

INTRODUCTION

The Christian concept of the human soul usually means life for the body, rationality, the spiritual within, and a carriage through death into eternity. Many think of the soul as “something that goes somewhere else when the body dies.”¹ For centuries the theological understanding of soul included the idea that the human being was both spiritual and material. In Western Catholicism, catechesis and preaching felt the anxiety for the destiny of the soul after the dissolution of the human being.² The soul appeared before Jesus Christ for judgement: welcomed in heaven, sent for purification to purgatory, or eternal punishment.

Questions about the soul that have traditionally been asked in philosophy and theology are being raised in other contexts. For example, modern biology demonstrates the role of the brain in how people experience meditation, liturgy, and religious behaviour.³ Even consciousness is of increasing interest to scientists and philosophers.⁴ Religious people may sometimes feel threatened by scientific studies which locate consciousness and memory in brain processes. Others see a need to defend the traditional account of soul to affirm human dignity.⁵

To many people it appears intuitively improbable that our “most private feelings, original perceptions, special skills, hard-won achievements – our individuality, consciousness, our very souls and our ability to explain ourselves in language – are entirely determined by the electrical-chemical activity of a soft, wrinkled, grey-and-white lump of matter that you could comfortably hold in one hand.”⁶ Similarly, “I

¹ John Garvey, “Christianity isn’t ‘spiritual’,” *Commonweal* Vol.122 No.9 (5 May 1995), pp.8-9

² Pietro Stella, *Don Bosco*, translated by Alan McDonald SDB (Ascot Vale, Victoria: Salesian Province Centre, 2004), p.30

³ Rich Heffern, “Our brains are wired for liturgy,” *National Catholic Reporter* Vol.46 No.10 (3 March 2010), p.1 & p.18; Joel Stein, “Just say Om,” *Time* No.30 (4 August 2003), pp.48-56. This cover story featured the front page title, ‘The Science of Meditation’.

⁴ Nicholas Humphrey, *Soul Dust: The Magic of Consciousness* (Princeton, New Jersey: Princeton University Press, 2011); Rich Heffern, “Consciousness: Science’s biggest mystery,” *National Catholic Reporter* Vol.44 No.12 (8 February, 2008), pp.7-9.

⁵ Keith Ward, *Defending the Soul* (Oxford and Chatham, New York: Oneworld, 1992); Paul Badham, *Christian Beliefs about Life After Death* (London: SPCK, 1978), who defends Cartesianism in chapter 6, ‘A Defence of the Concept of the Soul’, pp.97-104

⁶ Sheila Hale, *The Man Who Lost His Language, A Case of Aphasia* (London and Philadelphia: Jessica Kingsley Publishers, 2007), p.104. Sheila Hale writes about her late husband Sir John Hale. “Before John’s stroke the mind-body problem was for me an abstract issue, somehow unrelated to the anatomy and physiology of the unlovely organ that apparently makes all of us what we are.” (p.104)

still can't believe that human beings are wholly contained in the bowl of porridge inside our heads."⁷

Nevertheless the centrality of the brain is now held to have significance for understanding human identity and ethics.⁸ It is commonplace to hear that the brain is the "most complex and least understood organ in the human body. It is the source of free will, personal identity, and other dimensions of the self, which is why information about the brain is so sensitive and must be protected."⁹ Frequently the spiritual soul is substituted by the material brain; even the human genome is postulated as the secular equivalent of the soul.¹⁰ This has led some to ask, 'whatever happened to the soul?'¹¹

There is also a popular idea that a 'God spot' has been found in the brain.¹² Alternatively it might be, "a spirituality gene, or a neural mechanism coded to seek transcendence."¹³ If this is true, in the Magnificat hymn (Luke 1:46-55) when Mary said that her 'soul magnified the Lord,' was she declaring "that her brain magnified him? Those scientists who equate consciousness exclusively with activities of the brain would say that is the case."¹⁴ Mind or consciousness has become a 'mortal soul', not the immortal soul of theology.¹⁵

⁷ Susan Wyndham, *Life in his Hands: The True Story of a Neurosurgeon and a Pianist* (Sydney: Picador, 2008), p.286. Wyndham writes about Charlie Teo, a notable but controversial Australia neurosurgeon; and Aaron McMillan (1977-2007), a young classical pianist. When McMillan was 24, he was diagnosed with aggressive, rare brain tumour, which Dr.Teo operated on and enabled the young pianist to continue performing until his death.

⁸ Walter Glannon, "Neurobiology, Neuroimaging, and Free Will," *Midwest Studies In Philosophy* Vol.XXIX No.1 (September 2005), pp.68-82

⁹ Glannon, *Neurobiology*, p.82

¹⁰ Alex Mauron, "Is the Genome the Secular Equivalent of the Soul?," *Science* Vol.291 No.5505 (2 February 2001), pp.831-832 (p.832)

¹¹ Eric L.Johnson, "Whatever Happened to the Human Soul? A Brief, Christian Genealogy of a Psychological Term," *Journal of Psychology and Theology* Vol.26 No.1 (Spring 1998), pp.16-28; Patrick D.Miller, "Whatever Happened to the Soul?," *Theology Today* Vol.L No.4 (January 1994), pp.507-510

¹² The expression 'God Spot' was coined by Steven Connor, "'God Spot' Is Found in Brain", *Sunday Times* (2 November 1997), p.9. He was reporting the findings of neuroscientist Vilanayur S.Ramachandran and others. Ramachandran used the term 'God module'.

¹³ Robert Wuthnow, "Cognition and religion, (2006 Paul Hanly Furfey Lecture)," *Sociology of Religion* Vol.68 No.4 (Winter 2007), pp.341-360 (p.343)

¹⁴ Rich Heffern, "Rethinking the soul," *National Catholic Reporter* Vol.44 No.12 (8 February, 2008), p.8. Cf. Susan Greenfield, "Soul, Brain and Mind," in M.James C.Crabbe, (ed.), *From Soul to Self* (London and New York: Routledge, 1999), pp.108-125

¹⁵ Greenfield, *Soul, Brain and Mind*, p.108. Greenfield says scientists would be dismayed if they opened books such as Paul Churchland's *The Engine of Reason, the Seat of the Soul* (1995) to find that there is nothing about "the quintessential feature, *immortality* of the soul, but rather focus on the mind, brain and consciousness." (p.108)

This thesis proposes that a contemporary Catholic understanding of the human soul needs to be aware of and responsive to developments in the study of brain and mind by modern philosophy and science. It supposes that these developments might make real contributions to Catholic thought, without necessarily being in conflict with it or seeking to replace it. Before outlining the investigation, we wish to set the scene in a fuller way.

Fade-out of the Soul

Historically, science has been influential in debates over the nature of humanity.¹⁶ This continues to be so. For instance, it has recently been asked whether the genome might correspond with soul. “By placing all our hopes (and fears) in our genes, we are fueling the expectation that the human genome will be the last word about human nature.”¹⁷

Neuroscience, or study of the brain and nervous system, prompts questions about the soul, mind, self, free will, consciousness, intentionality and how these relate to the brain.¹⁸ There is so little consensus, however, that in the twenty-first century, there does not appear to be “a generally agreed account of what former generations referred to as the human soul...despite rapid advances in detailed knowledge of brain chemistry, we seem no closer to a single theory about the relationship between human autonomy and natural brain chemistry.”¹⁹ Still many see the human soul being reinvented in light of the neurosciences and technology.²⁰

On the other hand, sceptics envisage souls as immaterial clumps of “Godstuff” that control material bodies and are the source of meaning and emotions: “this idea of immaterial souls, capable of defying the laws of physics, has outlived its credibility thanks to the advances of the natural sciences.”²¹ In the popular imagination, it seems

¹⁶ Robert Bud, “Life, DNA and the model,” *British Journal for the History of Science* Vol.46 No.2 (June 2013), pp.311-334

¹⁷ If science uses the term soul, it is generally in the sense of a self-aware mind with moral sense and free will. Steve Paulson, *Atoms and Eden: Conversations on Religion and Science* (New York: Oxford University Press, 2010), p.1.

¹⁸ David T. Bradford, “A Critique of ‘Neurotheology’ and an Examination of Spatial Perception in Mystical Experience,” *Acta Neuropsychologica* Vol.10 No.1 (2012), pp.109-123

¹⁹ John Cornwell, “Maps of the mind,” *The Tablet* Vol.249 No.8089 (19 August 1995), pp.1048-1049 (p.1048)

²⁰ John Cornwell, “Dissecting the soul,” *The Tablet* Vol.250 No.8143 (31 August 1996), pp.1128-1129; Paul J. Werbos, “Neural networks and the experience and cultivation of mind,” *Neural Networks* Vol.32 (August 2012), pp.86-95

²¹ Daniel C. Dennett, *Freedom Evolves* (New York: Viking, 2003), p.1

angels are more likely to be accepted than souls.²² Yet for others, there is a sense that a world with room for angels can also make space for the human spirit.²³

In any case, persons are increasingly seen as an assembly of about a hundred trillion cells, of thousands of different types. Host cells are mindless, mainly autonomous micro-robots. Since we are conscious, it is argued, we must have conscious selves consisting of those little parts, “trading in a supernatural soul for a natural soul... That is, “we can and should replace these sacrosanct but brittle traditions with a more naturalistic foundation.”²⁴

This philosophical view is known as ‘physicalism’ wherein humans are totally explicable in material terms, becoming complex biochemical machines.²⁵ The universality and determinism of the laws of physics means that the physical universe is a closed system. Nonphysical entities cannot affect anything physical. A spiritual soul is thought irrelevant, because it cannot influence what is said or done or what is happening inside the brain. “Your brain, as much as the rest of your body, is under the complete control of the laws of physics.”²⁶

In this context religious people may ask, do we still need the soul, particularly if we no longer speak about the soul?²⁷ There is a disinclination to discuss the soul because of its unwelcome overtones of body-soul dualism. Again, if the brain resembles a computer, human thought may be wholly material.²⁸ There is lessening philosophical acknowledgment that immaterial, irreducible activities of the human intellect and will have their source in the immaterial, irreducible nature of the human soul.²⁹ This is also because humans are regarded as undividable from nature and evolution.

²² Tony Walter, “Angels not souls: popular religion in the online mourning for British celebrity Jade Goody,” *Religion* Vol.41 No.1 (March 2011), pp. 29-51.

²³ David Albert Jones, “Angels as a guide to ethics,” *The Pastoral Review* Vol.4 No.1 (January/February 2008), pp.11-16

²⁴ Loyal Rue, *Religion is Not about God: How Spiritual Traditions Nurture Our Biological Nature and What to Expect When They Fail* (New Brunswick, New Jersey and London: Rutgers University Press, 2005), pp.2-3. & p.306

²⁵ Stephen M.Barr, “More than Machines,” *Commonweal* Vol.136 No.20 (20 November, 2009), pp.16-20. Barr is professor of physics at the University of Delaware, in the United States.

²⁶ Barr, *More than Machines*, p.16

²⁷ Francis Selman, “Do We Still Need a Soul?,” *Priests & People* (April 1994), pp.149-152

²⁸ Selman, *Do We Still Need a Soul?*, p.149

²⁹ As observed by W.Norris Clarke, S.J., *The One and the Many: A Contemporary Thomistic Metaphysics* (Notre Dame: University of Notre Dame Press, 2001), pp.258-259

Interestingly, although the soul was seen as in the hands of the Church, it was not out of bounds for modern philosophy and science. Philosopher René Descartes (1596-1650) studied brain-behaviour relationships,³⁰ and questioned whether living things were animated by souls. Descartes denied that it was the soul which conferred life on living entities. Creatures die, he insisted, because a principal part of the body degrades and not because the soul leaves the body.³¹ Thus a live animal is compared to a watch which has been wound up, and a dead animal to one which has run down.

In the face of all this, Christian scholars have not been afraid to continue to investigate the universe. In fact, the Middle Ages saw the advent of a group of theologian-natural philosophers who were important in the coming scientific revolution. They used Aristotelian natural philosophy in the curriculum of the new medieval universities.³² Later Christian scientists and philosophers studied the brain:³³ Niels Stensen (1638–1686) known as Blessed Nicolas Steno,³⁴ Edme Mariotte (1620–1684),³⁵ and Vincenzo Chiarugi (1759–1826).³⁶

Despite scientific challenges, e.g. to the traditional belief in free will, most of the great scientists during the nineteenth century like James Maxwell and Isaac Newton rejected the causal closure of the physical world and its resultant physicalist anthropology. Other notable scientists who had religious ideas include William

³⁰ David B. Arciniegas and Thomas P. Beresford, *Neuropsychiatry: An Introductory Approach* (Cambridge: Cambridge University Press, 2001), pp.5-6. In fact, “the historical importance of Descartes’ work cannot be overstated, and must be recognised for its instrumental role in the genesis of neuropsychiatry.” (p.6)

³¹ Peter Harrison, “The Virtues of Animals in Seventeenth-Century Thought,” *Journal of the History of Ideas* Vol.59 No.3 (July 1998), pp.463-484 (p.481)

³² Edward Grant, “When did modern science begin?,” *American Scholar* Vol.66 No.1 (Winter 1997), pp.105-113. See also Edward Grant, *The Foundations of Modern Science in the Middle Ages: Their Religious, Institutional and Intellectual Contexts*, Cambridge Studies in the History of Science (Cambridge: Cambridge University Press, 1996).

³³ Richard Joyce, “Cartesian memory,” *Journal of the History of Philosophy* Vol.35 No.3 (July 1997), pp.375-393; J. van Gijn, “René Descartes (1596–1650),” *Journal of Neurology* Vol.252 No.2 (February 2005), pp.241-242.

³⁴ R. Shane Tubbs et al., “The bishop and anatomist Niels Stensen (1638–1686) and his contributions to our early understanding of the brain,” *Child’s Nervous System* Vol.27 No.1 (January 2011), pp.1-6

³⁵ Edme Mariotte, known too as Edmond, was Abbot of the Priory of Saint Martin de Beaumont-sur-Vingeanne, a Catholic priest, and a founding member of l’Académie des sciences de Paris in 1666. He is generally known as the first scientist to discover the physiological blind spot or Mariotte’s Spot in visual fields

³⁶ Donald L. Gerard, “Chiarugi and Pinel considered: Soul’s brain/person’s mind,” *Journal of the History of the Behavioral Sciences* Vol.33 No.4 (Fall 1997), pp.381-403

Paley, Charles Darwin, Albert Einstein and Pierre Teilhard de Chardin.³⁷ This thesis is set within that context of such investigative traditions.

Belief in physicalism has been growing, and is widely accepted as axiomatic, yet as we shall see, it is also facing serious challenges.³⁸ The recent popular atheist writings of philosopher Daniel Dennett, biologist Richard Dawkins, neuroscientist Sam Harris and author Christopher Hitchens, are not the main context for this thesis, although they will be taken into account.

The Vatican astronomer, Guy Consolmagno S.J., does not fear the effect of scientific atheism on believers because he thinks that most believers will not read their books. Rather he sees disastrous effects on a believer's view of science. The typical churchgoer may not have great knowledge about science, but they know their churches. Any choice between science and religion will probably favour religion.³⁹ Consolmagno thinks the 'New Atheists' are actually reinforcing anti-science prejudices among the public.

Perhaps inspired by this concern, Pope Benedict XVI recommended that the Pontifical Academy of Science adopt an interdisciplinary approach, allied with philosophical reflection; one that would take seriously the growing accomplishments in the sciences, which he acknowledged deepen the wonder at the complexity of nature.⁴⁰ This is the way the thesis seeks to proceed.

Investigation Outline

The thesis opens in Part I on Catholic Thought, which aims to outline what we will call the traditional Catholic understanding of the human soul, by gathering significant teachings from the magisterium of the Catholic Church, from other Church bodies and Catholic worship, and from the International Theological Commission (ITC). This last named group is not part of the magisterium of the

³⁷ François Euvé (trans. Joseph A. Munitiz SJ), "A Spirituality for Scientists: Historical Overview," *The Way* Vol.50 No.1 (January 2011), pp.95–104.

³⁸ Barr, *More than Machines*, p.17

³⁹ Guy Consolmagno, S.J., "The godless Delusion," *U.S. Catholic* Vol.73 No.11 (November 2008), pp.28-31

⁴⁰ Pope Benedict XVI, "Address of His Holiness Benedict XVI to Participants in the Plenary Session of the Pontifical Academy of Sciences, Clementine Hall, Thursday, 28 October 2010," in Werner Arber, Jürgen Mittelstrass and Marcelo Sánchez Sorondo (eds.), *The Scientific Legacy of the 20th Century, The Proceedings of the Plenary Session 28 October-1 November 2010*, Pontificiae Academiae Scientiarum Acta 21 (Vatican City: The Pontifical Academy of Sciences, 2011), pp.23-24

Catholic Church as such but advises the Church's chief magisterial body in the Vatican's curia, the Congregation of the Doctrine of the Faith.⁴¹

These recent teachings and discussions provide a philosophical, theological and ecclesial account of the human soul. The perspective is vast, in both space and time: the soul or spiritual principle of human beings is united with an earthly yet perishable body. Still, there is the central Christian belief in the resurrection of the body, and the implications of that belief are realised after death. In fact, resurrection faith colours the outlook on the whole of life. Mortal existence is transformed, and that does influence how we understand the nature, the vocation and destiny of human persons.

At the same time, however, these ideas and teachings pertain to human beings who are studied by various branches of knowledge such as the sciences. It can be rightly asked whether the Catholic explanations about the soul are 'current', in other words, compatible with present-day thinking, with neuroscience particularly; or as a minimum, whether Catholic thinking is aware of current research and its possible repercussions for thinking about the soul.

One objective of this thesis is to investigate that awareness and some efforts at engagement with the sciences. On the surface, in popular literature and scholarly discussions alike, the Church's teachings appear to be irrelevant, or at least inadequate for people today. This is the view of some scientists who are involved with Church-sponsored dialogue, and some theologians. Part Ia analyses a number of statements from the magisterium, the popes and the Roman Curia at the Vatican, relating to the soul/body, and then ponders a few theological responses which show a scientific consciousness and an interest in dialogue.

In partnership with the teaching authority of the Church, there have been prominent and influential thinkers throughout in history of the Catholic tradition. Since the Middle Ages, the Church's most cited teacher has been Tommaso d'Aquino (Thomas

⁴¹ Lieven Boeve, "Creating space for catholic theology? A critical-empathetic reading of Theology Today," *Theological Studies* Vol.74 No.4 (December 2013), pp.828-855. As Tilley recalls, Pope Paul VI established the International Theological Commission (ITC) in 1969, with up to thirty members appointed for renewable five-year terms. The documents of the ITC are not official teachings but manifest the ideas being thought of in Rome. Terrence W. Tilley, "Family Traits, Family Feuds," *Commonweal* Vol.140 No.10 (1 June, 2013), pp.21-23

Aquinas). His systematic, carefully-reasoned inquiries intelligently and famously incorporate the ideas of the ancient Greek philosopher Aristotle. But the language and conceptuality that he used has become unintelligible to many who were schooled in a scientific and technological milieu. We explore in Part Ib Tommaso's discussion about the soul, which has been drawn upon over the centuries and still informs Catholic teachings and theological work. The thesis is interested in how the successors of the Thomist tradition handle the issues which are raised by brain and mind research, which is the subject of a chapter in Part III. There are some interesting results.

The above also raises the question of dialogue between traditional teachings and current research and studies; we will return frequently in the thesis to this important matter.

As foreshadowed above, developments in the sciences raise important issues for Catholic thought, generally. The second part of the thesis aims to critically examine but also to learn from modern science. One of the major points to emerge is what appears to be alternative and essentially functional explanations, which are founded on cause and effect and are effective on several fronts: brain, mind, animals and evolution, life and time. Perhaps these comprise a modern, credible rival account to the ancient understanding of soul; and for some, a much-needed secular replacement for this religious and spiritual concept.

Even so, we have to ask questions of the scientific accounts, and whether they are or can claim to be far-reaching or complete, as the traditional explanations of the soul.

Part II has five chapters. Firstly, Chapter 1 considers findings of neuroscience. We examine some applicable areas from the brain sciences which command the attention of many and can influence our understanding of the soul. Next, we look at how neuroscience itself approaches the human soul. Chapter 2 thus focuses on research into religious, spiritual, or mystical experiences. In other words, we examine the empirical studies of brain, mind and 'soul'. These are considered though a selection of relevant cases.

Now, if the brain, mind and body are a unity and interlinked, then it follows that anything which affects the brain naturally has consequences for the body and mind. This is the focus of Chapter 3, which considers degeneration of brain areas and how it affects people's lives and souls. The thesis suggests that such neurodegeneration provides an opening for a Catholic Christian interpretation of brain, mind and soul. We also seek out the limitations of neuroscience in this degenerative environment which is frequently progressive and, at present, unstoppably so.

Any discourse about the soul only can seem too ethereal and disconnected from the material world. The thesis acknowledges that the bodily dimension of human existence can be easily forgotten in discussions about the spirit. Hence Chapter 4 sets out to reclaim this organic, material dimension of human nature by probing the human descent from other animals in evolution, especially the brain component. There are valid notions of human uniqueness in the animal kingdom and we hope to show how these support the traditional notion of the soul. In particular, the fact that humanity is both physically and spiritually one of a kind.

Finally, this second part of the thesis concludes with Chapter 5 which seeks to add another dimension to our consideration of the human soul, by offering a more broadly existential outlook. Scientific-social studies are used to counter an individualistic account of human beings, thus we are interested in subjects such as society, language, the young brain and mind, and the phenomena of dreams. The whole of life constitutes the journey of life for a person and the soul is there throughout, located in an interpersonal world of culture and meaning, and a life that awaits beyond death.

In the third part of the thesis, we return to the themes of Part I. Accordingly, the purpose of Part III is to propose an updated Catholic understanding of the soul illuminated by the sciences and related philosophy considered in the central part of the thesis.

The first chapter of Part III comes face to face with a persistent issue which any account of the soul will soon encounter, the issue of dualism. This is a suitable place to discuss dualistic ideas after the range of scholarship in Part II. Despite the physicalist grounding of the sciences and the associated philosophy in the analytic

tradition, there are some contemporary dualist thinkers, perhaps surprisingly even among followers of Tommaso. Sometimes the reaction to dualism seems to be an aversive reflex of condemnation, as if any dualistic metaphysics were a cancer which needs to be killed off as rapidly as possible. We listen to Christian dualists and argue that where there are differences with other contemporary thinkers, there could be scope for dialogue.

Then Chapter 2 turns to the antithesis of dualism: Christian Materialism. Here we critically study the responses of a very different group of Christian thinkers to the sciences and associated issues. The thinking is nonreductive, but in several instances so much so that it leads to cancelling out the soul as traditionally understood; as an ontological, real and spiritual principle in human beings that can survive bodily death.

Following that, we critically examine the views of contemporary Thomism outlined in Chapter 3. The Thomistic conceptual scheme, especially hylomorphism, is problematic for many thinkers today. But we argue that it can offer an alternative to reductionism and physicalism.

To finish, Chapter 4 of Part III returns to the soul as taught by the magisterium. The powerful insights in Part II are a challenge to the Church's teaching. The thesis proposes that any development or renewal of the Church's teaching will only be possible via dialogue with the sciences (neuroscience in particular) and philosophy. We suggest that dialogue has begun, but is still very much a work in progress.

The Conclusions propose a number of modest considerations for a future Catholic understanding of the soul, in light of the three parts of the thesis.

Concepts and Considerations

Here we briefly clarify some concepts and other considerations used in the thesis.

The Soul

Although the discussion of the soul in the thesis is largely objective, it is experienced subjectively too. For example, one description of the soul is "my true and divine self, inhabiting my body for a while, making what it can of the world, growing in

experience, and along the way accounting for every higher impulse, action and desire. At birth, my soul started on this particular adventure; at death, it will leave and find others, endlessly voyaging and learning. My soul is myself; and it is not often the self people see.”⁴² This account can be analysed and criticised, even if it sounds dualistic, it is an expression of one writer’s experience. Naturally such accounts are not held up to as normative but rather as personal experience.

In the context of Catholic devotional practice, many of the faithful still remember the (souls of the) deceased during November.⁴³ Yet in other contexts the word soul seems to be out of fashion, perhaps because people no longer believe that departed souls need interceding for. For example, at the Catholic Mass prayers are offered for ‘those who had lately died’ rather than for their souls. Others may ask, is the soul an, “invisible golden parachute which so many of us intend to ride into eternity?”⁴⁴

The soul is popularly synonymous with spirituality and religion, whereas the mind is synonymous with cognition and intelligence, and the heart is understood as emotions.⁴⁵ Over thousands of years, there has been a tension between the need to ‘know’ and a desire for what scientific knowledge is unlikely to offer.⁴⁶ ‘Soul’, ‘mind’, and ‘body’ reach back to the third millennium BC animism, and the soul in ancient Greece (eighth to fifth centuries BC).⁴⁷ A very influential notion of ‘soul’ came from the ancient Greek philosopher Aristotle, for whom it meant ‘principle of life.’ According to this view, all living things had souls: plants and animals too.⁴⁸

⁴² Ann Wroe, “The vanishing soul,” *The Tablet* Vol.255 No.8414 (15 December 2001), p.1777. Wroe has a doctorate in medieval history.

⁴³ People may wonder where do souls go in the hereafter. Cf. also Alice Camille, “Soul searching,” *U.S. Catholic* Vol.75 No.11 (November 2010), pp.44-46

⁴⁴ Camille, *Soul searching*, p.45

⁴⁵ John R.Peteet, *Depression and the Soul. A Guide to Spiritually Integrated Treatment* (New York and London: Routledge; 2010), pp.3-14

⁴⁶ Rosalie Osmond, *Imagining the Soul: A History* (Stroud: Sutton Publishing, 2003), p.217

⁴⁷ ‘Mind’ was used to speak of psychological capacities, particularly thinking, the will and affections. ‘Body’ referred to corporeal characteristics of appearance, physique, health, and sensation. Cf. David B.Claus, *Toward the Soul, An Inquiry into the meaning of ψυχή before Plato*, Yale Classical Monographs Vol.2 (New Haven and London: Yale University Press, 1981); John P.Wright and Paul Potter (eds.), *Psyche and Soma: Physicians and Metaphysicians on the Mind-Body Problem from Antiquity to Enlightenment* (Oxford: Clarendon Press, 2000); I.C.Brady et.al., “Soul, Human,” in *New Catholic Encyclopedia, Volume 13 Seq-The*, Second edition (Detroit: Thomson/Gale and Washington, D.C.: The Catholic University of America, 2003), pp.336-353.

⁴⁸ Anthony Kenny, *The Metaphysics of Mind* (Oxford: Clarendon Press, 1989), p.18. Kenny notes there is no presumption that souls are inevitably immaterial, e.g. the soul of a plant could be a string of DNA.

One meaning of soul has been linked with human self-renunciation, goodness, and repentance. In the *Crito* Socrates views the soul as the part of man scarred and eventually ruined by wrong-doing, having ‘lost his soul’.⁴⁹

Other meanings include: humans as “a kind of metaphysical Siamese twin, brute matter yoked to sublime spirit,”⁵⁰ ‘a joyful soul’,⁵¹ and linked to a person’s legacy after death, “a mutable remainder of death that exists in the divergent memories of legatees.”⁵²

There remains a contemporary use of this notion of ‘greatness of soul’.⁵³ The ‘great-souled man’ [sic.] was first described in detail in Book IV of Aristotle’s *Nicomachean Ethics*, however the first major in English-language philosophy of the concept of greatness of soul or mind is in David Hume. Greatness of soul or mind was linked with seventeenth and eighteenth century social and political culture.⁵⁴

There is an association too with the spirituality of the inner self.⁵⁵ Often traditional notions of salvation are avoided by emphasising self-knowledge. That is, by focussing on the present, making the individual holy or resacralising the self.⁵⁶ Spirituality is located in the ordinary and unpredictable experiences of the self in tension with the self as unified being or soul.

⁴⁹ İlham Dilman, “Body and Soul,” *Philosophical Investigations* Vol.25 No.1 (January 2002), pp.54-66 (p.58)

⁵⁰ Damien Broderick, *The Last Mortal Generation: How Science Will Alter Our Lives in the 21st Century* (Sydney: New Holland Publishers, 1999), pp.113-114. Compare this to the poem by Andrew Marvell, “A Dialogue between the Soul and Body,” in Daniel Robinson (ed.), *The Mind* (Oxford and New York: Oxford University Press, 1998), p.357-358

⁵¹ Karen Hellwig, “Pearl’s Wisdom,” *Journal of Gerontological Nursing* Vol.31 No.7 (July 2005), pp.55-56

⁵² Carl Paul Ellerman, “The Remains of Death: A Reconsideration of the Soul as Legacy,” *The Journal of Value Inquiry* Vol.33 No.1 (March 1999), pp.89-98 (pp.89-90).

⁵³ For example, Anne Griffin and Jay Lefer, “Fragmented Testament: Letters Written by World War II Resisters Before Their Execution,” *Journal of the American Academy of Psychoanalysis and Dynamic Psychiatry* Vol.38 No.2 (June 2010), pp.261-284

⁵⁴ Graham Solomon, “Hume on ‘Greatness of Soul’,” *Hume Studies* Vol.26 No.1 (April 2000), pp.129-142

⁵⁵ Robert Wuthnow, *After Heaven: Spirituality in America Since the 1950s* (Berkeley: University of California Press, 1998), pp.157-165. Wuthnow cites Thomas Moore’s *Care of the Soul*, Uma Silbey’s *Enlightenment on the Run*, Larry Dossey, *Recovering the Soul*. See also Thomas Moore (ed.), *The Education of the Heart: Readings and sources for Care of the Soul, Soul Mates, and The Re-Enchantment of Everyday Life* (Rydalmere, New South Wales.: Hodder & Stoughton, 1996), pp.11-25

⁵⁶ Wuthnow, *After Heaven*, p159

The soul also relates to personal identity, “your soul is what makes you *you*.”⁵⁷ For some the soul can resolve philosophical puzzlements about identity over time, but others see no reason for the soul to exist. Neuroscience does not *disprove* the soul as brains and psychological states may be correlated with it. However if the physical brain *alone* accounts for mentality, a soul need not be postulated.⁵⁸ For others in neuropsychology, the healthy brain results in the mind and the soul. The unanswered question is, “How exactly does the brain accomplish this?... how the soul arises from brain matter.”⁵⁹

The Mind and Brain

Traditionally, soul includes but differs from mind and brain. The soul as self could assist a unified theory of brain and soul. One query is whether it is “plausible to suppose that the neurological self can do duty for the soul.”⁶⁰ Perhaps not, for example, a group of researchers unfamiliar with computers could produce hypotheses to explain how computers operate. The idea that a computer is merely the connections between transistors might seem true but is not the complete picture.⁶¹ The neurological self is one dimension of other selves, for example, the social self, the genetic self and the immunological self.

The mind is characterised as being unobservable;⁶² yet it is accessible, where the owner of mental states has a type of private immediate access. So it is subjective from one ‘point of view’. And it is non-spatial, that is, mental states do not occupy a region of space. The mind is also subject-dependent, where mental states exist only for a subject of awareness.⁶³ Brain states do not display these characteristics, and therefore cannot adequately reduce mental states. The distinctive character of the mental certainly appears to be lost under such a reduction.⁶⁴

⁵⁷ Earl Conee and Theodore Sider, *Riddles of Existence: A Guided Tour of Metaphysics* (Oxford: Oxford University Press, 2005), p.10

⁵⁸ Conee & Sider, *Riddles of Existence*, p.11..

⁵⁹ Eric A.Zillmer and Mary V.Spiers, *Principles of Neuropsychology* (Belmont, CA: Wadsworth/Thomson Learning, 2001), p.34 & p.569

⁶⁰ J.Andrew Ross, “The Self: From Soul to Brain A New York Academy of Sciences Conference, New York City, 26–28 September, 2002,” *Journal of Consciousness Studies* Vol.10 No.2 (February 2003), pp.67-85 (p.83)

⁶¹ Ross, *The Self: From Soul to Brain*, p.83

⁶² Colin McGinn, “What is it not like to be a brain?,” in John Cornwell (ed.), *Explanations: Styles of Explanation in Science* (Oxford: Oxford University Press, 2004), pp.157-172

⁶³ McGinn, *What is it not like to be a brain?*, p.158

⁶⁴ McGinn, *What is it not like to be a brain?*, p.158.

The mind has been studied in numerous ways throughout history. For example, the nature of the mind, having a mind and other questions have feature in philosophy of centuries with diverse positions have been held: mind as souls or mental substances (dualism), mind as behaviour (behaviourism), mind as brain (mind-brain identity), mind as a computer (machine functionalism), mind as causal structuralism (causal-theoretical functionalism).⁶⁵

The mind is demonstrated in civilisation, art, science, philosophy and extraordinary individuation.⁶⁶ It has been suggested that if the mind can know, and know itself, then we gather more data, and richer data about it from the ages of history and from all cultures, and also from each act of introspection and deep awareness of the self. In this way, controlling the definition of mind controls how humankind, culture, and history are defined.⁶⁷ Yet, contemporary theorists of mind almost homogeneously dismiss pre-twentieth century accounts of soul and mind, perhaps with the exception of Hume's ideas. Historically, we might also note that apart from the Epicureans, "every theorist before the seventeenth century held that the soul outlived the death of its feeble, corrupt host."⁶⁸

Body and Soul

Bodies are obviously necessary for earthly life, however in recent centuries Western societies have tended to divide spirituality and materiality. Therefore, those who sought to develop their spirituality would have to deny material desires and worries, overcome the burden of materiality, and transcend the limits of the material body.⁶⁹ On the other hand, the biblical and Christian traditions are rich heritages,⁷⁰ plus

⁶⁵ These are subheadings and titles from several chapters in the book by philosopher Jaegwon Kim, *Philosophy of Mind* (Boulder, Colorado: Westview Press, 1998)

⁶⁶ Marilynne Robinson, *Absence of Mind: The Dispelling of Inwardness from the Modern Myth of the Self*, The Terry Lectures (New Haven and London: Yale University Press, 2010), p.120

⁶⁷ Robinson, *Absence of Mind*, p.32

⁶⁸ Paul S.MacDonald, *History of the Concept of Mind: Speculations about Soul, Mind and Spirit from Homer to Hume* (Aldershot and Burlington: Ashgate, 2003), p.361

⁶⁹ Meredith B.McGuire, "Why Bodies Matter: A Sociological Reflection on Spirituality and Materiality," in Elizabeth Dreyer and Mark S.Burrows (eds.), *Minding the Spirit: The Study of Christian Spirituality* (Baltimore and London: The Johns Hopkins University Press, 2005), pp.118-134 (p.118)

⁷⁰ Susan F.Mathews, "Toward Reclaiming an Authentic Biblical-Christian View of the Body," *The Linacre Quarterly* Vol.68 No.4 (November 2001), pp.277-295; Earl Muller, S.J., "Toward a Theology of the Human Body," in *Christianity and the Human Body, A Theology of the Human Body* (St.Louis, Missouri: ITEST Faith/Science Press, 2001), pp.73-104; James F.Keenan, S.J., "Christian perspectives on the human body," *Theological Studies* Vol.55 No.2 (June 1994), pp.330-346

recent anthropologies, e.g. ‘Theology of the Body’,⁷¹ they have also emphasised the “distinctive capacity of the *human* body to express the human *person*.”⁷²

Scholars also recognise that embodiment is the means for humans to encounter God.⁷³ There is a feminist insight that the “dichotomy between body and soul, the latter strengthened at the expense of the former, is a patriarchal construction which has dominated Western philosophy and Judeo-Christian theology and spirituality for thousands of years and allowed to remain normative.”⁷⁴ Other thinkers relate the body to the incarnation, the Body of Christ.⁷⁵ Such ideas can fruitfully “confront the ‘soul-less body’ of materialistic modernity, and, for that matter, the ‘bodiless soul’ of a rootless postmodernity.”⁷⁶

Body-Soul interactions feature historically, e.g. in melancholy. The body acted on the soul; medical interventions contributed to treatment by correcting melancholic passions of the soul. Vice-versa, healing the soul even vice itself through ‘spiritual physick’ was an essential to overall treatment of the disease.⁷⁷ Melancholy was viewed as a “disease of the soul” attended to by religious “physicians of the soul”.⁷⁸ How the mind-body interact becomes the ‘problem’.⁷⁹

Physicalism, Materialism, Naturalism

For those working in philosophy of mind, physicalism is a dominant view. It holds that causal efficacy of the mental via mental properties is consistent with causal physicalism, which presumes that nonphysical and thus mental causation need to be grasped as being reliant on particular physical processes that lie beneath it. But it

⁷¹ John Paul II, *The Theology of the Body: Human Love in the Divine Plan* (Boston: Pauline Books & Media, 1997); Robert F. Gotcher, “The Theology of the Body: Some Reflections on the Significance For Medical Professionals,” *The Linacre Quarterly* Vol.73 No.2 (May 2006), pp.115-131.

⁷² Gotcher, *The Theology of the Body*, p.116. This overcomes the mechanistic Cartesian worldview.

⁷³ Edna Mary MacDonald FMA, “Toward a Theology of the Body, An Analysis of the Letters of Maria Domenica Mazzarello,” *Journal of Salesian Studies* Vol.8 No.2 (Fall 1997), pp. 310-331

⁷⁴ MacDonald, “*Toward a Theology of the Body*,” p.310

⁷⁵ Anthony J. Kelly, C.Ss.R., “‘The Body Of Christ: Amen!’: The Expanding Incarnation,” *Theological Studies* Vol.71 No.4 (December 2010), pp.792-816

⁷⁶ Kelly, *The Body Of Christ*, p.815

⁷⁷ Jeremy Schmidt, *Melancholy and the Care of the Soul: Religion, Moral Philosophy and Madness in Early Modern England*, The History of Medicine in Context series (Aldershot, UK and Burlington, USA: Ashgate, 2007), p.35

⁷⁸ Schmidt, *Melancholy and the Care of the Soul*, p.185 & p.186

⁷⁹ James Le Bas et al., “A discussion with D.M. Armstrong about the nexus between philosophy and psychiatry,” *Australasian Psychiatry* Vol.10 No.4 (December 2002), pp.324–324. See also the cartoon by Neil Phillips, “Shrunk,” p.324. Armstrong upholds and defends a materialist theory of mind. See D.M. Armstrong, *The Nature of Mind and Other Essays* (St. Lucia, Queensland: University of Queensland Press, 1980).

appears that the only way to understand non-physical causation is to reduce its autonomy.⁸⁰ Most analytic philosophers agree that the brain is somehow constitutively linked to mind, supported by the completeness of physics: every physical effect that has a sufficient cause has a sufficient physical cause.⁸¹

Philosopher David Papineau concedes that in empirical matters, there is nothing certain. “There is no knock-down argument for the completeness of physics. You could in principle accept the rest of modern physical theory, and yet continue to insist on special mental forces, which operate in as yet undetected ways in the interstices of intelligent brains.”⁸² But he concludes that there is no virtue in philosophers rejecting a premise which has, by any normal inductive standards, been established by over a hundred years of empirical work.

Naturalism is often interchangeable with physicalism and materialism.⁸³ Indeed naturalism has been described in these terms: “a reincarnation of materialism, piggybacks on science, and draws its modern prestige from that free ride, even though it goes far beyond legitimate scientific research methods and findings. Not content with investigating the material world as true science does, naturalism claims that the material universe and all it contains is all there is: all of life, with all its features and activities, is to be understood exclusively within a closed material framework.”⁸⁴

Another view is that naturalism is a research program and not a set of methodological, metaphysical or epistemological dispositions, since the methods and findings of science can alter.⁸⁵ If current analytic philosophy has a ruling ‘philosophical ideology’, it is surely naturalism. It involves empirical science, metaphysical reflection, and common sense: a detailed theory which claims to

⁸⁰ Josep E. Corbí and Josep L. Prades, *Minds, Causes and Mechanisms: A Case Against Physicalism*, Aristotelian Society Monographs Series 17 (Oxford & Malden, Massachusetts: Blackwell Publishers, 2000), pp.1-38

⁸¹ This definition of the ‘completeness of physics’ is what is referred to as ‘weak completeness’ in David Yates, “Emergence, Downwards Causation and the Completeness of Physics,” *The Philosophical Quarterly* Vol.59 No.234 (January 2009), pp.110-131

⁸² David Papineau, “The Rise of Physicalism” in Carl Gillett and Barry Loewer (eds.), *Physicalism and its Discontents* (Cambridge: Cambridge University Press, 2001), pp.3-36 (p.32)

⁸³ Fales, *Naturalism and Physicalism*, pp.122-131; Thomas Polger and Owen Flanagan, “Natural Answers to Natural Questions,” in Valerie Gray Hardcastle (ed.), *Where Biology Meets Psychology* (Cambridge, Massachusetts: The MIT Press, 1999), pp.221-247

⁸⁴ Neil Brown, “Faith Versus Naturalism,” *Compass* Vol.47 No.3 (Spring 2013), pp.29-32 (p.29)

⁸⁵ Fales, *Naturalism and Physicalism*, p.122

explain the structure of cognition and consciousness in analytic philosophy of mind.⁸⁶ Brain-mind research is used to highlight how the physical and physiological dimensions of the brain ought to complement the mental and subjective dimensions. The complementarity of brain and mind is supported by studies of how mind and brain processes are coordinated in space and time.⁸⁷

Tommaso d'Aquino

Parts of the thesis will refer Tommaso d'Aquino and contemporary Thomistic thought. More details are in Part I and Part III. To help anticipate this, we note that some argue that the concepts from a thirteenth century world are vastly different from today's and that no bridges can be successfully built. But others retort that philosophy is perennial in that many of today's conceptual problems are akin to problems faced Plato and Aristotle.⁸⁸ Admittedly, much written by ancient and medieval philosophers has been superseded by scientific progress. However, much of Tommaso's treatments of some important subjects remain relevant.⁸⁹

Maintaining the relevance of Tommaso does not entail returning to a pre-critical thirteenth century worldview; it may simply involve recovering insights of a classical figure for current discussions.⁹⁰ Tommaso can broaden today's preoccupations. As one writer remarks, it is refreshing to read a thinker who argues and reflects, rather than shouting and claiming, "who withdraws himself so as to let the matter speak for itself rather than intrude with his own subjectivity at every available turn, and who presents a balanced, comprehensive vision of the whole *sub ratione Dei* – or, in the light of God's logic – without a selective, one-sided 'concentration' on christological, Trinitarian, existentialist, or liberationist, making room for everything in its proper place in the divine scheme of things rather than reduce everything to its place in the human."⁹¹ This can liberate one from perceived prejudices.⁹² One

⁸⁶ Michael Thau, *Consciousness and Cognition* (New York: Oxford University Press, 2002), pp.10-11; Jaegwon Kim, "The American Origins of Philosophical Naturalism," *Journal of Philosophical Research* Vol.28 Supplement (2003), pp.83-98

⁸⁷ Andrew A. Fingelkurts, Alexander A.Fingelkurts and Carlos F.H.Neves, "Natural world physical, brain operational, and mind phenomenal space-time," *Physics of Life Reviews* Vol.7 No.2 (June 2010), pp.195-249 (p.196)

⁸⁸ Anthony Kenny, "Aquinas Medalist's Address," *Proceedings of the American Catholic Philosophical Association* Vol.80 (2006), pp.23-27.

⁸⁹ Kenny, *Aquinas Medalist's Address*, p.25

⁹⁰ Anselm K.Min, *Paths to the Triune God: An Encounter Between Aquinas and Recent Theologies* (Notre Dame, Indiana: University of Notre Dame Press, 2005), pp.1-7

⁹¹ Min, *Paths to the Triune God*, p.2.

limitation is that use of Aquinas is shaped by his dominant status, and that this may overshadow the different ideas of other Medieval thinkers on the human soul, such as John Duns Scotus and Albertus Magnus.⁹³

Limits

Some of the research areas to which the thesis refers cannot be examined in any detail. Some can barely be acknowledged, for example, differences between male and female and their spiritual journeys,⁹⁴ and near-death experiences.⁹⁵ The soul is a question in other Christian theologies too,⁹⁶ but the subject of the thesis is the Catholic tradition. Likewise, our thesis looks at science in the West,⁹⁷ which is the principal but not the only approach to the study of nature. The discussion is broadly centred on Christianity, although other world religions have been interested in neuroscience.⁹⁸

Some Christian scholars find fault with assumptions about the soul which are traditionally found in Catholic teachings, e.g. the soul is created at fertilisation.⁹⁹ Yet the thesis is not bioethical in intent. Likewise, the soul, death, judgement and resurrection are themes in other theological fields such as eschatology,¹⁰⁰ which for

⁹² The ethos of contemporary theologies says Min is activist and political, historically-conscious and relativising of knowledge, unilaterally uplifting of one idea, and “increasingly fragmentary and heterocentric in the deconstructionist sense of giving up in the name of *differance* all attempts to grasp reality as totality.” Min, *Paths to the Triune God*, p.3. See also Min’s report card on the state on contemporary theology and the proposed dialectics, pp.310-337

⁹³ Thérèse Bonin, “The Emanative Psychology of Albertus Magnus,” *Topoi* Vol.19 No.1 (January 2000), pp.45-57

⁹⁴ Mary Greenan FMA, “Our Sacred Story: A Changing Story or a Story of Change,” *Journal of Salesian Studies* Vol.9 No.1 (Spring 1998), pp.75-96

⁹⁵ Pim van Lommel, “Near-death experiences: the experience of the self as real and not as an illusion,” *Annals of the New York Academy of Sciences* Vol.1234 (October 2011), pp.19-28; James W.Green, *Beyond the Good Death: The Anthropology of Modern Dying* (Philadelphia: University of Pennsylvania Press, 2008), pp.121-125

⁹⁶ Jeffrey H.Boyd, “The Soul as Seen Through Evangelical Eyes, Part II: On Use of the Term ‘Soul’,” *Journal of Psychology and Theology* Vol.23 No.3 (Fall 1995), pp.161-170

⁹⁷ E.g.Ted Peters, “Religion and Science from the Viewpoint of Western Scholarship,” in Chan, Tak-Kwong; Tsai, Yi-Jia and Frank Budenholzer, (eds.), *Religion and Science in the Context of Chinese Culture*, Fu Jen Series 2 (Hindmarsh, South Australia.: ATF Press, 2005), pp.7-17

⁹⁸ For example, Stephen Kaplan, “Grasping at Ontological Straws: Overcoming Reductionism in the Advaita Vedānta - Neuroscience Dialogue,” *Journal of the American Academy of Religion* Vol.77 No.2 (June 2009), pp.238–274

⁹⁹ Rodney J.Scott and Raymond E.Phinney Jr, “Relating Body and Soul: Insights from development and Neurobiology,” *Perspectives on Science and Christian Faith* Vol.64 No.2 (June 2012), pp.90-107

¹⁰⁰ Despite endorsements and reservations, Peter Phan credits Rahner who “has brought eschatology from its long-occupied ‘appendix’ status to the central position in Christian theology.” Peter C.Phan, “Eschatology,” in Declan Marmion and Mary E.Hines (eds.), *The Cambridge Companion to Karl Rahner* (New York and Cambridge: Cambridge University Press, 2005), pp.174-192 (p.190).

Catholic thought includes the intermediate state¹⁰¹ and purgatory.¹⁰² Belief in purgatory has declined since the Second Vatican Council,¹⁰³ although the traditional November remembrance of the Holy Souls endures. Such theological matters are unavoidably overlooked.

Science-Theology Dialogue

As mentioned above, the relationship between science and theology is a significant and relevant issue, and will feature throughout the thesis. In working towards a contemporary Catholic understanding of the soul, much dialogue will be needed. This thesis certainly draws on ‘theology’ in the Catholic Christian tradition.

Leaving historical misunderstandings aside,¹⁰⁴ the relationship between science and religion is a long one, although there has been recent academic interest.¹⁰⁵ Some discuss science and religion broadly,¹⁰⁶ and others specifically understand the relationship to be between science and theology.¹⁰⁷ The scholarship on this dialogue can take a number of directions and forms.¹⁰⁸

¹⁰¹ Also called “intermediate stage” by J.P.Kenny, *The Living Hope of Christians: a Christian estimate of what lies beyond* (Homebush, N.S.W.: St Pauls, 1995), pp.56-57; and “interim state” in E.J.Fortman, *Everlasting life: Towards a theology of the future life* (Staten Island, New York: Alba House, 1986), pp.126-138

¹⁰² Christians from the second century turned to God to pray for those who died and in the Western Church this was understood to be a process of purification but also expiation or satisfaction for sins. Gerald O’Collins SJ and Mario Farrugia SJ, *Catholicism: The Story of Catholic Christianity* (Oxford and New York: Oxford University Press, 2003), p.226

¹⁰³ John E.Thiel, “Time, judgment, and competitive spirituality: a reading of the development of the doctrine of purgatory,” *Theological Studies* Vol.69 No.4 (December 2008), pp.741-785

¹⁰⁴ Stephen Dilley, “Charles Darwin’s use of theology in the Origin of Species,” *The British Journal for the History of Science* Vol.45 No.1 (March 2012), pp.29-56; Alvin Plantinga, *Where the Conflict Really Lies: Science, Religion, and Naturalism* (New York: Oxford University Press, 2011); John Brooke, “Science and Religion: Lessons from History?,” *Science* Vol.282 No.5396 (11 December 1998), pp.1985-1986

¹⁰⁵ Varadaraja V.Raman, “Changing Landscape in Science-Religion Dialogues,” *Zygon* Vol.45 No.1 (March 2010), pp.177–192; Philip Clayton, “The Religion-Science Discussion at Forty Years: “Reports of My Death are Premature” *Zygon* Vol.40 No.1 (March 2005), pp.23–32

¹⁰⁶ Sean Esbjörn-Hargens and Ken Wilber, “Toward a Comprehensive Integration of Science and Religion: A Post-metaphysical Approach,” in Philip Clayton and Zachary Simpson (eds.), *The Oxford Handbook of Science and Religion* (Oxford: Oxford University Press, 2006), pp.523-546; Varadaraja V.Raman, “Science and Religion: Some Demarcation Criteria,” *Zygon* Vol.36 No.3 (September 2001), pp.541–556

¹⁰⁷ Michael Welker, “Science and Theology: Their Relation at the Beginning of the Third Millennium,” in Clayton & Simpson (eds.), *Oxford Handbook*, pp.551-561

¹⁰⁸ Ann Pederson, “New Directions, New Collaborations,” *Zygon* Vol.45 No.2 (June 2010), pp.499–505; P.Roger Gillette, “A Religion for an Age of Science,” *Zygon* Vol.37 No.2 (June 2002), pp.461–472; Michael Welker, “Springing cultural traps: The Science-and -Theology Discourse on Eschatology and the Common Good,” *Theology Today* Vol.58 No.2 (July 2001), pp.165-176

The use of models is a useful way to frame the science-theology interface. For instance, John Polkinghorne's proposes four theological categories in the dialogue between science and theology: deistic, theistic, revisionary and developmental. For each of these four categories Polkinghorne refers to a recognised thinker: Paul Davies (deistic), Ian Barbour (theistic), Arthur Peacocke (revisionary), and Polkinghorne himself (developmental).¹⁰⁹

There are naturally other influences and models,¹¹⁰ including wisdom and feminist traditions.¹¹¹ There are also ideas beyond the English-speaking world, e.g. other cultures and religions.¹¹² However, the predominance is from Anglo-Saxon authors from the United Kingdom and North America, with an American context for the evolution-creation debates, a focus on content rather than context of theology and science.¹¹³

But we draw on the work of an established thinker in this field. Ian G.Barbour (1923-2013) provides what is probably the most influential taxonomy. Critics recognise that he is perhaps the most widely cited author in the area of science and religion.¹¹⁴

Barbour identifies four types of relationships between the methods of science and the methods of religion.¹¹⁵ Firstly, Conflict, e.g. between genetic determinism and

¹⁰⁹ John Polkinghorne, *Science and the Trinity: The Christian Encounter with Reality* (London: SPCK, 2004), pp.1-32

¹¹⁰ Mikael Stenmark, "Models of Science and Religion: Is there any Alternative to Ian Barbour's Typology?" in Hubert Meisinger, Willem B. Drees and Zbigniew Liana (eds.), *Streams of Wisdom? Science, Theology and Cultural Dynamics*, Studies in Science and Theology Volume 10, Biennial Yearbook of the European Society for the Study of Science and Theology (2005-2006) (Lund: Lund University, 2005), pp.105-119; Taede A.Smedes, "Beyond Barbour or Back To Basics? The Future of Science-And-Religion and the Quest for Unity," *Zygon* Vol.43 No.1 (March 2008), pp.235-258

¹¹¹ Jürgen Moltmann, *Science and Wisdom*, translated by Margaret Kohl (London: SCM Press, 2003), particularly section II, "Theologians and Scientists on the Way to Wisdom", pp.24-29; Lisa L.Stenmark, "Feminist Epistemologies, Hannah Arendt, and the Science- and- Religion Discourse," in Clayton & Simpson (eds.), *Oxford Handbook*, pp.821-835; Celia Deane-Drummond, *Biology and Theology Today: Exploring the Boundaries*, (London: SCM Press, 2001), pp.184-207.

¹¹² Nidhal Guessoum, "Science, religion, and the quest for knowledge and truth: an Islamic perspective," *Cultural Studies of Science Education* Vol.5 No.1 (March 2010), pp.55-69; Richard Olson, "A Dynamic Model for 'Science and Religion': Interacting Subcultures," *Zygon* Vol.46 No.1 (March 2011), pp.65-83

¹¹³ Willem B.Drees, *Religion and Science in Context: A Guide to the Debates* (London: Routledge, 2010), p.3

¹¹⁴ Geoffrey Cantor and Chris Kenny, "Barbour's Fourfold Way: Problems with His Taxonomy of Science-religion Relationships," *Zygon* Vol.36 No.4 (December 2001), pp.765-781. Barbour responds to Cantor and Kenny's criticisms in Ian G.Barbour, "On Typologies for Relating Science and Religion," *Zygon* Vol.37 No.2 (June 2002), pp.345-360

¹¹⁵ Ian G.Barbour, *Religion and Science: Historical and Contemporary Issues* (New York: HarperSanFrancisco, 1997), pp.77-105

human freedom. A historical case of conflict occurred in the trial of Galileo in 1633, a more recent conflict zone is sociobiology.¹¹⁶ It remains a continuing issue in some schools in the United States, where the status of Creation ‘science’, Intelligent Design and methodological naturalism is actively debated.¹¹⁷ Conflict can arise from authority, political rivalries, and threats, e.g. Protestant Reformation in the case of Galileo, or conflicting views, e.g. Darwin.¹¹⁸ Barbour’s two opposites are scientific materialism and biblical literalism. The first starts from scientific method and matter but then makes philosophical claims; the second starts from theology and scripture makes scientific claims.¹¹⁹

Secondly, Independence seeks to avoid conflicts between religion and science, such as body-soul dualism. It involves recognising separate viewpoints, fidelity to the character of each arena, contrasting methods, and differing languages. Independence avoids conflict but it also rules out the possibility of constructive dialogue.¹²⁰

Thirdly, Dialogue, which begins from the general features of science or nature rather than specific scientific theories.¹²¹ The scientific enterprise raises “limit questions” which Barbour calls ontological questions that are not answered by scientific methods. These may be open to religious answers. Other examples of dialogue include the discussion of methodological parallels between science and theology; nature-centred spirituality, and environmental ethics, which references both scientific and religious views.

Fourthly, Integration, like viewing the brain and mind as two aspects of one self. Three versions of integration are natural theology, theology of nature, and systematic synthesis.¹²² For example, a theology of nature might begin from religious tradition based on religious experience and revelation, but draws on insights from contemporary science in reformulating particular doctrines such as providence, creation and human nature.

¹¹⁶ Barbour, *When Science Meets Religion*, pp.124-126 and Michael Cavanaugh, “A Retrospective on Sociobiology,” *Zygon* Vol.35 No.4 (December 2000), pp.813–826

¹¹⁷ Robert T.Pennock, “Can’t philosophers tell the difference between science and religion?: Demarcation revisited,” *Synthese* Vol.178 No.2 (January 2011), pp.177-206.

¹¹⁸ Barbour, *Religion and Science*, p.77

¹¹⁹ Barbour, *Religion and Science*, pp.78-84

¹²⁰ Barbour, *Religion and Science*, p.89

¹²¹ Barbour, *Religion and Science*, pp.90-98

¹²² Barbour, *Religion and Science*, pp.98-104

Several scholars highlight how theology differs from science in some ways.¹²³

Science is neither theistic or atheistic; but theology has to be theistic: theology, unless it means religious studies, “must be, at the very minimum, about a personal God, who can and must be worshipped, and not merely admired as a superior form of sunrise or sunset, or a mere mist hovering over a well-manicured lawn.”¹²⁴

Others, thinking along social constructivism and postmodernist lines, argue that knowledge is constructed by societies or groups within society which mirrors certain values and needs,¹²⁵ and situations in particular traditions. An example would be a postmodern deconstruction of Western metaphysics and epistemological foundationalism.¹²⁶ In this view all data is theory-laden, there is under-determination of scientific theories by facts, and how epistemic and non-epistemic value-judgments have a shaping role in the scientific process.¹²⁷

Here, theology and science are affected by postmodern culture which questions the autonomy of the individual, universal rationality and objective truth. But this need not lead to deconstructive postmodernism and relativist ideas in nonfoundationalism or contextualism as reactions against universal rationality.¹²⁸ Science can also be shaped by *religion* as opposed to theology, for example, in ‘theistic science’ and ‘faith informed-science’,¹²⁹ as it is questioned whether science is independent of ideology or religion.¹³⁰

¹²³ For example, Stanley L.Jaki, “Cosmic Rays and Water Spiders,” in John Marks Templeton and Kenneth Seaman Giniger (eds.), *Spiritual Evolution, Scientists Discuss Their Beliefs* (Radnor, Pennsylvania: Templeton Foundation Press and New York: The K.S.Giniger Company, 1998), pp.67-97

¹²⁴ Jaki, *Cosmic Rays and Water Spiders*, p.96.

¹²⁵ Mikael Stenmark “From Modern to Postmodern Conceptions of Knowledge – Where Do We Stand Today?” in Dirk Evers, Antje Jackelén and Taede Smedes (eds.), *How Do We Know? Understanding in Science and Theology*, Issues in Science and Theology Series (London: T. & T.Clark, 2010), pp.29-43

¹²⁶ J.Wentzel van Huyssteen, *Duet or Duel? Theology and Science in a Postmodern World* (London: SCM Press Ltd, 1998), p.5

¹²⁷ van Huyssteen, *Duet or Duel?*, p.15

¹²⁸ J.Wentzel van Huyssteen, *Alone in the World? Human Uniqueness in Science and Theology* (Grand Rapids, Michigan and Cambridge, U.K.: William B.Eerdmans Publishing Company, 2006), p.10.

¹²⁹ Mikael Stenmark, *How to Relate Science and Religion: A Multidimensional Model* (Grand Rapids, Michigan and Cambridge, U.K.: William B.Eerdmans Eerdmans Publishing Company, 2004), p.171 See chapter 8, ‘A science shaped by religion’, pp.171-208.

¹³⁰ Mikael Stenmark, “Should Religion Shape Science?” *Faith and Philosophy* Vol.21 No.3 (July 2004), pp.334-352.

For now, and through the thesis in general, it is presumed that Barbour's scholarship is sound and has firm foundations. It is now time to begin by exploring the Catholic understanding of the human soul in Part I.