the soul as the activity of the Spirit in the human person and his assertion of the necessity of relationship; intimacy must not mean that one owns or possesses the other. Encounter must not turn into union. To let the other take possession of me is to violate not only my personhood but that of the other as well. Barth now offers a further, Kantian, stricture: I must not attempt to use the other in any way, not even for the enrichment of my own well-being. To do so would be an illegitimate attempt to make the other my property. It would be an attack on both my own freedom and that of the other person. We would both become less human. Distortion of humanity takes place when one uses the other to satisfy a perceived sexual need: the other becomes an "it", rather than a human person.¹⁶⁹

Relationship is thus the primary form of what it is to be a human person: we are genuinely people only as we are in relationship with other people. Further, the motif of actualism is again evident. Humanity in stasis would not be humanity at all: "humanity is the determination of our being as a being in encounter with the other man".¹⁷⁰ This is most clearly realized in the relationship between man and woman, and in particular in marriage. However, a human person cannot accept responsibility for another in the way Jesus does: "The humanity of Jesus consists in His being for man."¹⁷¹

(5) Covenant, creation, and history

(a) Humanity in the covenant

Barth's intention is to make clear both the noetic and ontic priority of the covenant and the inextricable connection between it and creation. It is not only an intellectual presupposition of the doctrine of creation; it is the reality behind the words, one beyond all explanation. Barth says that behind the human person as a finite creature there stand God and his Word. God has nothing to do with negativity and chaos. Barth rejects both "the world as a part or emanation of the divine being (i.e. monism) and the doctrine of the world as an independent entity, eternally coexisting with God (i.e. dualism)".¹⁷²

Covenant is inextricably linked with creation in that it is its internal basis: "it is the goal of creation".¹⁷³ Conversely, creation is the external basis of the covenant. That is to say, it is what the covenant is about. It is what makes it possible: "the creature is destined prepared and equipped to be a

¹⁶⁹ CD III(2), p. 307.

¹⁷⁰ CD III(2), p. 248.

¹⁷¹ CD III(2), p. 243.

¹⁷² CD III(2), p. 154.

¹⁷³ CD III(1), p. 231. This theme is expounded in pp. 94-228 of CD III(1).

partner in the covenant".¹⁷⁴ From that point of view, humanity is central to God's creative purpose. Fulfilled humanity has therefore, he thinks, a cosmic significance that extends to humanity in its unfulfilled aspect as well.¹⁷⁵ We note that "cosmos" for Barth is not the physical cosmos investigated by astronomers, though it does, in some sense, contain it. Cosmos is that which is created and consists of the upper and the lower spheres, heaven and earth.¹⁷⁶ Heaven is "the sum of that created reality which is invisible, unknown and inaccessible to man".¹⁷⁷ This distinction between heaven and earth is an ontological one. Humanity, Barth tells us, exists on the boundary between the two. The two-fold division of the creation is a parable that expresses the nature of the covenant, "in which the divine and human being and action meet".¹⁷⁸

There is one creator and one good creation, and in spite of everything, this reality of goodness remains in the human race. Barth thinks that we cannot make a basic principle out of what has gone wrong. We can only understand sin in relation to God's saving action in Jesus Christ. It is not the starting point of theology. The revelation in Jesus Christ is that beginning. In and through Jesus Christ, God grounds the human person, body and soul, in the divine self. That is quite independent of any self-perception, even that of an atheist. Humanity is with God and cannot escape that act and determination. Study of humankind, not based on that fact, can only be relative. It is valid insofar as it remains faithful within its limited sphere. "Relative" does not mean valueless, simply that we cannot discover the truth about the human condition in one of the sciences or in a combination of them. They deal in phenomena rather than realities. The action of the living God binds up the existence and constitution of humanity. The living God holds each human person within the gracious covenant. Neither life nor death nor judgement can change that fact.

(b) Jesus, Lord of Time

Humanity, in covenant partnership with the God who "loves in freedom",¹⁷⁹ is free within its created finitude. For Barth, the created world and humanity with it exist irrevocably in time. I shall later explain how biological science provides an emphatic parable pointing to human ontological finitude.¹⁸⁰ Unlike the Creator in his eternity, human persons have a past, a present and a future. We cannot know what time may mean for other created entities.¹⁸¹ Jesus is the Lord of created time, yet in order to participate in human life he must live within it. The form of his life is earthly, temporal and

¹⁷⁴ CD III(1), p. 97. This theme is expounded in pp. 228-329 of CD III(1).

¹⁷⁵ CD III(2), p. 203.

¹⁷⁶ Price, *Karl Barth's Anthropology*, p. 131, suggests that Barth, especially at CD III(2), p. 216, also uses "cosmos" (*Kosmos*) to mean humanity in the world.

¹⁷⁷ CD III(2), p. 11.

¹⁷⁸ CD III(2), p. 12.

¹⁷⁹ CD II(1), pp. 257-321.

¹⁸⁰ See Chapter 5 (4) (f).

¹⁸¹ CD III(2), p. 521.

finite. The content is the eternity of God. The temporal contains the Eternal. The changes and chances of this world shape the presence of the Eternal. Without inhabiting time, Jesus could not be its Lord. This is not Docetic play-acting. It is the genuine historical existence of the Word made flesh. In the resurrection, the eternal being of God becomes and remains historical.¹⁸²

(c) Salvation history

The history of God's fleshly engagement with the world is not accessible by, nor subject to, the criteria of historical investigation. One facet of this takes place in the forty days between his resurrection and ascension, "The event of Easter is as it were the prism through which the apostles and their communities saw the man Jesus in every aspect of their relation to them -- as the One who 'was and is and is to come'."¹⁸³ However, as Barth's comments on Bultmann's position show, he does not understand the resurrection just as an idea that transforms the perspective of the disciples. Rather it is a real event in time and space. It is not possible to generalize from this instance. It is the origin of the disciples' faith, but distinct from it. For Barth the pre- and the post-resurrection earthly histories are different in kind but inseparably linked. He is now "the contemporary of all human beings".¹⁸⁴ The two histories are as the time of Jesus' life and death and the time of his revelation. Both are the time of the human person Jesus, Lord of time. Each is a gift that he took to begin and confirm the covenant with the human race. That means that God has time for us! Therefore time is real and a property of the created world, it has no meaning or prior nature in itself. It is, relativized but not discarded.¹⁸⁵ As we shall discuss in Chapter 5, this is the genuine time in which the biological life of human and other creatures is confined.¹⁸⁶ Indeed time has a definite purpose, namely that it should be and has been fulfilled in the mission of the Son, the source of human freedom and maturity.¹⁸⁷

Humanity has no prior capacity to realize its own self. Such fulfilment is the gracious gift of God. Barth sums up his account of humanity in one phrase: "the being of man is a history". The "primal history" is the incarnation in which "it is the existence of the man Jesus" that defines and teaches the being of humans.¹⁸⁸ It would seem that we can think of Barth's "primal history" as being a facet of salvation history. "History" is contrasted with "state" even though that state may not necessarily be a static one. Even the most mobile state is not the same as a history. Thus, Hunsinger's motif of actualism appears once more. History occurs when a being changes its state through an external cause and enters

¹⁸² Adam Eitel, 'The Resurrection of Jesus Christ: Karl Barth and the Historicization of God's Being', *International Journal of Systematic Theology*, an. 2008, pp. 36-53.

¹⁸³ *CD III(2)*, p. 442, quoting Rev. 4:2.

¹⁸⁴ George W. Hunsinger, 'The day break of the new creation: Christ's resurrection in recent theology', *Scottish Journal of Theology* 57 (2) 2004, referring to a revised translation of *CD III(2)*, p. 440.

¹⁸⁵ *CD III(2)*, p. 45.

¹⁸⁶ See Chapter 5 (4) (d).

¹⁸⁷ *CD III(2)*, p. 459.

¹⁸⁸ *CD III(2)*, p. 157.

into a new one. Only in Jesus this condition is strictly fulfilled. In this being God acts for and on behalf of the threatened creature. In this history, all that God does for humankind takes place: covenant, salvation, revelation. If we ask what a human being is, he or she is the being “whose Kinsman, Neighbour and Brother is the man Jesus”.¹⁸⁹ The being of human persons consists in that they are now with him. The one who is for all people enacts human history within himself. Human existence thus transcends its limitations, while yet remaining finite.

(d) Time

Time is a genuine property of finite human existence. The mission of the Son is time’s focus. We have already referred to Barth’s use of the term “saga” to denote the human account of divine actions. It witnesses to what we cannot depict in temporal terms.¹⁹⁰ In sum, Barth’s (and in his mind the Bible’s) understanding of time is certainly not linear. However, we should here again see in play actualism which Hunsinger says is “the motif which governs Barth’s complex conception of being and time”.¹⁹¹ In fact there appears to be very little or no correspondence between what counts for Barth as the only significant time, namely the time of Revelation, which is the time God has for us; and what we might loosely call clock-time or calendar-time which at this point he describes as “lost time”.¹⁹² Yet God’s extra-temporal decree of grace in its execution and actualization posits time as “the form of existence” of the creature.¹⁹³ Under grace, the constraints of time mould creation. We shall have more to say about that in Chapter 5 as a parable of the truth.¹⁹⁴ Relativistic and quantum-mechanical complications apart, time appears to humans as constituted by a series of events in definite order but there can be no extrapolation from this to some notion of how God might perceive it, or rather what time might be in itself as created by God.¹⁹⁵ It might be tempting for a physicalist critic of Barth to dismiss his implied account of time as incoherent. However, two twenty first-century scientists, writing about the relationship between two fruitful physical theories, say that, even in purely scientific terms, there is no unique, coherent story of the world to be told,

for the phenomenon of quantum mechanical entanglement and the space-time geometry of special relativity - taken together - imply that the physical history of the world is infinitely too rich for that.¹⁹⁶

¹⁸⁹ CD III(2), p. 160.

¹⁹⁰ See Chapter 3 (4) (g).

¹⁹¹ Hunsinger, *How to Read Karl Barth*, p. 4.

¹⁹² CD I(2), p. 49.

¹⁹³ CD III(1), p. 68.

¹⁹⁴ See again Chapter 5 (4) (d).

¹⁹⁵ For an account of one among a number of recent theories about the relationship of space--time and quantum gravity see Martin Bojowald, ‘Follow the Bouncing Universe’, *SA*, Oct. 2008, pp. 28-33. See also Craig Callender, ‘Is Time an Illusion?’ *SA*, June 2010, pp. 41-47.

¹⁹⁶ See David Z. Albert and Rivka Galchen, ‘A Quantum Threat to Special Relativity’, *SA*, March 2009, pp. 26-33. For more on entanglement see Vlatko Vedral, ‘Living in a Quantum World’, *SA*, June 2011, pp. 20-25.

I am not suggesting that Barth's theology is in some kind of agreement with physics, as perhaps Thomas Torrance¹⁹⁷ might have done. However, I am reiterating a point already made about reason.¹⁹⁸ Even where empirical matters are in question, it must extend beyond the simplicities of sequential time or Aristotelian logic. If that is the case, Barth's theological reasoning has at least as good a claim to its own semantic universe as does physics.

However, Barth and the physicalist would agree on one point: human creatures are finite and bounded in time and space. Barth would add that the real boundary is God's own self. It is impossible for us to step outside this condition and understand what might be going on beyond the time we inhabit. According to Barth, it is not legitimate to translate theological assertions into the language of time. This is especially the case with the beginnings of humanity, referred to earlier, but also with its bounded future. Saga, salvation history, is not bound to an evenly flowing time sequence, tied to the laws of thermodynamics on which biological life and hence human history, as normally recounted, depend.¹⁹⁹ However, salvation history does have its own structure. Time, human and divine, interact because the Word becomes flesh.

(e) Time is threefold

For Barth there are three epochs or facets of time. The time of preparation stretches from the creation to the incarnation. Secondly, there is the time fulfilled in the earthly history of the Son of God. Lastly, there is the time of waiting and of a hope that is primarily eschatological. It contains both the "now" and the "not yet". Over each and all of these three Jesus is Lord.²⁰⁰ Barth's position concerning the epoch since the Christ event is like that of the New Testament-scholar Joachim Jeremias (1900-1979) who summed up the message of the parables of Jesus as "eschatology in the process of realization".²⁰¹ In the last published part of the *Church Dogmatics*, while laying stress on the completed

¹⁹⁷ For Torrance, see Chapter 1 (4) (b) (3).

¹⁹⁸ See previous discussion, Chapter I (4) (b) (ii).

¹⁹⁹ The second law of thermodynamics requires that the universe as a whole, considered as an isolated system, always flows, as it were, downhill, that is in the direction of greater disorder. "I shall use the phrase 'time's arrow' to express this one way property of time, which has no analogue in space." Arthur S. Eddington, *The Nature of the Physical World* (Cambridge: Cambridge University Press, 1932), p. 69. This together with other thermodynamic laws governs biological life as well as cosmology (at least until recently, see Bojowald above. See also the speculations of Roger Penrose in *Cycles of Time* (London: Vintage, 2011), especially pp. 53-54. Among many discussions of the second law, the clearest and most relevant to the present purpose is that by Stephen W. Hawking, in *A Brief History of Time* (London: Bantam, 1988), pp. 143-153. For time's arrow in an eschatological context see also Charles Wesley (1707-88) in *Hymns and Psalms* (London Methodist Publishing House, 1983), Hymn no. 354, vs. 4. "The arrow is flown, The moment is gone." I shall again be discussing "time" as the reality for creatures, including human ones, at Chapter 5 (4) (d), (e) and (f).

²⁰⁰ CD III(2), p. 498.

²⁰¹ For "eschatology in the process of realization", see Joachim Jeremias, *The Parables of Jesus*, trans. by S. H. Hooke (London: S.C.M., 1954), p. 159. The German phrase is "*sich realisierende Eschatologie*" and its originator, Jeremias says, was Ernst Haenchen (1894-1975). Jeremias acknowledges C. H. Dodd as a pioneer in the study of

work of Christ, Barth asks, referring to the first petition of the Lord's prayer, "How does it stand with us who are obviously in the middle between the 'is' and the 'will be'?"²⁰² Characteristically Barth gives an ethical content to the eschatological. In the time of waiting and hope, the task of the witnessing community of the followers of Jesus is to be human. "Human" is to be in a position to hear at the last day that those things which, with no hidden agenda, one did for the least of the brothers and sisters of Jesus were indeed done to him.²⁰³ That points to the final words of this dissertation.²⁰⁴ For Christian history has a new meaning, intimately connected with what went before. The Christ event has fulfilled history. The new community has no other basis, not even in its doctrines and institutions. The grace of God and the gift of the Spirit bind all together.

(f) Time and the limits of human understanding

Barth's discussions of time are difficult to integrate with each other. Hunsinger, in connection with the problem of double agency, points out that such temporally related words as "cause", "operation", "effect" cannot be understood in their dictionary sense, or as they might be employed in a laboratory, without too much reflection.²⁰⁵ It is relevant that Hume found them in any case problematical.²⁰⁶ They must be subject, like certain other words employed in theology, to the procedure of "*Aufhebung*". Considerations relevant to double agency are also relevant to those surrounding creation, covenant and election. Such words, or rather the notions to which they refer, must be subject to affirmation, negation and reconstitution on a higher plane. They can, thinks Hunsinger, have then their place, redefined, in characterizing the economy of the God who "loves in freedom".²⁰⁷ We must ask if the Hegelian move, by Barth, is simply a way of licensing irrationality. This might be the case if he intended it as a strategy for extrication from a philosophical dilemma. However, the motive is a theological one. Human language cannot capture the divine. It must allow God who loves in freedom to capture it. This is inevitable not only because language is a product of earthbound human circumstances but also because only God can know God. At its limit, human understanding can

the parables. Dodd and, to a much greater extent, Jeremias emphasize the dynamic element of the kingdom as "kingship", "kingly rule", "reign", "authority"; C. H. Dodd, *The Parables of the Kingdom*, 2nd edn (London: Fontana, 1961), p. 29, including footnote. There is an entry for Jeremias in the Index volume of *CD* referring to *CD* IV(4), p. xi and p. 164. However, the name does not appear in the English text or in the index of Volume IV (4) itself. See further, Christopher Rowland, 'The Eschatology of the New Testament Church', chapter in *The Oxford Handbook of Eschatology*, ed. by Jerry L. Walls (Oxford: Oxford University Press, 2007). For exegesis of Jesus' parables of the kingdom see Chapter 5 (3) (d).

²⁰² *CD* IV(4), p. 163. See also Dalferth, 'Karl Barth's Eschatological Realism' in *Karl Barth Centenary Essays*, ed. by S.W. Sykes (Cambridge: Cambridge University Press, 1989).

²⁰³ *CD* III(2), p. 508, referring to Matthew 25.

²⁰⁴ See Chapter 6 (4).

²⁰⁵ Hunsinger, *How to Read Karl Barth*, p. 200.

²⁰⁶ David Hume, *An Enquiry Concerning Human Understanding* (New York: Prometheus, 1988), pp. 69-74.

²⁰⁷ *CD* II(1), pp. 257-321.

only say that, “To know God is to know where the mystery is located.”²⁰⁸ Barth himself puts it this way: “it is because and to the extent that we know God that we know his incomprehensibility.”²⁰⁹ Nonetheless, God has revealed to humans what they need to know.

(g) Humans cannot possess time

Barth makes clear that we do not own time, even the present moment: it is the gift freely given as “real time in the present of God”.²¹⁰ To want anything else is to want to be God. The presence of God in the human present is that of the living God; every moment he offers us is unique: an “opportunity which he wills to be realized in and through us now”.²¹¹ As for the past: we are neither at liberty to freely remember or to forget, we cannot own what is past, and its reality also belongs to and is promised by the God who was active in love then as he is now. Our desire to reach back into history, though the results are interesting in themselves, is a failed attempt to grasp at a past when we did not exist and to thus extend our being in time by making the past our present. Yet God will maintain its reality. It is both always present to him and genuinely still ours.²¹² We must live in an awareness of our own history yet we must not inhabit it as a home. As regards the future, we live under the threat of having no more time: we are not at liberty either to ignore or to be preoccupied with this stark fact. However, we have no way of securing our future: to attempt to do so is to enter a blind alley. Humans have an appropriate time tailor-made, in quite a different dimension from God’s eternity and in no way comparable to it. It is pointless to yearn for that which our created nature forbids us to possess. Death is not of itself an evil, thinks Barth. Our future is in God, no other guarantees are necessary or possible and there is no other reality. The Lord’s Prayer makes the matter clear: “Give *today* our bread for *tomorrow*”.²¹³ (Barth’s italics.) Fear of the future is appropriate provided that it is fear of God, not an invented idea of God, but God as God is in God’s own self, in both judgement and mercy as “our Covenant partner and friend”.²¹⁴ In Chapter 5, we shall give more thought to time as it directly concerns us and other creatures.²¹⁵

(6) Theological anthropology: a text already known

As we have seen, Barth in no way attempts to fashion his anthropology according to the latest scientific understandings, even of his own day. For him the sciences even in the widest sense

²⁰⁸ Bruce McCormack, lecture at Keble College, Oxford, 08/03/2010.

²⁰⁹ Barth, *Göttingen Dogmatics*, p. 358.

²¹⁰ *CD III(2)*, p. 531.

²¹¹ *CD III(2)*, p. 531.

²¹² *CD III(2)*, p. 538-39.

²¹³ *CD III(2)*, p. 548.

²¹⁴ *CD III(2)*, p. 549.

²¹⁵ See Chapter 5 (4) (d).

cannot get at reality, only at the phenomena of the world. I have more to say about that in the following chapter.²¹⁶ Yet such findings, including those of natural science, can, he thinks, offer pertinent commentary on the text concerning the human person already known through revelation.²¹⁷ In the present chapter, we have considered selected parts of Barth's understanding of this text. Two complex themes emerge on which we shall later offer commentary from the standpoint of the Darwinian scientific matters considered in Chapter 2. The first involves saga and time, the second, the soul and the self.

In saga, mediated by Scripture, the Word communicates that text. The content is God's action in creation and salvation. Their history unrolls within a complex time and space. It must include in some way the space--time we inhabit. Their story, within consecutive time, we call "history". According to Barth, revelation discloses the core of this saga. It is the divine summons of that created thing which he called into being and set apart in the election of Jesus Christ. For he is the pioneer of the human vocation. Human persons are indeed, he says, finite entities, acting in and being acted upon within the realm referred to by saga. They are at the boundary between heaven and earth. However, they live within the limited empirical time and space of the world. Their boundary is not time and space. It is the living God who "loves in freedom".²¹⁸ In Chapter 5, we shall see what commentary Darwinian science with its own understanding of history can offer on those topics.²¹⁹

Another theme in this text concerns the relationship between the soul and the body that together make up the human person. The soul is not a human possession. It is the result of the gracious action of the Spirit within the limits of the human body. It is thus their bounded physicality as well as their relationships with each other and with their Triune Creator that constitutes human beings. Barth holds that the human soul is not a substance of any kind, but is dependent on the particular activity of the Holy Spirit within a physical frame. That places it beyond any kind of investigation which does not have revelation as its source and guide. For the divine freedom encloses human selves. The plural is vital, for the relationship with God and others is fundamental to true humanity. Mind and reason also have a place in this discussion. Science in the succession of Charles Darwin has something to say concerning these matters. We shall see the theologically relevant commentary it might offer in Chapter 5. There we shall discuss in more detail how Barth's understanding of scientific activity might contribute to a theology that can converse with the Darwinian biology of the human person.

²¹⁶ Chapter 4 (2) (d).

²¹⁷ *CD III(2)*, p. 122.

²¹⁸ *CD II(1)*, pp. 257-321.

²¹⁹ See Chapter 5 (4) (d).

CHAPTER 4

KNOWLEDGE: HUMAN AND REVEALED

(1) Introduction

This chapter will critically examine Barth's understanding of the human activity of natural science. We shall see in what ways it can inform a twenty first-century dialogue between, on the one hand, themes from a theological anthropology in the same stream as his, and, on the other, selected aspects of the Darwinian picture of humanity. It will first clear up some possible misunderstandings arising from the available translation of the *Church Dogmatics*. It will then discuss what Barth sees as the limits of any epistemological or ontological human investigation. We shall note examples at the frontiers of present-day understanding where for different reasons science fails to progress and the uncertainties of both kinds surrounding them. We continue by discussing Barth's understanding of natural science and its consequences and then discuss Barth's understanding of biology, and relating it to theological ways of knowing, pointing to some less satisfactory features and considering the direction in which a theology of science in the same stream as his ought to be developed.

(2) Human knowledge - human limits

(a) A clarification

The standard translation of *Die Kirchliche Dogmatik* uses the English word "science" to designate all academic activities whose aim is to acquire knowledge.²²⁰ Apparently, at random, the standard translation refers to what I call "natural science", either as "exact science" or "inductive science". According to the translation, Barth suggests that theology, at any rate the theology he expounds, is "closer methodologically to the inductive sciences (*exakten Wissenschaft*) based on observation and inference than it is to philosophy (*Weltanschauungen*)".²²¹ What Barth himself is acknowledging is a purely formal similarity between the investigations of natural science and theology but, as he immediately points out, there must be a sharp distinction in practice, consequent on their

²²⁰ For Barth's discussion with Heinrich Scholz on the sciences see *CD I*(1), p. 8, also Frei, *Types*, p. 45. See also Thomas F. Torrance, *Karl Barth: Biblical and Evangelical Theologian* (Edinburgh: T&T Clark, 1990), p. 128.

²²¹ *CD III*(2), p. 12, *KD III* (2), p. 12. "*exakte Wissenschaft*" is translated unselectively either as "exact science" or "inductive science". The former prioritizes physics and mathematics. It seems to exclude branches of natural science like biology which until relatively recently have depended more on description and classification rather than measurement. The latter seems to imply a highly disputed epistemology of the sciences. We follow Price in thinking that Barth wants to include biology, along with physics and chemistry. There is no need to comment on the problem of induction at this point, it was not what Barth was talking about. See Price, *Karl Barth's Anthropology*, p. 101.

sources. As to philosophy, what Barth objects to is the elaboration of all-embracing metaphysical systems or cosmologies, whatever their intellectual origin or focus.

(b) Cosmologies as understood by Barth

The term “cosmology” in this case applies to those ancient and medieval theories about the hierarchy of heaven and earth. It concerns the ordering and delegation of God’s power over the totality of all created things.²²² However, in fact, as Barth expounds it, there is a positive value in such systems, in that each created entity is seen on its divinely ordained rung in a ladder of command and obedience reaching up to the Creator.²²³ Thus in pre-modern times there was order and stability in the created universe. In upsetting that scheme, Copernicus actually placed humanity at the centre. Instead of seeing himself in a humble position near the foot of a ladder of authority, Enlightenment man saw himself as one whose understanding could compass and command everything in an ever-widening natural and intellectual world. There was already such criticism, early in the seventeenth century.²²⁴ Placed at the centre where God had been, humanity could now aspire to the heavens.

(c) A negative consequence of Copernican cosmology

For Barth, this disturbance of proper hierarchy had made possible a new and unrestricted absolutism. It was political in such as “The Sun King”, Louis XIV, intellectual in such as the polymath Leibnitz, who in his teaching “most perfectly revealed the ideal of the inner attitude to life which prevailed at the time”.²²⁵ Barth’s point must be that even medieval cosmology, illegitimate though it may be, puts humanity in a more truthful perspective and with fewer harmful consequences than more recent schemes. For Barth, the project of a total understanding of heaven and earth is not a legitimate human activity, whether for scientists or theologians, still less for philosophers. Kant was of a similar opinion though his reasons were not those of Barth. Kant argued on the basis of his antinomies.²²⁶ In

²²² C. S. Lewis, explaining the notion of hierarchy in a literary and social context, traces it back to Aristotle with references to the *Politics*: C. S. Lewis, *Preface to Paradise Lost* (London: Oxford University Press, 1954), pp. 72-80. He offers a summary of the point relevant to us in a quotation in his chapter heading, concerning a concept found in Indian religious philosophy: as “Order” or “Right”, “but it is difficult to find any equivalent for it in modern English since it is at once cosmic, ritual and moral”. For a much fuller account of the medieval understanding of cosmology see C. S. Lewis, *The Discarded Image: An Introduction to Medieval and Renaissance Literature* (Cambridge: Cambridge University Press, 1964).

²²³ God cannot be included in a class which contains other existents, a point well understood in classical theology, but here however we are also talking about a large complex of views, including popular misunderstandings of what we might call the official position.

²²⁴ John Wilkins, an Anglican bishop and popularizer of Copernicus, “reported that a common objection against the Copernican system was that it elevated man above his true station.” Brooke, *Perspectives*, pp. 82-89, esp. p. 88. See also J. H. Brooke in Olby and others, *Companion*, p. 768-769.

²²⁵ Barth, *Protestant Theology*, pp. 23-65. cf. Price, *Karl Barth’s Anthropology*, pp. 32-36.

²²⁶ For an example of Kant’s argument see Immanuel Kant, *Critique of Pure Reason*, trans. and ed. Vasilis Politis (London, J. M. Dent, 1993), pp. 359-368 [A497/B525 –A515/B543]. For exposition see Körner, *Kant*, pp. 113-118.

both cases, the rejection of grand schemes is not surprising, since for both of these thinkers even our understanding of the world in detail is limited. I shall now consider Barth's view of natural science.

(d) Natural science cannot uncover reality

The findings of natural science, in particular those concerning the human person, are working hypotheses. Barth asserts that this provisionality is inevitable.²²⁷ As we have seen, this is a well-grounded epistemological stance for natural science, independently of any theological thinking.²²⁸ Arguably, our earlier conclusion did leave some room for the possibility of an asymptotic approach. Successive approximations to the truth would eventually coincide for practical purposes with truth in itself. However, even if this were the case, empirical truth could not be truth understood theologically. The source of true words is truth itself disclosed by the event of the Word.

Barth understands that the sciences, including natural science, deal not in truth but in phenomena, the appearances of things. That is at odds with versions of a realist philosophy. They assert the objective existence of inferred entities like positrons or genes, having the properties ascribed to them by investigators, say positive charge or self-replication. In addition, according to realism, scientific theories point to previously undiscovered facts about the world we live in. For Barth however, the items in question may exist in some way. We may be entitled to assert on the evidence available that they have certain properties. However, we cannot know the ontological state of affairs that gives rise to the appearances. The reality is not available. We can understand Barth's views as philosophical, though in a more restricted sense than that of the all-embracing schemes he deprecates. His views of world systems relate to those of Kant who thought that, "since there are objects of experience, there must be things in themselves; and that since what we apprehend are the objects of experience we cannot possibly apprehend things in themselves".²²⁹

Daniel Price notes this relatedness to Kant but argues nonetheless that Barth allows that a scientist can responsibly make truth claims.²³⁰ This however represents Barth as conceding more than he does. Although he does speak of scientific knowledge, he is not referring to justified truth claims. Barth's point of view might be characterized as theologically based fallibilism or its near relation instrumentalism. We can understand it as follows. There exists a created thing-in-itself, a real state of affairs, caused and known by God. That is the ground of the empirical phenomena available to scientific investigation. This ground is not accessible to finite human understanding except as far as it is disclosed

²²⁷ *CD III(2)*, pp. 12, 23-25. *CD III(4)*, p. 44. In §44 of *CD III(2)* Barth consistently refers to "phenomena" as being what natural, including biological, science investigates, see for instance *CD III(2)*, p. 90.

²²⁸ See Chapter 1 (2) (g).

²²⁹ Körner, *Kant*, p. 92. See Kant, *Critique*, pp. 61-62 [A41/B59], "the question, 'What are the objects considered as things in themselves?' remains unanswerable even after the most thorough knowledge of appearances."

²³⁰ Price, *Karl Barth's Anthropology*, p. 109.

by revelation to be the good creation of the God who “loves in freedom”.²³¹ In addition, we know from this same source that the reality, the ground of human persons, is that they are God’s covenant partners in Jesus Christ. Developing Barth’s account, we may say that what is available to natural science is the potential for the elaboration of a good-enough, symbolic (i.e. in mathematical, diagrammatic, or using natural language) explanatory account of the created physicality of that ground, consistent with the phenomena it exhibits. Along with Kant, Barth is sure that “the content of our knowledge comes from without”. That is to say that the connection of our language with the thing in itself is not arbitrary.²³² This must be the case in whatever symbolic form we express our understanding. The working hypotheses of natural science should thus have a degree of correspondence to real states of affairs. That follows from their origin in the good creation of God. However, they do not tell us the truth about underlying reality; they are corrigible and often corrected. According to Barth, science offers us explanations that help us to understand the order in the world, including that of human physical existence. Yet our human creaturely understanding even of empirical matters is finite. Our working hypotheses, which may not yet be “good-enough”, are attempts to approach the limits of what is knowable. However, even with the everyday we come to the edge of our present understanding.

(e) Intelligibility of the world not guaranteed

Even from the point of view of empirical science, it is not certain that we shall be able to understand fully the world we experience. This reinforces what I have already said about the provisional nature of scientific findings. I offer well-known examples directly touching this everyday world, but at the boundaries of what we now comprehend, one from the present state of physics and another related to our understanding of human mentality. They are examples of what we might call second-order ignorance, that is to say the extent of the unknowns is unknown.

(i) Quantum mechanics

We have several times mentioned quantum mechanics, developed during Barth’s lifetime, but which he does not consider. I am referring to it again because it illustrates the provisional status of the hypotheses of empirical science, even at their most developed. It is an elaborate discipline, fundamental to physics. It makes extremely accurate predictions about the value of a number of physical quantities.²³³ Its practical applications now surround us in, for instance, every example of consumer electronics. From that point of view, we might think it “good enough”. However, there are

²³¹ *CD II(1)*, pp. 257-321.

²³² ‘Beyond Non-foundational and Postmodern Readings of Barth’, McCormack, *Orthodox and Modern*, p. 150.

²³³ In the case of the magnetic properties of the electron in quantum electrodynamics, calculation and experiment agree “to a precision of ten decimal places”, yet other calculations, also derived from the parent quantum field theory, produce nonsensical results. See Greene, *Hidden Reality*, pp. 76-77.

problems. One of them is the “double slit experiment”. That appears to demonstrate that the same electron can, by passing simultaneously through two different holes in a screen, be in two places at once. Attempts to describe this state of affairs in words lead to what in classical logic would be a formal contradiction. Part of the resolution is that all the predictions of quantum mechanics are about probabilities. But this is not the place to attempt even a simplified explanation of that and the following paragraph does not do so.²³⁴ However, I need to comment on the implications for our general understanding of the world in the light of the successful working hypotheses of physics.

A finding from the above experiment as well as many others is that it is in principle and in practice impossible to know in advance precisely what any one subatomic particle (say an electron) will do. On the scale of everyday life, very large numbers of the constituent particles of matter make up the object. In such situations, the result is certain. Consistency is attainable with bullets or with balls. However, for individual particles only observation after the event will deliver precise information. The “wave function”, a mathematical statement that describes the state of things until the measurement is done, no longer applies. It is said to have “collapsed”. It is impossible then to offer a reason why one of the possible observable effects rather than another has taken place. The difficulty is not simply due to the limits of our experimental techniques. The theory requires it. Physicists commenting on it often suggest that everything possible does happen, but in different worlds. The world we know is only one of an infinite number of worlds into which this world is constantly splitting. Each one must contain an entity nearly identical to ourselves but its (or their) subsequent histories will increasingly diverge.²³⁵ We, as we are, and our world, are for the same reason one of the multiple products of the same process extending from the past. We thus enter a realm of apparent unreason. Yet the, otherwise highly successful, reasoned mathematics permits and, some say, requires it.²³⁶ Perhaps other explanations may be possible. If that is so this apparent *reductio ad absurdum* (of quantum mechanics) is surely the last resort.²³⁷ However, the problem is still unresolved and we do not know whether it is soluble. The extremely useful working hypothesis known as quantum mechanics is certainly not yet “good enough”

²³⁴ See ‘Being in two places at once’, Cox and Forshaw, *Quantum Universe*, pp. 7-26, especially p. 19.

²³⁵ Cox and Forshaw, *Quantum Universe*. Some argue that the many worlds of quantum mechanics and the many worlds of the multiverse are the same thing, and that the multiverse is necessary to give exact operational meaning to probabilistic predictions from quantum mechanics. Raphael Bousso and Leonard Susskind, ‘Multiverse interpretation of quantum mechanics’, *Phys. Rev. D* 85, 045007 (2012), <<http://link.aps.org/doi/10.1103/PhysRevD.85.045007>>. Downloaded 22/02/2012.

²³⁶ Summed up in the, now popularized, thought experiment of “Schrödinger’s cat”, considered by many authors. For a semi-technical discussion of it and of other issues in the problematical status of quantum mechanics see, for example, Cushing, *Philosophical Concepts in Physics*, pp. 290-330.

²³⁷ For a famous, though not generally accepted, attempt to resolve these problems in a deterministic theory see David Bohm, *Wholeness and the Implicate Order* (London: Routledge, 1995), pp. 65-100. For a counter-factual history of the subject in which Bohm’s interpretation of quantum theory triumphs see Cushing, *Philosophical Concepts in Physics*, pp. 351-353.

to satisfy the human intellect. From this point, physics cannot travel further without entering into metaphysical speculation of the kind mentioned by Popper.²³⁸

(ii) Science and the self

There is a near parallel to this state of affairs in at least one aspect of the attempt to understand human mentality already considered in more detail in Chapter 2.²³⁹ There we saw that, concerning the human consciousness of self, there is no consensus about what the problem amounts to. Some see it is a puzzle waiting for an empirical solution, in all probability by the experimental methods of cognitive neuroscience.²⁴⁰ Others see it as a philosophical problem. Still others see it is an impenetrable mystery. Evolution has not given us the intellectual tools we need to solve it. There are a multitude of detailed studies of phenomena connecting mentality and the brain's physicality, many of those may well qualify as good-enough working hypotheses in respect of their immediate scope. There will certainly be progress in the empirical understanding of mental activity and its relationship to the body. But there is no agreement on whether there can be a solution to the problem of the conscious self within the limits of natural science or even whether we would recognize one if we found it.²⁴¹

(iii) Theology and the unknown limits of empirical science

What progress can we expect on the above problems? Some believe, with uncertain plausibility, that the two and perhaps their solution are intimately connected.²⁴² We can expect that understanding will advance. However, these two key examples suggest that natural science may have limitations. Although the incarnation points to the reality of created things as made and sustained by God, that is not the same thing as guaranteeing their complete intelligibility to human minds. It would not be surprising then, and it is at least plausible from an empirical standpoint, that we cannot know more than that a certain "x", say "the collapse of the wave function" or the "human self" exists, without knowing exactly what "x" stands for. Any explanation of the behaviour of wave functions will not be part of theology. However, theology does point to a given, one that is inaccessible to the methods of

²³⁸ See Chapter 1 (2) (c).

²³⁹ See Chapter 2 (5) and (6).

²⁴⁰ "Of course we realize that methodological breakthroughs are needed to reveal the relevant physiological processes in the brain and link them meaningfully to mind and behaviour." in a review article Frith & Frith, *Social Brain*, p. 172.

²⁴¹ Clark, *Mindware*, pp. 185-187.

²⁴² See the mildly sceptical concluding remarks of Polkinghorne, *Quantum Theory*, p. 92. Penrose speculates that although quantum theory does not itself provide an explanation of the conscious mind, the importance of quantum effects at the molecular scale at which brain processes take place does suggest that the explanation may lie in non-computable processes for which, he says, the theory provides room. Penrose, *Shadows of the Mind*, pp. 393-395, p. 420.

natural science, namely revelation. It is the only source of our knowledge concerning the reality of the human self.

Our conclusion after weighing philosophical, historical, sociological and empirical arguments was that the propositions of science are working hypotheses. For theological reasons, this was also Barth's position. Whether or not our assumptions are theological, it is thus rational to hold that the propositions of natural science are not necessarily wrong. In fact, they may be of great practical use. However, their truth value is relative to the limitations of human finitude. They are and always will be provisional. We now turn to some of the implications of that understanding.

(f) No grand narratives

The above considerations rule out grandiose schemes purporting to disclose an ultimate explanatory principle unifying all knowledge. That is not only by Barth's theological stance against cosmologies, previously considered and by his understanding of the way empirical science proceeds, but also by the way science fails to arrive at conclusions even in its understanding of human persons and the physical world they inhabit. In the present day, strictures such as those would apply to views like that of Stephen Hawking. Talking about the possibility of a physical theory of everything, he suggested that it enabled discussion about "... why we and the universe exist. If we find the answer to that, it would be the ultimate triumph of human reason -- for then we would know the mind of God".²⁴³ The same applies to the unrelated proposals of David Bohm who, with more modesty but similar intent, put forward the outline of a universal thought scheme, bringing together a reformed quantum mechanics (already noted) with a metaphysical understanding of the relationship between human thinking and the whole of existence.²⁴⁴ However, similar considerations might also apply to certain biological theories about what constitutes humanity both individually and collectively, which we have considered, including those of E. O. Wilson and his followers and successors.²⁴⁵ As we noted, Barth does not share the thoroughgoing scepticism about natural-science characteristic of postmodernism but he would be in sympathy with its suspicion of all grand narratives.²⁴⁶ This is not because there is no grand narrative. We are simply not in a position to comprehend or write it: only God can do that, for God's revelation only tells humanity what it needs to know. But how does Barth himself view natural science and theology as ways of knowing?

²⁴³ Hawking, *Time*, p. 175.

²⁴⁴ Bohm, *Implicate Order*, see Chapter 4 (3) (e) (ii).

²⁴⁵ See Chapter 2 (5) (b).

²⁴⁶ Barth further rules out all versions of political scientism and historicism, including those which without the necessary empirical evidence purport to explain fully the development of human society. They may suggest that human well-being can be comprehensively furthered by obedience to economic canons whether capitalist or socialist in their ideological basis. This latter important topic is however outside the scope of this dissertation. For an analysis of Barth's theology in a political context, see Gorringer, *Against Hegemony*.

(3) Science and the theology of revelation

(a) Like and unlike

Barth sees a similar methodology in both theology and the sciences. Their proper procedure is in the opposite direction to the grand philosophical systems. Something external to the thinker authorizes judgements. He commends natural science when it does not begin with an *a priori* and then attempt to set out the kind of comprehensive world view referred to above, illegitimate even for theology. All the sciences, including theology, are human attempts to bring into knowledge and understanding something beyond the inquiring subject. However, there is an unlikeness. Sciences, other than theology, deal in phenomena and not in things as they are in themselves.²⁴⁷ Theology, however inadequately, deals in a reality, one that wills its own self-disclosure.

Thus for theology, the object is God, who can in fact be object only to God's own self-knowledge, nonetheless God gives and discloses God's self to be known.²⁴⁸ God, the indissoluble subject, enables and permits God's self to become the object of human knowledge.²⁴⁹ There is thus a dialectic of veiling and unveiling, though in a different sense from that of Barth's first use of the phrase. The unknowable is also the known in God's humanity.²⁵⁰

However, if the knowledge of God depends on the character of God, who himself determines to make himself known, neither the knowing nor the object of knowledge is under human control. Therefore, there is a further fundamental distinction between theological knowledge and the rest. Because of the nature of its object theology cannot propose to construct any normative system, even one peculiar to itself, in the way other sciences may do in a limited way for their own subject. For Barth a philosophy of theology or a meta-theology, proposing to erect even a limited system for itself, would be impossible. It would be an illegitimate attempt to define and constrain the scope, content and mode of action of revelation. Further and fundamentally, in the *Church Dogmatics* the question is not whether knowledge of God is possible. We might answer that question by an attempt to fit theology into some epistemological scheme. The right question must be, "What is true human knowledge of divine revelation? -- on the assumption that revelation itself creates of itself the necessary point of contact in man".²⁵¹ This is quite different from the kind of questions which natural science attempts to answer which we might summarize as, "What is the explanation of the empirical world where the senses create the necessary point of contact for human beings?" The scientific method assumes that the divine will not be even a part of the answer. A problem for science is that, like theology, its

²⁴⁷ CD III(2), p. 12.

²⁴⁸ The use of the word "object" to refer to God cannot be taken in an "objectifying sense", see the editors' preface to CD I(1), translation of 1975, page viii.

²⁴⁹ Brown, *Subject and Object*, p. 140ff, Jüngel, *God's Being*, pp.55-57.

²⁵⁰ As we noted earlier, Barth's theology changes. See Chapter 3 (2) (b).

²⁵¹ CD I(1) (1975), p. 29.

questions are self-involving. Empirical science, in particular cognitive neuroscience, knows that the means of sensing is part of what people are. We cannot understand the functioning of humans separately from that of their fallible senses. Embodiment entails at least that. A claim to complete objectivity is a very strong one. Theology in the stream of Barth asserts that nothing entitles human science to make it. "Good enough!" is the best we can hope for.

(b) Is Barth right to assert a methodological closeness?

There are fundamental differences consequent on their subject matter. What then does Barth intend in laying stress on a methodological closeness of theology to the natural and other sciences? Is he trying to attach to theology some of the increasing prestige that the sciences attract because of their growing success? We might suspect that with some writers, but not in Barth's case. His intention is threefold, he writes,

If theology allows itself to be called a science, and calls itself a 'science' in so doing it declares: (1) that like all the other so-called sciences it is a human concern with a definite object of knowledge; (2) that like all the others it treads a definite and self-consistent path of knowledge; and (3) that like all others it must give an account of this path to itself and to all others who are capable of concern for this object and therefore of treading this path.²⁵²

(i) Barth's intention

Commenting on the above citation, McCormack says that Barth intends to defend, not only theology, but all sciences from the aggrandizing attempts of one (say physics) to assert itself as a paradigm for the rest. This tendency is still evident: we have already noted in this study how philosophers of natural science, with no obvious justification, devote most of their attention to physics as though this would provide a key to a methodology for science as a whole.²⁵³ However, Barth's remarks must also apply to the totalizing world systems based on Darwinian biology proposed by E. O. Wilson and to the "universal acid" of Daniel Dennett, already mentioned.²⁵⁴

(ii) No science can properly define its object

McCormack goes on to suggest that Barth's complete intention as indicated in writings between 1922 and 1925 is to point out that if theology is unable to offer a definition of its object (God the indissoluble subject), it shares this incapacity with the other sciences in regard of their own objects,

²⁵² Bruce McCormack, *Orthodox and Modern* (Grand Rapids: Baker Academic, 2008), p. 286, referring to *CD* I(1), pp. 7-8.

²⁵³ See Chapter 1 (2) (a).

²⁵⁴ See Dennett, *Dangerous Idea*, p. 61 and *passim*. For E. O. Wilson see Chapter 2 (5) (b).

although they will not admit it.²⁵⁵ This point has even more substance than it did at the time when Barth was writing. We have already seen it with biology where the definition of “life” is elusive, and which cannot specify what a human being is.²⁵⁶ However, such conceptual debates have no effect on day-to-day science. Physics has more fundamental problems. It may take many years to resolve them. There are paradoxes of quantum physics where we leave common sense behind.²⁵⁷ There are a number of other unresolved questions, one, in physics, is connected with general relativity. We shall consider it later. Further, according to Greene, we do not know whether, as he hopes, we are on the frontiers of gaining some certainty of the existence of an infinite number of universes, or whether we shall perforce have to confine our attentions to the one we can observe directly.²⁵⁸

(iii) Complex relationship of the disciplines of natural science

We see from the above one aspect of something that Barth could not fully appreciate in his era. Although we might say that the search for patterns is part of its objective, physics itself does not conform to an orderly pattern. Moreover, he could not now have suggested that each science pursues a definite and self-consistent path of knowledge. In any case the remark hardly squares with the account of scientific activity we have given in Chapter 1. There we saw that the course even of successful natural science has been full of inconsistencies and complex human factors.²⁵⁹ Neither does an orderly pattern characterize contemporary practice. Academia no longer pursues all natural science in isolated compartments. There are multitudes of cross-disciplinary enquiries where supposedly different fields merge at the edges and regroup. Sometimes there is dispute about which discipline has the intellectual (or also by human necessity, financial) priority. Two examples from established but progressing natural science will be enough to make this clear.

The first is that of cognitive science. The acknowledgements in the book by Andy Clark previously referred to cover at least eight different disciplines including the less expected ones of economics and anthropology.²⁶⁰ Each must have its methods and priorities. Another case, among many, is the study of human origins, that is to say history before records began. Even a basic understanding demands not only palaeontology, but evolutionary biology, genetics (not only that of humans, but

²⁵⁵ McCormack, *Orthodox and Modern*, p. 288, with references to Barth there cited.

²⁵⁶ See Chapter 2. See also Scarre, *Human Past*. This comprehensive work of nearly 800 pages contains no attempt to define humanity.

²⁵⁷ See Chapter 4 (2) (e) (i).

²⁵⁸ Greene, *Hidden Reality*.

²⁵⁹ See Chapter 1 (2).

²⁶⁰ Clark, *Mindware*, page x.

animals and crops as well), archaeology (thus also soil physics and chemistry), sociology, linguistics, historical geography and many more.²⁶¹

It is therefore not quite true, as McCormack suggests in agreement with Barth, that each science has a methodology proper to its object, and that this cannot be dictated by any of the others: the actual practice of natural science often requires many different methodologies for the study of a single object; the resulting activity can be of great complexity.²⁶² The further conclusion is that the natural sciences cannot be placed in a simplistic hierarchical scheme, their interrelations and overlaps even at the theoretical level are much too complex for that.²⁶³ The interpenetrating, interdependent and, at their best, cooperative nature of scientific activities suggests that a suitable model of these relationships would be more like a dynamic multidimensional Venn diagram or perhaps a three-dimensional network. This is not the place to attempt such a study.

The nature of the relationships does however have something to say about Barth's notions as applied to the natural sciences, formed at a time when frontiers between the latter were only beginning to be blurred. Attempts to situate theology as one paradigm among the interconnected and ceaselessly mutating programmes of natural science would be problematical. It would find itself within a constellation including the disciplines of anthropology of a non-theological kind, sociology and psychology. Judging by the content of many papers presented at the science--religion conference referred to earlier, many practitioners already work in just such a situation.²⁶⁴ But the naturalistic presuppositions of these and other inquiries, even when only methodological, mean that, although they might validly function as dialogue partners, they can make no direct contribution to the substance of a theology intending to ground itself in revelation. We might think that in distancing himself from natural science, Barth would have today even more justification. That will not be my conclusion. The situation should encourage us to listen more carefully to what empirical science is saying. I shall develop that proposition in Chapter 5.

On its relationship to other disciplines, McCormack suggests that we should understand Barth's intention as a reminder. Theology is not a metaphysic pretending to be the ground of other sciences. Nor, given the particularity of its subject matter, is it one of them. Rather it stands as a "disruptive influence" reminding them of their fallibility and their limitations.²⁶⁵ None of them is in a

²⁶¹ For a comprehensive overview see Scarre, *Human Past*. For vivid portraits and intellectual biographies of a diverse team from different disciplines working on a common project see Chris Stringer, *Homo Britannicus* (London: Penguin, 2006).

²⁶² McCormack acknowledges a debt to the philosopher Hilary Putman in his own understanding of science, which again refers to the generality of human attempts to gain knowledge and understanding of the worlds of nature and human affairs.

²⁶³ Making schemes such as that of Peacocke harder to justify. See Chapter 1 (4) (d).

²⁶⁴ See Introduction (1) "What and how".

²⁶⁵ McCormack, *Orthodox and Modern*, p. 289.

position to justify an epistemological foundation. McCormack thinks that Barth encourages theology to regain its place in the academy by reminding it that each discipline shares in the fallibility and fragility of all human schemes. This implies that the natural scientists are ready to listen. That is an optimistic hope. What the quoted citation from Barth does underline is that, in spite of its subject matter, theology can only speak from human finitude.

(c) Miracles and Barth

For Enlightenment and modern thought, including empirical science, miracles are impossibilities. The argument against them which suggests that such events are not in accordance with the regularities observed in the natural world, and so are contrary to something called reason, was put forward by Matthew Tindal in the sixteenth century. Like arguments have often been repeated since, and with particular force by Hume.²⁶⁶ We have seen that “reason” is an ambiguous concept. However, we can make it more precise in this case. Natural science assumes that there must be an explanation for every physical event, agreeing with known or knowable empirical working hypotheses. The probability of such and such a proposed natural explanation of a given event being correct may be thought very high although it is logically impossible to put a number to it.²⁶⁷ Even Darwinian natural selection, one of the most solidly supported of all scientific theories, is a working hypothesis. It is certainly not the only possible explanation for every aspect of the living world.²⁶⁸ Science has theoretical gaps well as empirical uncertainties. However, because any of these might be eliminated at the next scientific advance, theology cannot take advantage of them to provide support for belief in miracles or anything else. Barth certainly does not acknowledge a need to do that.

He provides two grounds for countering disbelief in miracles. Firstly, empirical methods cannot tell us the nature and properties of things in themselves. Secondly, God is sovereign in the creation. God is free to act as God wills. God is omnipotent, that is to say he has the power to act according to his nature as the one who “loves in freedom” and in no other way.²⁶⁹ Concerning biblical accounts of miracles, Barth’s interest is not in their accuracy according to modern historical canons. He usually seems to assume that, but he is not committed to asserting the empirical truth of every miraculous account in Scripture. Yet there is a central irreducible miracle, the event of Jesus Christ himself, his life, death and resurrection.²⁷⁰ The point of miracles for Barth is the character they bear as they witness to God’s kingdom breaking into human history.

²⁶⁶ David Hume, *An Enquiry Concerning Human Understanding* (New York: Prometheus Books, 1988), pp. 100-119.

²⁶⁷ Chapter 1 (2) (g).

²⁶⁸ Ruse, *Discontents*, p. 133.

²⁶⁹ Hunsinger, *How to Read Karl Barth*, p. 30, referring to CD II(1), pp. 257-321.

²⁷⁰ Hunsinger, *How to Read Karl Barth*, notes on his Chapter 7, at p. 289.

A first thing, which they [miracles] obviously have in common, is that they are all acts of power (δυνάμεις), and are often described as such. They are done, in fact, with a divine and unconditional freedom, and in this respect, they are absolutely sovereign, alien, incomprehensible, and transcendent in relation to all the orders, forms and developments known to men. For this reason, if we may again refer to this in passing, they cannot be measured by the old idea of fate which controls the affairs of men or by the modern notion of a mechanism which operates according to the norm of remorseless physical, chemical, biological or other natural laws.²⁷¹ The dimension in which God is powerful has no place in these conceptions. But it is the power of God alone which is the power operative and revealed in the miracles of Jesus.²⁷²

In the occurrence of a miracle, “God is not different from what he is otherwise”.²⁷³ For God is God. Nothing that can be said, no matter how well justified according to human canons, will encompass what God is and does. Human language or even human mathematics, unless enabled by divine grace, cannot enlighten us. The current state of human science and its problems with logic and methodology referred to above are not Barth’s topic here. He declares the capacity of God to do whatever God determines to do. That determination is neither arbitrary nor capricious. It follows from what and who God is in God’s own self. The attempt to explicate from the strictly human canon of the supposed laws of nature, the manner in which God reveals God’s self, might or might not make use of good science. It would be impossible theology.

It is Jesus, the Royal Man, who performs the gospel miracles. According to Barth, that is their significance. He does them in response to some human need other than his own. He does not through them intend to better the general human lot. The proclamation of the gospel is not simply in word but in the deeds of Jesus: “They are cosmic actualizations of his *kerugma*”, that is to say the acting out of his preaching in the created and empirical world “in order to summon men to faith”.²⁷⁴ We may therefore see them as elements in that history of salvation that both stands at a distance from but also intertwines with and inter-penetrates history as we normally tell it.²⁷⁵ Science has indeed no possibility of investigating such events. From Barth’s point of view, unless an ethical dimension requires consideration, theology has no purpose that requires it to comment on empirical scientific investigations or conclusions as such, whether or not supposed miracles are concerned. Beyond ethics, the further dispute arises when science claims to solve problems of ontology: the knowledge of how things are in themselves is uniquely the province of revelation. Barth’s view of miracles does not satisfy any demand to fit them into a naturalistic explanation of how the universe must function. He does not

²⁷¹ For mechanism as explanatory in science see Chapter 1 (4) (c) (iv).

²⁷² CD IV(2), p. 219.

²⁷³ CD II(1), p. 539

²⁷⁴ CD IV(2), p. 217.

²⁷⁵ See Chapter 3 (5) (d).

intend it. Their significance is within a threefold context of faith: the faith of those present at the events in question (whatever their empirical nature), the faith of those who set down the record as witness to what God was doing in Jesus Christ, and the faith of those who encounter the Scripture as later read. It is true that the recounting of the gospel miracles, even accompanied by agnosticism about “what actually happened” might witness to what God is and does. In no case however do they function happily in any debate in the terms of the empiricist thinking of natural science. In that, revelation is an unacceptable category. Consequently, miracles cannot have any apologetic function. However, beyond the gospels, the thoroughgoing empiricist still must answer or find a rational way of dismissing the question of why anything exists. We can sum up the matter theologically by saying that the miracle stories of the gospels are part of that sacred history which joins creation to the end of time and which Barth calls *saga*. They are about happenings that dislocate human time so that the last things are present in the day-to-day history of the world.²⁷⁶

(d) Creation and calling

We have earlier considered some aspects of Barth’s doctrine of creation especially that of humanity.²⁷⁷ It is independent of scientific theories and not intended to contradict or comment on them. His concerns are theological. What is made is the good creation of God, and in this respect, humanity is as other creatures. The difference, the ontological particularity of the human person is in the vocation, the divine call. It is by faith through the revelation witnessed to in Scripture that we know this. That faith is in God the creator who, in a non-temporal way, is antecedent to the world. There is no analogy between God’s perfect, yet still occurring, act of creation and any action or process carried out by human beings. The only comparison is with the eternal begetting of the Son by the Father in the free generosity of omnipotent love.²⁷⁸ Revelation is thus determinative for the doctrine of creation, but it by no means satisfies human thirst for complete and coherent knowledge. We think, for instance, of the speculations of physical cosmologists and molecular biologists (as well as historians) about the beginnings of things they study. This goes too far if the researcher’s desire for finality overtakes the humility dictated by empirical findings.

(e) Incompleteness and inconsistency

Barth suggests that the particular (i.e. non-systematic) character of theological data also applies to the empirically given. There is a distinction between systematic thinking, namely the attempt to cover comprehensively every side of a given question, with system building. System building is the aspiration to erect a system as a complete and fully articulated body of connected, mutually consistent

²⁷⁶ For *saga* see Chapter 3 (5) (d).

²⁷⁷ See humanity elect in Christ see Chapter 3 (4) (a).

²⁷⁸ *CD III(1)*, p. 15-16.

concepts beginning from a set of axioms and applicable to a given sphere of knowledge. Pushed to the limit, given the axioms and the rules of inference it would be possible to deduce all statements in the system in the way intended in, for example, Euclidean geometry. Barth himself is thus a systematic thinker in the first sense but emphatically not, as Hunsinger points out, a system builder.²⁷⁹ He does not even aspire to closure: he knows that the angels laugh uproariously as he trundles his barrow-load of books along the road.²⁸⁰ Some passionate remarks by McCormack about the significance of inconsistencies in the *Church Dogmatics* further reinforce this.²⁸¹ Natural science aspires to be systematic in the first sense: completeness and consistency are its goals. Is Barth right to suggest that they are unattainable?

(f) Is Barth right about science?

Natural science, according to Barth, possesses only a measure of objectivity: its findings are “relative”. A scientific theory is a human ordering of the phenomena. McCormack and others think it is the making of models, rather than an account of reality.²⁸² A new theory, able to account for existing findings and suggest new ones, could be recognized as having a measure of objectivity since this would count as evidence for its correspondence with a genuine state of affairs in nature. However, as I have argued there can be no movement beyond this to certainty about reality itself.²⁸³ Conversely, scientists would consider the integration of their empirical or theoretical findings into an already established theory as evidence counting towards both their correctness and that of the theory. (What William Whewell and, more ambitiously, Edward O. Wilson, call consilience.²⁸⁴)

Nonetheless natural science cannot be, in any fundamental sense, “objective”. Just as the world as seen through human eyes is one constructed by the eye and the brain from data selected by them;²⁸⁵ so human scientific understanding of the empirical world can only be little more than an elaborately agreed provisional perspective. From the logical and mathematical points of view, we cannot know even that systems restricted to a given area are complete.²⁸⁶ From the practical, scientific point of view, as our earlier arguments suggest, none have even approached the state of completeness. Even if humans thought we were getting there, we cannot know how much there is that we do not

²⁷⁹ Hunsinger, *Barth*, pp. 29, 53.

²⁸⁰ Quoted from Georges Casalis in Mangina, *Karl Barth*, pp. 25-26.

²⁸¹ McCormack, *Orthodox and Modern*, p. 276.

²⁸² McCormack, ‘Theology and Science’, *Orthodox and Modern*, p. 287. For a philosopher’s criticism of the understanding of scientific theories as models see John Dupré, *Human Nature and the Limits of Science* (Oxford: Oxford University Press, 2001), pp. 12-15.

²⁸³ Chapter 1 (2) (g).

²⁸⁴ Chapter 2 (5) (c).

²⁸⁵ See for instance Frith, *Making up the Mind*, for experimental demonstration of this.

²⁸⁶ Or rather, they cannot, in any system rich enough to contain arithmetic, be shown to be both complete and consistent as Gödel demonstrated: Stephan Körner, *The Philosophy of Mathematics* (London: Hutchinson, 1968), pp. 72-97.

know. The twenty first-century physicist, several revolutions later, is astonished that his late nineteenth-century counterpart might have thought the science nearly complete: and that in the paradigm of the so-called exact sciences!²⁸⁷ As we have suggested there is no finality in empirical science, any more than in theology where it is forbidden by the nature of its subject matter.²⁸⁸

It cannot however be totally false since this provisional understanding produces many powerful results, which have been transformative for human life. However, the inhabitants, if there are any, of a planet circulating around a star in Alpha Centauri, would see things very differently. This is not scepticism about the existence of the real world, but doubt about human ability to know it. Thus the sovereignty of natural science is not as clear as an apologist for it might hope, and Barth is right, pragmatically and strategically, as well as theologically, not to base any conclusions on scientific findings.

(g) Is theology a science?

A minor, though important, conclusion of the arguments in the preceding paragraphs is that theology gains no advantage by insisting that it is a science. Whatever may have been the case in mid-twentieth-century German-speaking academia, in the present English language context *scientia* is largely seen as pre-modern and “science” almost invariably refers to empirical natural science.²⁸⁹ In spite of all the problems and confusions, the material success of this complex of disciplines has changed the world. Insistence on including theology within it can only lead to an unnecessary and unproductive misunderstanding of the kind of truth to which theology claims to witness.²⁹⁰ Neither theology nor, at the limit, natural science, can unambiguously say what they are about.²⁹¹ However, the reasons are quite different: the object of the one turns out to be an ineluctable “subject” while the empirical objects, which the other attempts to understand, become more complex and even (in a non-metaphysical way) more mysterious and puzzling, the more intensively they are studied. This alone demands a conceptual barrier between these disciplines, though it will not preclude the kind of dialogue I shall attempt in Chapter 5.

²⁸⁷ “There is nothing new to be discovered in physics now. All that remains is more and more precise measurement.” William Thomson, Lord Kelvin (1824-1907). Address to a meeting of physicists of the British Association for the Advancement of Science, 1900. Cited in Randall, *Warped Passages*, p. 85.

²⁸⁸ See Chapter 1 (2) (g).

²⁸⁹ See footnote on *OED* definition of science at Chapter 1 (4) (c) (ii).

²⁹⁰ As we argued earlier, the efforts of Torrance and Pannenberg to associate physics and theology using the concept of “field” were unproductive. See Chapter 1 (4) (c) (iii).

²⁹¹ For some modern attempts at a *scientia* see in Chapter 1, under “Aquinas and the clarifying function of natural theology”, Chapter 1 (4) (c) (iv).

(4) Consequences of Barth's view of science

(a) Scientific findings to be accepted -- up to a point

A theology asserting the primacy of revelation in the account of human knowledge of how things are in themselves can accept any empirically well-based claim in natural science at its face value without objecting to a naturalistic explanation. Indeed, empirical science might offer a comprehensive explanation of the natural features of human existence that would take all the observed phenomena, physical and mental, into consideration. Granted this possibility, even though it is a theoretical one, it would be both unnecessary and unwise for theological anthropology to predict the insolubility of any given problem or puzzle relating to somatic or mental existence. However, it might be perfectly reasonable to be humanly or even scientifically sceptical about more extreme claims.

In my preface I mentioned assertions, now going back many years, like those that religious experience can be explained by (say) an excess of carbon dioxide in the blood stream, by psychotropic drugs or by some kind of cerebral trauma. These, for me, already ruled out such phenomena as evidence for religious claims from experience.²⁹² Much more recently, as we have seen, there have been attempts by such as Dennett and Pinker to provide adaptive explanations of the phenomena of religion.²⁹³ Since then the disciplines of cognitive science of religion and the connected neuroscience have become prominent. All these understand religion as a natural phenomenon. Though widely differing in their methods and, often their conclusions, they commonly see religion as a whole as an outcome of the complex interaction between genes, culture and the personal circumstances of the believer. Such claims, when presented as empirical working hypotheses, give weight to the secondary status that a theology in the stream of Barth in any case attaches to religious experience and to religion in general as human phenomena.²⁹⁴ Moreover, on the premises of theology in the stream of Barth the existence of plausible natural explanations has no bearing on the veracity of a claim of divine communication. What would be relevant is how the content of such a supposed communication might cohere with revelation witnessed to by Scripture.

(b) Barth, Portmann and evolution

What did Barth himself understand of the natural science of his time? In particular, what did he know of evolutionary biology? Did he attempt to situate it within a doctrine of creation? Barth may have gained his understanding of evolutionary biology from his fellow academic, then Professor of Zoology at Basel, Adolph Portmann (1897-1982). Portmann was a Darwinian in the sense of accepting

²⁹² As suggested in, for example, William Sargent, *Battle for the Mind* (Westport, CT: Greenwood Press, 1975). Frith, *Making up the Mind*, gives details of the location within the brain of various mental functions.

²⁹³ Pinker, *How the Mind Works*, pp. 554-558. Dennett, *Dangerous Idea*, pp. 511-520.

²⁹⁴ Barth did not change his mind about this, see his 1963 essay 'Christianity or Religion', Barth, *Fragments Grave and Gay*, pp. 27-31.

the physical descent of living things from a common ancestor but did not think that natural selection fully explained the origin of species.²⁹⁵ Neither did he accept a thoroughgoing reductionism. Barth says that he was not a conventionally religious man. He emphasized the uniqueness of the human developmental process, much of which, he thought, takes place slowly and outside the womb. Barth says that, unlike others, Portmann does not speak as a theological apologist or intending to demonstrate the uniqueness of man; yet for him body, soul and social relationships are an integral whole and he warns of the danger of basing a view of humanity on its biological inheritance alone.²⁹⁶ He thought that parallel features in very different species could not be explained in that way. He was sure that a dogmatic insistence on chance mutations as the only process by which species can change places the experimental biologist in the role of a prophet without the necessary qualifications.²⁹⁷ Barth's own general scepticism about all-embracing systems may have made him sympathetic to Portmann in this. However, Portmann's views could be interpreted as suggesting a kind of principle, an "inwardness", so that an organism can be a "centre of experiences", expressing itself in an outward form.²⁹⁸ He thought that there might be an additional set of teleological factors explaining the origin of secondary sexual characteristics and external features of the organism. His biological theories appear to have a metaphysical, possibly a mystical, component, each organism, plant or animal is a "subject" whether or not it is conscious, though in the later work cited (some time after Barth's death), he shows himself well aware of and accepting of the, then recent, developments in molecular biology. However, he died in 1982 and the more recent work in the evolution of development, which promises coherent adaptive explanations of some of the phenomena he wished to account for, would have been unknown to him.²⁹⁹ Portmann is within the Germanic tradition of romantic biology exemplified by J. W. Goethe (1749-1832) whom he cites extensively. Barth does embrace an ethic that implies respect for life, but his possible sympathies with Portmann are unlikely to have extended as far as the latter's metaphysical or mystical beliefs.

(c) Barth and "Darwinianism"

Barth may well have derived from Portmann a mild scepticism about the mechanism of evolution. However, according to McCormack, as a "modern" theologian Barth "saw no merit in seeking to oppose evolution but contented himself with the understanding that this theory belongs to natural

²⁹⁵ Adolf Portmann, *Essays in Philosophical Zoology: The Living Form and the Seeing Eye*, trans. by Richard B. Carter (Lampeter: Edwin Mellen Press, 1990). See also Adolf Portmann, *Animals as Social Beings*, trans. by Oliver Coburn (New York: Viking Press, 1961). For the contribution of Germanic romanticism to Darwin's own intellectual background see R. J. Richards, 'Darwin on Mind, Morals and Emotions' in Hodge and Radick, *Darwin*, p. 115.

²⁹⁶ *CD III(2)*, p. 87.

²⁹⁷ Portmann, *Animals as Social Beings*, pp. 63-64.

²⁹⁸ Portmann, *Essays*, p. 90.

²⁹⁹ See Chapter 2 (2) (b).

science. It is therefore not something that a Christian understanding of creation ought either to support or to contend against”.³⁰⁰ Gorringer points out that Barth attacks “Darwinianism” as an all-embracing metaphysic, as a world view and as a claim to give a total characterization of humanity.³⁰¹ However, he is not even singling out a scientific world view for sceptical attack; as we have seen, he has no brief for any world view or, as he calls it, “a cosmology”.³⁰² Even truths derived from revelation cannot, for him, justify such a scheme. Further, he emphasizes the close kinship of humanity with other animals and for that reason it is unlikely that he had any quarrel to pick with the general notion of evolution as envisaged by Darwin. It would be as near to factual status as any other item of human knowledge. Whether or not he precisely understood or agreed with the concept of natural selection is not crucial for his theological anthropology.

What Barth objected to and would object to still is scientism, the overweening ambition to encompass the whole of existence, including human existence, within its sphere.³⁰³ A world view that aspires to a scientific rationalism (as opposed to a purely methodological empirical strategy) falls under this stricture. In sum: Darwinianism can only be incompatible with Barth if the particular metaphysical (protagonists might say “anti-metaphysical”) world view grafted on by Dawkins, Dennett and their allies is accepted. Barth then is indeed justified in saying that theological opposition to scientific activity “is required only if it becomes axiomatic, dogmatic and speculative”.³⁰⁴ Thus he would deny the all-embracing quality, the “universal acid” as Dennett puts it, proposed by physicalist apologists for the Darwinian paradigm.³⁰⁵ He emphasizes the human and, what he calls the relative character, of all scientific findings. Nowhere does he deny their applicability to the natural world as presented to human senses. In some ways, like Peacocke and a number of other more recent writers, Barth has sympathy for a scientifically based holistic account of the human person such as Portmann’s.³⁰⁶ Barth has supplied reasons why science, for all its fascination and achievement, cannot answer the question of what a human being, or indeed anything at all, is. His intention is to read obediently the Word of God and this must have priority over the claims of natural science.

(d) Barth’s stance compatible with natural science

Theology in the same stream as Barth can work alongside natural science, without sharing its methodology because in its self-understanding, it deals with a God who is the creator and source of everything. God’s self-existence is the prior condition of the existence of the empirical and so not

³⁰⁰ McCormack, *Orthodox and Modern*, p. 13.

³⁰¹ Gorringer, *Against Hegemony*, pp. 197-198.

³⁰² See Chapter 4 (3) (b).

³⁰³ For an extended definition of scientism see Brooke and Cantor, *Reconstructing Nature*, pp. 45-46.

³⁰⁴ *CD III(2)*, p. 25.

³⁰⁵ Dennett, *Dangerous Idea*, p. 61 and *passim*.

³⁰⁶ See Chapter 4 (4) (b).

contained within its categories. Further, God's self is the presupposition of the possibility of thinking about anything at all.

Such theology is aware that from the point of view of biological science all living things, including humans, are evolved and purely physical mechanisms. A theology that holds that the reality of the human person is the consequence of an act of God has no reason to dispute it. The doctrine of election makes no assumption about the physical nature and origin of the human creature. As we have seen, the soul is an activity of the Creator within the human body. It is not dependent on a particular level of physical complexity. A theology in the stream of Karl Barth is thus available irrespective of the working hypotheses of natural science. He says in the preface to the four volumes in which he deals with the doctrine of creation: "There is free scope for natural science beyond what theology describes as the work of the Creator".³⁰⁷

(e) Barth should not have avoided natural science

A consequence of Barth's theology from revelation and his understanding of the deliverances of natural science might be simply to ignore the latter. Such a neglect of natural science might have seemed reasonable to Barth. He was well aware of his human limitations. He could focus on the familiar field of theology, whose source, quite other than the empirical, is the witness embedded in Scripture.

In any case, for him theology is prior to other academic disciplines and is entitled to operate independently of them. That is because of its claim to recount the self-revelation, understood from Scripture, of the one who grounds all existence. However, it cannot pretend to provide epistemological or empirical norms for the sciences: they have their proper language, as it does itself. Indeed the technicalities of the two human enterprises are very different and not necessarily transparent to the other. It is perfectly reasonable that it should be like this. For itself theology, as we have said, can point out that rational discourse, even when referring to the empirical matters, which are the concern of natural science, is not limited to the simplicities of sequential time or Aristotelian logic. Any theology including Barth's has at least as good a claim to its own semantic universe as does physics, or indeed any natural science. Scripture, and the theology articulated from it, provide a norm for the Church's preaching. They are human witness to the Word and work of the God who "loves in freedom".³⁰⁸ None of this depends on the deliverances of natural science.

Nevertheless, the enfleshed Word embraced the finite space-time of physical human life. Scientists investigate that physical world and, optimistically, seek truth in it. Barth did not pay enough attention to that search. His own doctrine of the physical humanity of God already should have required

³⁰⁷ CD III(1), page x (preface).

³⁰⁸ CD II(1), pp. 257-321.

it. Further, in the fifty years since he was at work natural science and the technology based on it have immeasurably widened the horizons of human life. A great deal has been already written about the possible theological concomitants of that expansion. Both natural science and theology hope they are journeying towards reality. However, their diverging trajectories seem unlikely to meet. Barth's theology takes revelation as a given and the consequences of the incarnation as determinative for a genuine understanding of human life. Theology in the same stream must be able to connect credal faith with the empirical, without surrendering its proper territory to natural science. In the following chapter, we shall consider it in more detail. However, there cannot be a statement of perennial validity. We can only say what can be said here and now. That is what I shall attempt in the following chapter as I justify and exemplify the outline of a constructive dialogue between my theology in the stream of Barth and the Darwinian understanding of the human person.

(5) The argument of this chapter

According to Barth, the Enlightenment saw the displacement of humanity from its position at the geometrical centre of the universe, understood in fact as its lowest and most humble point, to a position of command. Now the one who was "the measure of all things" might apprehend everything that existed with more and more certainty. The old cosmology at least had a better understanding of humanity's true place than that, but, in fact, for Barth there can be no cosmology, no universal meta-narrative: even revelation only tells us what we need to know. When aspiring to provide meta-narratives, science often presumes too much and should, like any cobbler, stick to its empirical last. In fact, in spite of commanding success, it comes up against very difficult conceptual barriers, and there is no advance guarantee that it will succeed in removing them. Natural science is a very complex enterprise, and perhaps Barth has not understood it very well, however his theology from revelation is perfectly compatible with a natural science which does not speculate beyond the limits of empirical reference. Indeed, science cannot penetrate into the inner nature of created entities; those are the province of revelation, which tells us very little about any created reality except that of the human person. Theology from revelation does however have a duty to engage with natural science because of its increasing centrality in human life and its potential both for good and evil in the sphere of the natural, but primarily because of God's engagement with physicality in the incarnation. In the stream of Karl Barth there are possibilities for doing so which allow each partner in the dialogue proper scope but which do not oblige either to cede territory. But can there be a proper conversation?

CHAPTER 5

SCIENCE AND THEOLOGY : INTERACTION

(1) Context

(a) The discussion so far

In chapter one we established that scientific theories should be understood as fallible working hypotheses. Using a typology suggested by David Fergusson we examined a number of examples of the modes in which science and religion had related through natural theology from the seventeenth century until the present day. Those contribute largely to the context of our discussion in the present chapter. In chapter two we summarized the progress of Darwinian biology concentrating on its understanding of the human person. We saw how biology located humanity as an entirely physical creature, and as one species among several million inhabiting the planet. In chapter three we gave an account of Karl Barth's theological anthropology. Effectively his claim is that revelation distinguishes humanity ontologically, rather than phenomenologically from other species. That arises from the particular setting apart of the human race in Jesus Christ, the pioneer. We discussed David Clough's challenge to that position but were not convinced by it. We noticed that Barth's statement, "Man is the soul of his body." established God's action as constituting the human person. Chapter four examined Barth's understanding of natural science and found that his view of scientific theories as being concerned with phenomena rather than things in themselves was consistent with our view of them as working hypotheses. We noted that in general terms Barth accepted Darwinian biology. We found that his theology from revelation was compatible with a natural science which did not over reach itself by claiming knowledge of ontological matters or a universal theory of everything. So far then we are left with the problem of discovering how two such different enterprises as Darwinian biology and Barth's theological anthropology might be brought into relation with each other. However, given the variety of projects in natural theology considered in chapter one Barth's theological anthropology would be only one of the ways through in which a Christian doctrine of the human person might interact with Darwinian science.

(b) Confusion about truth claims

The science-religion interaction, takes place in the context of two kinds of truth that we considered in chapter one, the empirical and the ontological. Confusion and mistake result from their conflation. Hence the peculiar difficulty of joining the two disciplines. The interaction is often done under the banner of natural theology. It is frequently understood as permitting ontological deductions

to be made from empirical data. That poses risks. The data may be wrong or wrongly interpreted. Paley's argument that ingenious contrivances of nature demanded a corresponding divine designer failed when Darwin showed that nature itself could design. Sarah Coakley's argument concerning sacrifice seems to have a similar structure. It might have the same vulnerability as Paley's to advancing science.

Natural theology in the wake of Paley, as practised in Britain in the eighteenth and nineteenth centuries, frequently assumed that the creation narratives in Genesis reflected with some accuracy how God had gone about making the world. Scripture and other ancient writings were wrongly used as sources for empirical information. In the earlier part of the nineteenth century such confusions enabled what was in effect a strategy of coalition of science and religion. Charles Lyell's rejection of the catastrophic biblical deluge as a causative agent provoked such a response described by Brooke and Cantor.¹ It is a case study of the "Scriptural Geology" of George Fairholme. In 1833 his work offered "a complex mixture of history, biblical exegesis empirical observation and appeals to the laws of nature". Although informed by theology such an author would have strongly rejected any suggestion that his work was not empirically anchored. For him written records, of which scripture was one, took their place alongside empirical investigations as source material. It took several decades before theology in Britain was excluded from geology. But that is one example of a an interrelation between science and religion which was ultimately dysfunctional. An assumption that the truth about things in themselves can be known from fallible accounts of perceived phenomena leads to mistake and confusion. Darwin's powerful working hypotheses were backed up by geological as well as biological information. Assumptions that biblical sources had some kind of equivalence, or even priority in empirical matters lost all intellectual credibility. The ontological truth claims which lie behind the biblical narratives are not in the same realm as the empirical truth claims made by natural science. We shall take up that question again later.²

Another error lies in arguing by analogy from inadequate or misunderstood theory or empirical data. We saw an example of such failed natural theology where Torrance and later Pannenberg argued from the physics of fields to the nature of the action of the Holy Spirit. Misunderstanding of the science, nullified their efforts. In any case as we have repeatedly pointed out even powerful and successful theories, however well understood, are no more than working hypotheses. They cannot claim more than a provisional expression even of the empirical truth we mentioned above. Still less can they be taken as ontological statements.

¹ Brooke, John Hedley and Geoffrey W. Cantor, *Reconstructing Nature: the Engagement of Science and Religion* (Edinburgh: T&T Clark, 1998). pp.57-62

² See chapter 5 (4) (a).

In chapter one we considered non reductive physicalism. Like the authors of *'Whatever Happened to the Soul'* I accept the arguments that point to a complete physical explanation of human functioning as possible in principle. There is no Cartesian "Ghost in the machine". There is then a genuine controversy which will be differently argued according to prior assumptions. The suggestion of these authors is that a sufficient level of physical complexity in an organism governed by physical laws causes or enables an ontological change. That is to say it adds "a capacity for relationship with God". I state in my chapter one some serious difficulties about that notion including the existence of persons who are certainly human but with very impaired mental capacities of or none at all, or who have not yet developed them. But the proposition that a physical change can bring about a "spiritual" capacity is a confusion of the two kinds of truth. What is at issue here is not a particular arrangement of the physical components of the brain but the action of the Spirit on whatever kind of physicality. To be properly employed natural theology must take all the above into consideration. I intend to do that later in the present chapter.

(c) Barth at the centre?

By widespread consent Barth was a giant of twentieth century theology. He was compared to Thomas Aquinas. Yet for the majority of the authors considered in chapter one, Torrance apart, he has little or nothing to say. Why is this? He stopped writing fifty years ago. Since then the whole world has been transformed and not just by science. The science-religion debate has a burgeoning literature. The thousand page *"Oxford Handbook of Religion and Science"* (2006) offers summary views and case studies of some main trends. In the whole Barth takes up scarcely a couple of dozen scattered sentences. One author, while discussing other matters, does present a possible explanation for Barth's near invisibility in the field. He "developed a complex theological hermeneutic of the cognitive priority of revelation..."³. That is another way of expressing Barth's distaste for natural theology. According to him the working hypotheses of natural science cannot determine theology. But neither can theology affect them. If accepted, Barth's stance does have one important consequence. According to his premises, we cannot reason from our understanding of the empirical world around us or from our own interior states to knowledge of God or to any kind of ontological truth.⁴ Knowledge of God arises primarily from scripture's witness to the revelation of God in Jesus Christ. However as we shall later see, Barth's prohibition of natural theology does have an important exception although he does not recognize it as such. It is just that exception which might permit the conversation to take place.

Matters that were marginal to Barth's theological project, in particular the theological status of animals, have now become central. David Clough does lead Barth into the twenty first century.

³ Wesley J. Wildman. "Ground of Being Theologies" *Oxford Handbook*. FN p.620.

⁴ For some discussion of "truth" see chapter 1 (1) (b).

But Clough's reconstructive surgery is drastic. There will be debate about the results. Meanwhile, can anything other be done with Barth's anthropology, reformed perhaps but not reconstructed, that will be helpful in the present? Can a theology not based on the world we perceive, let alone the world understood by science, have any relevance for humanity given that science now bids to provide the master narrative for life? Those are the questions we shall now examine.

(2) Can there even be a conversation?

(a) Dialogue is possible and necessary

As we have seen, the science religion relationship can take many forms. Time and space have limited us to some important examples within the Western theological tradition. In chapter one, within the analysis of natural theology, we considered examples of deist, Unitarian and panentheist engagements and found them unsatisfactory. For the first two the radical separation between humanity and deity leaves the human person isolated and at the mercy of unbridled power, one cog in the machine of nature. Panentheism risks a fatal confusion between creator and created which again crushes human autonomy. None of those three can lead to a productive dialogue. There is a fundamental theological reason why such dialogue is possible between Trinitarian theology and the Darwinian understanding of the human person. It is that the transcendent truth about God and humanity makes itself known in the empirical realm in the life, death and resurrection of the God-man Jesus Christ. The human nature the incarnate God in all its physicality is thus necessarily included in the subject matter of the dialogue. In the case of Barth

It is in view of the only possible explanation of Holy Scripture that we have laid the principles of exposition indicated - not of course believing that they apply only to biblical exposition, but believing always that because they are valid for biblical exposition they are valid for the exposition of every human word, and can therefore lay claim to universal recognition. It is not at all that the word of man in the Bible has an abnormal significance and function. We see from the Bible what its normal significance and function is. It is from the word of man in the Bible that we learn what has to be learned concerning the word of man in general.⁵

Thus, theology must take human words, including scientific words, with utter seriousness because, beyond their empirical reference, they can also be vehicles of revelation. Such truth will never be in propositional form. We may express our understanding of it in the form of words. We do the best we can. Yet, there is always a surplus of meaning. We cannot capture the whole.⁶ But theology must

⁵ *CD* I(2), p. 466.

⁶ We refer again to the previous discussion of truth at chapter 1 (1) (b).

not retreat into mysticism. Theological anthropology must not turn inward on itself. Even if its own understanding of what humanity is were not in question, theology would still have a duty to listen to the secular witness. At the very least we have to understand theological utterances in that context in the twenty first century. If revelation indeed delivers, the primary truth, the ontological truth, about humanity, the theological role of secular anthropologies will be to enter into a conversation that will help theology to better understand and communicate itself. Where science asserts omniscience founded on naturalistic dogma, theology should have a role in criticizing its pretensions. The theology--science dialogue ought to be a public one.

Such a public theology must note that, even intelligent, human self- understanding is not now governed by any of the philosophical schemes whether they are idealist or existential that Barth discusses so extensively and rejects. They are not now the problem for theology. Questions about how human life is to be lived may appear to come first. However, the vital pragmatic and political questions about how to sustain people and peoples in a dignified and healthy life alongside all the other living creatures on the planet throw us back on theological ones. "How?" sends us back to "Why?" Empiricist human biology, one of the leading narratives of modernity, cannot answer such questions. That is not its purpose. There is thus, as we have said, the task of articulating with integrity a dialogue between it and theological anthropology from revelation. But there are obstacles: including the creation stories in the Bible, understood in Barth's theological stream as "saga". There are also the miraculous elements in the gospels and elsewhere.⁷ On the face of it, they are impossible to reconcile, with what we can suppose about the origins and course of human life. For the well-tested working hypotheses of natural science can (and often do) supply criteria for judging credibility. Theology must pay attention. But we cannot achieve "credibility" by diluting theological content. However, proper dialogue, relating both to what natural science and a theology from revelation have to say, is a step towards credibility. It should at least demonstrate something of how these two perspectives on reality can together illuminate understanding of the human person. Therefore, we will now consider an example of constructive interaction between theological anthropology in the same stream as Barth's and human biology in the succession of Charles Darwin.

(b) Searching for a common language

In a dialogue or conversation there ought to be a common language. In the case of Barth, we might characterize the theological language as a self-contained discourse. That does not in itself make communication impossible. Other disciplines than theology have their own specialized language and problems of translation across boundaries. Yet we can often overcome them. We may find striking examples within natural science. For instance, the terms "nucleus" and "membrane" mean one thing in

⁷ For miracles see Chapters 4 (3) (c) and 5 (4) (g). For saga see Chapter 3 (4) (g).

physics and quite different things in cell biology. The term “resonance” has different significations in physics and chemistry.⁸ There is no danger of confusion in these cases because the context is readily specifiable and there is a common syntax. Because of this clarity about both reference and use, there is scope for communication between physics, chemistry and biology.⁹ These discourses are not in that sense self-contained. There is more difficulty about the discipline, within physics, of quantum mechanics. The terms “wave” and “particle” appear to function in ways directly corresponding to their use in ordinary language. Waves appear unproblematically in hydrodynamics and the theory of sound as well as in consideration of electromagnetic radiation on a large scale. Particles, or large bodies treated as such, are common items in terrestrial and celestial mechanics. In classical mechanics and electrical theory, waves and particles are different kinds of physical thing, inconsistent with each other in their properties. However, in quantum mechanics, there are objects with the properties of both. Nonetheless, it is possible to ignore the discrepancy if we describe their behaviour in a mathematical language. We can set up an axiomatic system and correlate its variables with features of the empirical world.¹⁰ Yet philosophical and logical problems of this discipline have not been resolved.¹¹ The discussion is ongoing. Does this provide an analogy for the structure of a discussion between Barth’s theology and Darwinian biology? Is there a language corresponding to the language of mathematics in which the two disciplines might constructively conduct a dialogue even if no conclusion can be reached?

(c) No common language between science and Barth’s theology

However, the prospect of a dialogue on these terms does not appear promising. Frei argues that for Barth, theology has a distinctive language that cannot be translated without remainder into other ways of speaking.¹² It functions largely as a description of Christian belief, it is not philosophically founded neither does it have to conform to a set of rules which can be stated apart from their context.¹³ That was evident from our earlier remarks about the notion of “truth”.¹⁴ That language does however have its own rules, appropriate to its context. That is what makes it, in Barth’s wide and, as I suggested, not necessarily helpful sense, a science.¹⁵ Such rules might be designated as preliminary theology, prolegomena. But they are in fact not preliminary to theology, they are themselves part of

⁸ For definitions, see the glossary at the end of this dissertation.

⁹ To take one example: biology needs the aspect of physical theory called thermodynamics; for any discussion of the flow of energy within the living cell, see Elliott and Elliott, *Biochemistry and Molecular Biology*, pp. 4-5.

¹⁰ Henry Eyring, John Walter, and George Kimball, G. *Quantum Chemistry* (New York: Wiley, 1944).

¹¹ See Chapter 4 (2) (e) (i). See also later in this chapter, footnote at 5 (2) (d).

¹² Frei, *Types*, p. 39.

¹³ See also Chapter 4 (3) (a).

¹⁴ See also Chapter 1 (1) (b)

¹⁵ See also Chapter 4 (3) (b).

the theological corpus. Unlike a philosophical prolegomena, they provide no way to align theology to other academic disciplines.¹⁶

Theology for Barth is a necessary function of the Church, which is accountable to God for its talk of God. Jesus Christ, who is the being of the Church, is the criterion of this talk for he is God in his turning towards humanity. In that theology, address to God in prayer and talk about God tend to run into each other and the same is true of theology and theological method.¹⁷ This is not, however, a formal rule. For Barth there are no invariable, formal rules. Even the rule that statements are self-involving may be violated in an appropriate context. Granted those points, which Frei expounds, it is certainly not exact to say that the only rule for Barth is that there is no rule. There are motifs and typical procedures which give a sense of order and coherence to Barth's arguments.¹⁸ However, we must still answer the question: "What dialogue is possible between a theology which functions with a vocabulary and grammar internal to itself and a physicalist science like evolutionary biology which seems to deny that such language can have any reference whatever?" The difficulty is increased because, as we have just noticed their understanding of what constitutes truth is quite different. Could there be a metalanguage, a neutral language designed to talk about language itself? It would be somewhat like the case for the mathematics we have mentioned, which allows the bringing together of the apparently incompatible phenomena of waves and particles in quantum mechanics. Clearly, the answer is no. There is no neutral standpoint above or between empirical science and Christian theology as Barth, and theology in the same stream as his, envisages it. Can we do better?

(d) A model for dialogue

However, there may be a more promising illustrative precedent from physics. Physicists have still not been able to demonstrate a formal compatibility between two highly successful theories, Quantum Mechanics and Einstein's General Relativity. The fundamental problem is that, according to quantum theory, physical reality, matter-energy, has a grainy structure, but relativity can only work if it is continuous.¹⁹ They are two axiomatic systems with different assumptions. The hope is that some further theory of greater generality will accommodate the two. That may indeed happen. However, to put it in other terms, a common language, one self-consistent grammar and vocabulary for these two aspects of matter-energy has yet to emerge. Roger Penrose thinks this may be an ontological matter, a question concerning the nature of reality itself. He says, "This problem is not a minor one, but it presents us with a fundamental difficulty, and it leads us to a direct clash between the foundational

¹⁶ Frei, *Types*, p. 47

¹⁷ Well illustrated in, for instance, Karl Barth, *Evangelical Theology*, pp. 159-170, where theological activity is seen to be a form of prayer.

¹⁸ Hunsinger, *How to Read Karl Barth*.

¹⁹ See reference to Einstein at Chapter 1 (2) (f).

principles of quantum mechanics and those of general relativity.”²⁰ So far, none of the many candidate theories, which aspire to uniting the two, has pointed to any empirically testable conclusions. Indeed Penrose suggests that we may never get to such a “Theory of everything”.²¹ So, for the moment, in addition to the logical and epistemological problems internal to quantum mechanics itself, physics has to live with two incompatible working hypotheses, that of quantum mechanics and that of general relativity. Both of them are mathematical. They refer to matter-energy. That by no means prevents a discussion between the two because their topic, however conceived, is the same. In discussing black holes or the beginning of the universe, both need to come into play.²² The intended parallel may not be quite exact. However it has nothing to do with the physical theories in question. It is rather about conversation and rational argument, the necessity to continue talking and the hope and possibility of fruitful dialogue even when there are no grounding assumptions in common. That does provide a helpful way of thinking, about a dialogue between theology and science. Conversation that is in some sense rational is possible even though the participants appear to have no common ground other than that of the existence of the subject matter under discussion. They even have or use different notions of truth. Such conversation or dialogue will not in any way deny the good faith or competence of those engaged. It will not assume that the two can find a common perspective. It will help to clarify the issues at stake. The subject matter will be the human person.

(e) The terms of the dialogue

According to Biggar,²³ Barth’s doctrine of the analogy of faith, which replaces that of the analogy of being in Roman Catholic theology, asserts that we must inevitably reconceive the world we experience in terms of its fundamental relationship with the Word of God. In this way, different elements of our experience can either be verified or falsified. The Word of God transforms the nature of “natural factors” and makes them serve it. Biggar asserts that Barth thus affirms general revelation while rejecting natural theology. This may go too far. The context of these remarks in the *Church Dogmatics* makes clear that Barth is referring to the transforming possibilities inherent in the application of Holy Scripture in its testimony to Jesus Christ. The original character of the alien elements of natural factors “has first to be removed so they have first to receive a new nature, and be awakened and newly created for this service.”²⁴ Those are possibilities transformed by grace, not inevitabilities. Barth returns to the question of revelation in the section “The Glory of the Mediator” within the

²⁰ Penrose, *Road to Reality*, p. 849.

²¹ Penrose, *Road to Reality*, p. 1028.

²² It is possible that one of the plethora of mathematical constructions, known as string theories, impenetrable except to specialists, will provide the necessary connections. For a non-technical discussion see Greene, *Hidden Reality*, pp. 96-101, though Penrose, *The Road to Reality*, is very sceptical.

²³ Biggar, *Hastening*, pp. 146-161.

²⁴ *CD I(2)*, p. 682.

Doctrine of Reconciliation. The various lights of life are such in the context of creation as the external basis of the covenant. They are “provisional, problematic and relative”.²⁵ However, the incarnation enables them to become ministers of the divine Word. But, we have to take this within Barth’s understanding of revelation as an event conditional on grace alone. Humans cannot manoeuvre themselves into a position where revelation becomes a likelihood or even a possibility. The concept of general revelation as it is frequently understood (and as has been applied in some versions of natural theology), implies a universal and continual divine communication, concerning the nature of God’s own self. This would be through features of the world as human beings experience it. Humanity is naturally attuned to this communication. However, as Barth understands it, revelation is, in every case, a particular event, whose only prior condition is the grace of the God who “loves in freedom”.²⁶ According to Barth, the Church has a special task of proclamation. However, God may choose to speak to us through any way he pleases, even those the Church might consider thoroughly unsuitable.²⁷

Nonetheless, Biggar has made a crucial point. Barth wishes to say that the account of the human person as depicted by the Word of God has an absolute priority over that from any other source, whether it be that of a science or of any philosophy. For, “the ontological determination of humanity is grounded in the fact that one man among all others is the man Jesus”.²⁸ From this viewpoint, we may with Biggar,²⁹ in his exposition of Barth’s concept of “annexation”³⁰ in respect of the ethical realm, enter into a more general dialogue. Moreover, wherever we propose to go, the Logos has preceded us. However, we must not take for granted everything that Darwinian science may assert. We must be especially suspicious of the ontological claims made by certain of its proponents. Some seriously dispute them on other grounds than theology. Especially this is so when they involve a thoroughgoing reductionism. However, where this involves an empirical question, theology must be careful not to take sides on the issue. Our procedure will then be very similar to that set out by Messer³¹ (acknowledging a debt to Frei³²) in which he adopts the fourth of five possibilities for the engagement of theology with science. “Both science and Christian doctrine contribute; the shape of the account is determined by Christian doctrine, and the scientific contribution is critically appropriated to that doctrinally shaped account.” George Hunsinger puts forward a similar procedure suggested by Deborah van Heusen Hunsinger. It also originates in the work of Frei. The two disciplines, in their case theology and psychology (used in pastoral counselling), are related to, and operate together in a pattern indicated by

²⁵ CD IV(3.1), p. 163.

²⁶ CD II(1), pp. 257-321.

²⁷ CD I(1), p. 55.

²⁸ CD III(2), p. 132.

²⁹ Biggar, *Hastening*, pp.1 52153.

³⁰ CD II(2), pp. 522-3.

³¹ Messer, *Selfish Genes*, pp. 49-50.

³² Frei, *Types*.

“without confusion or change” in the Nicene Creed. Each discipline retains its autonomy but the framework is one in which theology retains its priority.³³ Empirical science retains its rights, *qua* science, but gains no licence to trespass. This procedure will be operated within the examination of “secular parables of the truth” previously referred to.

The above priority needs justification. It arises from the logic of revelation. It assumes that revelation of the divine does take place and is available to us. If we are right about revelation, no source of supposed knowledge can be more truthful. We are here talking about ontological truth. That is the truth about how things are in themselves. It has no other source but revelation. If that is not the case then our whole project fails. That is not to suggest infallibility. Rather, given our assumptions, that is the way in which we must proceed. Evidently we run risks. It is obvious that we might have mistaken the content of revelation. In any case we must first justify this use of a particular form we intend for the dialogue.

(f) Parables in dialogue

Paul Louis Metzger thinks it might be possible for Barth to put scientific work, as a human activity, in the same category as the music of Mozart, to whom Barth devoted some theological attention.³⁴ According to Barth, Mozart was not a theologian and did not intend any profound message in his music. We cannot draw a moral from it. Nonetheless, it is an aspect of that best culture which is in harmony with creation. It is thoroughly creaturely, keeping, without pretension, to the limits assigned to it by the Word. I describe that musical stance as one of integrity. There is scope, according to Metzger, for natural science to be seen in the same light, and so as parabolic in effect though not in intention. In part, I agree with him. However, I think that, in spite of similarities, he may have drawn the parallel between scientific and musical activity too closely. Whatever the case for the music of Mozart, I do not see scientific work as necessarily leading to harmony with nature or displaying a harmony within it.³⁵ What it can and often does supply is the kind of experimental and pragmatic truth we have earlier characterized.³⁶ I am saying that, when applied to the empirical world, a search for resonance under the guise of a human aesthetic of harmony may in fact lead it in an opposite direction to reality. We have earlier seen that “beautiful” theories are not always correct ones.³⁷ I further suggest that it often happens that beautiful ideas have to compete with each other. This may be the case with different

³³ George W. Hunsinger in the chapter ‘Post Liberal Theology’ in *Cambridge Companion to Post Modern Theology*, ed. by Kevin J. Vanhoozer (Cambridge: Cambridge University Press, 2003), p. 52.

³⁴ Paul Louis Metzger, *The Word of Christ and the World of Culture: Sacred and Secular through the Theology of Karl Barth* (Grand Rapids: Eerdmans, 2002), pp. 204-216.

³⁵ Like most human activities science can of course be misapplied to exploit and manipulate the given of the world, but that is not the point I am making here.

³⁶ Chapter 1 (1) (b).

³⁷ See Chapter 1 (4) (d) (ii) for extended discussion on this point.

string theories in physics. The concept of the selfish gene has, on the face of it, a beautiful simplicity, but the jury is still out when it comes to defining what a gene is, or deciding at what level of biological organization natural selection takes place.³⁸ It may remain out. The empirical world resists attempts to apply such human canons.³⁹ For all we know, the real world as created and known by God does so as well. Perhaps God is less tidy than we would like. We might cite Haldane's comment concerning the proliferation of beetle species.⁴⁰ In spite of all the above, Metzger has pointed to an important use of scientific theories as parables. It is one that reinforces my own understanding of their possibilities. We shall now see that their potential use in that way depends much more on their integrity rather than on their being in some way a true description of or correspondence with the reality of things.

Integrity in the formulation of a scientific theory is a vital quality. We cannot take it for granted. It is hard won. A genuine search for truth, even practical and pragmatic truth must struggle to resist all kinds of external pressures and their associated temptations, whether political, sociological, structural, financial, personal or ideological. As we have just seen, even an internal drive for the aesthetic can mislead. Only the ethical constraint of integrity can and must remain. Rowan Williams' comment already noted is here especially relevant:

Theology should be equipping us for the recognition of and the response to the parabolic in the world -- all that resists the control of capital and administration and hints at or struggles to a true human understanding, in art, science and politics.⁴¹

This goes much further than an examination of natural science. It is a plea for a clear-sighted discernment of meaning and integrity in all human activities. The meaning and integrity of an activity come from beyond its context, whether cultural, political or religious. Meaning and integrity are rooted in the grace initiated and enabled capacity to listen for and respond to the prevenient Word. There is no specifically sacred or secular meaning of the election of humanity or of the Word made flesh. Integrity is vital in human activity, whether it is understood as sacred or secular. Therefore, there is no distinction at this level between secular and sacred meanings. Indeed strictly speaking, there cannot be any sacred or secular. There is simply the presence of the creation and what we (or other creatures) have made of it or from it. Summoned into being by the divine *fiat*, the creation carries its own multitude of meanings. The gracious Word calls them to human attention. The gift of integrity and the source of meaning are in the fecund, purposeful activity of the one who calls. That action of the Word (or gift of the Spirit) can mend weakness of intention. However, it does not supply knowledge or

³⁸ See Chapter 2 (2) (b).

³⁹ See Chapter 1 (4) (d) (ii).

⁴⁰ For God's, "special preference for beetles" see Chapter 5 (4) (e), FN on Haldane.

⁴¹ Williams, *On Christian Theology*, p. 42, referred to at Chapter 1 (4) (c) (vi).

understanding beyond the limited intellectual capacities and possibilities of insight given to humans. (Even so, our report card is likely to be marked “Could do better!”) Theology needs to find insightful ways of communicating all this to science. In science, as we have several times pointed out, “good enough” working hypotheses are the best we can do.

So, grace enables us to hear as true words purely scientific propositions, understood as working hypotheses in the secular sphere. They relate not simply to one sphere sacred or secular, but to whatever is created or is brought to light by human agency. Such provisional propositions cannot be understood as true in themselves. However, when they carry the marks of the disinterested quest for truth, that integrity (in conformity with the Word) enhances their capacity to bear truth. In that way they resemble the gospel parables. Therefore, with limited factual content, they carry their distinctive sacred and secular meanings for the world.

However, we need to keep reminding ourselves that we cannot base a theology on scientific propositions. However secure we may suppose them to be they are about the world of phenomena. We noted the example of Thomas Torrance who wanted to construct a theology that understood Barth’s theology as analogous to Einstein’s insights concerning the space time continuum. He took those in some sense to be true. Torrance thought that the objectivity of Barth’s could be united with that of Einstein in a scientific methodology.⁴² Theology offers itself as hostage to a human and purely provisional understanding of the physical world when it makes such assumptions. Especially, as we have earlier pointed out, that is the case when different understandings of the concept of truth are involved.

A proposed method of conversation between Barth and natural science

However, I propose that a theology understood as witness to revelation may hear and incorporate scientific words not simply as literal truth (correspondent, coherent or pragmatic) but as parabolic expressions which themselves take on something of the character of revelatory truth. Barth encourages that intention for “The more seriously and joyfully we believe in Him, the more we shall see such signs in the worldly sphere, and the more we shall be able to receive true words from it.”⁴³ They can point to already revealed truths, ones that may have been neglected or misunderstood. In their thorough creatureliness, the scientific propositions may change, but the realities they were trying to point to will remain.

⁴² See chapter 1 (4) (c) (iii) For an analysis of Torrance’s position see Gary Dorrien, *Theology without Weapons: The Barthian Revolt in Modern Theology* (Louisville: Westminster John Knox Press, 2000), pp.160-163.

⁴³ CD IV(3.1), p. 122.

Thus, we have a proposition to test: scientific findings are the fruit of human activity. They are therefore provisional. In some cases they may turn out to be incomplete or incorrect. Can they nonetheless be understood as parables, in a way analogous to certain passages in the gospels? That may also be the case for other aspects of culture. What gives the particular parables we want to discuss a potentially greater significance is their grounding in the rigour and intellectual force of the best natural science.⁴⁴ However, before we make that test we need to explore the form and function of parables in general.

(3) The parabolic form

(a) Scientific working hypotheses as texts

It may at first seem surprising to claim that we can assign the deliverances of natural science to the literary genre of “parables”, although the word does have an extremely general sense.⁴⁵ However, parables are primarily texts.⁴⁶ They are not books. Like other texts, they have, according to literary theory, horizons, that is to say a collection of meanings proper to the text itself, and not necessarily the same as any authorial intentions. These latter may in any case be unknown. According to Gadamer, a text accumulates meanings through the historical process of its reading and interpretation. It can easily be seen how this would happen since interpretations are bound to differ according to critical fashions and social circumstances that change through time. Each interpretation would have the potential to influence succeeding ones. The reader also has horizons consisting of the range of meanings that she or he is able and willing to attribute to the text in her or his historical and cultural circumstances. Meaning stabilizes, for the moment, where the two coincide. It is this coincidence or fusion of horizons that we are searching for when we interpret a given text.⁴⁷ By analogy with literary examples, the scientific text has implications, hidden meanings, unknown to its author. That has certainly been true for Darwin’s working hypothesis of natural selection. It is still being applied to states of affairs unknown to him in the natural and human worlds a century and a half from its first statement.

⁴⁴ Macken, *Autonomy Theme*, pp. 63-66.

⁴⁵ The *OED* defines a parable as “a (usually realistic) story or narrative told to convey a moral or spiritual lesson or insight; esp. one told by Jesus in the gospels. (Now the usual sense.)”, *OED* online *ad loc.* Draft definition. 2(a) 27/05/2010. For extended comment on definitions of “parable” see Klyne Snodgrass, *Stories with Intent: A Comprehensive Guide to the Parables of Jesus* (Grand Rapids: Eerdmans, 2008), pp. 7-15.

⁴⁶ For an extensive discussion of scientific theories as texts see Mary Gerhart and Allan Melvin Russell, *New Maps for Old, Explorations in Science and Religion* (Continuum: New York and London, 2001).

⁴⁷ See Kevin J. Vanhoozer, *Is there a Meaning in this Text? The Bible the reader and the morality of literary knowledge* (Leicester: Apollon, 1998), pp. 106-108, referring to the work of Ricoeur and Gadamer. For “fusion of horizons”, see also Frances Young and David F. Ford, *Meaning and Truth in 2 Corinthians* (London: SPCK, 1987), pp. 151-2, referring to Gadamer, *Truth and Method*, pp. 216-217, 273ff, 333ff. Scientific theories, working hypotheses, may be expressed either in natural or in mathematical languages. For our present purposes, dealing with the biological sciences relevant to the human person, we will largely ignore mathematics, although analogous considerations may well apply there.

A fusion of horizons, not unlike like the literary case, takes place when a researcher, aware of a present horizon of accumulated applications, successfully applies an old theory in new circumstances. We shall now explore the possibility that some such fusion of horizons may occur in the quite different case when theological and scientific texts are brought together. There theology may see science as thus offering it “a surplus of meaning” in its own text, a parabolic commentary on that text in which revelation delineates the human person. I am not intending to do more here than appropriate in a limited and partial way insights from hermeneutical theory to see what kind of contribution scientific texts might make to theological understanding. Jeanrond, in spite of himself, encourages us here, “For Barth and Gadamer, there can be no doubt the truth (Gadamer) or the Word of God (Barth) will make itself known to all human beings who are willing to open themselves fully to the theme of the text.”⁴⁸ That prospect of disclosure applies most clearly to texts in which integrity is evident. In other words, the text within its context and in spite of human fallibility should demonstrate a settled intention to be truthful. To explain what I am proposing, I now offer some different examples of parables. Parables are indeed one of the forms in which the Jesus of the New Testament gospels chooses to communicate his message. I need to demonstrate that there may indeed be a relationship between scientific statements and other texts so designated in different contexts and of a very different literary genre. I first need to draw a distinction between certain secular examples, also sometimes called parables, which are relevant to my purpose and others, which are not, because there is no fusion of horizons. We shall now consider one of the latter kinds.

(b) A classic secular parable

A classic secular example of the didactic and hortatory use of something like this form is provided by John Wisdom’s, so described, “parable” of the invisible gardener. Here, as deployed by Anthony Flew, it is used in order to draw attention to the then increasingly obvious disconnection of mainstream theology from the mid twentieth-century Anglo-Saxon trends in analytical and linguistic philosophy and in general from the modern secular person’s way of thinking. The present purpose is to see what pointers it may have as a literary form to the concept of “secular parables of the truth”.

Once upon a time two explorers came upon a clearing in the jungle. In the clearing were growing many flowers and many weeds. One explorer says, ‘Some gardener must tend this plot.’ The other disagrees. ‘There is no gardener.’ So, they pitch their tents and set a watch. No gardener is ever seen. ‘But perhaps it is an invisible gardener.’ So they set up a barbed wire fence. They electrify it. They patrol it with bloodhounds..... But no shrieks ever suggest that some intruder has received a shock. No movements of the wire ever betray an invisible climber. The bloodhounds never give cry. Yet still the

⁴⁸Jeanrond, *Barth’s Hermeneutics*, p. 93. Jeanrond is himself heavily critical of both Barth and Gadamer; he prefers Bultmann and Ricoeur, but his remark stands.

believer is not convinced. 'But there is a gardener, invisible, intangible, insensible to electric shocks, a gardener who has no scent and makes no sound, a gardener who comes secretly to look after the garden which he loves. At last the Sceptic despairs, 'But what remains of your original assertion? Just how does what you call, an invisible, intangible eternally elusive gardener differ from an imaginary gardener or even no gardener at all?' "Flew concludes an "A fine brash hypothesis may thus be killed by inches, the death of a thousand qualifications."⁴⁹

Considered as a report of a real-life event, this narrative is unlikely but not formally impossible. However, the "once upon a time" indicates a situation in an imagined past world, a counterfactual construction. There is an intended parallel between it and a likely discussion between a believer and an unbeliever about the possibility of verifying theological assertions. The effect of the parable's rhetoric is to question the assumption of the believer that his propositions must refer to something, since it asserts that they are compatible with any possible empirical state of affairs. There is thus a prior assumption that only propositions giving empirical information can count as factual. It thus presupposes the methodological assumptions of successful science and takes them to be component propositions of an incontrovertible world view. However, the statement of such a world view would itself be a non-empirical proposition. Moreover, this use of the parable does not notice that the success of natural science depends on its sticking to the cobbler's last of its physicalist methodology and only going beyond this in order to bring to light further empirical propositions. String theory might be an example of a collection of non-empirical propositions, metaphysical in Popper's sense of the term, which may have this potential.⁵⁰ The proposition, "There is no God", however considered, is not one of these. The horizon of the text, based on an empiricist philosophy, cannot coincide with that of a theology based on revelation. We shall need to avoid texts that contain such hidden anti-theological assumptions or indeed any metaphysical theses that might distort a theology. The propositions of physical cosmology do not fall within our remit. If they did, we might wish to avoid certain of them that seem to contain a metaphysical use of the anthropic principle: a prior assumption, necessary to the conclusion that human life or something like it cannot be a unique phenomenon. We simply do not yet know.⁵¹

(c) An example from the Old Testament

The Bible is the classic source of successful parables. I offer my own reading, of one in the Old Testament: the accusatory parable of the prophet Nathan. The relevance to the matter in hand will

⁴⁹ Anthony Flew, 'Theology and Falsification - A', *New Essays in Philosophical Theology*, ed. by Anthony Flew and Alasdair MacIntyre, (London: S.C.M., 1955), pp. 96f.

⁵⁰ See Chapter 1 (2) (c).

⁵¹ David Wilkinson, *Science, Religion and the Search for Extra Terrestrial Intelligence* (Oxford: Oxford University Press, 2013).

become apparent. It discloses the sin of David with Bathsheba and David's attempt to conceal it with murder: both God's condemnatory judgement and his mercy are depicted in the context in which the parable is told.⁵² The story Nathan tells, of the rich man who uses his power, without either justice or mercy, to tear from his nurturing embrace the lamb, the only thing the poor man owns, draws David into the situation depicted and arouses his righteous anger and declaration of death for the sinner. The denouement comes as the prophet points out that David is the merciless oppressor in question. This is a fruitful story for the preacher and a stringent lesson for politicians and other power brokers, a text with many surpluses of meaning, which still thunders to us across the centuries. It can cogently function as a basis for elements in public theology. However, the point here is that it illustrates typical features of the parabolic form, in which hearers are led to become deeply involved in the situation and shocked or surprised by the outcome.⁵³

In this case, as I see it, the parable is a story within a story, but at its centre is an upsetting of the depicted hearer's expectation and a traumatic existential shift as the identification of subject and object is reversed. The outside and the inside story together provide a further parable in which Nathan daringly reads the character of the King David. Nathan does not know in advance the outcome. He hopes, but does not know, that this God-directed confrontation between himself, the Spirit-inspired prophet, and the overwhelming royal and priestly authority of the anointed king with a short temper (immediately to be demonstrated), will lead to a triumph of justice over naked power rather than sudden death, or at the best exile for the prophet. We can see this as an ironic repetition and reversal of the earlier story in which the boy David unexpectedly triumphs over the giant Goliath. As seen in a Christian perspective, weakness triumphing over power, which is at the same time secular and priestly, may be read as anticipating the narrative of the passion and resurrection as well as the kenotic thread in the gospel according to Paul.⁵⁴ However, my point here will be that the parabolic meanings of this complex story, as part of a possibly fictional biography of King David, are independent of their circumstantial correspondence or lack of it to a factual record of events in the physical world of human history as recounted by a truthful chronicler. This story, whatever its factual basis, and bearing in mind its hortatory intention, does have integrity. For full effect such stories do however have to be formally possible. The essential however is that they resonate with the lived experience of listeners and readers over the millennia: there is a fusion of horizons between that of the original teller of the tale, further themes in the gospels and Paul, and contemporary experience. That is to say, they have a plausible

⁵² 2 Samuel 12:1-7. I have been reflecting on this parable, on and off, over several decades and cannot now identify my sources for these interpretations.

⁵³ Referring to this passage, Thistleton says, "narrative can catch the reader off guard". Anthony Thistleton, *New Horizons in Hermeneutics* (London: Harper-Collins, 1992), p. 567.

⁵⁴ Philippians 2:1-11.

empirical reference and context, although the meanings may be differently understood in the light of subsequent human history. The constant in this case however is the command of the creator God of the covenant that human persons should “do justly and love mercy”. Enough has been said. This is not the place to insert the resultant sermon.⁵⁵ Where the parabolic form displays the integrity we have already discussed, it can vividly and profoundly illuminate both the moral and the physical life of humanity and the ways of God.⁵⁶ It does not depend on a one- to-one correspondence to events in the empirical world, even though we might much prefer it if it did. We shall discuss later what else might be required if the working hypotheses of natural science are to be used in this way.⁵⁷

(d) The gospel parables of the kingdom

Nathan’s parable illustrates some of the characteristic features of those of the Jesus of the synoptic gospels.⁵⁸ Like many of these latter, it includes a vivid and pithy story or saying relating to a human situation. The gospel parables have a difficult to capture quality, which combines a sharply focused narrative with an elusive meaning. There is an element of surprise, a dissonance or a paradox: the hearer is drawn in and confronted with the present and future fact of God’s kingdom.⁵⁹ The kingdom is not a political state or goal, democratic or otherwise, and certainly not an idealized theocracy. It is no sort of human government, where God’s will is mediated by some kind of institution, even a supposed divinely ordained one. It is the actuality and immediacy of God’s judging and redeeming purpose breaking into the everyday world of human affairs, in both fulfilment and promise in the coming of Christ. In the parable, the day-to-day is annexed as a vehicle for that which is beyond thought or imagination. Human time is seized and projected into God’s time, as the seed grows secretly.⁶⁰ Mundane life is unexpectedly shattered by the in-breaking of God’s power, as a thief in the night.⁶¹ The kingdom of the humble⁶² is depicted, remorseless and secret as yeast in the dough⁶³ and generous as the seed grown in a fertile field,⁶⁴ its citizens subverting worldly expectations of a reward

⁵⁵ At the time of writing (February 2012) such a sermon might have had something to say about bankers’ bonuses.

⁵⁶ See Chapter 5 (2) (f).

⁵⁷ See Chapter 5 (2) (e).

⁵⁸ Again I cannot now disentangle the multiple sources of my material though they include Jeremias, as well as direct reference to the gospels. I have referred to Snodgrass, *Stories with Intent*, which offers careful and comprehensive exegesis of every parable. However, my intention is not to try to discern what Jesus (or a later redactor) might have meant by any given parable but rather to hear what might be an overall message in his preaching as reported in the synoptic gospels. I follow Jeremias, as well as Barth, in seeing in the synoptic gospels a message of “eschatology in the process of realization”. This approach is consistent with more recent authors such as Christopher Rowland, *Eschatology*. See further at Chapter 3 (5) (f).

⁵⁹ Matt 6:10/Luke 11:2.

⁶⁰ Mark 4:22-32.

⁶¹ Matt. 24:42-44/Luke 12:39-40.

⁶² Matt. 18:1-5/Mark 9:33-37/Luke 9:46-48.

⁶³ Matt. 13:33/Luke 13:20-21.

⁶⁴ Matt. 13:1-9.

proportionate to the labour invested,⁶⁵ or neighbour love to the degree of relatedness.⁶⁶ The hearer must be permanently on guard, vigilant for the summons of the King, alert in repentance to face divine judgement.⁶⁷ In sum, eschatology is in the process of realization.⁶⁸ In general the parables of Jesus offer not closure but questions about human existence and humanly conceived purposes under the sovereignty of the strange and generous God who “loves in freedom”.⁶⁹ The parables of Jesus are indeed expressions of that revelatory truth we have previously considered. Perhaps something of these elements might occur in a secular parable of the truth.

(e) Secular parables of revelatory truth

In view of the preceding examples, what might be the form and function of a secular parable of the truth in respect of the scientific understanding of the human person? We have already noted that according to Barth the truth, that is to say the ontological truth, about any feature of the physical world is simply not empirically available. Richard Bell makes a similar distinction. Like Barth's it is related to Kant's famous distinction between the phenomenal and the noumenal which we have already mentioned.⁷⁰ Bell has however a development from that which he gets from Schopenhauer. Referring to Genesis 2-3 he suggests that we understand these accounts of the beginnings of things as myths. Below the surface they do in fact refer to realities about the world and the human situation. According to Barth the scientific propositions we are proposing to use can function in a somewhat similar way to the myths that Bell refers to. However their origin is different. The difference is decisive. Myths spring from the human imagination. We cannot review here the enormous literature myths still provoke. Empirical reference is not essential to them and there may be none at all. Serious misunderstandings of biblical texts arise when they are thought to have an empirical reference.⁷¹ Yet myths contained in scripture can certainly be read ontologically as Bell suggests. However that is not our purpose here. Like myth, natural science is human in its origin. But it is essential to scientific theories that they do refer to the physical world. Such theories are intersubjectively testable. They are working hypotheses. Yet they cannot of themselves reveal the thing in itself. The most elaborate and concentrated investigations by the methods of any humanly conducted science can, of themselves, do nothing more than set in order the phenomena. This is what even the most fruitful and well-supported theory of natural science amounts to. A constant theme in our present work is the provisionality of

⁶⁵ Matt. 20:1-16.

⁶⁶ Luke 10:25-37.

⁶⁷ Matt. 25:31-46.

⁶⁸ Jeremias, *Parables*. See footnote at Chapter 3 (5) (f).

⁶⁹ CD II(1), pp. 257-321.

⁷⁰ See for instance Karl Barth, *Protestant Theology in the Nineteenth Century* (Grand Rapids: Eerdmans, 2002) p.26.

See also See Kant, *Critique*, pp. 61-62 [A41/B59].

⁷¹ See chapter 5 (4) (a), also chapter 5 (1) (b).

natural science. Some writers on the science-religion relationship fail to be sufficiently aware of that characteristic. The advantage of Barth and theologies in the same stream is that they take it fully into account. According to them scientific theories might be understood as commentaries on a text already known by revelation.⁷² The commentary might take the form of a parable.

The parables we have already considered have the form of narratives. They are not straightforward accounts of actual events in the empirical world. They have some kind of didactic purpose in view. Although the empirical world has to be recognizable in the text there is no need of any detailed correspondence with it. Whatever further authorial intention they might have, the biblical narratives among them, function in a way that makes them transparent to the truth of revelation. For that purpose there should be a certain authorial quality: whatever their degree of actual correspondence to the empirical world, there should be an intention to tell truth without ideological distortion, and whether or not the message is congenial to the hearer or the teller of the tale. That is to say, they must partake of “faithfulness, genuineness and reliability”.⁷³ Those are among the contributors to what we have already named as “integrity”. Something similar will need to be the case for the scientific narrations, which we shall now consider. Although we cannot see scientific theories as true in any absolute sense, this does not mean that we can be unselective in our examples. We are looking for something in certain working hypotheses, empirical generalizations, which might on one level express what is probably the case physically. On another level they might be a disclosure of the Word. That is to say they might point to revelatory that is to say ontological truth. The caution here is that, as we have seen, such truth is not by its nature simply expressed in propositional form. None the less because of their origin and integrity secular parables of the truth will have some connection with the empirical as well as the ontological.

Integrity is important. For instance, if biological science has generally abandoned the Lamarckian understanding of the mechanism of evolution, it will not be credible as a parable of the truth. In our choice of examples, we need sometimes to exercise a hermeneutic of suspicion: we are, of course, mainly concerned with those of Darwinian biology. But, in any case we might find it difficult to use those elaborate constructions relating to other universes, descriptions of mathematically possible worlds which shade into a purely speculative cosmology whose ideological agenda, as we just saw, might be that of countering the anthropic argument for meaning and intention behind the physical.⁷⁴ The suspicion that this is one of their purposes will remain relevant until they arrive at a satisfactory degree of empirical reference. Further, although my method is different from that of McGrath, our intentions are similar, in that we both want natural science to speak relevantly to theology. I must

⁷² CD III(2), p. 122.

⁷³ CD IV(3.1), p. 110. See previous remarks on integrity at Chapter 5 (2) (f).

⁷⁴ See Chapter 5 (3) (b).

therefore be alert to the danger, we recognized earlier, of selecting scientific material to make points congenial to my theological standpoint.⁷⁵ If only for reasons of space there will need to be a measure of selection, but in fact the material I shall use is from a broad sweep of human biology rather than from specific instances.

We are trying to discern the Spirit, as Barth expresses it, to hear the Word. He thinks that we can expect to 'encounter "parables of the kingdom in the full biblical sense, not merely in the witness of the Bible and the various arrangements, works and words of the Christian Church, but also in the secular sphere'⁷⁶ He says that in this parabolic form, such words are emphatically not to be understood as natural theology. However we do not find that particular distinction useful. This is natural theology even if Barth does not wish to name it as such. We discern in the created world something pointing to the ways of the creator. Our use of the parables is intended to point to the ontological. Their effect is therefore not unlike that of myths referred to above. However their basis in the exact human disciplines of empirical science stamps them with a character distinct from that of myths or what Barth refers to as "saga". They have their origin in modernity. We shall see how they point to the time-bound physicality of human life. With all that in mind, we now turn to some working hypotheses of Darwinian science, which we see as providing such parables.

(4) Darwinian parables of human existence

(a) The Origin of Species

The *Origin* expounds an empirical working hypothesis. It is certainly not intended as a work of theology in the way that Newton's⁷⁷ *Principia* was. Indeed it challenged theology. In particular it challenged the way scripture was read. The challenge was not necessarily from the recital of reported empirical data. Reports can be incorrect. Some of Darwin's second hand ones were. Further his theory was radically incomplete. It explained how species differentiate. In spite of its title, it did not explain how species began in the first place. That is still the subject of research and argument. Only later was it understood how traits were passed on down the generations. Further, according to Richard Dawkins, "much of what Darwin said is, in detail, wrong".⁷⁸ The theory did not and does not do its work by completed rational discussion based on unassailable evidence. Alternative physicalist working hypotheses to that of natural selection are now being discussed.⁷⁹ Apart from that, there are many

⁷⁵ See Chapter 1 (4) (d) (ii).

⁷⁶ CD IV(3) p.117.

⁷⁷ See chapters 1 (4) (a) (ii) and 2 (2) (a).

⁷⁸ Dawkins, *Selfish Gene*, 2nd Edn. 1989, p.195.

⁷⁹ Carl Zimmer, 'The Surprising Origins of Life's Complexity' SA August 2013. pp.76-81. based on Daniel W. McShea & Robert N. Brandon. *Biology's First Law. The Tendency for Diversity and Complexity to Increase in Evolutionary*

controversies about the way natural selection functions.⁸⁰ So the challenge to theology from Darwin's *Origin* arose and arises from the grand sweep of its explanation of how the natural world functions.

How did Darwin's empirically based parable do theological work?⁸¹ Even before the *Origin* it was known from the fossil record that the earth's population of living things had changed over time. That was impossible to reconcile with a literal reading of the Genesis account of creation where each creature comes into existence fully formed. Cuvier, among others, came to express the belief that what God had created were species. They had evolved to their present state. It was still thought that humanity was a distinctive and separate creation. Darwin's achievement, in spite of the gaps in the theory, was to persuade his readers that the species themselves and any subsequent changes in them must have resulted from the process of evolution over time. God did not need to intervene. Natural selection was a sufficient explanation of change from one epoch to another. The same process explained the origin of humanity. As J. H. Brooke points out the effect of the *Origin* was accompanied and reinforced by a critical re-evaluation of the Biblical text that took place in Germany and slowly permeated into Britain.⁸² The rethinking of theological positions on human origins was one aspect of a whole complex of intellectual and cultural changes in a secular direction begun by and following on the Enlightenment.

So there never has been a settled comprehensive theory of natural selection. There is not one now. Darwin's theory is not a finished product. It speaks though its integrity. The Word (or the action of the Spirit) is the origin of human integrity in science. That does not make the theory infallible. Yet Darwin's theory has been and still is immensely fruitful for all aspects of biology. It is an indispensable working hypothesis.

Theology should indeed take it as a parable. Parables do not have to supply closure. They unsettle. They challenge accepted wisdom. Yet in spite of incompleteness and even inconsistency, if there is integrity in the tale and its teller, the parable's rhetoric can initiate a sharp change of theological perspective, for the attentive hearer. Darwin points unequivocally to a physical origin for all of nature including human nature. It does not strictly demonstrate how things are in themselves. None the less it contributes to a theology of creation. It points to the physicality of the creative act. It does however allow room for an underlying ontological reality, other than the physical and empirical to which we give the name "life".

Systems (University of Chicago Press: Chicago 2010). Jerry Fodor, and Massimo Piattelli-Palmarini, *What Darwin Got Wrong* (London: Profile Books, 2010).

⁸⁰ For a carefully argued undogmatic account of them see Sterelny and Griffiths, *Sex and Death*.

⁸¹ See chapter 2 2(a).

⁸² John Hedley Brooke, *Science and Religion, Some Historical Perspectives* (Cambridge: Cambridge University Press, 1991), pp.263-274.

It is Darwin's parable that frames the following discussion. Following on from it there are further and more detailed parables. They point to an explicit or implied dialogue-between the ways we understand the continuities and the distinctions among created things. They also suggest that there is an ontological unity called life. Within that unity there are distinct things. In their togetherness and their separateness they contribute to God's good creation. Such conclusions cohere with the complex notion of revelatory (and therefore ontological) truth I have already sketched.

However, theology can helpfully read science including *The Origin* as a parable that can point suggestively to the thing in itself. Science can suggest ontological states of affairs without strictly being able to demonstrate them.⁸³

(b) Humanity contained within the unity of living things

Darwinian science deals with a large class of empirical phenomena under the heading "life". Among those *Homo sapiens* is only one among several million species. Although, as we saw earlier, there is no satisfactory univocal definition of life, there are various common factors in its diversity. As parables, they point to something not generally emphasized by theology from revelation, though implicit in it, namely the ontological unity of life. However, because they are provisional they cannot strictly demonstrate it. That unity is not brought about by the similar physical phenomena across biological life but by God's initiating and sustaining activity in the creation. The physicality is thus the consequence of God's activity. There is no need to postulate a "life force" or some common physical essence. Life is one of the things that God does. It is a feature of the good creation.

(i) Features common to the physicality of life

More recently other features of the scientific parable under discussion have come to light. Many life processes are identical throughout very different species. This has become increasingly obvious with the development of biochemistry and molecular biology. The common physical factors include the almost universal presence and activity of adenosine triphosphate (ATP) which mediates the energy originating in the Sun's nuclear reactions.⁸⁴ ATP is at work in functioning units called mitochondria, understood to be the descendants of independently living organisms, now essential to both plant and animal cells. There are twenty amino acids, which are the building blocks of many thousands of proteins as well. There is DNA, which is the chief carrier of information down the generations, by a code that is identical in every organism.⁸⁵ In eukaryotes, the DNA is surrounded by

⁸³ See discussion on truth at chapter 1 (1) (b).

⁸⁴ For a summary of the role of ATP in living things see Elliott and Elliott, *Biochemistry and Molecular Biology*, pp. 30-36.

⁸⁵ See Chapter 2 (2) (c).

chromatin that plays a part in switching genes on and off.⁸⁶ These chemical components are participants in mechanisms common to almost all living things including humans and bacteria. They are often most easily studied in the latter, so that the bacterium *Escherichia coli* is a source of information concerning human cellular functioning.⁸⁷ The animal and plant kingdoms, known by Genesis, which by and large form the most obvious context for human life, can be seen to have a particularly close relation.⁸⁸ It is clear, for instance, that there is a basic physical similarity among those organisms, largely constituted as they are by nucleated living cells. Chlorophyll in plants and haemoglobin in animal life, are somewhat similar in structure.⁸⁹ They are complex oxygen-carrying proteins facilitating the exchange of gases with the atmosphere which is respiration. Differences in molecular function between plants and animals at the cellular level can be seen as details. An interstellar visitor might at first wonder why humans find the distinction at the macro level so compelling. I shall return to that point later.

(ii) Common origin and interdependence of plants and animals

The shared features of living things, of which there are some twenty one different categories (sometimes known as “kingdoms”) besides those of plants and animals, lead to the working hypothesis of “the last common ancestor” of all living things as well as to a common ancestor for plants and animals. There are a number of plausible competing theories about the exact nature of the “last common ancestor” and how it might have arisen from some kind of primeval soup. That must have contained naturally occurring quite simple chemical substances, themselves widespread within the solar system. More recent hypotheses suggest life began in chemical activity on the surface of rock on the sea floor possibly within structures known as thermal vents.⁹⁰ So far, the last common ancestor appears to be a logical construction rather than a satisfactory working hypothesis. The issue is made more complex by the possibility of the lateral transfer of genetic material across species, especially in the case of micro organisms. Those are matters of current research.⁹¹

What is essential to the life of plants and animals is their primary reciprocal dependence through the oxygen-carbon dioxide exchange whereby the one supplies what is essential for the other; geological processes over cycles of millions of years play their part in this. The breakdown of animal excretions and the death of living things and their decay are facilitated by bacteria. The final products

⁸⁶ Elliott and Elliott, p. 367. See glossary also Elliott and Elliott, pp. 17-22. See also the diagram of the tree of life at Chapter 5 (4) (a) (ii).

⁸⁷ Elliott and Elliott, pp. 3-4.

⁸⁸ As will be clear from the subsequent diagram of the tree of life, we are considering here only one branch, the eukaryotes - and leaving to one side two other large groups. We also omit viruses which cannot live independently, Elliott and Elliott, *Biochemistry and Molecular Biology*, pp. 16-26.

⁸⁹ Elliott and Elliott, p. 274.

⁹⁰ For a history and extended summary of the research see Jeffrey L. Bada and Antonio Lazcano, ‘The Origin of Life’ in Ruse and Travis, *Evolution*, pp. 49-79.

⁹¹ See Chapter 2 (3) (a).

are the simple chemicals, largely mineral salts, on which plants feed. Like all other species humans, when alive, share in these interpenetrating patterns and in the end their physical remains are themselves recycled.

There are of course considerable differences between plants and animals, besides those of mobility; among them are the rigid cell walls of plants and the non-rigid ones of animals. A vital further difference between animals and plants is that the latter are capable of directly synthesizing the amino acids and carbohydrates they need: animals cannot do this but their bodily processes cannot take place without them. Animals are therefore totally dependent on plants (or on other animals, which depend on plants) for the nutrition that sustains them. There are of course many, many more ways in which plants and animals, humans among them, in their common features and striking differences, depend on each other in the complex web that is life on the planet.

The point here is that these working hypotheses, some as yet insecure, provide nonetheless a parable of the unity within diversity of organic life, necessarily including human life. The parable adds force to a prior theological understanding of what life is in itself, not only as a phenomenon but as gift given in its wholeness, to the creation-

(iii) Humans and other organisms as communities

From another point of view each human organism, like other multicellular ones, is an elaborate multilevel community (Stamos⁹² says "consortium") of interdependent finite creatures, including microbes in the gut carrying out essential functions. There are more than a thousand species of micro organism in the human digestive system alone. Some simply have a common source of nutrition; others are dependent on each other in different ways. Another group may be harmful or potentially so.⁹³ The whole comprises roughly ten times as many cells and also ten times as many genes as the human body itself. The full implications of this latter finding are not yet known. Authors cited suspect that the disruption of such microbial lives and relationships by the use and misuse of antibiotics as well as by rigidly sterile birth practices is playing a part in the spread of diseases of the human immune system. The formerly independent processors of energy, the mitochondria,⁹⁴ indispensable for all eukaryotic metabolism, also contribute to the body's community.⁹⁵

⁹² Stamos, *Species Problem*, p. 294 and pp. 333-4, citing Margulis.

⁹³ Commensal, symbiotic or parasitic.

⁹⁴ For mitochondria, see Chapter 2 (3) (a).

⁹⁵ Jennifer Ackerman, 'The Ultimate Social Network', *SA*, June 2012, pp. 20-27. Martin J. Blaster, 'Who Are We? Indigenous Microbes and the Ecology of Human Diseases', *EMBO Reports*, Oct. 2006, at <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1618379>> downloaded 14 May 2012. Yun Kyung Lee and Sarkis K. Mazmanian, 'Has the Macrobiota Played a Critical Role in the Evolution of the Adaptive Immune System?', *Science*, Dec. 24 2010, pp. 1768-1773, <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3159383>> downloaded 14/05/12.

In terms of division of labour and their interaction with the environment, each animal body, including the human one, is structurally not unlike a colony of social insects. Such insects are bound to each other by their shared common interests in nutrition and respiration and programmed (as a whole) towards reproduction, and even to die themselves for the welfare of the colony.⁹⁶ Similarly, all the body cells have a life span less than that of the whole and most (but not neurons) are replaced through life, some of them very frequently. The only features that may continue over extended time beyond the cycle of what may be seen as an individual life are the genetic and other kinds of DNA and perhaps some parts of the chromatin surrounding the genome. These are subject nonetheless to modification from one generation of the organism to the next. We have already noticed that human physicality, like that of other animals, is evident in the electrochemical mechanisms that among other things carry the cerebral processes on which thought in some way depends.

Not only that, but brain and body are intimately interconnected, the one united with the other in a complex of dynamic relationships in which physical action of all kinds, including gross motor function, plays its part.⁹⁷ Each body is indeed, in a sense, a community, composed mostly of transient elements, but with continuous and unifying features. One such feature is the changing activity of the nervous system, and another the action of chemical messengers, hormones, which ensure that the whole is maintained physically in a dynamic equilibrium. This description of the phenomena is thus a story of community, functioning by a multitude of interlocking processes. Nothing within its physical boundary is static. This physical story has a surplus of meaning. We can see it as a parable. It points to, though it does not demonstrate, the way in which ontological life, life as it is in itself (the soul) is not a state nor a substance but something happening to the physical body. In that case, it is a non-physical happening. The body, as we saw according to Barth, is its form, its principle of unity.⁹⁸ The life or soul is neither empirical nor emergent. It is the consequence of the unceasing gifting activity of the Spirit on which it depends. The Spirit sustains the soul within the body in both constancy and change, against everything that could destroy and negate it. At least in human persons (we cannot say what happens in other organisms) the soul is that factor which lifts the physical functioning of the body with its brain into full consciousness and selfhood with both relationship and individuality. This connects with our discussion of the work of Stephen Pinker where we noted his understanding of the human mind as “what the brain does”.⁹⁹ He fills out the summary working hypothesis by a detailed discussion of the

⁹⁶ For more parallels between complex organisms and colonies of social insects see Mark W. Mofett, ‘Ants and the Art of War’, *SA*, Dec. 2011, pp. 64-69, also Wilson, *Sociobiology*, especially p. 399, Col. A. Ant colonies are credited with something indistinguishable from intelligence by Mitchell, *Complexity*, p. 4. For more detailed consideration of the interplay between individuality and community in biological organization see Sterelny and Griffiths, *Sex and Death*, pp. 151-179. It is closely connected with a discussion on altruism.

⁹⁷ See Chapter 2 (6) (b).

⁹⁸ See Chapter 3 (4) (e).

⁹⁹ See Chapter 2 (5) (h).

propositions of evolutionary psychology. He indicates a large number of observations and experiments to support that thesis. However, the point here is that we should understand mind, not as a static disposition of matter, but rather as a series of connected events happening to matter.¹⁰⁰ That is an empirical hypothesis. It is not a statement about the mysterious action of the Spirit in the body. We can, however, see it as a parable of that action of the Spirit within the confines of the physical body which we have described in the previous paragraph. To repeat: the soul, according to theology in the stream of Barth, is not a substance, it is a happening. It is the event of God's mysterious action within the physical human body.

(iv) All life is from the dust of the earth

As is clear from the above, the history of human life cannot be divorced from the history of life as a whole. Darwinian biology has discovered some, and will discover more, of the story of the change as well as the continuity of the millions of forms of physical life over the epochs of time. Some features have been present since the beginning and through the hypothetical last common ancestor until the present.¹⁰¹ Humanity and each living thing thus has its particular history, beginning with the cosmic remainders which contributed to the formation of the planet Earth. The several plausible accounts of the beginnings of life on this planet have not led to universal agreement. Yet the broadest working hypotheses of Darwinian evolution are sufficiently coherent and have enough secure empirical connection for us to say that, although, like every human effort they are provisional, they are nonetheless good enough. They are not final truths but act nonetheless as parables of final truth exposed by revelation. Humanity is irrevocably planet-bound, formed "from the dust of the earth" in the most thorough and intimate way. Inside and outside, the human self is physical. It takes its historical origin from and is located within a very specific physical environment on which it depends. Such generalities refer also to Jesus of Nazareth as a human person.

(c) The biological humanity of the Son of God

Darwinian biology must indeed see the life in Palestine of Jesus of Nazareth as that of a human person. However understood, the different constructed genealogies in both Matthew and Luke explicitly witness that Jesus had human ancestors.¹⁰² If this is the case, he was a member of a genetic community, with ancestors going back to the same small band somewhere in the continent of Africa as everybody else. My theology in the stream of Barth cannot specify in what way the pre-existent Son is

¹⁰⁰ Also referred to at Chapter 3 (5) (h).

¹⁰¹ Some of the continuities among disparate forms of life are quite unexpected: see Chapter 2 (2) (d).

¹⁰² Matthew 1:1-17 and Luke 3:23-38. I am not considering the exegetical and theological problems of the virgin birth in relation to these passages. However, on whatever supposition about its physical facticity, a genetic connection, with a human ancestry for Jesus, remains.

related to that ancestry. However, the connection is genuine and ontological because he is “truly God, truly human, and both in a single subject”.¹⁰³ In any case this man, Jesus, is physically related to prehumans, however they are conceived to be and whatever forms of life they may be descended from historically or have given rise to. It is obvious, although it is startling to see it stated, that in whatever way the modern human person is physically related to *Pan troglodytes*,¹⁰⁴ so is he. The tree of life includes that man along with *Myxomycota*, *Quercus robur*¹⁰⁵ and everything else. Considered as a secular parable of the truth, what surpluses of meaning might the working hypothesis of the Darwinian tree of life offer to theology?

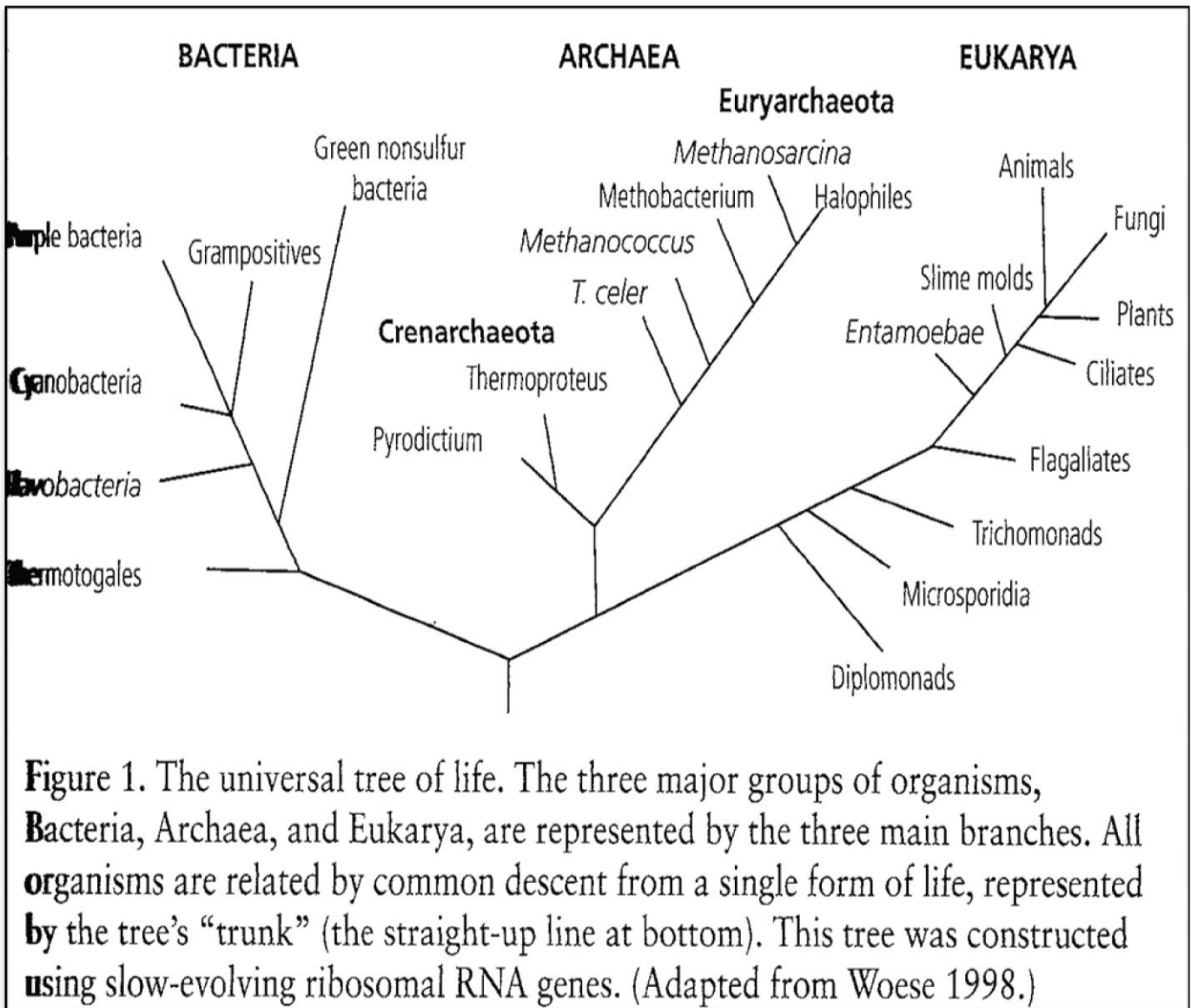
¹⁰³ ‘Karl Barth’s Historicized Christology’ in McCormack, *Orthodox and Modern*, pp. 201-233, especially p. 229. The author is here defending his own understanding of Barth’s Christology but the quotation stands as a classic theological statement around which discussion might centre.

¹⁰⁴ The chimpanzee.

¹⁰⁵ Slime moulds, the English oak.

A WORKING HYPOTHESIS OF THE TREE OF LIFE

From Francisco J. Ayala, 'Molecular Evolution', Ruse and Travis, *Evolution*, p. 133.



(i) What follows from the theology of the incarnation

The theological datum of the incarnation informs us that God's self took on human flesh. The empirically based tree of life includes, among the animals, the biological humanity of the Son of God. There is a commonality of biological life that the human Jesus necessarily shares with other living creatures, each of their own kind, and in the most detailed way. The physical relationship can be seen as a parable of the ontological one. In consequence, it is simply not possible to take a utilitarian view of any living creature or to understand its purpose or value as arising from whatever relationship it may have to human desires or needs. We cannot know what soteriological implication this might have for non-human creatures, but what we can say is vital.

Each creature subsists in the knowledge the Creator has of it. The human person is the only biological entity whose reality is specified by revealed knowledge as indicated by Holy Scripture. The theology in the stream of Karl Barth, put forward in the present work, asserts that human uniqueness resides in the vocation of election of each one in Jesus Christ who is the prototype. However, it remains that there is, according to human understanding, an impenetrable mystery belonging to the existence of each and every living thing. Barth and my theology in the same stream are clear that:

Man is only a creature, not the creature..... Even the Word of God does not envisage man except in this insignificance. Besides man, there are other creatures, posited by God and distinct from God, with their own dignity and right, and enveloped in the secret of their own relation to their Creator.¹⁰⁶

(ii) Animals other than humans

For other creatures we have increasingly powerful working hypotheses relating to the phenomena of each existence. Each species and indeed each member of each species has its own biological individuality. We can see such phenomena as parables of the unique divinely chosen ontological relation unknown to us, which each individual and each species has with its maker. What they are in themselves, the particularity of each relationship, is known only to the Creator. It is not the same as the election that is the ontological status of humans. The hint given by Scripture is that praise of the Creator is the common vocation of everything that is made.¹⁰⁷ The above considerations entail at least the ethical injunction, a divine command, of respect for life, that we have already referred to. But this is not simply life as a generalized phenomenon, but refers to each life as known by the giver of life.

¹⁰⁶ CD III(2), pp. 3-4.

¹⁰⁷ For instance, Psalms 19:1-5, 69:34, 96:11-12, 98:7-8, 103:22, 148:1-10, 150:6; Is. 42:10; Job 38:7, referred to by Celia Deane-Drummond, *Eco-Theology* (London: Darton, Longman and Todd, 2008), p. 86.

There are many cases where we cannot easily define a species or, indeed, what may be an individual life, or what may be the distinction between the life of a colony (say of social insects, ants or bees) and that of an individual. But that is also a necessary theological ignorance. It leads to a precautionary principle. Not knowing the ontological status of other living creatures implies that we should assume that each has its proper purpose, its *telos* within the gifted quality of things within God's good creation. Indeed we may see the tentative conclusions of Sarah Coakley concerning biological purpose as being parabolic pointers to that theological hypothesis. In any case, we must approach life and lives with trepidation. They are not freely at human disposal. Humans must not allow themselves to become the aggressors in the struggle for life without good and sufficient reasons.

The working hypotheses of Darwinian biology indicate multiple physical connections between diverse species. They provide a parable. They point to a redefinition of community that includes the non-human as well. That may indicate a this-worldly reference for the eschatological visions of the peaceable kingdom and of the lion lying down with the lamb.¹⁰⁸ Perhaps Barth is mistaken in condemning dogmatic vegetarianism as an "unwarranted anticipation" of the eschatological. Moreover, recognition of human membership within a multi-species community must take note of the ethic implied by the divine subjection to contingency in the incarnation. In imitation of that, the greater must serve the lesser, for that is the "the same mind that was in Christ Jesus"¹⁰⁹. One particular example of such a renunciation of self, a kenotic ethic in the community of many species, is that it provides proper theological rationale for animal welfare charities. Such service towards other species dictates resistance to the evil of cruelty. Perhaps also giving up something that is not yet forbidden by the divine command might in fact be a proper witness to the multi-species community. Could that renunciation include abstention from human experiments on other species? It might be right to do this, even though the experiments could benefit humanity. In spite of its incongruity from a Darwinian standpoint, and in spite of Barth, could vegetarianism be understood as a proper pioneering action towards a this-worldly peaceable kingdom? The above thus suggests a number of ways in which Darwinian biology points to the incarnation as relevant to our treatment of other species although it remains "for us and our salvation".¹¹⁰

(iii) Other living things

As animals ourselves, we might want to assume that plant life is in some way freely available to us in a way that creatures with more similarity to ourselves are not. We might suppose this

¹⁰⁸ Isaiah 11:6-9, 65:24. For a discussion of some of the issues involved see Southgate, *Groaning of Creation*, pp. 78-91.

¹⁰⁹ Philippians 2:5, NRSV.

¹¹⁰ The Nicene Creed in *Methodist Worship Book* (Peterborough: Methodist Publishing House), p. 190.

to follow from the distinction, assumed by Barth and present in Genesis, between the plant and animal kingdoms. However, according to Barth that is not the case. Although those created things are a “means of life” and humanity may be authorized to use their “superfluity” sensibly, none of them is human property. If humanity has any “lordship”, it is strictly in exercise of a given responsibility, in this case the one of feeding ourselves. A “reverent humanity” must refrain from “Senseless waste and destruction”.¹¹¹ However, there is more to be said. Biological life is one. The empirical oneness of the parable points to, though does not demonstrate, an ontological unity. According to John’s gospel Christ is the source of life, both biological and spiritual (ontological). Worship of the giver entails respect for the gift of life both in its individuality and in its multiplicity. The parable thus deepens and emphasizes the commonality of life between the plant and animal kingdoms. Ellen Davis analyses, from what she describes as an agrarian perspective, the implications of the message of the Old Testament for modern land use. That gives expression to the giftedness of created things which includes both plants and animals.¹¹² Darwinian biology thus pushes us beyond our anthropocentric perception of living things to a realization that human welfare, human salvation, can only be one facet of God’s purpose for creation.

The present study concentrates on theological anthropology. However, the parabolic message we are considering suggests the free generosity and the fecundity of the whole creation. Human persons are inextricably enmeshed in it. If each created thing is given to itself to fulfil its *telos*, its divinely assigned purpose within the scheme of things, we are bound to recognize a value in creation. There are hints of that in Scripture.¹¹³ We are certainly entitled to admire what we see as the aesthetic qualities of created things. Yet the value remains whatever its relationship to humankind and indeed, whether or not we find it admirable. For “God saw that it was good”.¹¹⁴

To preserve the natural world from destructive exploitation and to enable plants and animals to flourish in continuing life-communities are laudable and proper human goals. Yet we can only do that anthropocentrically.¹¹⁵ We think we may be aware of God’s purpose. Yet we simply cannot understand the empirical world in any other way than a human one. The working hypotheses of our natural science inform us. Obviously, humans like every other species following the Darwinian drive of natural selection seek their own welfare. But humanity is only one of several million species. It must not assume unqualified priority for its own interests. We do not know what self-awareness other creatures may have, although we do in some cases have the beginnings of an understanding, -- but we know who

¹¹¹ CD III(4), p. 351. I have not space here to examine fully Barth’s arguments in § 55, *Freedom for Life*.

¹¹² Ellen F. Davis, *Scripture, Culture and Agriculture: an Agrarian Reading of the Bible* (Cambridge: Cambridge University Press, 2009).

¹¹³ Deuteronomy 20:19, NRSV, “Are trees in the field human beings that they should come under siege from you?” (Though this is primarily about food trees, others may be felled for the purpose of constructing siege works.)

¹¹⁴ Genesis 1:24, NRSV.

¹¹⁵ For a recent discussion of some of the issues involved see Michelle Nijhuis, ‘Which Species will Live?’, *SA*, Aug. 2012, pp. 62-67.

we are and we have a certain power over our own choices. However, the indiscriminate wish to master and control the given of the created world, even with the best of intentions, suggests a misunderstanding of human nature. It implies wisdom beyond our capacity. It supposes knowledge of the *telos* of created things that we do not possess. Quite apart from that, thoughtless human interventions in the creation have brought about menacing problems of environmental catastrophe. The consequent disasters may destroy humanity. But in any case humanity has no title to the Earth. On the plane of creation (as opposed to salvation) humanity is rightly seen as only one tiny element in a network of cause and effect stretching over the time, space and matter-energy allotted to the world in the divine purpose. Under God each thing in the creation exists in itself, the sum of its “goodness”; its function in the divine economy is not transparent to us.

The above considerations should not lead to nature mysticism in any form. This is still not Albert Schweitzer’s “reverence for life”, neither is there any question of the worship of any created thing.¹¹⁶ Nor does anything in nature point unequivocally to the reality of God, the knowledge of whom comes through scriptural revelation. Nor am I intending to reformulate, either as a metaphysical or empirical hypothesis, James Lovelock’s Gaia hypothesis of the Earth as a homeostatic (self-regulating) super-organism.¹¹⁷ The theological message of these Darwinian parables is simply to point to a divine command of respect for created things, to which the fact of creation by the generous God entitles them. This respect needs to be translated into a complete way of human living in the world and attitude to it. As we noted, Ellen Davis shows how one aspect of this may be sketched from the attitude to the Earth and its resources presupposed in much of the Old Testament.¹¹⁸

(d) The human race: one and many

Darwinian parables point to both human unity and diversity.

(i) Human unity

Natural science provides an effective working hypothesis delineating the biological unity of the human race. The story of the human species, as Darwinian biology tells it, makes obvious the physical chain of cause and effect, linking humans over the generations. As we saw in Chapter 2, and emphasized earlier in this chapter, there are good reasons for thinking that all humans now alive are descended, though perhaps not exclusively, from one small group. Perhaps they numbered only a few thousand. Their descendants radiated out from the African plains and eventually arrived by a complex

¹¹⁶ Albert Schweitzer, *My Life and Thought*, trans. by C. T. Campion (London: Guild Books, 1955), pp. 194-214.

¹¹⁷ Ruse and Travis, *Evolution*, pp. 576, 713, 874-875, also James Lovelock, *Gaia: A New Look at Life on Earth* (Oxford: Oxford University Press, 2000).

¹¹⁸ Davis, *Scripture, Culture and Agriculture*. See Chapter 5 (4) (b) (c). For a summary of many of the issues, see Deane-Drummond, *Eco-Theology*.

series of migrations at the locations they occupied before modern means of travel. Moreover, analysis of human genomes reveals links between culturally very different peoples. It further seems likely that very diverse cultures whose persistence was in the past thought to result from differences of cognitive abilities, and some of which were consequently labelled as “primitive”, are the result of struggles for survival in very testing environments.¹¹⁹ The abilities needed for the present-day lives of the isolated populations of hunter-gatherers are very different from those of the modern urban people. But they make no less a demand on their intelligence. It is also clear that the linguistic skills needed for effective communication in such environments are no less than those of city dwellers. It now appears that there is quite a narrow range of cognitive capacity across different peoples. The physicalist story, a provisional one, of one human race, provides an emphatic secular parable of the truth. It emphasizes the text already known.¹²⁰ It points to, but does not demonstrate, the ontological unity of humanity. It is the election of human persons in the humanity of Jesus Christ that brings about that unity.

It might turn out however that the “out of Africa” hypothesis would have to be substantially modified, say because of the inclusion within the genome originating from Africa of a proportion of Neanderthal DNA much greater than is at present thought to be the case. It might make the parabolic function of this particular account less obvious. However, the unity of humankind, not the parable of it, is the theological given: “For from one ancestor he has made all nations to inhabit the whole earth”.¹²¹ We should then be considering a slightly different, empirically based parable on the common ancestry of both Neanderthal and more recently African-based subspecies or varieties of human-like creatures. Indeed, we would be obliged to make that change since one of the criteria for the utility of a parable is its integrity. Integrity, as we earlier specified, is not the same as truth, but must include conformity to current working hypotheses of natural science. It is further the case that even if studies of cognitive and other abilities do, as some think, reveal deep-seated differences in the human family, genetic in origin, raising again the spectre of different “races” of humankind, this would be no reason for changing the theological assertion of common humanity explicit in revelation. Even if the parable had to be abandoned, the theological reality grounded as it is in the election of humankind in Jesus Christ and the incarnation would remain. What the parable does not do, or should not do, is to found an ideology that, while tracing the unity of humankind, misunderstands or discounts the evident diversity within it.

¹¹⁹ See Chapter 2 (3) (b). (Referring to the work of Jared Diamond.)

¹²⁰ *CD III(2)*, p. 122.

¹²¹ Acts 17:26 (NRSV). The margin has “from one blood”.

(ii) Human diversity

Many aspects of Darwinian biology, as well as some obvious features of common experience, offer parables of human diversity within the biological unity. That must include the very small, in percentage terms, but often very important variations in the genome. There are for instance the differences consequent on the molecular processes of the immune system. Some of these may be genetic in origin, and may lead to bovine milk, nuts or wheat products not being well tolerated. Even uniovular twins differ, not only because of each having a slightly different environment in the womb but according to recent hypotheses because of occasional genetic permutations, especially within the brain.¹²² Among humans in general there are striking differences in cognitive abilities, including dyslexia and autism and a number of others which are the result of different neurobiological processes in the subject, demonstrated by neuro-imaging.¹²³ External variations including those of skin colour, cheekbones, hair growth and others for which adaptive explanations have been put forward, add to the impression of difference between different groups of the one human species. However, as we have previously seen, closer examination reveals that the genetic diversity internal to human groups of the same geographical origin is much greater than that seen from one geographical area to another as a whole. The diversity among African peoples is much greater than that between Africans as a whole and Europeans, or the peoples of the Indian subcontinent.¹²⁴

Yet whatever may be the common features of any given human group each person has an unique set of biological parameters. Each person has a unique genome. Gene expression, the mechanism within the cells that switches the genes on and off is programmed differently in each individual. At its most obvious that is why people look and behave differently. Diversities, biological in origin, within the one human species could be seen as a Darwinian parable pointing to the Creator's one-to-one dealing with people. More especially, if that is how the Creator works it must be part of the human vocation as well. Thinking based on stereotypes is forbidden.

The observation of diversity raises another question: as we saw in Chapter 2, in spite of their wide scope and great explanatory power the working hypotheses of Darwinian science cannot delineate exactly what is and is not human. Revelation points to one of the branches in the tree of life,

¹²² Tadjana Singer, and others, 'LINE -1 Retrotransposons: Mediators of Somatic Variation in Neuronal Genomes' in *Trends in Neurosciences*, Aug. 2010. Found at <<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2916067/?tool=pubmed>> downloaded 14/02/2012. See also Fred H. Gage and Alysson R. Muotri, 'What Makes Each Brain Unique?', *SA*, Mar. 2012, pp. 20-25. For a table of seventeen or so mechanisms in development and adulthood which may cause phenotypic variations in identical twins, see: T. B. L. Kirkwood, 'Understanding ageing from an evolutionary perspective', *J. Intern. Med.* 263, 2008, p. 119.

¹²³ Uta Frith and Chris Frith, 'The social brain: allowing humans to boldly go where no other species has been', *Philosophical Transactions of the Royal Society*, B 2010 365, pp. 165-176.

¹²⁴ See Chapter 2 (3) (c).

which includes the creature known to science as *Homo sapiens* (but perhaps others as well) , as the object of the Triune God's particular concern and of his own participation in and, in the person of the man Jesus, subjection to the contingencies it suffers. However, it is the divine election and call in the God-man Jesus Christ that defines and declares what human person is ontologically. Natural science, in itself, knows nothing of tha

The parable implied in the observation of diversity points to another consideration. Theology should be wary of programmes that aim further than the improvement of health and seek the maximization of biological fitness, either individually or collectively. Biological fitness could tend towards the diminution of human diversity. Its promotion was the programme of the Darwinian extremists of the eugenics movement, including many who would not have counted themselves as such. It was discredited by the results of racial purity ideologies that brought about the Shoah as well as prejudicial and murderous acts against other minority groups.¹²⁵ However, theology must still place a question mark over any programme for the genetic improvement of the human species. There is a common vocation for humans specific to them: "to glorify God and enjoy him for ever."¹²⁶ All human lives fulfil it. It is not only available to those who satisfy criteria of something called "normality". Obedience to the command implied in the divine election and call includes many ways other than the furthering of genetic fitness in which we humans can promote our welfare.

(e) Time and history

(i) The common-sense time of evolution

There are no obvious Darwinian parables to point to the complex nature of the time as envisaged by Barth and referred to in our earlier section concerning saga.¹²⁷ Such might possibly be found in physics where, in recent cosmology, time is by no means seen as having the unique flow known by biology and common sense, but depends on the location of the observer. In the time of Einstein's Special Relativity simultaneity loses its meaning.¹²⁸ In a particular case known as "the bubble universe", "what appears as endless time to an outsider appears as endless space at each moment of time to an insider."¹²⁹ Another so far theoretical construction envisages space-time existing as infinitesimal particles.¹³⁰ However, for Darwinian biology, time is the unproblematic background against which the

¹²⁵ Sterelny and Griffiths, *Sex and Death*, pp. 4-5.

¹²⁶ From *Westminster Shorter Catechism* (c.1640), found at <<http://www.reformed.org/documents/WSC.htm>> downloaded 06/06/2012.

¹²⁷ See Chapter 3 (5) (d).

¹²⁸ Einstein, *Special and General Theory*, pp. 17-27. For an exposition and interpretation by a physicist of Barth's understanding of the relation between time and eternity see Hilary C. Martin, 'Eternity and Temporality in the Theology of Karl Barth', *Science and Christian Belief*, October 2009, pp. 101 - 110.

¹²⁹ Greene, *Hidden Reality*, p. 68 -71.

¹³⁰ Lee Smolin, 'Atoms of Space and Time', *SA*, Jan. 2004, pp. 56-65, also Michael Moyer, 'Is Space Digital?' *SA*, Feb. 2012, pp. 20-27

essentially chemical processes of life take place, at different rhythms according to the organism in question. In almost every instance, such life processes are powered, directly or indirectly, by the Sun's energy, as they temporarily organize less ordered matter. As time flows this order breaks down again. In that way the total disorder of the closed universe, the only one so far of which we have any empirical understanding, inevitably increases.¹³¹ That process defines the arrow of time.

Since there may be other possibilities, possibly empirical, certainly logical, mathematical or purely imaginative, the time of Darwinian biology must also be seen as a working hypothesis.

Understood as a parable it points very directly, not to the complex time of saga, but to the inescapable givenness of time as humans normally experience it. It flows in only one direction. This is our time. It is that time which most directly concerns theological anthropology. It is the time which human history has to do with. In a sense we are contained within it. God is not governed by it. We are.¹³² For, according to Barth, God's extratemporal decree of grace in its execution and actualization posits time as "the form of existence" of the creature.¹³³ This is a corollary of his understanding that the physical body, subject to time, is the form of the soul. Yet it is not to be seen as a straight jacket. It is indeed an unavoidable feature of the human condition and also, as "given time", a loving gift from the Creator.¹³⁴

(ii) Non-historicist history: Darwinian time

Darwinian biology flowing in the familiar common-sense time stream contributes to a much wider narrative than the human story. That can be understood as a further parable. As we saw in Chapter 2,¹³⁵ evolutionary thought delineates a complex of closely interrelated histories of the past of the planet depending on whether collectivities of organisms, the organisms themselves or components of organisms are under consideration. Such histories are prior to and inextricably interconnected with histories purely of human activity.¹³⁶ Human-centred histories can be carefully assembled from well-attested sources and with the obscurities, difficulties and less secure hypotheses not hidden. They then have an integrity not possessed by large-scale tendentious explanations driven by ultimately unsuccessful historicist ideologies. The latter may be Hegelian or otherwise, including Marxist or fascist: some may have nationalist or racist agendas, explicit or covert.¹³⁷ Various religious or Christian versions

¹³¹ The second law of thermodynamics: the entropy (disorder) of a closed system always tends to increase. There is a large family of microorganisms whose life processes do not depend in any way on photosynthesis; the second law of thermodynamics is nonetheless equally applicable to them.

¹³² CD IV(3.1), p. 144.

¹³³ CD III(1), p. 68.

¹³⁴ CD III(2) pp. 511-533.

¹³⁵ Chapter 2 (3) (b).

¹³⁶ Diamond, *Guns, Germs and Steel*.

¹³⁷ Karl Popper, *The Poverty of Historicism*, 2nd edition, corrected (London: Routledge, Keegan, Paul, 1961). For a parallel view, trenchantly expressed in 1950, see C. S. Lewis, 'Historicism' in *Fern seed and Elephants*, ed. by Walter Hooper (London: Fontana-Collins, 1975, pp. 44-64). Lewis holds that Darwinian and other scientific

of history, like the old histories of Israel by Bright or Noth may fall into a similar category.¹³⁸ By contrast, to those historicist narratives, Darwinian biology has explanatory power and authority as history stemming from a widely applicable working hypothesis, about the way living entities and their components succeed each other and develop through the familiar biological time. That story is well supported not just by analysis of remnants from the past, but by experiments and observations carried out in the present where evolution principally driven by natural selection can be shown to be at work. The working hypotheses of Darwinian history are anchored in empirical data of various kinds. As effect follows cause, they witness as a parable to the reality of time as it is known by human beings and point to its theological status. Time is real and a property of the created world, it has no meaning or prior nature in itself. It is “relativized but not discarded”.¹³⁹ “Relative” does not for Barth mean valueless or of no importance. It means that that time is not an absolute, it has in itself no divine status. So we may agree with him in the way that the Darwinian parable obviously points. Time is vital as the genuine fabric of every kind of biological life including the enfleshed existence of the Logos. Further, in spite of its significance beyond time, the earthly life of the Son of God proceeds from conception to death, in the same succession of momentary instants, as that of every other human person.

(f) History and biology

There is one important caveat to all human history. We usually understand *Homo sapiens* as the chief subject of history, and indeed the relation of that species to its creator is the theme of the present work. However, the assumption that the story of the planet can be told as though humanity were of unique importance is itself a historicist one. We have just seen that secular historicism, driven by ideology, fails. But neither Barth nor theology in the stream of Barth sanctions any historicist scheme. That is even the case for “Christian” philosophies of history. Such a history cannot, for instance, see into the future and depict or prophesy the way in which the kingdom must come. The “transition from faith to sight” is not in the hands of the Christian Community.¹⁴⁰

Darwinian history is itself able to draw on explanatory principles, which help to make sense of the developing story of the natural world. However, it cannot reliably peer into the future any more than theology can. It cannot, for instance, make use of the idea of progress since that has no self-consistent definition. Progress cannot be understood as an increasing complexity through time, since

explanations, though open to suspicion, are less tendentious than other kinds of history. For Lewis the only genuine history is via revelation -- but we get of this no more than we need -- a less complex but not dissimilar view to that of Karl Barth. For salvation history (not the history of man’s religious quest) which encloses all other kinds of history see CD III(1), pp. 59-61.

¹³⁸ Martin Noth, *The History of Israel*, trans. by Stanley Godman (Edinburgh: T&T Clark, 1958), John Bright, *A History of Israel*, 3rd edition (Philadelphia: Westminster, 1981).

¹³⁹ CD III(2), p. 456.

¹⁴⁰ CD IV(3.2), p. 715.

species do not necessarily change in that way.¹⁴¹ For instance, the whale is arguably less complex than the hippopotamus-like creature which is its probable ancestor.¹⁴² Neither can it be a case of better adaptation to its environment since each is well adapted to its habitat. There are also contingent events, volcanic clouds, collisions with asteroids, shifts in the Earth's climate, which would rupture any steady progression. For all we know there might have been tiny chance changes in the constitution of the Cambrian sea which favoured chordates, the remote ancestors of humans, rather than quite different creatures among its teeming life.¹⁴³ Where a species is not widespread, as was probably the case at one stage for *Homo sapiens*, there is a risk that quite small-scale happenings could cause local catastrophes and extinctions. From the biological point of view the preservation and continuation of any given local species is pure chance. That discussion of the relative importance of such events and processes in the past continues. Biological change is real in time, but it is impossible in advance to assign a unique direction for it.

If the evolutionary story of life on this planet has no predictable course it is impossible to speak of its culmination. The representation of the tree of life, if it were possible to complete it, would trace the relationships of several million species. Understood as a parable it further makes it clear that in the story of life there are no central actors. Humans cannot have a leading role in some triumphant narrative.¹⁴⁴ From the evolutionary point of view *Homo sapiens* is simply one of the class of mammals, some of which may not have reached the limits of their evolution. It is true that humans have a number of capacities, including intellectual ones, as well the ability in a limited way to look ahead and consciously adjust to different environments. Nonetheless, other creatures in our world are also evolving and may be nowhere near their limits. We adopt the human perspective because we have no other. From the point of view of other successful species, say *Periplaneta americana*¹⁴⁵ or *Rattus norvegicus*,¹⁴⁶ things would and will look very different, although we cannot say in what way. According to theology in the stream of Karl Barth, only the text relating to the human person, as delineated by revelation, is known.

The significance as parables of the above factors is that theological anthropology needs to keep a sense of proportion. The doctrines of election and incarnation do indeed truly inform us that humanity has a special place within God's scheme and a particular vocation. But this is not because of

¹⁴¹ This paragraph draws on Sterelny and Griffiths, *Sex and Death*, pp. 280-310, and Ruse, *Discontents*, pp. 195-202.

¹⁴² Ruse, *Discontents*, p. 87, p. 202.

¹⁴³ Sterelny and Griffiths, *Sex and Death*, p. 290.

¹⁴⁴ Chapter 5 (4) (a) (iv).

¹⁴⁵ A particular insect, in fact one of the common cockroaches associated with human habitation. See Lancelot Borradaile and others, *Invertebrata*, 4th edn rev. by G. A. Kerkut (Cambridge: Cambridge University Press, 1961) p. 483.

¹⁴⁶ The Cambridge palaeontologist Jennifer Clack tips an evolved form of the common rat as the likely successor on Earth to the human race (documentary on BBC4 17/04/2012 and personal communication).

any natural qualities the species may possess. Revelation says little about the ontological status of other living things. As we have seen, this does not mean that we are absolved from thinking about them or making of them, in different ways as far as we are able, the objects of our concern. Each has its own history both in empirical terms and before God in its own being, whether or not we can understand any of it. It may have a connection with our human life and may even be inextricably linked with it. Whether this latter is the case or not, we owe other forms of life the respect they deserve as part of God's creation. In view of their many hundreds of thousands of different species, J. B. S Haldane suggested, ironically or humorously, that God might have "a special preference for beetles".¹⁴⁷ Seen as a possible parable of a divine perfection known through revelation, the fecundity of nature might be read alongside Jesus' picture of the God who notices the fall of the sparrow and points to a providential care beyond imagination.¹⁴⁸ Humans are indeed not God's only concern.

(g) Human finitude

Death is a condition of life. From the point of view of the working hypothesis of natural selection the death of a complex organism is inevitable. Biology makes it clear that the greatest proportion of the molecules, composing the body and their component atoms, are subject to exchange with those in the environment around it. Apoptosis, death of individual cells, happens all the time. It is an essential feature of the cell's program. When worn out it dismantles itself and the waste products are excreted. The different mechanisms that provoke cell death and maintenance in life are finely balanced. Humans and other animals live on a knife-edge. If excess cells fail to die but proliferate, autoimmune disease or in another case cancer are the results.¹⁴⁹ There are physical properties which establish the time span of a multicellular living organism. Our kind of creature is composed of a number of interconnected systems. Each one is vital to the functioning of the other. However failure of a system is not as it were programmed in a time limited way. The limitation is stochastic. The actual time span in a given organism has a chance distribution. One factor may be the eventual wearing out of genetic material attendant on cell division. The ends of strands of DNA are protected by a large number of inert telomeres, which keep breaking off and are not replaced. Finally, the DNA is damaged and the functioning of the living cell deteriorates over time. This process finally concludes with a collapse in the organization of the living thing and death. As long as the planet persists at something like its present

¹⁴⁷ Quoted in the report of a lecture by J. B. S. Haldane in *Journal of the British Interplanetary Society* (1951), Vol. 10, ref. from Elizabeth Knowles (Ed.), *Oxford Dictionary of Quotations* (Oxford: Oxford University Press, 1999), p. 356(b). By 1992 about 450,000 species of beetle had been described, see P. M. Hammond, 'Species inventory' in *Global Biodiversity, Status of the Earth's Living Resources*, ed. B. Groombridge (London: Chapman and Hall, 1992), pp. 17–39.

¹⁴⁸ Matthew 10:24-36, Luke 12:1-12.

¹⁴⁹ Elliott and Elliott, *Biochemistry and Molecular Biology*, pp. 512-516.

temperature and atmospheric composition, the chemical constituents can be reincorporated into other organisms, issuing in new life.

The above factors entail that there are physical constraints attached to human life, which, although in some ways quite obvious and banal, are nonetheless clarified by Darwinian biology. All this happens in different ways in different living systems. The process of ageing is very complex and is the subject of intensive research. Yet, whatever the mechanism, physical deterioration after the end of reproductive life in a given organism cannot, usually, be remedied for future generations of the species by the mechanism of natural selection. There might be selection in favour of extended life after reproduction if the activity of grandparents gave the grandchildren a better chance of survival. However attempts to model mathematically that state of affairs have not yet produced agreement.¹⁵⁰ What is at present understood of biology suggests that an end to empirical life of individual humans will always be inevitable.

Must the species suffer the same fate as the individual? As we have seen, historicism is forbidden. Theology cannot write a history of the future.¹⁵¹ However, biology contributes to what we might call a secular eschatology. Each species is time limited.

“Extinction is normal.”¹⁵² That is what the fossil record suggests. There is no reason to expect any different outcome for humans. From a Darwinian perspective, humanity is unlikely to last any longer than the 160 million years of the dinosaurs: “the most successful terrestrial animals to ever inhabit the earth”.¹⁵³ The human propensity for self-destruction on a massive scale suggests a far shorter span. Even if this were not so, the working hypotheses of geology and geophysics point to times in the history of the planet when profound cold, searing heat or the catastrophic consequences of continental drift would have made life as we know it impossible.¹⁵⁴ No reason is known why such events should not reoccur. In any case, the physics of the solar system predicts a limited life for the planet. Although no number can be assigned to the probability of extinction, there are many sound reasons for seeing humanity as very specifically located in time and in space. Any theological anthropology must be aware of this.

¹⁵⁰ Hawkes, K ‘Grandmothers and the evolution of human longevity.’ *American Journal of Human Biology*. 2003 May-Jun;15(3):380-400. A. Friederike Kachel, L. S. Premo, and Jean-Jacques Hublin, ‘Grandmothering and natural selection’ *Proc Biol Sci*. 2011 February 7; 278(1704): 384–391. Elliott and Elliott, *Biochemistry and Molecular Biology*, p. 347. For a review of work on ageing see T. B. L. Kirkwood, ‘Understanding ageing from an evolutionary perspective’, *J. Intern. Med.* 2008; 263: 117-127. It turns out that at least one organism, the freshwater hydra, is immortal (p. 117). For an overview with references to some more recent research see T. B. L. Kirkwood, ‘Why can’t we live forever?’, *SA*, Sept. 2010, pp. 24-32. Dawkins, *Selfish Gene*, 2nd edn, pp. 40-42. Nessa Carey. *The Epigenetics Revolution* (London: Icon Books, 2012) p.228.

¹⁵¹ Chapter 5 (4) (d).

¹⁵² Sterelny and Griffiths, *Sex and Death*, p. 205. For another aspect of “scientific eschatology”, so described by its author, see Donald Goldsmith, ‘The Far, Far Future of Stars’, *SA*, March 2012, pp. 26-33.

¹⁵³ Gregory M. Erikson, ‘Dinosaurs: the model system for evolution’, Ruse and Travis, *Evolution*, p. 517.

¹⁵⁴ Ted Nield, *Supercontinent: Ten Billion Years in the Life of Our Planet* (London: Granta, 2007).

The created condition of humanity, for the individual as well as the species, is one of impermanence. Humans like all other organisms are made from the dust of the Earth and on death decay into it. Of course, it did not need Darwin and his successors to point out that humans are mortal. However, the biological inevitability of this state of affairs offers an emphatic parable of the theological given of human finitude. Finitude is the ontological reality of the human condition, individually and collectively. The elect status of humanity indicated by revelation does not cancel out that reality. Indeed, we must see it as part of the human vocation.

The good creation of God, as understood by theology in the stream of Barth, has both positive and negative aspects. Moreover, Darwinian science points to something that modern, especially Western humans, find increasingly difficult to grasp: suffering and loss are unavoidable features of life in general and human life in particular. Some of it is an integral part of the natural world, the contest between predator and prey is one example. Others, for instance cancer, whether in humans or animals, may perhaps be contingent. It might have been otherwise. Apparently Darwin himself, as we have noted earlier, found such things impossible to reconcile with the existence of a good God.

However, many philosophies and religious traditions have looked for a way out of the perceived prison of finitude. John Hick made a careful survey of many of them and added his own speculations. One of those makes a distinction between the penultimate and the ultimate destinations for the human person after the death of the body. He thinks that there may be evidence concerning the former, which he calls the para-eschatological, while for the latter, the eschatological, the best we can hope for is a kind of sense of direction pointing to what it may be.¹⁵⁵ Much has been written on those topics since then and it is impossible to deal adequately with it here. One set of theological speculations, surveyed by Christopher Southgate, includes an eternity for all living creatures, for which their known finitude is some kind preparation.¹⁵⁶ Surely, goes the argument, the goodness of creation and the Creator must imply some such provision. I cannot do justice to these arguments, including Southgate's own proposals, in the space available.

These two authors witness to the ways in which much theology in widely different faiths and traditions is motivated by the desire to escape human finitude and its consequences in the way of limitations and weakness. Nonetheless, from the point of view of theology in the stream of Barth speculation about anything we cannot learn from God's revelation in Jesus Christ through Scripture is of little value. Our biological parable underlines the biblical witness which offers little, if any, support for that aspect of religion.¹⁵⁷ Humans are not immortal. It is a mistake to see finitude, which religion has sought to evade, as an evil consequence of the nothingness which is the enemy of God's creation.

¹⁵⁵ John Hick, *Death and Eternal Life* (London: William Collins, 1979), p. 22.

¹⁵⁶ Southgate, *Groaning of Creation*.

¹⁵⁷ See Chapter 1 (4) (e) re Joel Green.

According to Barth the result of that has been to allow scope for the real nothingness, the *nihil*, including the denial of the goodness of creation, to take charge.¹⁵⁸ It is not clear here what general target Barth is aiming at, though he does point to Marcion and Schopenhauer. In any case misidentification of what is an aspect of the goodness of the creation as the enemy leads in his view to a total failure to understand the human situation, and in particular to appreciate the real nature of sin. Barth's position may seem at first counter-intuitive, but the signs are all around us, both of a denial and of an over-preoccupation with death. One aspect of the former may be, in the West, its medicalization of life and death, as well as encouragement for memorial occasions held without a coffin in sight. Sometimes all solemnity is absent from the proceedings. The cult of violence in the media exemplifies the over pre-occupation. Yet natural life cannot be indefinitely extended in time.

Biology, for reasons readily understandable from the working hypothesis of natural selection, dictates finitude for the kind of organism we are. It provides likely reasons why this is so, and offers an emphatic parable relating to the reality of the human person already indicated by revelation. Theologically, any existence outside or beyond the time of human earthly experience must be the gift of the gracious God who "loves in freedom".¹⁵⁹ According to theological anthropology in the stream of Barth, human life, in God's good creation, has a boundary. That boundary is God's own self.

(h) Miracles

Natural science does not deal in miracles. Its chief working hypothesis is the uniformity of nature. It is apparent deviations from this principle which trigger investigations and in many cases further progress.¹⁶⁰ However, the hypothesis has recently been upset by speculations (in Popper's sense metaphysical), that other universes may exist in which numbers that were previously thought to be constants, which determine the behaviour of matter/energy, are in fact different.¹⁶¹ So far, we do not know whether these suggestions point to fruitful lines of investigation. However, the uniformity working hypothesis has in effect now changed to refer only to that part of nature which is accessible to us, that is to say within our universe.

Such uniformity is thus a rule applied to star systems, stardust and everything in between. It is true that in the case of quantum physics we are referring to a uniformity of probability, so, different large enough samples from the same source produce in each case a like distribution of similar events. However, uniformity of nature is a much more difficult rule to apply to the complexities of biology: above a certain level of organization, behaviour in detail is impossible to predict, although it may well

¹⁵⁸ CD III(3), p. 299-312.

¹⁵⁹ CD II(1), pp. 257-321.

¹⁶⁰ John Stuart Mill, *System of Logic*, 8th edition (London: Longmans Green, 1891), p. 201.

¹⁶¹ See for instance Alejandro Jenkins and Gilad Perez, 'Looking for Life in the Multiverse: Universes with different physical laws might still be habitable', *SA*, Jan. 2010, pp. 28-35; also Greene, *Hidden Reality*.

be explicable after the event. Nonetheless, it remains a comprehensively applicable working hypothesis. Even when we are considering human biology, or in the even more difficult case psychology, the consistent assumption is always that the same causes will produce the same effects. Any apparently different outcome would constitute unfinished business. Therefore, the original uniformity hypothesis has served natural science well, and the less comprehensive successor would still forbid the nature miracles of Jesus as well as the virgin birth and the resurrection. All of them would involve molecules in physical and biological systems behaving in ways that are not elsewhere observed. Those are certainly not natural events. We can therefore see the uniformity hypothesis as a “secular parable of the truth”. It is pointing at any theology that admits the miraculous, and suggesting that it recognize frankly that its subject matter cannot be assimilated to that of natural science. Acceptance of miracles has to be a theological decision. In particular, that has to be the case for the doctrine of the human person, whose real life is a continuing event, within a physical frame, enabled by the Spirit, and consequently miraculous in itself. As we suggested earlier, we can agree with Barth that natural science can have nothing to say about such acts of God, although human physicality, in all its aspects, is within its field.¹⁶²

(5) The argument of this chapter

We began this chapter by asking if there was any possibility of genuine dialogue or conversation between two such different partners as the physicalist Darwinian biology of the human person and theological anthropology in the stream of Karl Barth. The obstacle was the lack of a common language. We saw that even between and within the natural sciences there were communication problems, which were not simply misunderstandings and indeed sometimes were inherent in the very different nature of the subjects under consideration. We noticed however that if the conversation was about a given well-specified subject then communication had to be possible. In our case, we saw that attention to our subject matter of the human person might provide a possibility of fruitful dialogue. Following Barth, we chose parable as a suitable mode for this proposing to consider scientific working hypotheses as parabolic texts. That is say we were to look for findings with discoverable surpluses of meaning going beyond their primary empirical reference, what Barth calls “true words”¹⁶³. We therefore explored different examples of parable and it became clear that the scientific examples should demonstrate integrity and already be making fruitful contributions to empirical science. However, parables, for instance the gospel ones, do not depend for their effect on precise correspondence to a real-life event. The working hypotheses of natural science can function in a like way although they are liable to correction. We suggested that they point to (without demonstrating) theological realities -- perhaps previously neglected ones. The Darwinian parables pointed to the

¹⁶² See Chapter 4 (3) (c).

¹⁶³ CD IV(3.1), § 69.2, “The Light of life”, especially p. 120.

wholeness and connectedness of all kinds of life and the necessity to develop Barth's maxim of "respect for life" to include not simply animals but plants as well. All living creatures have at the cellular level a commonality of structure and function, they are interdependent and humans are empirically kin with all. This is not any kind of mysticism. It is scientific statement. It is parabolic of and points to a theological proposition which asserts that there is an ontological continuity of human life with all other kinds of life, plant or animal. We know nothing about the inner reality of other creatures, what they are in themselves. We do know that humanity has a vocation. God's calls it to be God's covenant partner, elect in Jesus Christ, the pioneer human person. According to theology in the stream of Barth, the principle of individuation of organisms is the soul. That is the consequence of the Spirit's action within the finite domain of the body. The soul depends radically on the body, which is its form. The extraordinary genetic similarity between human beings across the world and the working hypothesis placing the human family within a tree of life are parables of the ontological oneness of humanity. That unity is not dependent on the details of human descent. The Darwinian account of human relatedness, in the phenomena it describes, provides an effective parable of both the unity and the diversity which subsist in the ontological reality of the one humanity. One common feature of humanity is the attempt to sweep death under the carpet. It thus denies its reality as part of God's good creation. There are well-understood biological reasons for a restricted span for human life, whether individually or collectively. As parables, they point to human finitude, bounded as it is by the gracious God.

CHAPTER 6

NATURAL SCIENCE POINTS TO REALITY

(1) What we have tried to show

Barth elaborated his theology in the first half of the twentieth century. In part, it was a protest against the style of liberal theology then dominating continental, Protestant academia. Its political context was the changing fortunes of German militaristic nationalism from 1914 to its utter defeat in 1945. Modern science, that is to say Einsteinian and quantum physics together with Darwinian biology, was well on its way to dominance over that time. Indeed developments in physical science found wartime applications that affected the course of world history. In spite of these enormous movements the, admittedly unfinished, *Church Dogmatics* contains few direct references to politics or to natural science. Such gaps now seem inexcusable in a major theologian. Others have developed some of the political implications of Barth's work.¹ The original feature of this dissertation is that it shows how Barth's theology and theology in the same stream are able to connect with natural science and, in particular, with the Darwinian understanding of the human person as without remainder a physical entity. Three things favour that connection. The first is that Barth already understands that as a human enterprise the conclusions of natural science concern phenomena. Secondly they are powerful and useful but provisional and incomplete. They are not about, ontological realities. They cannot tell us how things are in themselves. The third component is Barth's notion of secular parables. They describe a way in which such science can function in relation to theology. In spite of its epistemological uncertainties and ontological incapacity, science points to truths to which theology must pay attention. Our first example of that was the emphatic indication that a new and critical approach to scripture was needed to cope with Darwinian science. Our further examples dealt with a dialogue between our contrasting understandings of natural life. On the one hand we have the individual and particular and on the other the collective and communal. Different levels of organization and complexity display that dual aspect of the phenomena of life. That dialogue, with its ethical dimensions, is where we must situate our theological understanding of biological life, including that of the human person. The parables also strike a blow against delusions of grandeur and suggestions that we may aspire beyond human boundaries. For we are enclosed by grace.

We have thus found answers to our research questions. We have shown that our chosen theological perspective is able to deal with the challenges of physicalist biology without sacrificing its

¹ For instance, Gorringer, *Against Hegemony*.

major tenets. It therefore maintains its integrity and in particular its doctrine of the human person in relation to the rest of the living world. Barth's secular parables of the truth are thus the basis of a positive interaction between Christian theology and natural science. They have a proper place within the 21st century dialogue between science and religion.

(2) Beyond the academy

For the public role of theology in our own society, a scientifically informed dialogue about the nature of the human person is essential. As Marx already understood, soon after the publication of the *Origin*, when he sent a copy of *Das Kapital* to Charles Darwin, evolutionary science was to form one of the determining grand narratives for humankind in modernity. Marx's admiration subsided, but Engels remained an enthusiastic disciple, as were later followers.² In the late modern era, Marxism has retreated into the undergrowth of defunct or dormant ideologies. Now the structure founded by Darwin becomes more and more a focus of humanity's self-understandings expressed in public discussion. In the rhetoric of some would-be moulders of the public mind, at any rate in Britain, Darwinian biology is understood as more than the essential basis for a science. It becomes the basis of any intellectually respectable view of the human person.³ Inasmuch as it comprehends human life as in essence a physical phenomenon, it directly or indirectly provides support for the ideology of free market capitalism. This is directly the case where it is (wrongly) understood as providing a moral justification for unrestricted competition.⁴ It is indirectly so where it grounds a materialist understanding of finite humanity. Such a view excludes the possibility of any reality beyond the physical that might be the source of life and value. Therefore, the right interaction between Darwinian science and theology is essential. Some theological work is less fitted for that because it is too impressed by the undoubted achievements of a human understanding of humanity. A theology, such as Barth's beginning with revelation can place the provisional working hypotheses of natural science in a proper perspective. It should travel well beyond the academic sphere of "Theology and Religious Studies".

(3) Revelation in a late modern context

I have hoped in this dissertation to develop a way for the twenty first-century science of the human person to inform theology from revelation as well as being informed by it. Neither party should impose an imperialistic agenda. Barth's Trinitarian theology was elaborated in the mid-

² Francis Wheen, *Karl Marx* (London: Fourth Estate, 1999), pp. 363-369.

³ See various works by Richard Dawkins including *The Greatest Show on Earth* (London: Transworld Publishers, 2010), *River out of Eden* (London: Weidenfeld & Nicolson, 1995) and *The Selfish Gene*.

⁴ Witness an attack by President Obama on supposed "social Darwinists" in the Republican Party. For this and accompanying comment, see Christopher Caldwell, 'Obama's grasp of social Darwinism is yet to evolve'. *Financial Times*, 2 April 2012, p. 15.

twentieth century. He had only a limited understanding of the science then in progress. There were revolutions still to come. Nonetheless, it has resources fit for the challenges of late modernity. Natural science needs to learn from theology that each is a genuinely human enterprise. I have spoken of a quality of human life that I have named as “integrity”; it includes an honesty of intention which recognizes its own fallibility. It is engendered by the Word. Both natural science and theology should own it. When they do, there can be a dialogue which includes genuine listening and understanding for both sides.

The conclusions of Chapter 5 underline the variety and the complexity of life as well as its unity. They thus contribute to themes which the popular imagination has already taken up as a result of highly professional, scientifically based television programmes and books. That might be seen theologically as opening the possibility of a renewal of two-centuries-old argument of “The Wisdom of God in the Works of Creation” which Darwin did so much to render unpersuasive. Then the more detailed understanding of the molecular functioning of the cell and the key part played by DNA might have increased the sense of wonder caused by encounter with the natural world. Thousands of different mechanisms dovetail together. They continue to operate over the lifespan of the organism. Dynamic communities of different species interact. They depend one on the other. All this arouses our admiration at its subtlety and intricacy. However, media presentations have not hidden a darker narrative. There is a parallel and interwoven story of malfunction, disease and pain: life feeds on life. It is an inevitable feature of the natural world which makes some biological versions of the anthropic argument unconvincing. This points to what might be seen as a lack in the theological ambition of the present work: I have not tried to supplement the partial theodicy in Barth’s account of humanity’s place in God’s scheme of things. He speaks of the “broken light” and of “the persistent rejoicing of creation being accompanied by its equally persistent distress and lamentation”.⁵ For Barth “Existence in this constant movement constantly discloses itself in the twofold form of light and shadow”.⁶ However, our theology in the stream of Barth follows him in asserting the impossibility of those totalizing explanations, among which what he called cosmologies are examples. In the same spirit our conclusions emphasize the finitude of humanity. They point to its structural continuity with all other forms of life. They underline its interdependence with other creatures. Those are necessary correctives for ambitions that remain towards humanity’s mastery of its environment. We do not know if, empirically speaking, humans will be very significant in the story of the planet Earth. The importance they do possess is the result of the free self-giving of the Son of God as the covenant partner of every human person: for he calls each one into life. The further task for theological anthropology in the stream of Barth is to explore

⁵ For steps towards a theodicy referring mainly to the non-human creation with suggestions for an ethical stance towards it see Southgate, *Groaning of Creation*.

⁶ CD IV(3.1), p. 145.

more fully human responsibility in relation to other creatures and their common home on a finite planet.

The effect of all the above is to place natural science in a theological perspective. I have tried to justify a view that, in spite of its spectacular achievements and even larger claims, empirical evolutionary biology cannot hope to understand the way things truly are in themselves. As we saw, one reason for this is that it is conducted by finite and fallible creatures, constrained by the political, economic or personal, and with many other motives than the search for pure knowledge. To an extent, these limitations are counteracted by the expectation that scientific theories must be corrigible through experience of the empirical world. If this is not evident, they will eventually die a natural death. I allowed the qualification that there might be what Popper called in his special sense “metaphysical” statements, what one might call pioneer science which probed ahead of the empirically ascertainable and pointed to possible physically testable future theories. Thus, there may be better and better working hypotheses, theories relating to the world. They must include many relating to human persons, in increasing scope and detail. They may provide further opportunities to discern in parables truths that we might have discerned from revelation but whose ontological significance we had not appreciated.

It might be objected that the truths discerned through our parables might equally be made available from the empirical working hypotheses whether or not they function as parables. But that is not exactly the case. We return to our earlier characterization of ontological truth. It is fundamentally revelatory rather than empirical. The truth of things in themselves cannot be captured. It is beyond the empirical. We can only point to it. The designation of parables and the analogy with the parables of Jesus and their kingdom message allow us to hope for something we could not otherwise know, and know something we could not define.

Moreover, empirical theories can never comprehend the reality of created things, as known by and related to their Creator. They cannot arrive at anything we can call in any absolute sense “truth”.⁷ To those whose integrity makes them aware of their own fallibility, and so, whether or not they understand what they are doing, listen for the Word, revelation offers as much true knowledge of humanity as they can bear. Natural science in itself has constraints, not simply due to the incidental or self-inflicted limitations of the human condition but also more fundamental ones stemming purely from our particular kind of creatureliness.

The effect of the parabolic dialogue between such a theological anthropology and Darwinian science is to deepen our understanding of reality. Our humanity is grounded in the dust of Earth.⁸ We are inseparably joined with the other inhabitants of this limited, precious and precarious domain. The consideration of secular parables of the truth leads us to reflect that in our finitude our

⁷ For truth see chapter 1(1) (b).

⁸ Genesis 2:7, 3:19, KJV.

human vocation is to “seek the welfare of the city”,⁹ while holding to the hope for another “city that has foundations, whose architect and builder is God”.¹⁰

⁹ Jeremiah 21:7, NRSV.

¹⁰ Hebrews 11:10, NRSV.

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GLOSSARY

Chordates: animals with a hollow nerve canal along the back – they include vertebrates.

Eukaryotes: organisms with nucleated cells, there are several million species including humans.

Membrane: the thin and differentially permeable partition which surrounds a collection of cells, a cell, or functional units within the cell. The same word (also **brane**) is used in cosmology referring to an independent and so far theoretical, multidimensional manifold with its own space--time which may be “thin” in some of its dimensions and contained within entities having more dimensions analogous to the way in which a flat object can be contained within a three-dimensional one.

Nucleus: the central part of an atom composed of protons and associated with neutrons all surrounded by electrons.

Nucleus: the complex component in a living cell which contains its genetic DNA.

Phenotype: total appearance of an organism determined by the interaction between its genetic constitution and the environment.

Prokaryotes are organisms whose cells are without nuclei.

Resonance: see for instance Catherine E. Housecroft and Edwin C. Constable, *Chemistry: An Integrated Approach* (Harlow: Addison Wesley Longman, 1997), p. 231, where the properties of water are explained by three apparently inconsistent arrangements of its components of hydrogen and oxygen, each of which makes its percentage contribution to the structure as determined by physical methods. This is called a “**resonance** structure” and is a feature of many chemical species of molecule, ion, free radical and others. It depends on quantum mechanics for its explanation, **resonance**, also appears in the theory of sound describing the way in which organ pipes, taut strings or enclosed or partially enclosed spaces respond to musical notes separately generated. The common term “**resonance**” arises from the way in which related mathematics is used to characterize these quite different physical situations.