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**Rev'd Andrew John Bigg**

# Theology, science and the *topos* of the *Logos*: a stable, dynamic topology of Creation

***Abstract***

This thesis argues that an integrated, dynamically stable theo-science may be explored by considering scientific and theological perspectives regarding stability itself, combining them in one overarching framework by embedding a scientific conception of stability within a broader theological conception thereof. Our very capacity to perceive 'reality' in a functionally consistent manner is dependent upon the physical cosmos presenting a particular, dynamic stability, allowing for the sustainable emergence of life in the first place.

Stability is hierarchically qualified, with higher-order functional systems such as those pertaining to life being an emergent result of particular modes of interaction between lower-level degrees of stability, ultimately right down to fundamental particles or fields. Theologically, any stability inherent to 'reality' must furthermore be considered to derive from the fact that such reality is, at its profoundest, a manifestation of God's revealing, Creative Activity through the *Logos*.

The thesis considers, qualitatively, the scientific and theological 'place' and relevance of stability from a holistic perspective regarding our anthropological development. Scientifically this is viewed in layered, evolutionary terms. Theologically, the Incarnation is considered of central relevance to our anthropological journey, transfiguring the process of its development so as to draw human nature into its intended eschatological stability 'at the right hand of the Father'.

Since stability can be considered scientifically in topological terms, the framework is developed by means of a 'theological topology' centred, as the etymology suggests, on the idea of a sacramentally stable, pervasive *topos* indicative of God's 'motioning', Creative Activity through the *Logos*. Such Activity becomes sense-objectified in the Incarnation, considered figuratively-speaking as a 'phase transition', the net effect of which is argued as a 'drawing in' (cf. John 12:32), reordering and enhancing all meaningful, creaturely contribution to the 'content' of Creation – content actively generated according to our iconic, creative capacity for conceiving (of) the *Logos*.

**Theology, science and the *topos* of the *Logos*: a stable, dynamic topology of Creation**

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***Introduction***

If theology and science are truly to complement each other in terms of their perspectives regarding any unified, underlying 'reality' then some consonance, or some degree of congruence, ought logically to exist between their respective understandings concerning the nature of any critical *stability* undergirding such reality and supporting our very capacity for perceiving and evaluating within it. Only then can truly sustainable doctrines or consistent hypotheses be treated in a justifiably objective and interrelated manner. As theology and science necessarily speak about the same cosmos they ought furthermore to have complementary things to say regarding the harmony lying behind any critical stability. Given that theological doctrine connects the creation, in its harmonious order, with the central conception of the *Logos*, an organization of focus upon such centrality ought to be of mutual relevance to theology and science, around which an increasingly informed conversation might coalesce.

In both theological and scientific domains stability may be qualified in layered, hierarchical terms. Scientifically-speaking, if one considers a fundamental physical basis for stability, then one of the most basic, calculable mathematical descriptions of such involves the minimizing of potential energy. The easiest examples to understand in this case tend to be trivial, static and uninteresting, such as a marble resting in the bottom of a bowl having minimized its gravitational potential energy. More involved examples in dynamic systems may involve many-body problems like the orbits of planets and moons in the Solar System. It might also involve an analysis of the possible trajectories describing the dynamics in question, analysing which trajectories reliably remain within a defined, finite region of phase space. Landau and Lifshitz offer a helpful insight into the complexity of stability analysis from the perspective of fluid mechanics,[1] appealing to a geometrical means of representation involving a 'space of states...each point in which corresponds to a particular velocity distribution' [or more generally to some vector field] and such that 'adjacent instants then correspond to adjacent points'.[2] Steady flow is then represented by a single point and periodic flow by a closed curve or loop in the space of states. A stable flow then requires that 'adjacent curves representing the establishment of the flow' tend towards either such a point or such a loop over time, each such 'limit cycle'

[1] Landau and Lifshitz, *Fluid Mechanics: Course of Theoretical Physics, Vol. 6* (Oxford: Elsevier, 2010), pp.95*ff*.
[2] *Ibid*, p.108.

or ‘limit point’ having its own ‘domain of attraction’.[3] Stability therefore becomes a dynamic concept, evaluated with reference to an extended time period. More complex regimes of stability (or instability) analysis then require appeal to more complex topologies accommodating any geometrical representation.[4] This connection between stability and a topological conception is important to what follows.

In chemistry not only is there the quantum level of consideration but also the question of the overall stability of reaction *networks* and the extent to which they are autocatalytic. In the biological domain things become yet more involved, since any energy-based aspect to our analysis becomes entangled in a complex interrelation with an information-based aspect. Biological stability emerges through a complex relationship between energetic and informational requirements, providing an interesting and *dynamic stability* having the potential for self-organizing, emergent properties. To give but one example there are, on the level of protein folding, many possible conformations that could occur purely according to energy requirements but only some of these present functionally useful properties concerning informational provision at active sites.[5] The overall result is a hierarchically-layered, functionally-modulated, domain-bounded, living arrangement or architecture, involving an intricately interconnected network topology and incorporating a critical, communicating balance between local and global modes of stability.

Theologically-speaking, one might consider a sacramental framework as qualifying the stability of the participate existence of the whole of created space, and especially of intelligent life within it. Creation is treated here as an *opening* of created space, accommodating creaturely participation over an entire hierarchy of levels with human nature at the apex by virtue of the divine image bestowed upon us. While the progression of consideration through physical, chemical and biological domains suggests a bottom-up development, such sacramental stability may be taken more as a top-down communication or bestowal, ultimately necessary for the sustained foundation of created space and order. For any appreciable reception of such communication, especially as *revelation*, to distil

[3] *Ibid*, p.109.
[4] *Ibid*, p.110.
[5] Alberts *et al*. *Molecular Biology of the Cell* (New York: Taylor & Francis, 2015), pp.354*ff.*

within the iconic human intellect it is then necessary that these top-down and bottom-up aspects meet according to an appropriately patterned or interwoven harmony.[6]

A dynamically stable, harmonious conversation between theological and scientific outlooks and insights ought to involve theology considering that science's epistemological enterprise, if worked out with the greatest possible degree of responsibility and accuracy, may carry advantageous and even (potentially) eschatologically significant consequences for our theological perspective. Science may highlight what it considers the most central anthropological prospects and challenges to consist in, and the future accentuation of theological activity may therefore become increasingly scientifically informed. Theology in turn may remind science that not every aspect of created space, or of what it *means* to be created, is susceptible of scientific analysis, pointing instead to a different form of holistic framework for considering Creation, especially where a deeper appreciation of stability is concerned.

The theology-science dialogue is of on-going importance, at one level of applicability or another, to many people throughout the world, affecting the psychological balance of human understanding and endeavour, weighing up different possibilities and avenues of inquiry. Indeed, there is a double urgency for dialogue among those communities that live in areas of intense religious pluralism and a heavy influence of the natural sciences.[7] This thesis suggests a hopefully robust, stable theo-scientific integration based mainly upon the relation of both disciplines to a dynamic conception of stability itself and its relation to the *Logos* concept, to the intelligibly meaningful harmonization therewith associated, even in 'becoming flesh and tabernacling among us'. It hopes further to suggest some interesting possibilities for how various core theological concepts – especially Incarnation and Transfiguration – might best be appreciated from the perspective developed here.

Background to the thesis

I am writing first and foremost as an ordained scientist and have tried to apportion material evenly between theological and scientific domains of consideration, aiming to focus on sources summarizing the salient contributory points in the most cogent manner. The variety reflects the fact that this thesis is not primarily a focus on the work of any *one*

[6] This use of language is, in part, inspired by Boersma's description of the weaving of a sacramental 'tapestry' (see below).

[7] S. C. Kim, *Religion and Science in Dialogue: An Asian Christian View* (Zygon, Vol.51, No.1, March 2016), pp.63-70.

theologian, philosopher or scientific theory but consists instead in the promotion of a conceptual framework for theology-science integration, a key aim being to demonstrate an internal consistency and interconnectedness concerning the language used in building up the framework. The kernel for this thesis originated through a combination of three distinct components: my motivational interest, a consideration of what I hoped to offer the theology-science conversation, and what I considered to constitute the critical underlying idea. I shall review these three aspects in turn.

The central motivation originally stemmed from a superposition of two related interests, both involving trying to see something as a *whole*, as far as possible without an overemphasis on one detail, or thematic set of details, obscuring the bigger picture. On the side of scientific interest, *Big Bang* cosmology illustrates that, for the first time ever, physics in the twentieth century was coming genuinely close competently to considering the cosmos, and various stable, emergent domains therein, as a whole. More recently biology has also developed a greater dexterity in viewing the interconnected, multi-dimensional landscape of its evolutionary domain more robustly as a whole (chapter 1). Increasingly science is starting to say things about the infinite,[8] especially in the wake of Cantor, and regarding eschatology (chapter 4). On the side of theological interest, theology might classically have seemed better suited to seeing the whole, aiming to say 'something about everything' rather than vice versa.[9] Science, however, is presenting a broader context of discovery in the 21st Century than ever before, excelling in piecing together connections between necessarily interrelated contingencies. Theology meanwhile looks to the source of all contingency.

This important distinction was promoted by Torrance, who emphasizes how scientific attachment to the contingent and the comparative contrasts with some acknowledged dependency on the non-contingent, but that both theological and scientific domains nonetheless appeal to the theme of *connectedness* in their own way.[10] He emphasizes that a form of approach cannot be divorced from its associated content in terms of knowledge acquisition and, furthermore, that the nature of our appreciation of any balance between contingency and universality inevitably shifts over time for any genuine advance in

[8] Sondheimer and Rogerson, *Numbers and Infinity: A Historical Account of Mathematical Concepts* (Cambridge: CUP, 1981), pp.147*ff*.
[9] S. Oliver, *What Can Theology Offer to Religious Studies*? In Warrier and Oliver, *Theology and Religious Studies: An Exploration of Disciplinary Boundaries* (London: T and T Clark, 2008), p.20.
[10] T. F. Torrance, *Theological Science* (Edinburgh: T and T Clark, 1996), especially pp.281-285.

understanding. Human modes of knowledge must remain open to change or *metanoia*. There is also the consideration that the contingency upon which scientific method depends includes that of its means of inquiry upon natural parameters defining and constraining our operational epistemology, or in other words how our particular embodiment means that we are on principle able to observe 'reality'. Our capacity to contemplate scientifically or theologically is contingent upon a particular, cosmic history. Defending the integrity and distinction of the created, while distinguishing the modes of *scientia* operative in theological and scientific searching for critical objectivity, Torrance looks to the inherence of an actively self-disclosing 'motion' rather than an unhelpfully static, inert interpretation of 'beginning' or 'principle'. Humanity should not seek inappropriate dominion over divine image, humanizing theology so as to make 'man himself the measure or central point of reference',[11] although on the other hand human nature still plays a pivotal theological role as assumed in the Incarnation.

To Torrance, knowledge of God only occurs through a means by which His self-disclosure can be treated objectively, such that 'theological knowledge takes place only through a critical reconstruction of subjectivity in accordance with the nature of the object'.[12] This proves especially important when it comes to considering the Mind of Christ, a critical theme in this thesis. It is also necessary to distinguish that domain in which God 'sees' Himself purely as or according to Himself, taken here to consist in the Trinitarian Immanence.[13] Such distinction may constitute an objective logic in itself, and one that is complementary to Torrance's insistence on distinguishing that domain according to which nature is known purely from a natural perspective.

Our physically-embodied, theological engagement within the created domain is treated here in terms of *propositional* and *prepositional* aspects. The former pertains to those proposed aspects of revelation that seem, within reason, detached from the context of our particular physicality – things we could not properly be claimed to have influenced in ontological terms. The latter is representative of a more direct consequence of our physical involvement in space and time, and a term chosen because one of the many consequences of such involvement is the need to decide upon the most appropriate use of prepositions when developing theological argument, discriminating between whether something is

[11] *Ibid*, pp.76-77.
[12] *Ibid*, p.98.
[13] As distinct from the outward 'regard' in which Creation is held together.

before or after, top-down or bottom-up, within or without, in or through, with or between, and so forth. This aspect emphasizes the God-humanity relationship as some product of that between God and created space overall and that between a topologically non-trivial, cosmic context and our contingent humanity. There is a certain symmetry between the manner in which the cosmic context forms us and that by which we come to form appreciable representations of it, and the possible significance of such symmetry is developed in what follows.

Stăniloae, in his profoundly creation-focussed theology, approaches the 'God-humanity' relationship through such a combination of 'God-world' and 'humanity-world'.[14] His focus upon creation theology allows for some sense of *theosis* to precede soteriological consideration. Humanity is immersed in such precedence in a way disposing us to search openly for higher levels of meaning. His understanding of *theosis* works itself out *in* space and time, involving completion in some revealed meaning and he suggests that 'human nature is not filled from the beginning with the whole substance of its pre-existent reason (Logos) in God, but is called to actualize this substance by voluntary effort'.[15]

Carr notes similarities between the theological concerns of Stăniloae and Torrance, both importantly searching for a united *Weltbild* allowing for revelation in space and time, holding fast to critical principles of rationality, contingency and a central reference to the *Logos* as securing the goodness of creation, pointed towards completion in a manner involving an inseparably active role for humanity while not allowing our theological significance to be considered in a manner divorcing us from creation as a whole.[16]

In the holistic context of this thesis I am advocating a scientific *ressourcement* within theology, informing our 21st Century context for exploring and interpreting the significance of a Christian doctrinal framework. The word *ressourcement* is chosen in comparison to the *Nouvelle Théologie* movement seeking to reinvigorate Christian thinking by returning to the Scriptures and the wisdom of the early Church fathers.[17] Here, however, the scientific *ressourcement* plays precisely to what classical theological sources

[14] E. Bartos, *Deification in Eastern Orthodox Theology: An Evaluation and Critique of the Theology of Dumitru Stăniloae* (Carlisle: Paternoster Press, 1999), pp.95-144.
[15] *Ibid*, p.105.
[16] T. Carr, *The Rationality of the Cosmos: A Study of T. F. Torrance and Dumitru Stăniloae*, in Baker and Speidell, *T. F. Torrance and Eastern Orthodoxy: Theology in Reconciliation* (Eugene: Wipf & Stock, 2015), pp.247-266.
[17] H. Boersma, *Nouvelle Théologie and Sacramental Ontology: A Return to Mystery* (Oxford: OUP, 2009)

or methodology are not so well-placed to do – namely to go right back to our earliest, physical roots as human beings, couching our understanding of such within a deeper appreciation of the interconnected nature of those contingencies saturating cosmic history.

The extension of our history to genuinely cosmic proportions has been dubbed *Big History*. One very recent presentation of this looks at cosmic history in the context of a series of transitional, threshold developments, or movements, from one era to another: transitions classified according to (a) having certain 'ingredients', (b) some identifiable structure, and (c) some particular 'Goldilocks conditions' that may in turn give rise to (d) critical emergent properties,[18] and ones that are necessarily *stable* within their own functional domains, defined according to a chain of relative, interrelated contingencies as systems self-organize. One motivation here is to provide some theological accentuation on this important viewpoint. Such motivation ought also to be fuelled by an emphasis on the urgency of the context facing 21st Century humanity, arguably coming towards the verge of another mass extinction if certain signs have been correctly interpreted.[19] The renowned evolutionary biologist E. O. Wilson, for example, expresses contemporary concern over the dawn of another extinction phase and argues, against more extreme approaches to the 'Anthropocene Era', for what he considers the best conservation plan, involving the reservation of one half of the Earth's surface for such purposes.[20] We need a scientifically and theologically fuelled urgency if the dynamic of human nature is to move properly towards the next phase, or threshold, in its active, contributory participation in *Big History*. One question then becomes the degree of conversation between scientific and theological outlooks on futurity: the former being more evidently and necessarily data-focussed than the latter.

Taken alone, each discipline's attempt to speak about 'the whole' in its own language remains incomplete, in some sense reliant upon the input of the other. The question then becomes whether a means of conceptual interaction might be suggested which ultimately *simplifies*, rather than complicates, the quest for a more holistic integration – perhaps a simplicity 'on the far side of complexity' as Wendell-Holmes put it.[21] Such simplification

[18] Christian, Brown and Benjamin, *Big History: Between Nothing and Everything* (New York: McGraw-Hill, 2014)
[19] A. Newitz, *Scatter, Adapt, and Remember: How Humans will Survive a Mass Extinction* (New York: Doubleday, 2013)
[20] E. O. Wilson, *Half-Earth: Our Planet's Fight for Life* (New York: Liveright, 2016)
[21] http://www.alisonmorgan.co.uk/Croft%202008.htm (accessed 2014)

may relate to those points of informed contemplation at which divine Activity becomes more transparent,[22] reorienting the nature of our encounter and engagement within the multi-dimensional, cosmic fabric whose causal interdependencies promote many possible avenues of enquiry.

Both theology and science are agreed on the concept of some united cosmic origin, albeit via different applications of language. Seemingly, something must just be. Whether one looks solely at this cosmos, or considers various multiverse theories, one is faced with an inescapable conclusion that, especially in theories of origin, there must be something that just is. A scientific perspective might suggest a quantum fluctuation consisting in some vacuum energy, or posit an essential mathematical construct,[23] while theology states first and foremost that God simply *is*, divine simplicity here emphasizing unity of 'substance' or essence.[24] An enlightening combination of origin principles between scientific and theological disciplines would clearly be valuable, and I believe that this is best to be found through a proper consideration and conception regarding the *Logos* and the harmonizing stability that it affords.

Novelty and the central, underlying theme

As to what I am purporting to offer as new, the central consideration is the particular combination of *vocabulary* involved in the advocated framework. The vocabulary and the topological flavour of the overall framework are aimed, as far as possible, at considering a holistic, cosmic viewpoint within which our anthropological journey develops. In the abstract to an article on a possible holographic origin for the *Big Bang*,[25] Pourhasan *et al* ask

> While most of the singularities of General Relativity are expected to be safely hidden behind event horizons…we happen to live in the causal future of the classical *Big Bang* singularity, whose resolution constitutes the active field of early

[22] P. N. Jordan, *Minimalist Engagement: Rowan Williams on Christianity and Science* (Zygon, Vol.51, No.2, June 2016), pp.387-404.
[23] Such as the *Mathematical Universe Hypothesis*, a theory technically having no free parameters. See M. Tegmark, *Our Mathematical Universe: My Quest for the Ultimate Nature of Reality* (London: Penguin, 2014).
[24] Also 'seeing' as a *whole*, through an impartial, undifferentiated 'regard'.
[25] Pourhasan *et al*, *Out of the White Hole: a holographic origin for the Big Bang* (Journal of Cosmology and Astroparticle Physics, No.4, April 2014), pp.1-16.

universe cosmology. Could the Big Bang be also hidden behind a causal horizon, making us immune to the decadent impacts of a naked singularity?

Somewhat analogously, one could ask, from a 21st Century perspective, what might constitute the *theological* focal point around which the questions or concerns of most causal relevance to humanity may be considered to accumulate or coalesce, and the degree to which any theological 'horizon' might shield us from the full, naked impact of such. Inasmuch as the concept of *Logos* could be considered a viable candidate for such a focal point, a theological term also retaining a critical relevance to the 'logic' of science, the Incarnation induces a change in perspective regarding such a conception. The concept of the 'singularity' will be extended metaphorically in what follows to the incarnational context. The theologically unique Mind of Christ will be taken to represent a critical, unifying cooperation between divine and human 'idioms' (see below) of operative engagement with respect to Creation, and such irreducible uniqueness is argued, by analogy with the concept of the singularity, to manifest an hourglass topology opening into the New Creation.

I aim to avoid any unhelpfully separatist dualism and therefore focus throughout on the principle of *distinction without separation*, indispensable to Trinitarian and Christological vocabulary. To this end, the vocabulary of this thesis tends towards a focus on certain key dual-aspect unities. Each such unity has its own context of application, but such contexts are dynamically interrelated. Overall, an integrated, dynamic and internally self-consistent framework is thereby constructed. Sometimes I refer to such dual-aspect unities as 'bonds' – a description carrying obvious chemical associations. If one wishes to speak about water, for example, one must do so within the context of a framework in which hydrogen and oxygen, although their respective locations within a water molecule can be distinguished, cannot be spoken of in isolation from each other without it becoming the case that water is no longer what is genuinely being spoken about.

While a bonded molecule has a certain *stability*, the interdependence or interrelatedness between the various aspects of consideration made here is in tune with the idea of an enveloping, dynamic stability. This inherent dynamic proves useful for keeping conceptual track of developments in an evolving context. The very idea of 'dynamic stability' is understood here in terms of some mutual, binding influence effected by and between those aspects, terms or components that coalesce in the functional context of a particular domain

of operation – the human mind being a pivotal example here. Where the holistic viewpoint is concerned, applying both to the Creation as an interconnected, cosmic whole and to the particular 'place' of the human mind therein, I look in each case to the idea of simplifying the context of focus by homing in on two key interrelating aspects (form-content in the case of the created whole and refuge-prospect in the case of the human 'mindscape' – see below for more details) aiming to maintain a suitably flexible but practically relevant vocabulary.

Interconnectedness is a critical concept here. In physical science, inasmuch as it considers finite systems requiring a formal context of definition, any representation or evaluation of interconnectedness is necessarily accompanied by some functional appreciation of compactness, or a degree of enfoldedness defining the relative strength of interconnectedness between various points in a system or space. Compactness may also relate to whether the system or space is open or closed with respect to another. The interconnected framework of this thesis is described here in similarly compact terms, through an 'enfolded' use of vocabulary and analogy.

The words 'interconnected' and 'compact' are chosen advisedly here owing to the deliberate couching of the overall framework within a topological treatment of 'created space' and its largely asymmetrical relationship with the 'Uncreated'. Topology looks to the holistic properties of shape and the nature of its connectedness within particular dimensionalities of space, something broader than more strictly geometric considerations involving metric distance and curvature. The decision to centre the use of vocabulary on an underlying topological conception was made for a variety of reasons.

Firstly, being mathematically grounded, its terminology is robustly defined while its application is wide-ranging and relatively flexible. Topological conception can be applied in many different evaluative and analytical contexts: point-set topology, rubber-sheet topology, algebraic topology and differential topology.

Secondly, its scientific application is an area of great contemporary interest, such application having been made at the cosmic scale[26] right down to the scale of Quantum Field Theory (involving stable 'kinks', 'vortices' and 'monopoles')[27] and String Theory.[28]

[26] J. Levin, *How the Universe Got its Spots: Diary of a Finite Time in a Finite Space* (London: Weidenfeld & Nicolson, 2002)
[27] L. H. Ryder, *Quantum Field Theory* (Cambridge: CUP, 1996), pp.390*ff*.

On intermediate scales it has been applied to the growing area of network topology,[29] applied to such diverse contexts as the Internet, neural networks, collaboration networks and social contact networks, as well as autocatalytic networks in chemistry (chapter 1) that may readily be extended into the biological domain. There is developing interest in the influence of topological properties on the development of biological systems.[30] Recent Nobel Prizes were awarded for work on topological phase transitions and materials science has benefitted from insights concerning non-trivial topologies associated with particular electronic wave-functions, such as in Weyl semi-metals.[31]

Thirdly, taking its mathematical grounding seriously, the concept of a topology circumscribes any specific geometric consideration – many geometries being able on principle to be accommodated within a given topology. Accommodation, especially in the sense of theological incorporation and embedded participation, is important here.

Fourthly, the concept incorporates a variety of ways in which aspects of continuity and discontinuity may be considered and by which categorical distinctions may be made between two spaces or structures. Among other things, it involves considering the nature of connectedness and the form of compactness, as well as invariants and homeomorphisms (transformations by stretching and bending rather than tearing or puncturing).[32] Through certain analogous or metaphorical extensions, these concepts have important application in what follows.

Finally, the very manner in which the notion of a topological space is defined involves a broader context consisting in an entire hierarchy of concepts concerning a general treatment of 'space'. This extends from the most general and flexible idea of a set through to the more tightly classified idea of Euclidean vector space, with an additional classifying condition being imposed at each level in the hierarchy, such as requirements of convergence, neighbourhood, boundary, symmetry, distance and orthogonality.[33] The

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[28] Yau and Nadis, *The Shape of Inner Space: String Theory and the Geometry of the Universe's Hidden Dimensions* (New York: Basic Books, 2010)
[29] Latora *et al. Complex Systems: Analysis and Models of Real-World Networks*, in Musumeci *et al. Energy and Information Transfer in Biological Systems: How Physics Could Enrich Biological Understanding* (London: World Scientific, 2003), pp.188-204.
[30] Doostmohammadi and Yeomans, *Topology in Biology: Mechanical Control of the Density of Cell Layers* (Department of Physics Newsletter, University of Oxford, No.11, Autumn 2017), pp.2-3.
[31] A. Boothroyd, *Magnetism Orders Exotic Fermions* (Department of Physics Newsletter, University of Oxford, No.9, Autumn 2016), p.5.
[32] M. Nakahara, *Geometry, Topology and Physics* (London: Taylor & Francis, 2003), pp.67-91.
[33] Reid and Szendrői, *Geometry and Topology* (Cambridge: CUP, 2005)

basis of definition regarding a topological space involves a particular collection of subsets of a set *X*, and, in the particular case in which the collection in question is the so-called 'power set' (the set of *all* possible subsets of *X*) the associated topology is referred to as a 'discrete topology'.[34] The choosing of subsets could be considered as some discrete selection, differentiating between one means of choosing a subset, or collection of subsets, and another. The set of all possible subsets therefore represents a summation over all these distinct possibilities, effectively summarizing an overall flexibility within the set or, in an applied context, the formal structure of a space.

One could extend this conception, by analogy, to a theological domain of application concerning *created* order or 'space'. There are several ways in which our created and creative intelligence may conceptually differentiate between one discrete category, component or dimension of created space and another, and there are several subsets or selections of interrelating 'domains' that we could focus upon. However, an overall interconnectedness according to the ultimate unity of cosmic origin demands some complementary integration. The cosmic whole, in its stably perceivable stability, then represents an emergently critical balance between integration and differentiation.

This way of thinking provides, I think, a basis for an analogous, topological treatment of cosmic, created space from a theological perspective, something more naturally communicating with physical, scientific approaches. Our very conceptual capacity for differentiation and definition within 'created space' exists in necessarily natural accordance with its underlying structure, topology, parameters and principles, in turn theologically rooted through (the concept of) the *Logos*. This inevitable constraint defines our accessible, finite modes of intellectual engagement, collectively summarized here by reference to our particular 'idiom', emergently operational within *this particular* interconnected, multidimensional, created space. The distinct, divine idiom of operative engagement with regard to Creation is then that which initiates, manifests and sustains the critical stability that is ultimately necessary for the emergence of our idiom of engagement and our capacity to perceive reality in an intelligibly consistent, dynamically stable manner.

[34] McCluskey and McMaster, *Undergraduate Topology: A Working Handbook* (Oxford: OUP, 2014), pp.17*ff* provides a reasonably accessible introduction to the relevant concepts.

Any putative 'topology', or basis for topological definition, associated with any hypothetical Uncreated "Space" – that 'domain' from or according to which the divine idiom engages with created space – is then categorically different in its nature, and interacts with the created through the Activity of the *Logos* in accordance with a holistic, undifferentiated regard or 'seeing'. I will argue that, through the Incarnation, the *Logos* reintegrates, re-harmonizes and recapitulates created order/space as the net effect of these two differently postulated *topoi*, distinctively associated with Uncreated and created, being united in such a way as to effect a unique mode or 'pointedness' of encounter. Such pointedness is represented by the 'node' or 'neck' in a hypothetical, compound hourglass topology[35] and is considered analogous in this case to an essentially induced and topologically irreducible 'singularity' corresponding to a mutual and necessary novelty of encounter in the Incarnation. This irremovable singularity represents, theologically, both the definitive coincidence of Alpha and Omega and the radical coincidence of divinity and humanity, or Uncreated and created more generally. The contingent, interconnected terms of created order (chapter 3) are 'drawn into' the divine Economy afresh according the unique and actively creative mode of encounter of the Incarnate *Logos* in created space so as to create a pathway into the eschatological openness of a new creation or reconfigured order.

The non-trivial 'topology' corresponding to our particular capacity for encounter and reception within created space is refashioned or transformed through the Incarnation and Resurrection, according to the enabling of a new mode of communicative engagement between the created and the Uncreated, within which the created is embedded and participate. The process of the 'breaking in' of a New Creation is then inseparable from the 'motioning' of the Incarnate *Logos* and Cosmic Christ, reordering or 're-membering' (see chapter 5) created space.

The capacity for metaphorical application within this topological conception will be invoked at various points, including the idea of a 'semantic hierarchy' regarding our capacity for encounter and engagement (chapter 3), making use of the classification of 'genus' concerning topological forms. The topological concepts of 'neighbourhood' and 'connectedness' will be applied theologically to the central concepts of divine-human communion and united, sacramental participation. The aforementioned 'node' (a term

[35] 'Compound' in the sense of the created context being embedded in the Uncreated.

borrowed from network topology) is taken as grounding the essential *stability* for both of these.[36] In both the scientific and theological contexts of application, topological consideration therefore remains intimately associated with some qualification of stability. In the theological case such qualification involves a hierarchical differentiation concerning the term 'motion' (see below); in the scientific case it involves a layered, bottom-up emergence building on previously established forms of stability and/or transitioning into new and topologically distinct domains of organization.

The very word 'topology' carries a convenient etymology for an application to theological context and the thesis presents what one might think of as a scientifically informed vision of a theological topology – a sacramentally pervasive *topos* being associated with the *Logos*, in some sense 'objectified' in the Incarnation, embedded in the Uncreated and fully participating in the divine Economy.

To our *finite* conceptual perspective, any revealable or physically discernible effect concerning such a pervasive *topos* relies on, and emerges from, a critical 'enfoldedness' or 'compactness' within created space. Our epistemological capacity, or mode of encounter, within such a compacted 'reality' then effectively engages with some form of 'diffraction pattern' (chapter 4) with respect to the creative 'motioning' of the divine Economy in Creation, through the *Logos*.

The idea of Creation, and its critical stability, deriving from the integrating, harmonizing role of the *Logos* suggests a musical metaphor. Levinson, defending the ontological objectivity of the non-physical in the context of a discussion on the artistic nature of a musical work, considers the underlying creative activity to be indicated or initiated through being contextually embedded within the uniqueness of a person, time and means of performance.[37] Such terminology could well be applied to the uniqueness of the incarnational context, something demonstratively defining a theological context for human completion through a Creative Activity being worked out through the *Logos*, indicating and initiating a New Creation in 'becoming flesh'.

[36] This grounding is eternal, its *foundational* relevance not being contingent on chronological progression, just as the relevance of the Incarnation should properly be considered to stretch back in time as well as forward. Such foundational relevance also pertains to a divine 'regard' or 'perspective' beyond distinction between the actual and the potential, and is in contrast to that *emergent* relevance occurring with respect to the human regard or 'mindscape'.

[37] J. Levinson, *What a Musical Work Is* (The Journal of Philosophy, Vol.77, No.1, Jan 1980), pp.5-28.

Dynamically interconnected, harmonious balance is critical. In terms of our interpretative perspective such should extend to some proper balance of association between the ideal and the material, between the mediate and the immediate, between the immanent and the transcendent, between integration and differentiation, and between theological and scientific insights. Furthermore, the creative, interpreting human mind represents a crucial domain of emergence and operative unification within that dynamic, hierarchically qualified stability that progressively enabled our embodied perspective and its quasi-stable (in the sense of being relative rather than absolute) *topos* of encounter. The emergence of such an operative *topos* from a scientifically engaged, bottom-up perspective is considered in chapter 1. An active interrelatedness between this and the aforementioned 'theological topology' is then considered possible as a result of our iconic bearing of divine image, fulfilled and completed through the Incarnation.

This unification highlights another critical theme in this thesis. Within an Incarnation-centred, topological representation of created space, two distinct 'idioms' of operative engagement *co*operate with one another through a dynamically pervasive 'tension' (see below) pertaining to the Uncreated-created interrelation in general and to divine-human communion in particular. Such idioms are taken here as relating to distinct moods of creative freedom: that associated with the finite and the created being participant in the openness or 'affordance' initiated by that associated with the Uncreated.

On the one hand there is the distinctive, operational epistemology pertaining to creaturely humanity, patterning and re-patterning various aspects of intelligibility in a manner inseparable from our environmental conditioning to search for such intelligibility in the first place[38] (chapter 1), *generating* meaning in so doing and handing it on to our progeny in various ways (chapter 5). If one is to take seriously the theological claim that all created space and its emergent properties are ultimately derived through the *Logos*, including our engagement with generating meaning, then such engagement becomes inseparable from our capacity for conceiving (of) the *Logos* (chapter 3).

On the other hand there is the top-down, divine idiom of operation, *manifesting* meaning in the sense that it is *latently established* within the order and stability pertaining to created

[38] Williams notes the importance of the inevitable association between our particular, natural drive to seek intelligible structure(s) and our means of generating and patterning meaning, considered in the context of maintaining a distinction between the underlying 'nature' of the sacramental and any focus on the practices surrounding the reception of one particular Sacrament. R. Williams, *On Christian Theology* (Oxford: Blackwell, 2000), pp.197-208.

space. Inasmuch as it is also channelled through the context of the Incarnation, divine engagement with Creation 'draws all things' (cf. John 12:32) to itself, bringing them "back" through Christ as Incarnate *Logos*, according to the 'hourglass topology' here being associated with the 'place' of the Mind of Christ (chapter 3). Such channelling occurs within and according to those material contours assumed and newly encountered in the Incarnation, contours defining our generative idiom of engagement and which may be related to the aforementioned 'compactness' within created space – a compactness transformed and opened into a New Creation through the node of the hourglass. Our generative, meaningful contribution to the 'content' of Creation (chapter 3) is thereby *re-manifested* through the unity of the distinct natures in Christ and the consequent cooperation of their respectively associated idioms of engagement with(in) Creation. Such cooperation is, I shall argue, no less relevant to the more strictly representational means of generating or patterning meaningful knowledge through scientific pursuit – which might be considered at least covertly sacramental – than it is to the more overtly sacramental engagement pertaining to a theological perspective on our participate activity and formation.

I therefore associate the divine idiom of engagement with a means of 'manifesting' meaning and the human idiom with a means of 'generating' meaning in a given, finite physical context, in this particular cosmos. As to the distinct moods of creative freedom, I adopt the view that divine freedom 'identifies' with necessity while human freedom 'correlates' therewith.[39] Bulgakov enlarges on this by suggesting that 'in creation, freedom is *prior to* the person, so to speak, and ascends through various stages of development *to* the person…Such an extrapersonal freedom is, in general, nothing else but *life* [italics Bulgakov], it corresponds to the living principle in creation'.[40] This fits with the layered, hierarchical framework of stability and its up-building to new operative levels within created order, involving a delicate interaction between chance and necessity upon which chapter 1 expands. The above use of vocabulary is also relevant to Schmemann's insistence, in the context of Eucharistic theology, that

> The empirical (or "visible") and the spiritual (or "invisible") are united not *logically* (this "stands for" that), nor *analogically* (this "illustrates" that), nor yet by *cause and effect* (this is the "means" or "generator" of that), but *epiphanically*.

[39] S. Bulgakov, *Bride of the Lamb* (Edinburgh: T and T Clark, 2002), pp.126-127.
[40] *Ibid*, p.130.

> One reality *manifests*…and *communicates* the other [italics Schmemann], but – and this is immensely important – only to the degree to which the symbol itself is a participant in the spiritual reality and is able or called upon to embody it.[41]

Since the above makes reference to 'motioning', to the 'Uncreated' and to 'sacramentality' it is worth enlarging on how these terms are being understood.

An understanding of 'motion'

Given the necessary distinction between that humanly-inaccessible Trinitarian Immanence in which God 'sees' Himself purely *as* Himself, and the economic but nonetheless uncreated *energeia* allowing for some aspectual revelation in created space,[42] encounterable by us, one may properly distinguish between within-ness and without-ness with respect to the Uncreated and divine nature. Where our capacity for encounter and for coming to 'know' is concerned we are, as it were, embedded and participant 'within' the aforementioned 'without-ness'. The term 'within' therefore requires qualification (chapter 4). Such participation importantly does *not* involve any manipulative, negotiating aspect of our 'seeing' or knowledge.[43] The process of theologizing (something properly accommodating scientific development in the broadest sense) is taken here to consist in an initiating participation in the self-knowledge of God, not presuming in any sense to 'see' God as God would do, but nonetheless suggesting a necessarily creative complementarity between divine and human modes of knowing.

One must likewise distinguish properly between an immanent, internal 'theo-motion' – that intrinsic *perichoresis* of the Trinitarian dynamic – and an economic 'motion' both enabling human understanding and being at least partially conceivable by it. The internal 'theo-motion' cannot be 'seen' by us as such, any mutual motioning of the Persons being united in an unmovable Event. Any 'motioning' into and throughout created space,[44] pertaining to the Trinitarian Economy, then amounts to a distinct qualification of the term 'motion'.

Oliver emphasizes the historical and theological understanding of this term within a broader, interactive, multidimensional framework beyond strictly discursive limits,

[41] A. Schmemann, *The Eucharist* (New York: St Vladimir's Seminary Press, 1987), p.39.
[42] T. Ware, *The Orthodox Church* (London: Penguin Books, 1997), pp.208-238, and K. Ware, *The Orthodox Way* (New York: St Vladimir's Seminary Press, 1995), pp.11-25.
[43] R. Williams, *The Wound of Knowledge* (London: DLT, 2014), pp.24*ff*.
[44] A motioning also *opening* such space in the first place.

holding together an ontological hierarchy that could be (re)configured to demonstrate relevance to contemporary scientific concepts. He relates the motional quality both to a means of approaching human knowing and to an understanding of the Eucharist as something motionally accommodating and reincorporating.[45] A complementary but distinct perspective on this is given in chapter 5, Eucharistic accommodation being pointed towards finding 'rest' in Christ. Oliver notes that the concept of 'rest' can also be hierarchically qualified. Such fits with the topological framework here and its hierarchical qualification of 'stability', and the inter-communing between Uncreated and created is then interpretable as a dynamic, harmonious but asymmetrical equilibrium pertaining to cooperative, divine-human interaction.

Oliver considers a bottom-up hierarchy from 'first potentiality' (the potential, for example, to learn an as yet un-encountered language) through 'second potentiality' (the engagement with learning such language) into 'first actuality' (becoming fully able to speak the language) and finally to 'second actuality' (actually speaking the language in practice). It is perhaps tempting to suggest, from *our* perspective, a top-down hierarchy along similar lines: the Immanent Trinity being in some first potentiality for self-disclosure; the Economic Trinity being in second potentiality thereto; the act of Incarnation being the first actuality; and the fulfilment of the entire mission of the *Logos* as returning to the Father constituting some completed, second actuality. Owing to the (co-)eternal and cyclical nature of such 'returning', however, one must postulate of any hypothetical, divine perspective that the Immanence of the Trinitarian Life consists in an ever-actualized potential – beyond distinction between act and potency.

The Immanent Trinity identifies with its ever-actualized potential for Creative Activity, revealed according to the Trinitarian Economy and manifest through the Incarnation in the integrated totality of its physical relevance, dynamically representative of an engagement throughout all created space and ultimately resulting in a newly established, re-stabilised Creation. The fulfilment of the 'second actuality', again from our perspective, would then be the full and final (re)incorporation and eschatological establishment of human nature in Christ 'at the right hand of the Father'.

Oliver's analysis makes reference to Aristotelian principles. McLaughlin revisits the Aristotelian concept of potency and conceptions of form and matter, essence and

[45] S. Oliver, *Philosophy, God and Motion* (Abingdon: Routledge, 2005).

existence, considering possible analogies within modern science, after the relatively late introduction of fundamental energy principles in the advent of thermodynamics. He suggests analogies through careful consideration of the distinctions between such concepts as kinetic energy, force, and the inherent configurational ambiguity of potential energy, including its subtle distinction of reference from that found in Einsteinian, relativistic physics. Seeing a link between the potential energies of the fundamental forces and Aristotelian potency, McLaughlin argues that the broader language of philosophical history does thereby have a cogent relevance to the particularities of modern scientific discipline.[46] Though this thesis is not a direct extension of this idea, such relevance is nonetheless considered important.

Scientifically, once the aforementioned, layered stability becomes operationally established, collective cooperation among interacting components may lead to further emergent properties. The requirement of finding and maintaining a dynamic pertaining to an appropriate energy-information relationship qualifies any degrees of freedom that may be interpreted in accordance with a biological consideration of 'motion', and the biological domain further represents a critical connection between the purely physical and the intellectual or psychological. Furthermore, the aforementioned integration between top-down and bottom-up aspects must at some level be related to the communicative and creative 'motioning' of divine Activity through the *Logos*.

The motioning or motion-inducing Creative Activity or Energy (see below) inseparably associated with the role of the *Logos* enables and dynamically qualifies our iconic, creative freedom from a theological perspective, affording us an integral, distinct and theologically significant idiom of engagement. Just as top-down and bottom-up components must harmoniously interrelate, so too ought the divine and human idioms of creative freedom properly and fully to cooperate, ultimately perfecting sacramental participation and completing sacramental process. The integrated totality of all 'motioning' can then be considered as incorporated within a participative, sacramental framework pointed consistently and coherently towards eschatological relevance and 'rest'. This thesis, given the considered importance of scientific input regarding any layered qualification of motion and stability, therefore insists on maintaining a rootedly physical aspect to any eschatological outlook (chapter 4).

[46] T. McLaughlin, *Act, Potency and Energy* (The Thomist, Vol.75, 2011), pp.207-243.

The late theoretical physicist John Wheeler once stated that time was defined so that motion looked simple. This may apply both to the trajectories of classical mechanics and to the particle interactions associated with Feynman diagrams in the quantum regime. It is therefore not unreasonable to suppose that, in order to make the notion of divine, economic 'motioning' in created space more accessible to human conception and appreciation, there needs to be some intelligible working understanding of 'God's Time' – or in other words that operative association with the temporal domain that is *particular* to the divine idiom. This is also considered in chapter 4.

The Uncreated-created 'tension' and sacramentality

On the basis of the topological framework I will retain, albeit cautiously, some hypothetical notion of "Space" as pertaining to the Uncreated, distinct from created space. The defining factor taken here to indicate a 'created space' is that any intelligent, emergent property, such as the human mind, within and with respect to that space may broadly be able to perceive it in a manner articulable through a language rooted in conceptual categories that are dependent, to whatever extent, on separation, distinction and differentiation. This may involve some *geometric* conception of distribution and dimensionality – including an array of intervals, points, lines, areas, volumes and so forth. The mind in question thereby participates in and according to such created-ness. Any particular, created representation, as a product of the human mind, may also be mathematically mapped or transformed into other representative spaces or geometries. As geometric conception is couched within some broader topological framework, a bounding, topological representation regarding such created space is fitting here. Rather like in a medieval *Mappa Mundi*, a space can be topologically moulded so as to be centred on those points or aspects considered to be of greatest theological significance.

This differentiating, geometrical conception can then be contrasted with purely *semantic* distinctions, avoiding strict separation, by which one might attempt to articulate the nature of what is here intended by the absolutely indivisible Uncreated ("Space"). A complicating factor, however, is that the purity of any such semantic distinction is blurred by the fact that our linguistic capacity derives from a particular means of encounter that is informed, at one level or another, by ultimately 'geometric' properties of relation through some degree of separation in created space. This is inevitable considering the spatial and temporal organization of our neurology and the irreducible requirement for particular

perceptions of space and time for our conceptual processing. The Trinity-in-Unity and Unity-in-Trinity pertains intrinsically to the Uncreated in the sense that enumeration of the Three Persons is not taken to imply any spatio-temporal separation or disjunction, and any distinction between the Persons is not differential in any graduated sense.

I therefore retain the language of "Space" with reference to the Uncreated simply as a hypothetical label to accommodate the *principle of that according to which* any notion of a divine, Creative Mind might be considered to operate or engage. Clearly one cannot think of divine intelligence as natural in any emergent sense, nor as artificial in any sense of being contingent upon something beyond itself. Simply referring to such as 'supernatural', beyond our conception of any material embodiment and dismissing pantheistic approaches, one would do well at least to retain a hypothetical vocabulary for referring to that according to which such intelligence could be considered to operate and, furthermore, to accommodate creaturely co-operation. In all cases of terminological distinction between the two idioms, the operative aspect of engagement pertaining to the divine idiom will retain a capital letter to avoid confusion.

There is an inevitable 'tension' of otherness between Uncreated and created but it is surely theologically axiomatic to suppose that any such tension must be pervasive and creatively efficacious – a positive interrelation or communicability between the two upon which any revelation (including that in the Incarnation) is dependent. Furthermore, given that the created is in some sense conceived through the *Logos* while the *Logos* may in another sense become conceived of by human intelligence (and ultimately conceived more directly and physically in the act of Incarnation), one could consider the opening of created space within the Uncreated – a creational approach – in a certain (creatively constructive) contrast with the manifestation or impregnation of the Uncreated within created space – an incarnational approach. This thesis takes an asymmetrical view of the dynamics of this mutual pervasion, divine initiative being always ontologically prior, and interprets such pervasion as an efficacious 'tension' that is constructively creative rather than obstructively oppositional. Appreciating this inevitable, Uncreated-created 'tension' of mutual otherness, and acknowledging the necessarily complementary dimensions of consideration pertaining to Creation and Incarnation, further involves bearing in mind that the context for the act of Incarnation required creaturely cooperation, involving a physically conditioned capacity for 'conception' in both senses of the term. This 'tension'

is taken here as constituting the *basis* of sacramentality, affording us our participative potential.

This basis is distinct from any one, particular sacramental encounter, or the reception of a specific Sacrament as instituted in the Church. It stands instead as a background theological constant[47] or pervading, background consonance, while specific encounter or reception would then compare to some particular, foreground vocalization, a description having convenient etymological association with some vocational component, or even an invocation performed as part of a particularly pronounced 'unfolding of the liturgical action'.[48]

It is important to be clear that while created entities can be represented (statically or dynamically) within a creatively abstracted space, the Uncreated cannot be represented according to any directly analogous terms, given the above considerations. Given that divine Creative Activity through the *Logos* facilitates the critical, communicative connectedness between Uncreated and created – providing a basis for intelligible, physically relevant revelation – it is logical to seek some dynamic representation of the overall relevance of the theological claim that all created space/order was derived through the *Logos*. As our appreciation of the 'relevance' in question must necessarily develop over a process of theological formation it must therefore be integrated over all relevant and revealing time. Any 'representation' of such relevance is therefore *in and of itself a dynamic*, a critical aspect of that dynamic stability pertaining holistically to the Creation in theological terms by virtue of its being derived through the *Logos*. It is within this dynamic mediation, communicating between Uncreated and created, that a sacramental ontology is considered to manifest itself with developing, theologically formational effectiveness. Given the above mention of 'compactness' as associated with created space, being finite at least in theological terms, the idea of an implicate enfolding and its contextually unfolded relevance will be developed below, with particular reference to a means of conceiving 'reality' developed and advocated by Bohm.

[47] In Bevans and Schröder, *Constants in Context: A Theology of Mission for Today* (New York: Orbis Books, 2004), there is, somewhat surprisingly, no explicit mention of *sacramentality* among the otherwise listed "constants" of Christology, Ecclesiology, Eschatology, Salvation, Anthropology and Culture.

[48] H. B. Green, *The Eucharistic Presence: Change and/or Signification* (Downside Review, Vol. 83, No. 270, Jan 1965), p.34. Green further relates his discussion on Eucharistic Presence to the concept of 'a necessary tension between Christ glorified and his members *in via*, still awaiting the full consummation of their union with him…' (p.41).

This abstract classification also reflects the participatory view of sacramental ontology advocated by Boersma, beginning from a concern over the need for a heavenly *ressourcement* with respect to appreciating the proper nature of our *topos*. He comments that 'St Paul's otherworldliness does not stand in absolute opposition to every this-worldly orientation. Rather, heavenly participation means that life on earth takes on a heavenly dimension...paradoxically, only otherworldliness guarantees proper engagement with the world'.[49] He seeks a return of the best aspects of the Platonist-Christian synthesis in order to engage with a sacramental treatment of the cosmos, especially given the parallel between Christ coming from and returning to the Father and the cosmic whole "going out" from and "returning" to God, according to the *exitus-reditus* schema.

Boersma is influenced by Schmemann's entirely proper connection between those material elements normally associated with our reception of a particular, instituted Sacrament and the cosmic totality.[50] Scientifically the derivation of such elements traces back, through a chain of interconnected contingencies, to the question of cosmic origin. In this respect the cosmic connectivity concerned may also be considered representational in a dynamic rather than a static sense – a dynamic pointed towards an eschatological relevance through the Incarnation. This dynamic is referred to by Boersma as the sacramental 'tapestry', woven according to the principle of participating interconnectedness and allowing for the aforementioned 'neighbourhood' of divine-human communion inasmuch as the various interrelated terms collectively comprising such a dynamic are assumed in the Incarnation. An open question is then the extent to which this can be understood according to some *communicatio idiomatum*. This thesis considers the concept of idiom specifically in terms of a mode of creative engagement, with eschatological establishment occurring through a bi-idiomatic cooperation in Christ.

Any search for sacramental ontology must, for Boersma, be consonant with the core epistemology underlying the Christian creeds.[51] He notes the fathers' view of 'mystery' as referring to 'realities behind the appearances that one could observe by means of the senses',[52] pertaining to a not fully accessible but nonetheless irreducible dimensionality regarding the supra-cosmic whole. He uses an illustration from C. S. Lewis whereby an

[49] H. Boersma, *Heavenly Participation: The Weaving of a Sacramental Tapestry* (Grand Rapids: Eerdmans, 2011), p.5.
[50] *Ibid*, p.9.
[51] *Ibid*, p.20.
[52] *Ibid*, p.21.

entity being represented is active in enhancing the effectiveness of the means of its own representation, thereby being 'present' in the representation in a sacramental manner.[53] Lewis describes the activity of the Sun falling on a representative painting of itself, such that the paint in question shines and thereby significantly enhances the effectiveness of the representation. He considers this a good analogy for sacramental activity and engagement. Fittingly enough given the discussion concerning *topos*, this understanding of the sacramental (which I will adopt here) stems from Lewis' essay entitled "Transposition".[54] The 'background' basis or grounding for sacramentality, that pervasive *topos* dynamically representative of God's economic motioning in created space, enables our participation and may further enhance a theological appreciation regarding our *topos* within Creation.

As to stability, Christ offers 'narrative' stability, principally through being both the Alpha and the Omega of such narrative, integrating and 'recapitulating' created order.[55] Such order consists in a temporally dynamic but integrated whole, indicating some overall theme or Creative Idea (see below). Over a sacramental process pervading the entire dynamic, everything relevantly conceivable with respect to the ordering role of the *Logos* is ultimately drawn back into, and re-established through, the Incarnate *Logos*. Creator and creature are kept distinct throughout by insisting that the latter is 'derived' and 'penultimate' in its significance.[56] Boersma's chief concern, in line with Radical Orthodoxy, is that an insuperable dilemma awaits any loss of consideration concerning a top-down, heavenly stability,[57] and furthermore (in agreement with de Lubac) that any separation between nature and the supernatural rends asunder the proper relationship between theology and philosophy[58] and, by extension, the natural sciences.

The working definition given here regarding a basis for sacramentality qualifies the associated ontology by virtue of its curiously immediate mediation "between" Uncreated and created. Baillie referred to the relationship between God and knower as 'mediated immediacy'.[59] Stearns picks up on this phrase, taking an epistemological emphasis in responding to a concern that 'the inescapable gap between the finite and the infinite is

[53] *Ibid*, p.23.
[54] In C. S. Lewis, *The Weight of Glory, and Other Addresses* (San Francisco: HarperSanFrancisco, 2001), p.102. Originally published in 1949.
[55] Boersma, *Heavenly Participation*, pp.40*ff*.
[56] *Ibid*, p.52.
[57] *Ibid*, p.83.
[58] *Ibid*, p.111.
[59] J. Baillie, *Our Knowledge of God* (New York: Charles Scribner's Sons, 1939), p.181.

eliminated and the distinction between mediacy and immediacy in knowledge is obscured'.[60] He suggests that a hard-and-fast model is required in order to avoid accusations of some artificial theological 'convenience'. It is important, given the above, that the infinite Uncreated engages with the dynamic that in itself becomes representative of the communicative interaction "between" Uncreated and created. Ontologically speaking, in the context outlined above, this mysterious engagement from the 'side' of the Uncreated – the immediate mediation – enables the sacramental participation of the created within the Uncreated in the first place, and such participation then effectively mediates such immediacy over space and time. The expression 'in the first place' attains added significance here, since such participation is principally centred on the dynamic, sacramentally pervasive 'place' of the *Logos.*

Overall, from our perspective, mention of the 'mediate' might indicate some epistemological accentuation – knowledge being progressively acquired through some developing, finite appreciation of directedness, meaning and purpose – while the 'immediate' pertains to an ontological accentuation, constituting some necessary *given(s)* concerning our capacity for appreciating 'reality'. Since for divinity there is, one must assume, perfect conjugation between Being and Knowing, divine nature is then essentially immediate in and of itself. We, however, cannot know anything that is not influenced, or re-represented, by the fact that our epistemological engagement is inseparable from our particular, materially-embodied nature. This inevitably means that our viewpoint concerning 'reality' is subject to change.

Related to the Uncreated-created 'tension', Wood examines three defining and deliberately ordered relations found in the Nicene Creed: God's relation to Himself as Creator; the relation between Uncreated and created; and the relation between created 'heavens' and 'earth', also reinforcing the inseparability but non-interchangeability of these two created aspects.[61] He is careful to stress the fundamental difference in any relation between created aspects and that between Uncreated and created. A metaphor of particular interest here, especially given the above remarks concerning 'motion', lies in his use of the phrase

[60] J. B. Stearns, *Mediated Immediacy: A Search for some Models* (International Journal for Philosophy of Religion, Vol.3, No.4, Dec 1972), p.197.
[61] D. Wood, *Maker of Heaven and Earth* (International Journal of Systematic Theology, Vol.14, No.4, Oct 2012), pp.381-395.

'the settled trajectory of the divine Economy'[62] – a metaphor which I shall invoke at various points in what follows.

The vocabulary of the thesis

I refer to distinct 'idioms' of engagement and creative freedom, as associated with divine and human natures, pointing towards an essential cooperation between them. Ultimately the deepest stability behind created order is the immutable stability of divine nature, Unity-in-Trinity and Trinity-in-Unity, and if human nature is to be stable in any enduring and theologically meaningful sense then it must be so by virtue of bearing divine image. Insofar as 'the Fall' indicates a blurring of such image, creation exists in a relative quasi-stability – something dynamically engaging but nonetheless finite, temporally dispersed and requiring a particular context of engagement for its completion, namely the Incarnation.

Two theological writers relevant to the choice of vocabulary in this thesis have both written on the subject of theology as 'drama' and an established dynamic. Balthasar applies the metaphor of the stage drama as part of an extensive and holistic presentation,[63] according to which the threefold form of Christian dogma is represented through an inseparable relationship between Author, Actor and Director – with the 'world' or cosmos constituting the 'stage'. Accordingly he is able to represent and incorporate many critical themes including, of particular relevance here, the following:-

(i) The fact of an objective 'tension' residing in the mere possibility of any enacted performance.[64]
(ii) The active involvement and breaking in of an essential 'background', especially in manifesting a relevant point of focus.
(iii) The importance of an integrated, cooperative and collective 'content' being worked out over the complete performance, emphasizing the important theme of interconnectedness.
(iv) The actively contributing participation of an 'audience', emphasizing the theo-drama as being necessarily dynamic and goal-oriented.
(v) The proper balance between the openness of an ultimate 'horizon' and the relative

[62] *Ibid,* p.391.
[63] H. U. von Balthasar, *Theo-Drama: Theological Dramatic Theory, Volume 1* (San Francisco: Ignatius Press, 1988), especially pp.15-23, 70-79, 105-109, 125-131, 249-305, 314-323 and 343-353.
[64] *Ibid*, p.128.

closedness of any humanly accessible revelation or humanly generated representation of meaning (or meaningfulness) in/over time. To use Balthasar's own words

> The objective tension lies in the inner transcendence of a strict immanence, in the justified expectation that the necessarily closed framework will – equally necessarily – be exploded by the intrusion of an absolute meaning.[65]

On the other hand, and in a manner complementary to Balthasar, Sayers focuses on the individual creative mind, and the sacramental significance of the artistic life or vocation. In her work on the Trinity,[66] she builds on Augustine[67] to develop her own contemplative analogy regarding the Economic Trinity, based on the idea that the creative image of the inherently creative Creator must, first and foremost, be manifest in the creative potentiality of any creature considered to bear divine image – that aspect of the creature being most truly iconic in a theologically meaningful sense. The analogy consists in relating the language of Father, Son and Holy Spirit, respectively, to the *Creative Idea, Creative Energy/Activity* and *Creative Power* pertaining to the artistic Mind in question, mutually defining an inextricable unity in the case of any actual, or even potential, creative work. She plays to her expertise as a creative writer and dramatist, examining the deeper working of literary styles, methods and abilities, and even accommodating a theory of the nature of Good and Evil, asserting that the Fall has blurred the image with the consequence that we always create slightly out of skew, betraying what she refers to as 'scalene trinities' in each individual.[68] In this respect too she agrees with Augustine's insistence on the disparity of the human mind. Her focus on the individual is relevant here inasmuch as the human being might be considered, in more abstract terms, to stand as a microcosm, representing a concentrated, cosmic significance regarding any higher truth or meaning.

Augustine's idea that the image of the Trinity in humanity is related to the unity of memory, understanding and will in the practical context of any thought-process[69] requires making a distinction between contemplating temporal succession and contemplating eternity, and such that the two communicate with each other, in addition to his distinction

[65] *Ibid*, p.346.
[66] D. L. Sayers, *The Mind of the Maker* (San Francisco: HarperCollins, 1979). Original work published in 1941.
[67] *Ibid*, pp.35-36.
[68] *Ibid*, pp.149-178.
[69] Augustine of Hippo, *On the Trinity* (United States: fig-books, 2013), pp.250-251, 269-274 and 289*ff*.

between inner and outer man. In the modern discipline of cognitive psychology, accepting the active engagement of human perception in any act of mental conception, involving *distinct classes* of memory (and on-going debate as to the nature and place of human 'will' and its freedom), direct use of Augustine's language could prove problematic in a thesis aiming to accommodate contemporary scientific language and outlook. This is where Sayers' particular vocabulary proves useful and Balthasar too uses the language of 'creative activity' and 'creative power', albeit in a slightly different context, referring largely to the place and contribution of the actor(s) in the drama.[70]

The language of Creative Idea, Creative Activity/Energy and Creative Power proves helpful, I believe, for a scientific context of consideration, and I will make use of this in what follows. The term 'Creative Activity' is especially important given that it is analogized (by Sayers) with the 'image of the Word', something carrying an importantly verbal quality, especially noting the possible French translation of *Logos* as *le Verbe*. This allows for an analogy of finite participation in the infinite, considering the verbal moods of indicative, subjunctive and the various participles as participating in the grammatically non-contingent infinitive, the very 'name' of the activity-bearing component.

The translation of *Logos* as *le Verbe* is also etymologically appropriate inasmuch as I am arguing that, through the Incarnation (and taking the Passion, Resurrection and Ascension of Christ as constituting an inseparable theological whole) the *Verbe* incorporates and trans-figuratively re-embodies the re*verb*eration of its own Creative Activity throughout that space deriving through it in the first place. The particular collection of interacting boundaries representative of the topology of created space defines the form of such reverberation, and the 'architecture' of Creation (chapter 2) is therefore intimately related to the manner in which it is 'drawn' both by and towards the Incarnate *Logos*.

Furthermore, where an idiomatic engagement with time is concerned, a critical association between the 'Creative Activity/Energy' and 'God's Time', referring back to the above section on motion, will be suggested (chapter 4). In terms of Van Huyssteen's threefold classification of approaches to *imago Dei* as substantive, functional and relational[71] a substantive approach is here considered critical to the scientific context of engagement – the creative mind being inextricable from an embodied brain and space-time also being

[70] Balthasar, *Theo-Drama, Volume 1,* pp.279-280.
[71] J. W. Van Huyssteen, *Alone in the World? Human Uniqueness in Science and Theology* (Grand Rapids: Eerdmans, 2006), pp.111-159.

best considered in substantive terms (chapter 4). I am somewhat suspicious of purely relational arguments which risk becoming too detached from what physical, human nature actually consists in, and consequently from scientific relevance.

Loades assesses Sayers' overall motivation as a theologically educated, professional writer and dramatist, commending her not only for a tenacity in aiming to show forth the truths contained in the creeds of Christendom through an analogy with what, to her, constituted good creative art, but also for 'wanting a "sacramental" view of creative freedom…the human somehow giving us clues to the divine, clear that the artist is subject to the judgement of God and must not misuse his materials or regard himself as their creator'.[72] The sacramental significance of such 'creative freedom' in an interactive, cosmic context is emphasized in what follows. It is also important that the analogy is cast specifically in terms of that critical domain of unification noted above, namely the *creative mind*.

Within the essence of a play or drama a latently or covertly residing 'answer'[73] (or resolution) presents its particular horizon. Balthasar remarks that 'scientific explanations render the existential question more baffling than it was even in myth',[74] and this thesis relates the dynamic, cosmic arena and its possible 'horizon', seen in topological terms, to ideas and concepts relevant to scientific engagement, suggesting that our active participation in such terms may be considered as being steeped in theological relevance. Balthasar goes on to say that 'Christian drama…can only act *in the presence of* [italics Balthasar] God, knowing that it is embraced by him; it can never allow the drama that flows from the horizon to be absorbed into the drama that presses toward the horizon'.[75] This, in essence, reveals the importance of the idiomatic distinction made here between the engagement of the divine Economy and our participate responsiveness. On the one hand there is the divine idiom of infinite operativity, ultimately integrating and holding all things together as some 'content' (chapter 3). On the other hand there is the idiom of compact, finite operation and activity, 'moving' (or being moved) in a particular manner and direction, able on principle to contribute to the generation of content, and involving an understanding of a particular, physical interconnectedness – a particular 'topology of reality' at least partially discernible, from a scientific perspective, through a layered means of considering stability.

[72] A. Loades, *Dorothy L. Sayers: Spiritual Writings* (London: SPCK, 1993), p.75.
[73] Balthasar, *Theo-Drama, Volume 1*, p.21.
[74] *Ibid*, p.77.
[75] *Ibid*, p.321.

On another point of vocabulary, divine 'simplicity', conveying the notion of 'being of one substance', is taken as the antithesis of confusion or deconstructive complication, but not in itself opposed to some appropriately *structured*, creative complexity. White emphasizes the importance of the notion of divine simplicity[76] in as far as God may well be complex, as related to some creative omni-potential, but in Himself is neither complicated nor compositional, as a composition of the human mind or otherwise. The human mind is, however, compositionally created and creatively compositional, consonant with some process of evolutionary formation (chapter 1). Yet it is nonetheless through the remarkable property of a practical, creative *unity* of self-consciousness (chapter 3) that we (like Sayers) may come to articulate our appreciation of that iconic property pertaining to divine image in humanity.

As to human attachment to the compositional, Wittman, as part of a commentary upon Aquinas, suggests that

> Broadly speaking, if a theological 'grammar' designates the rules and assumptions that attend knowledge of and therefore reference to God's being and activity, then a 'syntax' of the same will have something to say about the order in which this knowledge and reference is most elegantly and intelligibly (or sapientially) composed…[77]

The 'sapiential' aspect will be considered in chapter 3 and the 'ordering' here is important since the most natural ordering must necessarily be consonant with our physical and temporal participation in this cosmos, especially in relation to any developing 'conception' concerning the *Logos*. It will be suggested (chapter 4) that the medium of 'created space' itself partially determines some figurative 'diffraction' pattern with respect to such developing reception of that truth which is inseparable from God's revealed Word.

Expanding on the analogy of Authorship, the coined term 'idiom' is preferred to the at first seemingly comparable term 'genre', since the development of an overall idiom occurs through an immersion throughout the entire process of achieving articulate expressiveness as a whole. Such *immer*sion is necessary for the subsequent *emer*gence of stable domains of operation and expression within such a process. A genre, meanwhile, pertains more to a

[76] T. J. White, *Divine Simplicity and the Holy Trinity* (International Journal of Systematic Theology, Vol.18, No.1, Jan 2016), pp.66-93.
[77] T. R. Wittman, *Not a God of Confusion but of Peace: Aquinas and the Meaning of Divine Simplicity* (Modern Theology, Vol.32, No.2, April 2016), p.154.

secondary mode of expression more particularly tuned to a specific context of concern or encounter. Many genres may therefore emerge within an incorporating idiom. Chapter 5 suggests one such possible emergence of distinct genres of creative activity within our developing idiom of creative freedom.

Given that our idiomatic capacity for coming to know or appreciate the Creator's 'Art' is itself *part* of the Artwork, such could on principle influence the purpose or eschatological aspect of the Artist's engagement with the Creation. Understanding the Incarnation as assuming and consummating this influential potential is important. Fiddes even presents the idea that 'the divine Logos… achieves considerable imaginative identity; he does not know that he is impassible and so enters imaginatively into dying'.[78] This is bold phraseology, but it highlights the importance of considering distinct modes of knowing, particularly as associated with distinct idioms of engagement.

From a human, psychosomatic perspective, relevant to an incarnate mode of encounter, a robust, scientific understanding of human *psyche* involves a consideration of our inseparably embodied context (chapter 3). In line with this, Wirzba relates, or correlates, our means of 'seeing' (or knowing) to our manner of being, according to a certain *theoria* being necessarily accompanied by a presiding *ethos*.[79] Acknowledging this necessary, dynamic connectivity is important for considering any form of *topos* that one might associate with an embodied human brain and an inseparable, creative mind – one which is both physically and theologically relevant.

Considering the divine Infinity as 'simple' and non-composite is of course theologically parsimonious, beyond addition or comparison and arguably skirting the question of why one thing in particular should exist as if over or against another. This, alongside mention of *theoria* and its connection with 'sight' and *theos*, brings to mind Cusa's one, initial and ultimate, non-composite infinity, preceding differentiation and an archetype of unity which grounds 'thorough-going coincidence'. Not satisfied with the scholastic regime where contemplating the ineffable was concerned Cusa formed his own approach from various concepts already established by thinkers such as Oresme, Lull and Anselm, coming to the position that because the divine infinity 'transcends analogy...and exceeds

[78] P. S. Fiddes, *The Creative Suffering of God* (Oxford: Clarendon Press, 1988), pp.57-62.
[79] N. Wirzba, *Christian Theoria Physike: On Learning to See Creation* (Modern Theology, Vol.32, No.2, April 2016), pp.211-230.

composition and synthesis', it is antecedent to that which is 'contracted within the world's unity, the *universum*'. Here such contraction may relate to the compactness associated with created space. What is '*subsequently* "contracted"' of the divine 'maximality' is '*antecedently* "enfolded"...as infinite and one in the mind of God', and while God is 'absolute maximum' the universe then becomes a 'limited maximum'. Not only does this provide a logical basis for considering some evolving continuum but it establishes the 'Christ maximum' as the ultimate 'agent of coincidence', the 'maximum contracted individual' communicating a critical aspect of the divine infinity in our midst.[80] By hypostasizing a finite, contracted human nature a maximum of creaturely potential is drawn into a reconciled, radical coincidence. Chapter 5 explores the idea of a creative maximum from a more scientific perspective. The overall impression gleaned from Cusa's use of vocabulary here is definitely that of a created topology embedded in a broader, infinite Uncreated "Space", in tune with the framework promoted here.

As to our ability to come to *know* the Christ maximum, 'seeing' as through God's seeing, according to that Light in which our capacity for seeing is participate (cf. Psalm 36:9), we may come to acknowledge such a maximum, established through the Incarnation, as constituting the 'epistemological foundation and the logical model for theological method'. Yet, to Cusa, there is still ultimately a 'holy ignorance' beyond our knowing and not-knowing, something pertaining to our very being and 'illuminated...by union with the Light' so that such ignorance is 'not the opposite of knowing but its fulfilment'.[81] Our being derives theologically from a participation in that which enables both knowing and an acknowledgement of not knowing. Likewise, that 'topology' of created space shaping our very capacity to perceive and conceive in physical terms derives from some theologically principal but not in itself directly conceivable *topos,* within the profounder stability of which it may be considered to be embedded.

There is a particular aspect of 'coincidence' in this case between God and nature, although for Cusa there are also coincidences within nature and a coincidence 'beyond seeing'. Furthermore, if abstract concepts, even if comparative, nonetheless 'more closely approximate the nature of God as absolute' then it must be acknowledged that all attempted comparisons occur at some level on a hierarchy, which Bond, again in reference to Cusa, interprets in terms of 'linguistic similitude', 'logical similitude' and finally the

[80] H. L. Bond, *Nicholas of Cusa: Selected Spiritual Writings* (New York: Paulist Press, 1997), pp.13-26.
[81] *Ibid*, pp.34-37.

'iconic similitude' of the image – that which is most proximate to divine nature in terms of its 'utility' in being able to 'stir up an inquiry after the truth of the exemplar'.[82] Human 'sight' can thus be *elevated* according to such a structured, hierarchical arrangement, harmonized according to the *Logos* and ultimately attaining its *apex theoriae* as seeing '*in* all things nothing except *Posse*',[83] being as far as active contemplation can go.

Considering Cusa's work, Alfsvåg notes the central challenge to Scholasticism 'to maintain the idea of divine difference within the framework of a uniform rationality'.[84] Noting Cusa's affirmation that all learning is necessarily reliant on comparison, but that, in contrast to the thinking of Scotus and Occam, such comparison was not available in the infinite-finite case, effectively because they do not produce any readily discernible interface as such, he considers that

> As an alternative to the via moderna concept of causality, Cusanus suggests the Neoplatonic idea of participation as the appropriate approach to a closer investigation of the relation between the infinite and the finite…all entities are made what they are through participation in entity itself; as indefinable, pure entity or oneness is, however, a concept that is closely related to infinity.[85]

This is consonant with the aforementioned idea of various verbal conjugations, moods and voices participating within the affordance of the infinitive, the very simplicity and name of the verb itself. Having supposed a theoretical equivalence between actualization and non-actualization in divinity, Cusa is noted as developing this thinking towards the view that 'as humans realize their true humanity by participation in divinity, divine providence and human freedom coincide. One realizes one's freedom by being seen by God…The idea of divine indifference over against the difference between possibility and actuality is then not lost'.[86] Hollingsworth expresses the same idea in different words in stating that 'infinite being could not *be* if the possibility of its being were not *itself* actual [italics Hollingsworth]. Infinite possibility of being and infinite actual being are, then, coeternal'.

[82] *Ibid*, pp.44-53.
[83] *Ibid*, p.61.
[84] K. Alfsvåg, *Explicatio and Complicatio*: *On the Understanding of the Relationship between God and the World in the Work of Nicholas Cusanus*, (International Journal of Systematic Theology, Vol.14, No.3, July 2012), pp.295-309.
[85] *Ibid*, p.298.
[86] *Ibid*, p.303.

She too highlights the defining influence of the divine 'sight',[87] which might be compared to God's 'seeing' Activity in Genesis 1.

The Uncreated "Space" in which actuality and potentiality are beyond distinction is fundamentally distinct from the created space of heavens-earth unity in Genesis 1 in which these (and other) aspects are distinguishable but inseparable within the created whole (chapter 2). The Uncreated enables the participation of the created within it, but while this provides an eternal grounding for our participation in theological terms it says nothing in itself about how any specific development of such participation might occur over *Big History* in more scientific terms.

The created 'ethos' inseparable from our particular, idiomatic capacity for *theoria* could be considered representative of our 'mood' of participation, tuned according to those interconnected contingencies defining our physicality. If God's Self-knowing is then to 'operate' or 'engage' incarnationally, then the finite, composite and compactly "enfolded" physical basis for the human mind – hierarchically organized and evolved – must be assumed and re-hypostasized. This emphasizes the Mind of Christ as a critical theological concept. The participative, sacramental significance of its physicality ought then properly to have relevance not just to an overtly theological domain of consideration but also, at least covertly, to a scientific perspective regarding that which grounds our ability to contemplate and to come to various degrees of knowledge. Having now laid down the relevant pointers with respect to the use of vocabulary the specific layout of material in the main chapters will now be described.

Chapter layout

The *ressourcement* offered by recent scientific progress in unpacking *Big History* has increased our awareness of the many interrelated contingencies involved in reaching our modern anthropological context. This thesis takes as holistic a view of our anthropological journey as is practical in the given framework.

Considering our anthropological roots, chapter 1 begins with an overview of the context of evolutionary thinking and its significant development in more recent years, incorporating a more robust appreciation of the contingent interrelations involved. It appeals in particular

[87] A. Hollingsworth, *The Faces of Possibility in Nicolas of Cusa's De Visione Dei* (Modern Theology, Vol.32, No.3, July 2016), pp.341-360.

to the recent, integrative work of Smith and Morowitz, considering a contemporary view of the critically *stable* emergence and sustainability of the living dynamic of the biosphere. The emergence of a dynamic 'mindscape' out of this functional stability is then considered, suggesting a connection between the topography of our 'landscape' context of formation and the topology of our mental dynamic, appealing to Appleton's *Prospect-Refuge Theory* as a holistically accessible, scientifically respectable, dual-aspect means of considering the development of such a mindscape over time. Finally, the nature of human thought-process (critically inseparable from particular qualifications of memory) is briefly considered, suggesting a working set of developmental stages regarding our evolutionary history and finishing by considering possible theological corollaries of such development.

The theological relevance of our anthropology is expanded in chapter 2, looking towards a biblical justification for considering a stable, eschatological openness to our potential for active, creative contribution through our idiom of engagement, rather than some merely passive or preservative role. The argument invokes a strong Creation-Temple relationship, considering the embodiment of the significance of the Temple and its representative architecture through the assumption of human nature in Christ, establishing the dynamic architecture of a new, perfected creation. A biblical perspective on human nature, imbued with an eschatological relevance, is considered alongside the critical importance of a theologically stable *topos*.

Chapter 3 considers our mental domain from a more neuro-scientific and philosophical perspective, focusing on the critical centrality of self-consciousness and considering the capacity for creative enhancement that self-consciousness, or self-relation more generally, involves. Consciousness is taken as having a cosmic background and scale of relevance. A particular consideration of the nature of 'Art', involving a dynamic form-content bond (another dual-aspect, interactive unity), is then related to the cosmic, creative Artwork deriving from the 'Author' or through the *Mind of the Maker*, including the significance thereby implied regarding our conscious means of coming to recognize and appreciate such as 'Art'. Particular attention is paid to how central theological concepts such as Incarnation and Transfiguration may relevantly be understood within such a framework. Finally, there is a more in-depth consideration of the significance of the Mind of Christ, the Incarnation of the *Mind of the Maker*, involving a unique conceptual 'compactness' being associated with incarnational encounter, according to the aforementioned 'hourglass topology'.

Given the importance noted above concerning integration over time, Chapter 4 moves towards outlining a model according to which the more familiar analogies of phase transition and paradigm shift may be used to describe the outworking of the divine and human idioms of operation respectively (i.e. manifestational reordering and generational progression). Divine and human idioms of creative freedom are considered specifically in relation to their operative association with time, a consideration which is expanded to contemplate suitable options for both a panentheistic framework and a physical eschatology. It is argued that the Incarnation,[88] with respect to the topological framework in question, could in itself be considered theologically in terms of the phase transition metaphor.

Finally, chapter 5 looks at three particular genres of creative activity emerging within the developing, dynamic stability undergirding the human idiom of engagement. First there is the *pro-creative*, predominantly forced upon us by the nature of our physical and intellectual environments, and according to which we have a highly constrained freedom regarding the manner in which we may hand things on to subsequent generations. It is the genre most closely relating to various inextricable 'tacit coefficients' (chapter 1) left upon our mental operation by our evolutionary roots, and this aspect of our creative activity is something whose basis is clearly shared with other species. Out of this basis there emerges a *re-creative* genre of engagement, more specifically highlighting the freer, emancipated act of creative invention for its own sake. This is the genre of the hypothetical scenario and the thought experiment, highlighting significant prospect both for more lucid thought-process and for better informed, more focussed and coherent development. This then moves into the emergence of a *co-creative* genre, stemming chiefly from the specific engagement of human understanding with the creative strategies seemingly written into the humanly discernible, emergent order of the cosmos and the biosphere. This genre is taken as developing through an "autocatalytic" enhancement of our *re-creative* involvement. The latter two genres are intended to be representative of our distinctiveness among all other creatures, the re-creative laying the necessary developmental grounding for a fuller appreciation of our co-creative potential.

An important clarification is necessary here, since it might seem that this understanding implies that any co-creative engagement is something that only comes into genuine

[88] Importantly as understood in terms of the *totality of its relevance* from conception to the effect of the Resurrection and Ascension.

existence at some vaguely defined point in the history of our species' development. It is *not* being suggested that our participation before such a point is therefore eschatologically irrelevant. Rather, the concern is to focus specifically on that aspect of progression more relevant to a tangibly scientific dimension to our potential and its theological significance. There are, of course, broader ways in which human beings might be considered co-creators. Ninan, for instance, within the context of a quantum framework, suggests that

> Every human decision is a creation *ex nihilo*. This is probably what the statement "in the image of God created He them" essentially means. So a person is not making a decision but creating something totally new. We are involved along with God himself in creating the Universe we live in. We are co-creators with God.[89]

This is appealing in terms of its ubiquitous relevance to the entirety of our anthropological history. With regard to a more scientifically specific relevance to the context of our progressive development, however, such consideration needs to be more tightly focused, respecting that the basis upon which 'decisions' may be made is specific to a developing context of encounter which may become increasingly *informed* over the course of our anthropological development. The aim is to lay down some guiding conceptual contours for considering our creative development and progression, according to which that aspect of our co-creative potential carrying more specific, scientific relevance might become better emphasized.

In engaging with created order on a deeper and more integrally understood basis it is argued that our critical potential for 'conception' regarding the place and relevance of the *Logos* participates more deeply and thereby attains a profounder significance in relation thereto. The superimposed relevance of these genres of creative activity throughout our idiomatic development as a whole is then briefly considered, including a possible relation to the concept of an *Omega Point*, incorporating the idea of eschatological stability or 'rest' in as far as any aspect of continuity may exist between this and those interrelated components involved in our temporal development.

Final clarifications

Finally, the following points may provide helpful additional clarification:

[89] M. M. Ninan, *Quantum Theology* (San Jose: Global Publishers, 2003), p.111.

1. Reference is made to John 12:32 and the idea of Christ 'drawing all things' to Himself. The Greek word translated as 'I will draw' – ἑλκυσεν – can in other contexts mean 'drag' or 'haul', suggesting a context involving laborious physical exertion, defined according to whatever motion is allowed by physical laws and constraints. It is used again in John 21:6 when Jesus has just instructed the catch-less disciples to cast their net once again into the water, whereupon they obtain such a large catch that they can no longer 'haul' the net into the boat. This is fitting in relation to Christ's promise to make the disciples 'fishers of men', actively involving humanity and the Church in the process of 'drawing' or 'hauling' in but still ultimately on Christ's initiative. In the assumption of human nature a committed involvement is made to the long 'haul' while also defining a context for the demonstrable completion of human nature, being 'drawn in' to the Incarnate *Logos*.
2. As to the originally hypostasizing human mind or *nous* being re-placed by the hypostasis of the *Logos* in the Incarnation (chapter 3), it is worth noting Nesteruk's consideration, made in the context of searching for a neo-patristic synthesis between theology and science,[90] that the natural, discursive, finite and anonymous *dianoia* is distinct but inseparable from the infinite, named and supra-natural *nous*. The first is presented as being to science as the second is to theology. Nesteruk considers total awareness of *nous* or *dianoia* to be mutually exclusive with respect to that of the other, *nous* awareness being absent to any epistemology that is reducible to a series of logical steps, though present ontologically according to an *enhypostasis*. This might offer a complementary angle of approach with respect to the novelty associated with the Mind of Christ, although it is peripheral to the topological consideration here.
3. A core doctrinal concept is that of transcendence-in-immanence and immanence-in-transcendence. Intuitively one could consider such a concept by reference to a compact series of concentric circles emanating from their mutual origin without limit. The more circles there are the more the transcendence is emphasized but equally the more the commonality of their mutually defining origin – dimensionless in and of itself and thereby technically occupying no space – is likewise emphasized. The concentric circles may also represent a nested hierarchy,

[90] A. Nesteruk, *The Universe as Communion: Towards a Neo-Patristic Synthesis of Theology and Science* (London: T and T Clark, 2008)

irreducibly so by virtue of the fact that the larger circles fully contain smaller ones but not vice versa. Immanent and transcendent aspects are mutually emphasized and balanced within the same diagrammatic representation. Such representation is, however, still specific to the *focal* perspective of our creative intelligence, forming representations within and according to the 'terms' of created space as described above. Mathematically our conception of 'infinity' may be qualified hierarchically, while theologically our capacity for appreciating such remains finite in accordance with our finite understanding being dependent upon some revelation, representation or definition within created space.

4. According to Tracy's threefold classification of systematic, fundamental and practical theology,[91] the approach here could count as fundamental theology in view of its consistent relation to a chosen underlying framework. It is not being suggested, however, that such a framework is definitive, but simply that it constitutes a useful and potentially enlightening approach where seeking any integrated theo-scientific relevance is concerned.
5. Not wishing to divorce philosophy from theology, the tenets described here are, I believe, broadly in tune with the ethos of 'Radical Orthodoxy', involving a sacramentally qualified, ontological grounding within a participative framework, shirking unhelpful dualisms while accommodating constructive distinction or paradox.[92] Furthermore, I do not intend simply to reproduce past viewpoints but to suggest a fresh means for moving forward, seeking an involved engagement with 21st Century science and promoting the relevance of our developing epistemological engagement.
6. This thesis takes up the suggestion of Bawulski and Watkins that an act of genuine divine 'discovery' (I prefer the word 'encounter') of *novelty* in the Incarnation may have primary eschatological consequences for the 'new heavens' and the 'new earth'.[93] Bawulski and Watkins defend the tenets of classical theism, and my approach too remains predominantly classical in its outline, while taking a nuanced approach in considering how the suggested framework could work itself out in physical practice.

[91] D. Tracy, *The Analogical Imagination* (London: SCM, 1981), especially p.58.
[92] Milbank *et al. Radical Orthodoxy* (London: Routledge, 1999)
[93] Bawulski and Watkins, *Possible Worlds and God's Creative Process: How a Classical Doctrine of Divine Creation Can Understand Divine Creativity* (Scottish Journal of Theology, Vol.65, No.2, May 2012), pp.174-191.

## ***Chapter 1: From Landscape to Mindscape – Considering Biophysical Stability***

I begin by considering the broader significance of our biological history and anthropological roots to the context of the 'stability' of our journey as a species and its possible theological relevance. Such roots leave a lasting mark on the dynamic of our mental life and the formation of our idiomatic 'mindscape'. This mindscape will be taken to form a critical foreground for the working out of our anthropological journey and encounter in theologically relevant terms, affording us, among other things, a theologically significant appreciation of our *topos*. Such a 'foreground' can then be embedded within the enveloping 'background' basis given in the Introduction with respect to a sacramental stability, couched within the theological topology advocated here. This will have particular significance when it comes to considering the theologically critical 'place' of the Mind of Christ. This chapter will build towards this point by first considering the layered nature of the development from non-living manifestations of physics or chemistry, through the biological domain, to the noetic domain and the emergence of intelligence and subjective, psychological perspective.

As far as possible a holistic viewpoint is maintained, aiming to avoid excessive terminological confusion or dispute. Where the precise nature of detailed, evolutionary influences on our creative propensity and freedom is concerned, this thesis keeps an open view, simply holding creativity and anthropological history hand-in-hand while being aware of the as yet not fully resolved debate concerning Darwinian and non-Darwinian developments that may contribute to our propensity, as well as non-biological influences of environmental happenstance.[94] Furthermore, strictly Darwinian explanations of evolution with regard to creativity are often unable to explain those traits that are acquired rather than strictly inherited.

Comparison is also made between a pre-Mendelian, pre-DNA era of development – one that is *catalytic* rather than strictly *encoded* – and the pre-linguistic era of anthropological history. The non-biological aspect of our environment may also be taken as catalytic, as

[94] See Gabora and Kaufman, *Evolutionary Approaches to Creativity*, in Kaufman and Sternberg, *The Cambridge Handbook of Creativity*, pp.279-294. Adaptivity and open-endedness are proffered as distinguishing features of human creativity (without obviously categorical, temporal limit), emphasizing the importance of "interiorization" and allowing the 'metacognition' of forming representative models to think *about* thought, as well as permitting repetition and rehearsal.

our formation mirrors our response to environmental structure and intelligibility. As to whether our creative propensity is domain-general or domain-specific no definitive view will be (or needs to be) assumed here in either direction, since, in accordance with that pointed out by Baer,[95] the forms of evidence one looks towards will themselves be influenced by the way in which one has already, surreptitiously, come to think of creativity.

First, it is necessary to consider the bottom-up basis from which our mindscape may emerge with a practical and functional level of *stability*. This critical factor of stability is essential to the hierarchical ordering of living systems, as highlighted by the complex communicability that constitutes the dynamics of cellular life, largely by virtue of the phenomenal capacity of protein arrangements for functionally communicative cooperation. On the one hand there is the need for modulated regions of high and low complexity to be mutually stabilizing and, on the other hand, the necessary channels of information transfer must be maintained in conjunction with a favourable energetics. The living cell seems to be able to select or discriminate between various conformations of relative stability and instability and to perform required modifications in a computationally precise manner.[96]

Scientific insight, centred on physical principles, shows a fairly consistent process of attraction towards, and emergence from, underlying principles such as action-reaction effects, a minimization of potential and/or free energy, and the maintenance of a dynamic equilibrium. This lies at the core of many means of assessing physical stability. In cases when certain systems may be pushed so far as to undergo phase transition into a new regime – in which the above principles may then manifest themselves in a different configuration, according to a different form of structural stability – such transition potentially enhances variegation, as becomes evident among biological life-forms and in the potential for emergence of novel structures and operational systems.[97]

[95] J. Baer, *Is Creativity Domain Specific?* in Kaufman and Sternberg, *The Cambridge Handbook of Creativity*, pp.321-328.
[96] Alberts *et al*. *Molecular Biology of the Cell*, pp.109*ff.*
[97] A clear and thorough account of such theory can be found in H. E. Stanley, *Introduction to Phase Transitions and Critical Phenomena* (New York: OUP, 1987), beginning with a qualitative overview for non-specialists.

The complexity of any stability analysis is plain enough even when considered on the level of humanly engineerable systems.[98] There is an important distinction between absolute and conditional stability and yet another distinction between properties of a system that are only deducible through the explicit solving of a differential equation and those discernible through looking purely the form of equation without solution. There is also the question of timeframe regarding any perturbing influence, as well as the fact that a system may be composed of many interacting subsystems, each of which have different transient speeds of response. An involved matrix analysis is required even for systems whose engineering is far simpler than in the biological domain, accepting that complexity can be the result of any or all of high-dimensionality, manifold structure, connectivity, nature of operation and the form of any perturbing factors. While most of these principles are ultimately maths-based the aspects of consideration they point towards inevitably have resonance at the bio-physical level of inquiry.

Likewise, the concept of *convergence* is critical to mathematical stability analysis, and different strengths of convergence form a hierarchy from the strongest condition of asymptotic stability, where all dynamic trajectories 'near' to an equilibrium point strictly converge to that point, through Lyapunov stability, where the system dynamics are bounded in a region around the equilibrium point, to weaker conditions such as bounded systems exhibiting Lipschitz continuity, which imposes a maximum numerical value on how fast the function of a particular variable can change with respect to that variable. The concept of convergence could intuitively be extended to the broader context of the journey considered here with respect to our emerging mindscape. The stability of our mental dynamic may be considered in terms of some functionally reliable convergence upon particular critical mindmarks, concepts or categories (see below) that allow for a dynamic mental equilibrium with respect to our environmental encounter.

<u>The expanded framework of evolutionary biology</u>

The interconnected context of our anthropological roots is ultimately cosmic, a fact to which chapter 3 will return. Within the biological domain contemporary academia has unearthed a multi-dimensional plethora of interconnected contingencies concerning our formational history: those indelible influences intrinsic to our embodiment and

[98] Grujić *et al*, *Large Scale Systems Stability under Structural and Singular Perturbations* (Heidelberg: Springer-Verlag, 1987)

consequently to any emerging self-consciousness. The context of evolutionary thinking has expanded significantly in more recent times.[99] Awareness of particular details of evolution has stimulated a two-way dialogue with philosophy[100] and has more broadly informed our methodology for anthropological and socio-cultural analysis.[101]

The dominant evolutionary model in the 1940s was the so-called 'modern synthesis' based on a mathematical treatment of population genetics models. The critical processes were genetic drift (largely neutral in as far as it did not necessarily influence reproductive advantage) and some vertical, selective pruning over many generations, resulting in a fitness landscape. Speciation was considered predominantly allopatric, the result of natural boundaries dividing respective environments, leading to diverse evolutionary trajectories.

More recently, however, there has been movement towards an 'extended synthesis' of evolution, incorporating a far greater body of evaluative evidence on evolutionary influences than that originally accommodated by the mathematical treatment of population genetics.[102] This new synthesis refashions the older emphasis by opening up to such ideas as active niche-construction,[103] the evolution of evolvability as a whole, epigenetic mechanisms of so-called 'soft inheritance', and a generally more thorough consideration of the boundary conditions placed upon biological systems by the basic bio-physical constraints implicit in developmental mechanisms, not directly pertaining to nucleotide sequences. One such importantly acknowledged constraint is canalization, a bounding mechanism for phylogenetic development based on how later-emerging developmental processes are constrained by what has *already* been put in place by earlier ones.

The 'epigenetics revolution' has led to a variety of possibilities illustrating the potential of an inherently mechanistic system to function in a manner that appears to be not entirely

[99] Even ideas connected with memetics and cultural evolution are becoming far more legitimately testable in an age of big dataset availability. See for instance Sindi and Dale, *Culturomics as a Data Playground for Tests of Selection: Mathematical Approaches to Detecting Selection in Word Use* (Journal of Theoretical Biology, Vol.405, Sept 2016), pp.140-149.

[100] Well illustrated in Sterelny's essay, *Philosophy of Evolutionary Thought*, in Ruse and Travis, *Evolution: The First Four Billion Years* (London: Belknap Press, 2011), pp.313-329.

[101] Laubichler and Maienschein, *Evolution and Society*, in Ruse and Travis, *Evolution*, pp.330-347.

[102] See Pigliucci and Müller, *Evolution: The Extended Synthesis* (London: MIT Press, 2010).

[103] Hurford notes the metaphors of *bridge* and *niche* in understanding evolutionary stability, considering whether the facts point towards a completion of some final connection, as for example between anatomical and neurological development in the enabling of articulately spoken language, or rather towards an already-existing niche profoundly suitable for occupation by a particular form of life, acknowledging that such niches could on principle be either found or deliberately constructed. J. R. Hurford, *Origins of Meaning: Language in the Light of Evolution* (Oxford: OUP, 2007), pp.243-251.

deterministic. Even genetically identical twins do not have exactly the same brain structure, and certainly not the same mind. Furthermore, during the pre-natal period changes in diet and living conditions experienced at different points during that period have surprisingly different consequences for the resulting offspring. A broader 'epigenetic landscape' was needed in order better to relate to the observed distribution of phenotypes.[104]

Various other layers of explanation have been offered for various levels of evolutionary mechanism. In addition to other horizontal transfer mechanisms there was McClintock's discovery of transposons, transferrable sections of DNA sequence, as a mechanism for genome shuffling. At the level of environmental encounter, the concept of exaptation (a term coined by Gould and Vrba) makes the important distinction between a 'historical process' that may have formed a trait, or developmentally connected traits, to serve a particular function and a 'current product' in which a possibly non-adapted trait is co-opted to serve an entirely new purpose[105] – feathers being a classic example.

Another important recognition was that gaining reproductive advantage is only part of the story of evolutionary struggle, another aspect being the nature of competition for scarce resources in an ecosystem. Both competing organisms and the environment evolve in tandem with this requirement, and cooperative adaptation by symbiosis is one critical means of incorporating a response to such challenge. One means of understanding this connectedness became dubbed the *Red Queen Hypothesis* after the character in *Alice Through the Looking Glass* who says to Alice, "here, you see, it takes all the running you can do, to keep in the same place." Organisms must be in constant biological motion with respect to each other just to remain in the same niche, and sexual reproduction became an indispensable means of speeding up the capacity for such adaptive motion – male and female being, genetically-speaking, in biological 'motion' with respect to each other over the generations.[106] On the cellular level, symbiotic associations have further fuelled increasingly detailed theories of symbiogenesis.[107]

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[104] N. Carey, *The Epigenetics Revolution: How Modern Biology is Rewriting Our Understanding of Genetics, Disease and Inheritance* (London, Icon Books, 2012).
[105] Gould and Vrba, *Exaptation – A Missing Term in the Science of Form* (Paleobiology, Vol.8, No.1, 1982), pp.4-15.
[106] M. Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (London: Penguin Books, 1994)
[107] N. Gontier, *Reticulate Evolution: Symbiogenesis, Lateral Gene Transfer, Hybridization and Infectious Heredity* (London: Springer, 2015)

There also remains the question concerning how best to integrate the species-influencing action of natural selection on the individual organism with the individual-capacitating mechanism of reproduction for the future of a collective species. Rothman concludes that there are two interactive and complementary types of selection: natural and reproductive. The former acts on *being* (predominantly related to individual traits); the latter acts on *becoming* (predominantly related to holistic mechanism, having prospective and retrospective components).[108]

Rothman couches this within an appreciation of final cause in biological terms: an embodiment of purpose, *constituting* biophysical laws rather than merely conforming with them. In the case of somatic features the final cause is taken to be the circumvention of danger in an environment. In the case of reproductive systems, emerging over a population and in species characteristics, the final cause is, he argues, ultimately death, in terms of the part that the resulting statistics play in influencing the developing population dynamics. Though it suggests no detailed, mechanistic unfolding of the developmental aspect of reproductive systems Rothman's contribution is attractively lucid and consistent.

He states at one point that 'even in the simplest species, the need for sustenance does not give rise to random physical or chemical events, but to action that not only serves the *purpose* [italics Rothman's] of obtaining nourishment; it embodies that purpose'.[109] This is an interesting statement given that, considered theologically, one encounters the embodiment of divine purpose in the Incarnation of the *Logos* who Himself affords created order its profoundest sustenance.

Trying to comprehend the intricate process of morphogenesis alone, in addition to that of the growth and differentiation of cells, has demanded an analysis of biochemical hormones, toxic chemicals and the physics of mechanical stress.[110] Recently the evo-devo movement has shown great interest in integrating evolutionary and developmental considerations, and particular interest has focussed on the manner in which information is transferred and processed in biological systems.

Küppers emphasizes the role of various biological boundary conditions as not merely offering protection but providing information, or at the very least a context for

[108] S. Rothman, *The Paradox of Evolution* (New York: Prometheus Books, 2015)
[109] *Ibid*, p.133.
[110] For a comprehensive contemporary account see J. A. Davies, *Mechanisms of Morphogenesis* (London: Elsevier, 2013)

informational integration. He further distinguishes between structural and functional aspects of complexity. From an informatics perspective, he relates these to syntactic and semantic aspects respectively, the influence of the latter extending beyond the former. Overall 'actual information content is the result of the historical pathway evolution has taken'.[111]

Davies notes the current absence of any coherent info-dynamics, especially given that the manner in which we may view or define information transfer in functional terms is dependent on the context of our investigation. He emphasizes the need for a combination of 'randomness' and 'extreme specificity' in biological macromolecules – the randomness relating to a sufficiently high information content (in algorithmic terms) and the specificity relating to an expulsion of entropy from the domain of biological organization, released into the surroundings.[112] In their major work on the rudiments of information theory, Cover and Thomas affirm that the future of such theory rests upon the hope that new contexts of exploration will naturally fall in some respect into the contours of an analysis that functions on the basis of standardly defined quantities such as informational entropy, relative entropy and mutual information, as well as Kolmogorov complexity (a means of evaluating algorithmic complexity).[113]

Marijuán looks to 'informational architectures' accommodating 'upward and downward directions of causation' and notes the importance of considering the 'natural properties of biological information (rather than merely computation)'. He distinguishes between primary and secondary 'addresses' with respect to enzymatically active sites, the former being concerned with 'implementation' and the latter with some higher 'orchestration'. The overall challenge, for him, lies in 'making sense of the informational events produced by the dynamic coupling between amorphous and sequential architectures'.[114] Any formal organization involves cooperation between distinct levels in some hierarchical array of architectures pertaining to different functional relationships.

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[111] B. O. Küppers, *The World of Biological Complexity: Origin and Evolution of Life*, in S. Dick, *Many Worlds: The New Universe, Extra-terrestrial Life and the Theological Implications* (London: Templeton Foundation Press, 2000), pp.31-43.
[112] P. C. W. Davies, *Biological Determinism, Information Theory and the Origin of Life*, in Dick, *Many Worlds*, pp.15-28.
[113] Cover and Thomas, *Elements of Information Theory* (New Jersey: Wiley, 2006), pp.1-12.
[114] P. C. Marijuán, *From Inanimate Molecules to Living Cells: the Informational Scaffolding of Life*, in Musumeci *et al. Energy and Information Transfer in Biological Systems*, pp.217-244.

Recently, Marshall has presented an encouraging 'third way' between an atheistic, accident-centred theory of evolution and the position taken by Intelligent Design advocates.[115] He puts the information theoretic (bioinformatics) aspect of things first, placing natural selection as secondary. Clearly, natural selection requires first a substrate on which to operate, and there is far more to biological organization than some macroscopic filtering mechanism. Marshall promulgates adaptive engineering in the story of life. His advocacy of the idea of some actively creative operation as far back as the first ever living cells is attractive in its congruence to the importance given here to active contribution from the created domain, though it forces a careful consideration of what exactly is implied by words like 'intent' or of the ascription of any cognitive, sentient qualities to a system.

I think Marshall is right to connect any question concerning the origin of life to the origin of bio-chemical information, though one still needs to find a robust means of integrating informatics principles with those principles deriving from energetics. The energetics aspect of any living formation importantly defines the stability of metabolic pathways, while the informatics aspect considers how contextually salient information is provided to build the structures accommodating those pathways, in itself an energy-demanding process.

As to the secondary role of selective filtering, Stadler *et al*[116] add neutral drift, punctuated change, plasticity and modularity (describing functional arrangements of structures *not* predefined according to embryogenesis, ones facilitating new patterns of evolution just as much as they result from them) to the list of phenotypical phenomena not readily emerging from a mathematical, population genetics treatment of neo-Darwinism. They suggest a dynamic genotype-phenotype map taking account of *topological* considerations, ones that could explain phenotypical properties in a manner that 'grounds patterns of phenotypic evolution in biophysical principles and mechanisms rather than arbitrary and convenient assumptions about fitness'.[117] The topological formulation further allows for the incorporation of structural independence between two phenotypic characteristics and

[115] P. Marshall, *Evolution 2: Breaking the Deadlock Between Darwin and Design* (Dallas: BenBella Books, 2015).
[116] Stadler *et al. The Topology of the Possible: Formal Spaces Underlying Patterns of Evolutionary Change* (Journal of Theoretical Biology, Vol.213, No.2, Nov 2001), pp.241-274.
[117] *Ibid*, p.242.

emphasizes the role of selection as occurring mainly through the introduction of covariance factors between different phenotypic traits.[118]

Furthermore, there is now significant argument concerning whether mutations can properly be considered genuinely random,[119] and yet another aspect of evolutionary debate, highlighted by Bissen, concerns the manner in which 'chance' is understood.[120] The need is highlighted for a tighter awareness of the context in which particular terms such as 'chance', 'contingent' and 'design', as well as 'information' are defined and subsequently used or misused. Bissen argues that there exists a misconception on the part of creationist and intelligent design proponents that the nature of any debate is a matter of '*chance* vs. design' rather than '*evolution* vs. design', since, although different emphases are given to the place of necessity and law-based, probabilistic selection by different interpretations of the macroscopic journey of evolution, evolution is rarely presented as entirely blind chance.

Defining 'chance' is no easy task, implying the need for some existing framework of comprehension with respect to whatever might *qualify the nature* of any chance. Discriminating between coincident and non-coincident forms of chance is also only partially helpful. Any interpretation of chance is inseparable from some law-based framework within which patterns pertaining to probabilistic analysis may be quantified.

Chaos theory adds another layer to this. It is not just the sensitivity of any one, particular logistic map to initial conditions that is the defining feature of predictability or unpredictability. There is also the question of *structural stability* – the degree of sensitivity found in overall patterns of stability, such as the so-called 'strange attractors', with respect to small perturbations in the overall mathematical form of any underlying map/model.[121] In other words, one can examine how much the structural form of a mathematical mapping needs to be perturbed before subsequent iterations give rise to emerging, patterned regions of stability/convergence that bear little or no congruence to those arising from other, more distantly-related mathematical models. Differently hypothesized mathematical models would, furthermore, provide different enveloping frameworks within which any

[118] *Ibid*, p.261.
[119] See Kelly's contribution in J. Brockman, *This Idea Must Die* (London: Harper Perennial, 2015), pp. 174-176.
[120] D. Bissen, *Is Evolution Truly Random? Chance as an Ideological Weapon in the 'Evolution-Creation' Debate* (Science and Christian Belief, Vol.26, No.2, Oct 2014), pp.120-142.
[121] I. Stewart, *Does God Play Dice? The New Mathematics of Chaos* (Oxford: Blackwell, 2002), p.97.

probabilistic analysis could be carried out. It is important to distinguish this basically *topological* property, in which stability is being evaluated with respect to perturbations in the form of the equations (representing the manner of connectedness), from the more common idea of the stability of a physical *state* with respect to small perturbations in environmental conditions (the latter pertaining more strictly to Lyapunov stability). It is to an integrated view of such critical stability that I now turn.

An integrated viewpoint: the dynamically stable, non-equilibrium emergence of the biosphere

In a macroscopic biological context any notion of 'chance' must be taken in relation to the layered, evolutionary build-up to that context, always necessarily building upon or within some previously established, functionally stable, dynamic system, arrangement or architecture. Frequently recurring patterns may manifest themselves according to a certain cooperation between energy and information requirements. The form that our anthropological roots and developing journey came to take is inseparable from those dynamic biophysical architectures that first capacitated the emergence of life on Earth. For several decades now we have been asking how long living systems took to form, and by what means.[122] The first amino acids and proteins were originally thought to have been formed in a heated environment of UV rays, electrical storms, volcanic lava and meteorite impacts,[123] though now this idea is roundly challenged by the idea of emergence from hot deep-sea vents.

In a recent, comprehensive *magnum opus* Smith and Morowitz present a persuasive viewpoint in which the gap between geochemistry and cellular life is bridged by a biochemistry operating principally at the ecosystem level.[124] The substrate for this bridging takes the form of a basic, universal group of small-molecule metabolites, indispensable to the formation of a stable metabolic dynamic, and which is continuous right back to the proto-metabolic origins of life by virtue of the continuity of the laws of physical chemistry. From an energetics perspective the principal mechanism involves the opening of a reaction pathway allowing for a lightning-like channelling of electrons from a

[122] An excellent early summary of this in the context of humanity's developing ability to perceive and calculate various limits is found in A. Delsemme, *Our Cosmic Origins: From the Big Bang to the Emergence of Life and Intelligence* (Cambridge: CUP, 1998).
[123] D. Attenborough, *Life on Earth* (London: Reader's Digest, 1979), p.19.
[124] Smith and Morowitz, *The Origin and Nature of Life on Earth: the Emergence of the Fourth Geosphere* (Cambridge: CUP, 2016)

high-energy, high-entropy state of lower chemical potential to a low-energy, low-entropy state of higher chemical potential. Life consists in a non-equilibrium thermodynamics such that a given, representative trajectory of metabolic history need not cross through, or even near, a state of equilibrium. Closed, equilibrium systems are just not suited to life.

Life is not seen primarily as some property possessed by an individual organism but rather as a principle of *connectivity* over the entire aggregate of the biosphere, emerging from and actively tapping into the energetics of interactions between three abiotic geospheres: the lithosphere, the hydrosphere and the atmosphere.[125] The small molecule, universal metabolic substrate is argued to be a good candidate for 'anchoring' the necessary stability of the biosphere, while allowing the potential for error correction. Informatics principles are taken as being just as critical as energetics principles for the acquisition and maintenance of such stability.

Of vital importance is the self-amplifying *compactness* of reaction and network properties, incorporating an essential feedback for autocatalysis. This acts as the gateway for the aforementioned channelling cascade, channelling being furthermore a form of convergence. This consideration of 'network topology' lies at the heart of the discussion,[126] and Smith and Morowitz refer explicitly to a 'bowtie topology' (a phrase they reference as being used by other academics in the field) formed through a particular combination of catabolic and anabolic pathways, the former moving towards the central 'knot' and the latter moving away from it.[127] This is a good example of a topologically stabilized niche of coordinated chemical motion, such network topology being critical for the opening of what they call the 'biosynthetic gateway'.

Expanding on the place of information theory in their approach, they remark

> In some approaches to the origin of life, metabolism is viewed merely as the source of material for the biosphere. We wish to emphasize its role as a key source of *information* [italics Smith/Morowitz] for the structure of the living state…information is a property of systems that are subject to limits on their variation…Information in evolution is usually associated with processes of adaptive change, because that is how we recognize that variation is possible *ex*

[125] In their preface Smith and Morowitz minimize any appeals to panspermia theories on the basis that this could too often simply become a 'biogenesis-of-the-gaps'.
[126] Smith and Morowitz, *The Origin and Nature of Life*, p.33, pp.199-201 and pp.379-384.
[127] *Ibid*, p.180.

> *ante* but restricted *ex post*. The information in a unique and universal metabolism would be of a different kind, because it would preclude variation in the processes that permit structure to form at all…this is the information carried in *paths of least resistance*. It is essential to the organization of the biosphere because only along these paths are the residual problems of robustness in a hierarchical system simple enough to have evolutionary solutions.[128]

There is therefore an aspect of informational heritage that is implicit and an aspect that is more functionally explicit. As to energy requirements Smith and Morowitz see the composite distribution of available energetics channels, shaped by the nature of the various interfaces between the abiotic geospheres according to the natural structure of the Earth, as providing the necessary (and semi-flexible) boundary conditions for such information provision. They consider information to be 'inherently a distributional concept' according to which 'the range of processes that must be referred to in order to state a pattern indicates the scope of variations that should be considered to define an information measure for that pattern'.[129] They consider that if, overall, biochemical variation were included within that 'scope' indicated by an emergent pattern across the biosphere, such would enlarge the combinatorial space so far that any analysis of such would become equivalent to deciding 'whether self-organizing metabolism is possible or unique'.[130]

Overall, Smith and Morowitz see the ecosystem level of bio-dynamics as exhibiting a greater degree of invariance than individual organisms. Such organisms are expected to be more information rich and algorithmically complex by virtue of needing to find a compartmentalized speciality within the globally-connected network of energy exchange. Based on an entire cascade of bounded, stability-inducing phase transitions, building up an interactive hierarchy of nested domains of organization step-by-step (so that lower orders remain stable in and of themselves and living systems become heterogeneously 'nested' according to organizational modules), they consider progressive biological development as emerging from the small-molecular substrate for self-maintaining, autocatalytic metabolism. This gives rise to an 'oligomer' world, involving the cooperation of various enzymatic cofactors, effecting a transition from self-reinforcement around a possibly

[128] *Ibid*, p.171.
[129] *Ibid*, p.282.
[130] *Ibid*, p.282.

unique metabolic solution to some more selective system-level maintenance over non-unique states. This then grounds the emergence (at the cellular level) of 'individuality', robustly compartmentalized through genomic encoding. This individuality is argued to be indispensable for the emergence of specifically Darwinian dynamics in its characteristics of coarse-grained flow and shared fate.

The strength of the phase transition schema lies in the fact that phase transitions imply some cooperative mechanism allowing longer-range order or organization to emerge from interaction at the micro-level, reducing the dimensionality of variance in the new domain such that error margins are brought within controllable confines. Some aspect of continuity must be preserved across any domain boundary, especially given that the new domain still relies on some preserved framework of laws/principles. An 'order parameter' represents, statistically and causally, the primary feature of novelty in the new domain, around which other features are re-organized in accordance with the relevant principles. That aspect of the order parameter that is fully determined by boundary conditions is thus a necessity, and can be related to the continuity of the basic laws of physical chemistry, anchoring the stability of the biosphere.

Smith and Morowitz take the primary bounding condition to be energy stress rather than temperature. Rather than an externally variable parameter defining some equilibrium order useless to life, particular networks of 'transport currents' lead instead to non-equilibrium biological order. Life is seen as comprising of both *states* and *processes* in an integrated, jointly-ordered system, and any information measure must therefore relate both to the number of 'states of being' necessary to satisfy bounding constraints and also to the number of 'ways of doing something' necessary to satisfy the non-equilibrium demands. An information measure not only indicates the reduction in the number of states required to satisfy environmental constraints but also a 'reduction in the range of *histories* that perform a function, where each history is an integrated series of states and transformations'.[131]

Within the organizationally-heterogeneous, quasi-stable, domain-distributed and hierarchically-nested dynamic connected across the aggregate of the biosphere, the various 'order parameter'-distinguished patterns or architectures of functional organization are able to communicate with each other across various semi-permeable boundaries. The

[131] *Ibid,* p.27.

system as a whole remains necessarily flexible and 'plastic' in the sense that there is the possibility of substituting various domain-bounded components without destroying overall functional coherence and relative stability. Living systems therefore have the capacity to 'recapitulate' patterns of organization in new operational contexts,[132] such that ecosystems are neither super-organisms in themselves nor are they merely communities of individual species. Certain holistic properties remain invariant with respect to the species fluctuation. This ecosystem-level language might find relevance to a theological domain of inquiry. The Incarnate *Logos* recapitulates created order (cf. Ephesians 1:10) in such a manner that the connectedness of our sacramental participation, in the topological 'neighbourhood' referring here to our communion, is neither merely a natural community of individuals nor in itself supernatural in the sense of some pantheistic convergence.

One of the most appealing features of Smith and Morowitz's presentation is its obvious integrative power. Functionally sufficient, dynamic stability is critical, reliant upon constantly self-amplifying and reinforcing feedback in order to avoid the tendency towards system degradation. This amounts to 'using long-range correlations in an optimal way to ensure that – asymptotically – *all* errors are identified by comparison against a majority of uncorrupted, redundant degrees of freedom somewhere in the system'.[133] One could think of this as topological regulation. Organized, hierarchical complexity depends on a modular architecture which is in turn dependant on a layered metabolism, building from the level of atomic location/bonding up through the 'control' level of the cofactors, into the information-sorting and replicating level, and leading finally to higher-order processes now *additionally* regulated by specifically Darwinian selection as acting on individual organisms.

On its own, Darwinian selection would be too coarse-grained and wasteful, not itself able to explain any statistically reliable, necessity-based generating mechanism for life's origin. Heredity and ontogeny have to be in place before its action can produce positive, functionally effective feedback. Taking a bottom-up viewpoint, we start from a non-equilibrium geochemistry and accompanying, phase-transitional electron cascades ultimately responsible for generating a non-flat biochemical architecture. Induced order parameters can be interpreted as flux attractors, according to which the statistically most likely trajectory or 'fibre bundle' of flux pathways – offering a stable, but sufficiently

[132] *Ibid*, pp.274-276.
[133] *Ibid*, p.558.

flexible, core biotic metabolism – is the one in which fluctuations around the flux pathways are conditionally independent and therefore not augmented by cross-correlation.[134]

It is important to distinguish properly between the interior, non-Darwinian, bottom-up, *pattern-generating* selectivity of self-organization within or around some established order parameter(s) – technically called 'buffering' in control theory – and the exterior, Darwinian, top-down, *individual-filtering* selectivity (conditioning speciation) according to coarse-grained and possibly conflicting fitness requirements. The small-molecular level develops upwards through the catalytic control level of medium-sized molecules such as cofactors in order to influence, via what one might dub molecular canalization, what forms of individuality are eventually able to present themselves for Darwinian selection. Such additional selection can then feed its influence back in such a way as to "second" various important aspects of the already established, functional stability, such that subsystems come to cooperate more reliably as robustly integrated, context-dependent control systems. This Darwinian influence may then induce, over time, the formation of an interiorized model of an organism's surroundings, functionally insulated in order that a more reliable control system can develop.[135] This cooperation between top-down and bottom-up effects, especially with respect to the formation of some appropriately insulated capacity for accurate representation, might well be comparable, in its critical effectiveness, to the context of the mind-brain relationship and the emergence of self-consciousness (chapter 3).

Feedback, whether strictly homeostatic or otherwise, can be constructive for a particular purpose whether it is positive or negative in character. Environmentally circumstantial, quasi-stable feedback mechanisms are endemic to biological sustenance, such cycles either bursting or integrating with larger cycles within an environment or ecosystem, like a foam of bubbles bursting or recombining according to energetic stability. Such *temporarily and circumstantially stable – or quasi-stable – conglomerations of feedback cycles*,[136] which

[134] *Ibid*, pp.448-451 and pp.468*ff.* Of interest here, with respect to 'motion', is their additional observation that 'perhaps the most novel aspect of the mathematics of life will be that its forms of long-range order become so numerous and govern so much of the kinetics that we can no longer deal with them as isolated special cases one by one. We must begin to develop a theory of movement within space structured by long-range order'.
[135] *Ibid*, pp.16*ff* and pp.570*ff*.
[136] Of those cycles relevant to metabolic order the best known examples would be the Calvin and Krebs Cycles.

may change their structure and domain boundaries somewhat unpredictably over time, provide the nested and modulated hierarchy required for ecosystem-level organization of the biosphere. Hierarchical organization over a neurological system similarly undergirds the emergent properties associated with our brains and the functional stability of our consequent 'mindscape'.

The emergence of intelligence

The subject of human intelligence and creativity is clearly intimately connected to our self-consciously developing practice of behaviour, including the development of our linguistic capacity. The above discussion highlights that genetically selective influences do not represent the initial or exclusive driving seat over the history of life, having developed instead as efficient ways of establishing more *robust* assimilation of information in more strictly encoded form. Biophysical principles largely dictate what can, or cannot, on principle be formed or supported in a given environment. Recent advance has illumined the necessary complementarity between selective mechanisms and the way in which certain morphologies either could or could not be generated on principle.[137]

Despite the well-acclaimed success of what neo-Darwinism and its more recent extensions allow us to explain concerning our dispositional or compositional attributes, especially with respect to somatic features, newly-developed schools of thought have been required to tackle the phenomenon of language instinct and the development of evolutionary psychology.[138]

If one is to take seriously any analogy between biological and cultural evolution then the new synthesis contributes a certain basic intuition, in as far as words (a way of coding for concepts, analogous to the nucleotide sequence of 'letters') and culturally visible, established manifestations of ideas (comparable with genes coding for the production of particular proteins) are not the original driving force, but represent a more robust accommodation of particular ways of perceiving and subsequently conceiving that were, on principle, largely accessible to early, pre-linguistic humanity, for whom environmental

[137] B. Goodwin, *Beyond the Darwinian Paradigm: Understanding Biological Forms* in Ruse and Travis, *Evolution*, pp.299-312.

[138] The details of this complex development are beyond the scope of this thesis, but Ridley gives a good summary of such 'reverse engineering of human behaviour to try to understand what particular problems it was selected to solve'. See M. Ridley, *Genome: The Autobiography of a Species* (London: Harper Perennial, 1999), pp.91-106.

encounter was catalytic for the development of pre-articulate thought. Just as there was a pre-Mendelian era, so likewise there was a pre-linguistic or proto-linguistic period.

The need for a philosophical response to more recent developments in scientific knowledge and criticality has prompted a 'post-critical' philosophy showing particular interest in our intuition, a word whose very etymology suggests engagement via some (possibly surreptitious) tuition, rather than being entirely innate or instinctive. Polanyi takes a thoroughly holistic, integrated view of the human person,[139] noting its *focal* and *subsidiary* modes of awareness, in which development broadens the latter away from reliance on the former. He is critical of the empiricist's downplaying of the role played by human reason and personal judgement concerning empirical method. He emphasizes distinct stages of knowing through inarticulacy and pre-articulacy, as well as considering how explicit and tacit modes may interact, both at the 'ineffable' extreme where explicit articulation is impossible and at the 'sophistication' extreme where the explicit focus opens up a mode of thought *not* accessible to the tacit component, leading to a 'logic of achievement'.[140]

He emphasizes especially that 'when man participates in this life [that of noogenesis] his body ceases to be merely an instrument of self-indulgence and becomes a condition of his calling. The inarticulate mental capacities developed in our body by the process of evolution become then the tacit coefficients of articulate thought'.[141] This is not dissimilar to Rothman's idea (as above) concerning embodiment of purpose. The degree of emphasis with which one thing becomes focally articulated over another may then reflect a weighting of such coefficients according to the environmental challenges of the moment. The metaphor 'tacit coefficients' is I think an elegant one, calling to mind the mathematical analogy of coefficients as weighting successive terms in a power series, a series needing to *converge* at some limit if it is to remain finite and be interpreted as physically meaningful. Where an analysis of stability is concerned, such weighting is also relevant to time-dependent *Perturbation Theory*, in which correction terms to some initial, unperturbed base-model term (derived according to a simplified context in which an exact

[139] M. Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1974).
[140] *Ibid,* pp.327*ff.*
[141] *Ibid,* p.389.

solution is analytically obtainable) can have time-variable coefficients.[142] The idea of the stable aspects of our mindedness resulting from the brain having to perform ongoing correction procedures is considered in chapter 3.

The 'tacit coefficients' of our pre-linguistic formation are then developed in later generations as some accumulated, intuitive potential. Linguistic structure is therefore inextricably expressive of past encounter, such structure in turn forming the basis for our developing articulacy. In their investigation of the roots of creative space for a knowledge-civilization age, Wierzbicki and Nakamori make use of this pre-linguistic formation to suggest that articulate language might actually have reduced human awareness of our tacit and subsidiary capabilities as our reliance upon such articulacy makes these functions lazy, though still latent in our biology. This they call the *Rational Theory of Intuition*, in which they distinguish from Polanyi's talk of the tacit component and define intuition as 'the ability of preverbal, holistic, subconscious imagining and processing of sensory signals and memory content, left historically from the preverbal stage of human evolution'.[143]

They rightly see intuition as connected to a process of learning rather than some inflexibly inherited instinct.[144] The question of intuition is still, however, inevitably connected with that which is considered 'innate'. From a neuro-scientific perspective, Ward considers the definition of innate as being somewhat elastic but generally implying the presence of a potential capacity *not* reliant on explicit, *a priori* knowledge of environmental content. He suggests that the term stands for a 'readiness for certain knowledge to be acquired, but the knowledge itself is not strictly innate'.[145] While there is some instinctual readiness for knowledge acquisition such readiness requires the complementary development of an intuitive component, cumulatively learned through stably-structured, conceptually-convergent responses to environmental input, in order for acquired knowledge to become more robustly and consciously articulable as some mental 'content' or experience. Intuition might therefore be considered as developing such as to bring the latent potential

[142] The main application of this idea is in quantum physics, originally developed by Paul Dirac. A concise summary of this is given at https://en.wikipedia.org/wiki/Perturbation_theory_(quantum_mechanics) or, for more detail and especially for the context of stability analysis, see T. Kato, *Perturbation Theory for Linear Operators* (Berlin: Springer-Verlag, 1976)
[143] Wierzbicki and Nakamori, *Creative Space: Models of Creative Processes for the Knowledge Civilization Age* (Berlin: Springer-Verlag, 2006), p.36.
[144] *Ibid,* p.37.
[145] J. Ward, *The Student's Guide to Cognitive Neuroscience* (Hove: Psychology Press, 2015), p.418.

of our instinct and the heritage of the aforementioned 'tacit coefficients' into a greater degree of conscious awareness, necessarily working in tandem with environmental factors.

As to the communal heritage undergirding the development of speech, Aitchison traces a history of evidence from anthropology, archaeology and mitochondrial DNA in search of the developing seeds of articulacy, as the first hominids dispersed across the earth. In particular she notes the hypothesis that the Great Rift Valley separated the water-abundant west from the arid east, splitting the until then cohabiting groups of hominids in two, the ones isolated to the east being ultimately, if somewhat ironically favoured through the more demanding pressures of survival, with an increased adaptability for which speech development proved central.[146] She considers various theories of anatomical development and estimates of timeframes over humanity's punctuated journey out of Africa, something making any putative universality in grammatical form of language[147] all the more intriguing.

The basic utterances of our pidgin and subsequent creole languages formed in direct parallel with a fascinating but intense struggle to survive. The nature of the urgency facing archaic humanity, as it first came to develop basic linguistic skills, was different to that of most people today. Adaptability through reactivity, emotional response and basic understanding needed to be relatively quick. Our capacity for effective cooperation would frequently constitute the difference between life and death. If one accepts the 'out of Africa' hypothesis, then ever since early hominids were forced out of the forested areas and across the desert, urgency has never left their side.[148] With the seemingly few advantages of grasping hands, good focal vision and conveniently placed vocal chords, accompanied with a more efficiently connected brain, these special hominids were somehow able to reproduce, feed and move with sufficient creative awareness to come to survive, and even to dominate over, the large majority of creatures who are any or all of faster, stronger, more agile, better protected and perhaps less complicated to sustain than

[146] J. Aitchison, *The Seeds of Speech: Language Origin and Evolution* (Cambridge: CUP, 2000), especially p.55.
[147] See Berwick and Chomsky, *Why Only Us: Language and Evolution* (Massachusetts: MIT Press, 2016) for an up-to-date discussion of this.
[148] Agusti and Antón, *Mammoths, Sabertooths and Hominids: 65 Million Years of Mammalian Evolution in Europe* (New York: Columbia University Press, 2002), pp.241*ff.*

they were.[149] All these factors contributed somehow to the pre-articulate development of our humanity.

Developing our heritage: the compositional mindscape

Human mindedness, in its focal and tacit components, naturally strives in some sense to ponder its nature and 'place'. However, the functional operation of the mind relies on establishing an at least quasi-stable perspective, rooted according to some systematic means of relating the domain of thought to that of physical extension: in other words, relating the mental domain referred to here as our 'mindscape' to a particular means of encounter with the physical landscape within the context of which our species has evolved.

The relevance of a certain critical symmetry between the way in which we come to form representations of the world and the way in which the world in turn forms our capacity to form representations was marked briefly in the Introduction. Concerning especially the importance of our pre-linguistic formation, Appleton considers the shaping of our mental processes along precisely these lines and for empirical guidance he appeals to the hard, experimental observation of our tendency to prefer certain landscapes over others.

He notes that 'there are within everybody's experience innumerable kinds of interaction between the two worlds, that of 'reality' and that of the imagination. The latter is created by reprocessing raw material drawn from our observations of the former, material which has already been reprocessed in the act of observation itself'.[150] Light and sound are the two sensory media most overtly affecting orientation with respect to our environment, and are of considerable evolutionary significance. Appleton therefore asks, 'If I build, not one world of my own, but two, one in sounds and one in pictures, what is the relationship between them?'[151] This question attaches to the work of John Barrow,[152] especially in developing his theory concerning how the world of light shapes our intelligibility of space while the world of sound shapes our intelligibility of temporal ordering (itself partially

[149] See B. Bryson, *A Short History of Nearly Everything* (London: Black Swan, 1984), pp.522-543 for an informative, accessible and entertaining discussion on this.
[150] J. Appleton, *How I Made the World: Shaping a View of Landscape* (Hull: University of Hull Press, 1996), p.123.
[151] *Ibid,* p.155.
[152] J. D. Barrow, *The Artful Universe Expanded* (Oxford: OUP, 2005).

affected by the ordering of light in its degrees, tones or absence). In particular, Barrow remarks that

> The spatial order exhibited in painting or sculpture is heightened when endowed with a temporal aspect. Films are often more appealing than still photographs…music imposes its own perceptual order. It has a beginning and an end. A painting does not. Musical appreciation may be associated with a propensity of the mind to structure time in order to sort and store information. Music making is more complex, since it requires the coordinated action of different limbs or muscles. Thus it could be that our liking for music is...a by-product of an advantageous adaptation for coordinated actions.[153]

This highlights the importance of a coordination and synchronization of those 'worlds' pertaining to different sensory sources. The mind must have the capacity to unify its perception of such inputs by integrating associated conceptual categories, converging on critical points or aspects of focus and allowing our intelligible appreciation to become sufficiently articulable through just *one* communally spoken language, pertaining to *one* commonly perceived world. The non-trivial nature of any 'topology' of interconnectedness upon which our environmental encounter and perception is reliant can indeed be seen by considering this necessary integration over different sensory sources.

Appleton's worlds of sounds and pictures must combine into one landscape vision in which shades of light somehow connect with a temporal ordering of information, to which we have become tuned in our historical quest to establish our livelihood and which also affects our sense of aesthetic. He believes that this is broadly explicable in terms of morphology, function and evolution,[154] and compares the Stoic world, in which perception of rightness is to be unaffected by lessons that may teach one otherwise, to the Epicurean world of an obtainable and graspable objectivity realistic to individual attainment. He argues the latter to be more consonant with the lessons of neo-Darwinism, but advocates a conditioned romanticism that abstracts itself from classicalism far enough for novelty of achievement (cf. Polanyi) but not so far as to forsake the advantages of classical formalism

[153] *Ibid*, p.230.
[154] Appleton, *How I Made the World*, p.181.

and harmony.[155] In the biological domain such formalism is built according to largely non-Darwinian forms of selection and self-organization, as noted previously.

To Appleton the key influence upon his own means of coming to perceive the world must have derived from 'critical boundaries between that part of the world which I could see and that part which I could not, the field of perception and the field of speculation'.[156] He considers it crucially relevant that historical survival required (as for Rothman above) active encounter with often partially obscured danger. Perhaps for this reason *controlled* experience of danger provides an aesthetic pleasure for many people today.[157] Attraction to artistic expression, always operating in part through the 'field of speculation', must then similarly derive from some pleasure contained in the act of creation, deriving in turn from some inherited, innate capacity being developed through learning and creative intuition.

With regard to this thesis' use of vocabulary, centred on such themes as dynamic stability and interconnectedness, Appleton importantly develops a symbolic framework formed principally from two dynamically interrelated aspects referred to as 'prospect' and 'refuge'. Each of these is connected to a perception of environmental challenge: the prospect domain being seen in terms of a motivation and a capacity to search out and interpret environmental potential, incorporating whatever degree of risk we are prepared to take in pursuit of it; the refuge domain highlighting the requirement of some necessary degree of safety, being in a sense representative of that convergent stability which has allowed our very capacity for evaluating or interpreting our environment progressively and consistently to develop in the first place.

Appleton acknowledges a partial but constructive feedback in his theory, since 'just as our habits and our tastes in landscape are influenced by our life experiences, so also are our attempts to explain these things'.[158] His viewpoint importantly appreciates the relation between *how* we have been formed, physically and emotionally, and *what methodology* we therefore most naturally employ in order to appreciate this, expressing at root the necessary relationship between our physical ontology and our epistemological capability.

Appleton is certainly aware of the different timescales of evolution and evolvability, carefully distinguishing between an evolution in the *way* we respond to stimuli of

[155] *Ibid*, pp.191-198.
[156] *Ibid*, p.201.
[157] *Ibid*, p.207.
[158] *Ibid*, p.224.

opportunity and safety and that by which we acquired the *means* to respond in the first place.[159] Biophysical evolution progresses more slowly but consequently leaves a deeper impression on our communal heritage. The relatively rapid changes connected with urbanization subsequently saw the replacement of many of the signs of nature with new and distorted objects of focus, such that we found ourselves 'endowed innately with a mechanism for building a behavioural relationship with one kind of environment while living in another'.[160] Noting the historical struggle to emancipate ourselves from the baser challenges of our immediate environment, Appleton presumes some tension between an unwillingness to relinquish such dominance and a surreptitious yearning to engage afresh in that for which we are, in certain respects, naturally better tuned.[161]

His symbols of prospect and refuge co-exist as a tense, dynamic unity, informing the noetic interpretation and appreciation of our 'landscape' context. This provides a valuable, dynamic dual-aspect bond for the purposes of this thesis. Being both a dynamic and symbolic representation it can be extended to apply to the dynamic of our 'mindscape' in general, relating to the manner in which internal representations of the world preferentially become processed and interpreted by the brain.

While Appleton acknowledges that in a manmade work of art, such as a landscape painting, it is usually the stylistic aspects that are noted and not explicitly what is occurring with respect to a sense of 'prospect' and 'refuge' there is still a significant link. He argues that the *chiaroscuro* technique of juxtaposing light and dark emphasizes both prospect and refuge, while impressionism suppresses refuge and the *coulisse* represents a possible variety of forms of prospect-refuge interface.[162] In a broader anthropological context – living within the Artwork of Creation as a whole (chapter 3) – we live, 'move' and become intellectually acclimatized to our means of existence in the inseparably dynamic tension between these aspects of prospect and refuge, not selecting one to the exclusion of the other since they are not properly separable in the context of our mental dynamic. Our sense of stable 'form' concerning environmental perception, inducing our appreciation of 'refuge', itself contours that aspect of our environment that we then interpret in accordance with a sense of prospect, guiding in turn the manner in which we focus and develop our attention.

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[159] J. Appleton, *The Experience of Landscape* (Chichester: John Wiley and Sons, 1996), pp.149-169.
[160] *Ibid*, p.152.
[161] *Ibid*, p.156.
[162] *Ibid*, pp.203-205.

Given the symbolic nature of such description, Appleton further suggests that

> Once one has established that, even in traditional landscape painting, the interpretation of aesthetic response in terms of the observer's 'habitat' involves a large measure of symbolism, one can never eliminate the possibility that even the most abstract forms of art may lie at the end of an avenue which leads to the primitive game of hide-and-seek.[163]

This possibility is important if one is to extend or abstract the principle involved to the level of searching out a broader and theologically significant appreciation of our 'habitat' or *topos,* without divorcing ourselves from the formational importance and rootedness of our 'landscape' context. Something of this *topos* will inevitably be partially hidden or 'implicate', enfolded and participating within that deeper environing pertaining to the Life of the Trinitarian Economy.

The discipline of landscape architecture encompasses such areas as 'problem identification, user needs analysis and site analysis',[164] all of which could logically be developed according to Appleton's insight. There are empirically estimable factors regarding preference ratings, such as 'mystery', forming part of Kaplan's 'preference matrix',[165] and our sense of prospect could further be considered in terms of 'the promise of learning more about an environment as one moves further into it'.[166]

The prospect-refuge theory is attractive owing to its broad, applicative potential and critical, evolutionary awareness. It is scientifically relevant while remaining intuitively accessible to our more common, conscious experience and understanding. It presents a simple, suitably compact, conceptual framework that remains relatively flexible and extendable. Furthermore, it is properly focused on the important consideration of how *what* it has meant to become human affects the subsequent means by which we engage intellectually and creatively with our environment.

This symbolically represented dynamic also offers an intuitive means of connecting the spatial and temporal 'extensions' constituting our landscape encounter with those thought-

[163] *Ibid*, p.155.
[164] Cushing and Renata, *Themes in Landscape Architecture Publishing: Past Trends, Future Needs* (Landscape Journal, Vol.34, No.1, 2015), pp.15-36.
[165] Kaplan and Kaplan, *The Experience of Nature* (Cambridge: CUP, 1989)
[166] R. Kuper, *Examining the Visual Effects of Plant Foliation and Vegetative Winter Dormancy on Preference and Mystery* (Landscape Journal, Vol.34, No.2, 2015), p.139.

processes resulting from the interiorized, representational capacity endemic to our mental dynamic or mindscape. This critical landscape-mindscape interface provides a convenient context of consideration in which to re-present the critical relation between extension and thought. Only around the convergent stability of such can our mental development occur in a sustainable manner. In any species cerebral development relies heavily on physical conditions, and the evolving process involved has already influenced our means of sub-consciously processing any raw data of which we can subsequently become consciously *perceptive* and, from that basis, imaginatively *conceptive*.

We may therefore consider how such a representatively dynamic, prospect-refuge 'tension' or 'bond' provides the potential for understanding more about our operational epistemology. It is here being claimed that our appreciable reliance on a dependable and at least partly predictable form of mental refuge is inseparable from our gradually deepening awareness of mental prospect – that sense of prospective potential associated with pursuing particular avenues of inquiry. Our natural attraction to 'mental refuge' may be appreciated according to our naturally-conditioned tendency to focus attention according to some 'category' analysis, intuitively developed over time. Such analysis is inseparable from our capacity for acknowledging particular core concepts/categories – considered more fully below – whose interrelation in turn informs our 'prospective' sense. This natural inseparability conditions the intellectual *coulisse*, to borrow Appleton's term, of our mental dynamic, and inevitably has some bearing on our subsequent and "higher" intellectual capabilities, including our capacity to think more abstractly or philosophically. This dynamic further manifests itself through the basic human requirement or desire to be forward-moving in our intellectual, creative activity and provides a suitable means by which to consider the further evolution of our operative, mental domain and associated idiom of creative freedom (chapter 5).

Barrow offers a comprehensive survey of the critical sizes and scales that influence the structural and functional properties of the physical cosmos, the macroscopic biosphere and the relatively microscopic details of those individual organisms embedded in some particular landscape setting.[167] As part of this, and on the scale of human interaction with such landscape, he purposefully makes reference to Appleton's terminology in providing his own illustration of how the human mind picks out the most pleasing prospect-refuge

[167] Barrow, *The Artful Universe Expanded*, pp.56*ff.*

tension in its aesthetic evaluation of landscape, remarking that 'so many of the classically seductive landscape scenes combine symbols of refuge and safety with the prospect of uninterrupted panoramic views'.[168] He notes that 'the topography must allow us to navigate easily; landmarks, bends, and variations are welcome to the eye, so long as they do not create confusing complexities or mask dangers'.[169] Such 'confusing complexities' are more bearable in the abstracted context of manmade art because they constitute controllable exposures to risk.

Inherent to our ability to abstract is some degree of emancipation away from the *topography* of landscape towards what one might consider the freer *topology* of an overall, integrated mindscape, in which a tighter, conceptually more compacted prospect-refuge relationship can more readily be borne or imagined. Our mental dynamic is not something to be analysed as if from the evidence of a series of static landscapes, captured photographically in turn. Given the abstraction from the topographical to the topological domain, one might coin the term "photological" (something more like a film than a series of snapshots) to illustrate the means by which the processing of any mental imagery might be integrated and interpreted in the human mind. Any such hypothetical representation of our mental dynamic over time would then highlight the continual necessity for subtle, 'reweighting' adjustments, made right down at the neuronal level (chapter 3) and occurring in accordance with those 'tacit coefficients' previously impressed throughout our anthropological heritage as we 'moved' both physically and mentally, requiring the ability to shift the focus of our attention from one context to another.

The prospective aspect of our consequent thought-process might be considered in terms of a semantic elasticity, a potential for reinterpretation or re-evaluation, related to some inherent flexibility in our capacity for ordering and reordering various symbolic abstractions gleaned from our environmental encounter. Our mental refuge would then relate to the 'structural stability' or reliability of particular, integrated forms of representation, adaptable to differing contexts of encounter without fundamentally or necessarily altering the architecture of our cerebral organization to any macroscopically appreciable extent. Such reference to structural stability refers once again to a topological property. Just as a given topology could on principle support a range of geometries, so our

[168] *Ibid*, p.115.
[169] *Ibid*, p.113.

mindscape can adapt to accommodate different environmental challenges, according to a hierarchical manner of organization.

Dutton, also noting Appleton's influence, adds an emphasis on humanization, or evidence thereof in a landscape, being attractive for its added security feel,[170] and explores the evolutionary basis for a noted preference for Savannah landscapes among young children and a cross-cultural preference for water, animals and human activity in a landscape painting. Some preferences may of course reflect the manner of one's *nurture* or education: evolutionary background relates to a lowest common denominator while a particular form of education may produce instead a highest common factor reflecting a more culturally specific response concerning one's educated beliefs and interpretations. Dutton considers, quite logically, that the greatest bulk of evidence concerning the evolution of any *nature* (having predominantly genetic and epigenetic roots) underlying our more instinctive preferences must derive from the Pleistocene era, given the overwhelming majority of human generations thus far having existed in some pre-city culture. He suggests, similarly to Barrow, an attempted inventory of human nature and its relation to spatial and temporal qualities of awareness,[171] and emphasizes the importance of social co-operation. It is through such cooperative interaction that our baser instinctiveness provides a collective basis for the flourishing of a creative, learned and actively applied intuitiveness.

Creativity is clearly inseparable from our capacity to be imaginative and to appreciate the subjunctive. The 'worlds' of the real and imaginary (or the actual and the potential) are not separate in any absolute sense. What we contribute to the making of 'reality' is stimulated by an on-going formation in our imagination, while what we are most fluent at imagining is in turn heavily conditioned by the way in which we are already accustomed to perceive, and conceptually to focus upon, that which we believe we understand in/by 'reality'. Dutton notes the remarkable way in which 'children can invoke consistent rules and limitations within freely invented yet coherent fantasy worlds' but that 'children are also able…to keep fantasy worlds separate [for these really can be separated] from one another, and to quarantine multiple imaginary worlds from the actual life of the real world'.[172] This ability is rooted in our crucial capacity for distinguishing between that which is

[170] D. Dutton, *The Art Instinct* (Oxford: OUP, 2009), pp.19-21.
[171] *Ibid*, pp.43-44.
[172] *Ibid*, p.107.

subservient to us and that to which we are subservient, according to the form of our embodiment.

Dutton suggests a possible evolutionary role of fiction as arranging a repertoire of memorable, narrative suggestions made in accordance with a particular author's reality-influenced thought experiments concerning human interaction, which he argues is an aid in unknown social circumstances. He makes comparison with a chessplayer getting to the point of having to search through the interconnected, variation-rich thicket of opening possibilities, beyond the point at which beginner-style rules of thumb are helpful, aided by the records and lessons of games played by *others* ('fictional' with respect to that player's own particular set of games actually played) finding their way into the player's long-term memory.[173] This principle is related to what I will call the *re-creative* genre of our creative activity, developed in chapter 5. The formation and development of any individual mind is thereby inextricably linked to the communally-connected development of a collective human mindscape, and to an evolution in the creative freedom of its operative idiom overall.

The dynamic of thought-process

For all the advantages that language brings, thought (or thought-process) ought not to be conflated with language, whether spoken or mentally imaged. Even Fodor's *Language of Thought* (LOT) theory[174] says simply that there is a structural analogy between the two in terms of a relation between syntactic and semantic aspects. Any expressible thought must have been preceded by the operation of some pre-articulate faculty, a subliminal aspect to thought-process necessarily coming first, not least in evolutionary terms. I will think of language as a 'window on thought', as Jackendoff presents it[175] as part of a broader argument concerning how one might think about the active construction of human experience from the universal, foundational and evolutionarily-tuned 'grammar' of those concepts and constructions that are, again on principle, appreciable according to human nature. He takes language to be a tool for achieving articulate resonance in our conscious experience, making the persuasive suggestion that 'just as phonological grammar governs how the pronunciations of words can be put together, conceptual grammar must govern

[173] Dutton, *The Art Instinct*, pp.103*ff.*
[174] See Preti and Velarde-Mayol, *On Fodor* (Belmont: Wadsworth, 2001)
[175] R. Jackendoff, *Patterns in the Mind: Language and Human Nature* (Hemel Hempstead: Harvester Wheatsheaf, 1993), pp.184-203.

how the meanings of words are assembled from smaller conceptual primitives'.[176] Once again, language robustifies the development of our capacity for mental conception. There is a certain 'topology' lying behind that which is, on principle, accessibly conceivable for us, contoured by our embodiment and evolutionary history, and the developing context of grammar and specific uses of articulate language then 'geometrize' the accessible contours of such a topology in accordance with the particulars of our environmental encounter.

Bayne introduces the ways in which modern thought has approached the nature and subject of thought itself.[177] On the assumption that thought should have a purely physical basis he notes just one mainstream suggestion, the *Computational Theory of Thought* (CTT). A responsible degree of caution is clearly necessary regarding how far we ought to be prepared to push any computer-based metaphor to describe the workings of the human brain and its associated mindedness.

Penrose defends a position on the nature of consciousness which, through an argument connected with Gödel's *Incompleteness Theorem*, both denies that it can be reduced to a model based upon strictly computational simulation and yet also denies that it will remain necessarily outside of the explanatory capabilities of science.[178] The argument highlights the difficulty, for the computational world, in finding congruence with the operations of particular, specifically evolved embodiments. There remains a gulf between the programmatically designed and the naturally evolved, especially with regard to the extent to which natural memory may properly be viewed as 'compartmentalized'. The jury may be out concerning any balance between algorithmic and non-algorithmic processes and influences over evolutionarily history but human intelligence cannot realistically be considered purely algorithmic.

Human mental phenomena are all ultimately *stimulated*, while a computer program is predominantly *simulated*. Searle made a very similar point when he remarked that no matter how well a computer can simulate the workings of a digestive system it still doesn't actually digest anything and that 'any attempt literally to create intentionality artificially (strong AI) could not succeed just by designing programs but would have to duplicate the

[176] *Ibid,* p.189.
[177] T. Bayne, *Thought: A Very Short Introduction* (Oxford: OUP, 2013).
[178] R. Penrose, *Shadows of the Mind: A Search for the Missing Science of Consciousness* (London: Vintage Books, 2005), pp.7-77.

causal powers of the human brain'.[179] Penrose further remarks on 'the general quality of being able to *understand* [italics Penrose] that Man has somehow acquired, or developed to a high degree, through the pressures of natural selection', and he does not consider that computers can yet be said to 'understand' in this sense.[180]

Instead of applying the common metaphors of hardware and software to the brain and mind respectively, Bray suggests looking directly to the interestingly computational properties of proteins, constituting what he dubs 'wetware'. He proceeds to use this metaphor as part of his argument that cellular organizational mechanisms can be considered computational inasmuch as any 'wiring' is replaced by an efficient combination of molecular binding affinity and diffusion.[181] There is an inherently topological aspect to such organization, calling for a flexible potential for connectedness over varying scales and therefore a deeper insight regarding the concept of nearness or neighbourhood in cellular communication systems. Furthermore, it needs to be asked how organisms might "search" for the most biologically functional and efficient collection of *subsets*, interpreted in this case in terms of interrelating domains concerning possible molecular interactions. As noted in the Introduction, the very definition of a topological space is based upon the notion of a collection of subsets.

Just as topological consideration is inseparable from the theme of connectedness, there is also a certain challenge to CTT from connectionist models, less heavily modularized than Fodor's theory, and certainly it seems reasonable that different regions of the brain, incorporating different types of cells and involving differently layered architectures, might suggest some functional aspects better described by computational theories and others better described by connectionist approaches.[182]

Fodor's computationally-focused LOT hypothesis suggests inseparability between some intentional aspect of mindedness and an associated semantic appreciation concerning our environment, something *generated* through the processing of sensory input and

[179] J. Searle, *Minds, Brains and Programs* (Behavioural and Brain Sciences, Vol.3, No.3, 1980), pp.417-424.
[180] Penrose, *Shadows of the Mind*, p.148.
[181] D. Bray, *Wetware: A Computer in Every Living Cell* (London: Yale University Press, 2009). The subject of structural and computational properties of proteins and of the possibilities they might offer us for the engineering of efficient biosynthetic materials has been a growing area of recent interest, related to the area of biomimetics (chapter 5). See Böker and van Rijn, *Bio-Synthetic Hybrid Materials and Bionanoparticles: A Biological Chemical Approach Towards Material Science* (Cambridge: Royal Society of Chemistry, 2015)
[182] M. J. Cain, *Fodor: Language, Mind and Philosophy* (Cambridge: Polity Press, 2002), especially pp.81-111.

represented according to a particular, syntactical means of 'tokening' various symbolic cerebral states. One might consider here the interesting distinction between the 'intentional' (a property associated with the mind) and the 'intensional' (a logical property of some sentences).[183] Syntactically tokened mental states may not necessarily have to correspond to what we might articulate as some particular intention, but one could still assume a logical *in-tension* between any formal, syntactical aspect of mental processing/tokening and any semantically associated mental content or interpretation. The idea of such a dynamic form-content bond will be revisited in chapter 3.

CTT is relatively flexible, however, interpretable through representationalist approaches, an algorithmic view of processing, or simply through consideration of the mathematical potential of systematised arrays of symbols. The question nonetheless remains as to how any formal property or aspect 'generates' content, especially if different modes of thought-process become associated with different degrees of reliance upon developing linguistic capacity. As a prerequisite for robust articulation proto-linguistic cues must be effectively arranged and integrated.

From the perspective of operational epistemology, and assessing the form of any procedural rationality in those non-linguistic creatures comprising our living ancestry, Bermúdez suggests three levels of rationality: level-0, relating to reflexive, innate, tropistic behaviours simply requiring the stabilization of particular forms of information exchange; level-1, relating to the ability to compare 'affordances', seeing the environment as an agglomeration of afforded possibilities (a vocabulary clearly congruent with Appleton's prospect-refuge dynamic), but with such comparison relying *only* upon a means of representing different possible (re)actions internally; and level-2, relating to an evaluation of choice that grounds activity in instrumental beliefs concerning respective outcomes.[184] This highlights the importantly and necessarily *layered* development of rational operation over time, a stratified up-building that will be developed further in chapter 5.

As to 'affordances',[185] Siegel considers the degree of primacy that representationalist approaches should be granted in the field of perception.[186] She invokes what she calls

[183] J. R. Searle, *Making the Social World: The Structure of Human Civilization* (Oxford: OUP, 2010), pp.42*ff*.
[184] J. L. Bermúdez, *Thinking Without Words* (Oxford, OUP, 2003), pp.109-128.
[185] A theory originally credited to Gibson in 1977 – description found reprinted in Shaw and Bransford, *Perceiving, Acting and Knowing* (Hillsdale, New Jersey: Laurence Erlbaum, 1986), pp.127-143.

'experienced mandates' by which a subject is considered to be primarily drawn along by the manner in which they are *already* acting in a situation, in addition to other innate predispositions. The manner in which a particular encounter is perceived is shaped by the form of action involved in coming to such perception. The key question is then whether there is an internal representation of this action that provides specific illumination regarding perceptual content, as some 'proposition' characterising the possible 'affordance' of the encounter in question. Siegel argues that there must be some such representation.

In agreement with this, the term 'affordance' will here be extended metaphorically to a theological context of encounter in subsequent chapters. Any 'representation' associated with our developing appreciation of some theological affordance is then seen as something carried along with the *dynamic* of our iconic nature and its creative activity – our developing 'form of action' as collective and connected participators – especially inasmuch as we are 'moved' to conceive something of that critically pervasive *topos* associated with the 'motioning' of the *Logos* in and throughout created space/order.

From an evolutionary perspective, one must begin with some *proto-semantic* appreciation, an archaic sense of significance and environmental affordance which has become encoded in terms of some innate capacity. This physical, formational quality provides a necessary substrate upon which subsequent human response to contextual challenge can develop. Eventually one reaches the point of formally reproducible representations of semantic significance, allowing various forms of communication to become socially embedded. Such capacity is then developed and passed on over many generations, progressively transforming an original, proto-semantic appreciation into a more *robustly articulable* means of semantic expression. The key evolutionary stages concerning the development of thought-process are therefore being taken as follows.[187]

**(1) Perceptual** – based on the formation of constructive, internal feed-forward and feedback effects, responsive to particular types of stimuli impacting upon particular sensitivities pertaining to particular molecular constructs, leading to the formation,

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[186] S. Siegel, *Affordances and the Contents of Perception* in B. Brogaard, *Does Perception Have Content?* (Oxford: OUP, 2014), pp.51-74.

[187] This relates in part to the Model of Hierarchical Complexity – M. L. Commons, *Introduction to the Model of Hierarchical Complexity* (Behavioural Development Bulletin, No.13, 1-6, 2007)

development and active use of sensory organs. This constitutes the first level of 'representation'.

**(2) Conceptual–** based on the emergence of a primitive mental ability to respond syntactically, and with operationally sufficient consistency, to some proto-semantic quality of recognition, evaluating (and re-representing) more complex combinations of stimuli. Anatomical features may alter slightly over time in conjunction with such a process. A basic gesticulatory code thereby emerges, eventually becoming rhythmically embedded and/or ritualistically developed (chapter 3).

**(3) Articulatory** – emerging after the required networks, architecture and nature of connectedness in the human brain has developed, bridging onto the complementary processes of other anatomical developments. This allows for the major transition from relatively constrained *gesticulation* to more significantly varied and robust *articulation*. Social behaviour thereby develops more formally into something identifiable and maintainable as society.

**(4) Abstractive** – consisting in the development of an ability consciously to intend some detachment of thought-process from any closer connection with immediate stimulus or perceptual context, affording the possibility of intellectual inquiry becoming partly an end in itself and increasingly able to consider its own nature in more formal terms.

**(5) Beyond formal logic** – finally developing the capacity to think around those established contours which represent or reveal natural boundaries highlighting our various degrees of ignorance or unknowing, assessing the significance of any inevitable blackspots.

Considering evolutionary complexity as a relatively unpredictable passing on of a multi-faceted, embodied responsiveness to environmental challenge, the notion of 'freedom' becomes tricky to define (chapter 5). Such freedom is intrinsically conditioned by our temporality and circumstance of encounter, right down to the neurological level and any associated 'plasticity'.[188] Couched within such plasticity is the potential for the vital development of memory. Any particular, articulable memory, retrieved from the elusively distributed and hypothetical 'engram', is further dependent on the form of retrieval cue, in

[188] E. I. Moser, *Plasticity: More than Memory*, in Roediger, Dudai and Fitzpatrick, *Science of Memory: Concepts* (Oxford: OUP, 2007), pp.93-98.

turn stimulated by the encounter in question. Natural memory is not therefore to be considered merely as some fixed databank.[189]

As to the impact of evolution on the relative freedom afforded by memory, Clayton notes the important distinction between whether particular traits are shared on the homological basis of common ancestry or on the analogical basis of common environmental challenges. He highlights the distinction between quantitative and qualitative adaptations such as, respectively, an increase in the accuracy/duration of a type of memory and the development of a distinct class such as episodic memory.[190] Memory is, furthermore, inseparable from creative ability. As Klein notes

> Different memory systems have evolved to solve different problems…memory processes are not just in the animal's head: memory systems have procedures that are *designed* to use specific cues that are reliably present in the animal's environment…Each encoding, storage and retrieval feature has co-evolved not just with the environment, but with attention and learning mechanisms that are just as problem-specialized as the more traditional 'memory' features and without which these features would be inert.[191]

Not only does this make the important point that consciousness is not a topic of discussion which can properly be confined to our cerebral interior without reference to the broader environment of encounter (chapter 3), but it also makes clear that the development of memory accompanies our evolutionary journey in all of its unpredictability and heavily conditioned responsiveness to changing contexts of encounter. Along this process its effects become functionally differentiated into qualitatively distinct classes.

It would be helpful to have some robust, working means of translating this development into psychological terms. Vigo suggests a mathematically salient means of defining a psychologically practical measure of *information*, such that

> the notion of "the degree of surprise of an event" [as in Shannon's original electronics-based formulation] as the basis for measuring information is replaced

[189] M. Moscovitch, *Memory: Why the Engram is Elusive*, in Roediger, Dudai and Fitzpatrick, *Science of Memory*, pp.17-21.
[190] N. S. Clayton, *Phylogeny and Evolution: It Takes Two to Tango*, in Roediger, Dudai and Fitzpatrick, *Science of Memory*, pp.367-370.
[191] S. B. Klein, *Phylogeny and Evolution: Implications for Understanding the Nature of a Memory System*, in Roediger, Dudai and Fitzpatrick, *Science of Memory*, p.378.

> by the notion of "the rate of change of the structural complexity of a concept" or, equivalently, the rate of change of the structural complexity of the category (in intension) from which the concept is learned.[192]

His underlying assumption is that 'the manner by which organisms, and particularly humans, extract useful patterns for generalizing or ascertaining essential information about their environment…is necessary for organisms to be able to form concept representations (i.e., prototypes, rules exemplars, etc.) in the first place'.[193] He introduces his *Generalized Invariance Structure Theory*, which provides a means of tracking critical deviations from some invariant, conceptual norm or archetype and is subsequently used for the evaluation of conceptual or categorical complexity. The theory involves no entirely free parameters, which makes empirical verification easier, but a scaling parameter can be used to account for individual performance differences in various conceptual exercises.

Vigo even develops his own calculus in order mathematically to describe how we might keep track of changing structural complexity while still recognizing the constancy (or stability) of the concept to which the category in question critically gives rise. He introduces the idea of an *ideotype* as 'a higher order representation in psychological space that carries the structural information detected in categorical stimuli' and he interprets this practically as a 'compound memory trace'.[194] He also takes a hierarchical view of the contributory aspects to our mental experience, such that

> …perception subsumes sensation…likewise one may argue that conception (concept learning or concept formation) subsumes perception…In turn, reasoning and language subsume conception…which are subsumed by problem solving. Finally, problem solving is subsumed by what may be regarded as the highest level capacity of all: decision making.[195]

Not only is this consistent with that noted above (cf. Bermúdez), but Vigo also maintains that at each point in the hierarchy there is a corresponding qualification of memory. Importantly, our *conceptualizing* is taken to constitute 'a fulcrum…on which all the lower

[192] R. Vigo, *Representational Information: A New General Notion and Measure of Information* (Information Sciences, Vol.181, No.21, Nov 2011), pp. 4847-4859.
[193] R. Vigo, *Mathematical Principles of Human Conceptual Behaviour: the Structural Nature of Conceptual Representation and Processing* (London: Routledge, 2015), p.2.
[194] *Ibid*, pp.78-79.
[195] *Ibid*, p.16.

level and higher level capacities converge'.[196] As his theory develops it becomes clearer that this fulcrum looks rather like the "neck" in an hourglass topology. There are many different possible combinations of information-rich, sensory inputs and many possible abstract applications that may affect decisions on how to apply the results of conceptual processing, but any relative distribution or variety at the conceptualizing level must remain sufficiently compact and precise as for mental response to be reliably efficient – an evolutionary requirement revisited in chapter 3.

In the context of the earlier discussion regarding biological information, one could consider such error-variation problems in parallel to the critically sustainable degree of variance accommodated within Vigo's concept-category relationship (a type of structural stability within the conceptual domain). This may perhaps allow for an intuitive link between the idea of different qualifications of memory, or memory systems, accompanying the development of our cognitive capacity according to a modular, hierarchical view of cerebral organization, and the developing complexity according to which the hierarchical connectedness of the biosphere is able to self-organize. In other words, there is an intuitive organizational link between the biosphere and the noosphere in this sense. In both cases, modulatory or individuation mechanisms are useful as a means by which errors may be prevented from spreading, at least to a functionally sufficient degree, and in which error buffering mechanisms can become better established, enhancing bio-physical and mental stability.

Towards a theological connection

As argued above, a particular, layered arrangement, accommodating a dynamic, orchestrating stability, is critical for the reliable sustainability of our composite mental life, of that which not only grounds our thought-process in a more 'mechanical' sense but also influences the actively ordering and selectively filtering operation of intelligence to which such thought-process is necessarily conjugate. A primary function of intelligence is to evaluate degrees of *relevance*. In the context of a discussion on whether 'flux' or some more explicit, particular arrangement (i.e. as represented according to particles) constitutes a more fundamentally suitable physical basis of ontology, Bohm considers how mental process and knowledge acquisition might be related to the framework of such a discussion. He considers thought-process in its 'mechanical' aspect as the 'active response' of some

[196] *Ibid,* p.16.

composite memory, something continuously reintegrated over the various 'phases' of life like a reorganizing kaleidoscope of contributory, collectively interrelating components. He argues, however, that this mechanistic aspect does not inherently or totally guarantee that 'the thoughts that arise should be relevant or fitting to the actual situation that evokes them'. Such conceptually positive discrimination requires 'the operation of an energy that is not mechanical...that we shall call intelligence...able to perceive a new order...that is not just a modification of what is already known or present in memory'.[197]

The result of this operative intelligence constitutes an *emergent novelty*, beyond what Bohm refers to as the 'fortuitous interplay of elements of memory'. A theological extension of this might suggest that the novelty pertaining to a revelatory (from the divine 'side') and receptive (from the human 'side') communication between divinity and humanity, something attaining its *apex theoriae* in the incarnate Mind of Christ, ought to pertain to a still deeper emergent novelty or relevance. Very fittingly for the context of this thesis, Bohm's argument develops from his wish to avoid fragmentary tendencies in language by allowing the activity-centred role of the verb to form the kernel of linguistic development, constructing other aspects of linguistic expression around verbal roots in what he calls the 'rheomode', a scheme in which our means of constructing language acknowledges some *movement* as being the primary factor.[198] He appeals to our remarkably innate capacity effortlessly to fit the appropriate verbal mood to a given context, considering that this ought ultimately to derive from the fact that, when one considers the matter at the level of united flow or flux, 'the content of thought and its actual function are seen and felt as one'.[199]

Part of our ability to appreciate such flow is our capacity speedily to discern degrees of *relevance*, and Bohm bases his argument upon considering the root of the word 'relevant' as connected to the re-levation or re-lifting of some 'content' into a mode of attention whose fittingness to the context of encounter can be discerned according to the associated, functional degree of relevance (as evaluated by our intelligence). The active involvement of a memory system then constitutes a means by which the likelihood of establishing and maintaining higher degrees of relevance, and therefore of paying more proper attention, increases.

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[197] D. Bohm, *Wholeness and the Implicate Order* (London: Routledge, 2007), pp.61-68.
[198] *Ibid*, pp.34*ff*.
[199] *Ibid*, p.45.

Bohm notes that any re-levated content would stand out 'in relief'. This is fittingly a landscape term, here reflected in the mindscape. In this context one could say that human memory correlates with a re-levatory activity, and the iconic context of divine-human communication or encounter would then involve a subtle association between such receptive, re-levatory activity and some revelatory Activity. This association could then be understood according to an embedding of that 'topology' contouring the dynamic, bio-physical stability of our conceptual capacity within a broader and more theologically pointed, topological framework emphasizing a deeper, sacramental stability, based on a participatory model and established in accordance with the critically pervasive *topos* of the *Logos*. Our iconic capacity for conceiving something of this actively involving *topos* is again taken to be enabled by the 'motioning' of the Economic Trinity whose image is bestowed upon the activity of the human mind.

The framework of this thesis effectively points towards some working 'model' of interaction between that interconnectedness undergirding the communal *heritage* behind our developing, operative idiom of engagement and that communal *inherence* pertaining to divine nature and its associated, operative idiom as Trinity-in-Unity. The iconic image of Trinity-in-Unity, as may be discerned through our creative capacity (as per Augustine and Sayers), affords us a sacramentally significant stability: a reliable and theologically relevant *topos* of encounter.

Heidegger's ontological approach to our 'place' in the scheme of things advocated *Dasein* as a temporal entity, always possessing some mood, inseparable from the world with which its engagement produces mutual feedback, finding its priority in potential and its greatest redemption from its fallen state when distanced from the trivialities of idle *Gerede* and absorbed instead in attending to specific usefulness or relevance.[200] Of particular interest here, Malpas relates Heidegger's treatment of 'dwelling' in *Being and Time* to the consideration of some associated topology. He remarks that 'building must be understood as arising on the basis of dwelling rather than being that on which dwelling is based'.[201] In what follows here, the idea of humanity's contributory up-building is likewise taken as being on the basis of some integrally afforded *topos*, representing the ultimate grounding of our 'dwelling' in both bio-physical and theological terms. In the theological case this is extendable to the pivotal Johannine theme of mutual in-dwelling.

[200] M. Inwood, *Heidegger: A Very Short Introduction* (Oxford: OUP, 1997), especially pp.9-86.
[201] J. Malpas, *Heidegger's Topology: Being, Place, World* (Cambridge: MIT Press, 2006), p.271.

When it comes to any *topos* associated with the integrated bond of experiences, memories and representative perspectives forming our 'mindscape' it seems necessary to interpret our 'place' at least partly in terms of an egocentric sense of location, but one which can further act as a catalyst for learning, development and recollection. Such a 'place' is created, operative in created space, and one should properly distinguish here between the idea of space and that of place. Mackenzie considers the usefulness of this distinction and relates it to Luther's 'topology',[202] interpreting Luther as wanting to reconcile any opposition between the place of 'living before God' and that of 'living before the world'(although perhaps 'in' would be a more suitable choice of preposition in this context) and arguing that Luther should be read as seeking an equal balance between subjective and objective aspects of space. Formation within created space/order seems to aim towards the revealing of the *topos* of individual human perspective, holding a unique distinction and 'distance' between Creator and creature. Ultimately, however, we must come to appreciate some communally-integrated *topos* pertaining to a sacramental, participative sharing in the Mind of Christ, in which we commune in accordance with an integrated topology. Christ notably directs the Samaritan woman towards the idea that 'you will worship the Father neither on this mountain nor in Jerusalem' (John 4:21), pointing away from topographical constraint towards some greater, topological pervasion and freedom, worshipping 'in spirit and in truth'.

From a theological perspective it is also interesting to note Christ's statement that 'foxes have holes, birds of the air have nests, but the Son of Man has nowhere to lay his head' (Matthew 8:20 and Luke 9:58). The mental dynamic associated with the human 'head' and its associated *topos* cannot ultimately dwell in any convenient isolation of refuge or prospect alone, neither the refuge of the hole nor the prospective vantage point of the nest, having instead to live through an inseparable relationship between the two. Appleton's symbolic framework may therefore incorporate theological relevance. Owing to our unique capacity for higher modes of abstraction, allowing us a theologically significant intellect, no purely physical abode associated with our 'landscape' context ultimately suffices, especially not for the intended fullness of our humanity demonstrated through the Incarnation. The manner in which we carve our basic drive for survival into our physical surroundings does not, and cannot, equate to finding any eternal 'place' or abode. That

[202] J. Mackenzie, *Luther's Topology: Creatio Ex Nihilo and the Cultivation of the Concept of Place in Martin Luther's Theology* (Modern Theology, Vol.29, No.2, 2013), pp.83-103.

ultimately theological challenge requires a higher form of living relationship than that encountered in the localized context of an ecosystem. In responding to this challenge, the symbolic aspects of prospect and refuge should acquire theological relevance. What is *revealed* constitutes the basis of an 'affordance' pertaining to a higher environing, something ultimately defining a sense of eschatological 'prospect' in dynamic and developing relation with our ongoing yearning for a higher refuge (cf. Psalms 16:1, 17:8, 90:1 and 91:1-2) and eschatological 'rest'.

Summary

The hierarchical, modulated and dynamic order constituting the biosphere consists in particular, layered domains of stability, emerging according to a combination of energy and information requirements. The integration undergirding such stability affords individual organisms a natural platform of operation. The subsequent development of various requisite, functional faculties enables greater responsiveness to those aspects of an organism's environment that may, with sufficiently predictable consistency, actively be perceived according to some reliably intelligible pattern. This development is necessarily conjugate to, and therefore sufficiently correlated with, that organism's means of receiving sensory stimuli. Once the receipt of perceptual input has been processed, has become more robustly, efficiently and compactly interiorized and (in higher life-forms) integrally conceptualized, a new domain of *mental stability* emerges, largely on the basis of a capacity for integral, stored representations.

These representations may then be invoked in different ways according to different forms of retrieval cue associated with differently categorized classes of memory. In humanity, the development of a particular form of linguistic capacity lends an additional layer to this hierarchy, by which a relatively abstract use of language arising through various, conceptually convergent arrangements of symbols, becomes reliably stable *in itself*, feeding back so as to contribute to the enforcement of its own stability (perhaps even through some demonstration of proof) in a more self-conscious, deliberated manner. Among other things, this moves one step closer to highlighting the ultimately cosmic context of interactive formation lying behind the phenomenon of consciousness (chapter 3). The context for our overall mental 'affordance', and the necessarily correlative character of its relative and finite stability with respect to our environment, develops from

the interactive entirety of such cosmic context and the parameters, whether constant or evolving, associated therewith.

Various natural limits and a critical requirement for particular degrees of precision are necessarily placed on those conceptual *categories* to which our cognitive capacity relates, limits reinforced by the evolutionary requirement for speedy and reliable recognition of such categories. Too much variation may well render the category in question unrecognizable. Such limiting factors give the 'topology' of our mental engagement an hourglass form by virtue of our developing intelligence and capacity for clearer articulation first requiring some appropriate *convergence* upon various critically guiding 'mindmarks' or points of conceptual reference. Such necessary convergence means that any emergent, creative, practical application of our intelligence results from a prior channelling through the node or neck in this hourglass. This idea will later be re-expressed in considering the theological context pertaining to the Mind of Christ, where topological constraint will be reinterpreted according to various contingency-induced 'terms' inevitably influencing or contouring the mode of divine encounter in assuming a finite human nature (chapter 3).

Stability is an inherently graduated concept, inseparable from any consideration of functional establishment and from some qualification (or even quantification) of freedom, according to the necessarily correlative mode of interaction throughout previously established structures or architectures. Our mental stability is similarly inseparable from a consideration of those qualified degrees of freedom pertaining to our physically conditioned 'idiom' of operation. The next chapter looks towards our higher search for stability in a theological context and considers the nature of our *topos* from a biblical perspective.

## ***Chapter 2: From Creation to Temple – Considering Theological Stability***

The chapter title deliberately parallels the previous discussion on landscape-mindscape, highlighting a significant Creation-Temple connection. The Temple focus is chosen as a background *leitmotif* owing to it being a symbolically detailed and relatively continuous aspect of theological development over the biblical period, including its reinterpretation and reincorporation in the New Testament context, made newly relevant or re-elevated (cf. Bohm and noting further the French translation of John 2:19 involving the verb *relever*). Such a conceptual transition offers an insight regarding how our *topos* and its theological 'affordance' might be reconceived and even become liturgically manifest.[203] Creation and Temple are also suitable areas of focus for considering how the 'motioning' of the divine Economy, involving the critically pervasive 'place' of the *Logos* throughout the dynamic, created order, is sacramentally relevant to the establishing of our deepest and most proper *topos* through 'heavenly participation'. It is fitting that the Hebrew word כון indicating stability or the act/process of establishing is related to the word מכון for 'place'. Furthermore, the מכון־שבתו or 'place' of God's dwelling/rest is represented, in the temple context, by the דביר or holy of holies, from the root indicating speech or 'word'. The place of the word is therefore a concept related to the stability or establishment of the temple context.[204] Overall, this chapter considers the biblical significance placed upon our nature, *topos* and potential, emphasizing the importance of our theological and sacramental stability.

### Choosing a framework of interpretation

First, the approach should be clarified, especially in view of the contemporary scientific context with which this thesis is concerned. Clearly some 'irreducibly extra-scientific knowledge' is necessary in addition to what is more normally considered scientific knowledge, including some aspect of direct, personal acquaintance.[205] This should, however, be expressible in a manner *relevant* to the 'scientific' in the broadest understanding of the term.

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[203] Taking a definition of liturgy here in the broadest sense of the 'work of the people' – S. Burns, *Liturgy: SCM Studyguide* (London: SCM Press, 2006), p.5.

[204] The Greek word στηριγμός, translated in terms of support, stability or steadfastness (cf. 2 Peter 3:16-17) could, in a theological context, also be considered that which enables and sustains us in 'partaking' of the divine nature (cf. 2 Peter 1:4), especially in a participatory framework.

[205] R. Van Woudenberg, *Limits of Science and the Christian Faith* (Science and Christian Belief, Vol.24, No.2, Oct 2012), pp.129-148.

White argues, I think correctly, that there is no absolute standard of biblical interpretation that can be agreed upon on theoretically,[206] replacing the idea of objective intent with that of a 'central theological presupposition' about what God is doing. Here it will be considered how God-as-Author might accommodate potentially contributory or co-operational human activity, especially through an involving inspiration permitting contribution from our interpretative freedom of engagement with the text and the entire canonical process. Furthermore, Christian Tradition does not just concern interpretative activity, but also the question of how such activity is to be embodied.[207] From an educational perspective, canonical process consists in the maintenance of a normative and educationally relevant judgement as to how a collection of texts may be interpreted within a sufficiently consistent framework to be semantically enduring while still permitted a sufficient novelty of encounter to remain alive and fresh.[208] The phrase 'canonical process' comes from Sanders, who emphasizes that 'a primary character of canon is its *adaptability* as well as its *stability* [italics Sanders]'.[209] Once again therefore, stability remains a central concept.

An allegorical approach is taken here, relating the structure of a text to critical (but stable) underlying concepts or metaphors, or to the comparable structure of another text in a different context. It seeks, for its own validation, semantic consistency of such means of interpretation across the Canon. It is through consistency of relevance to an overall framework of symbols/allegories, involving some hind-sighted lens of interpretation, that such texts can realistically be claimed to be 'inspired'.

In considering the allegorical method as being rooted, philosophically-speaking, in the human mind's limitations in relating to the 'objects' of its thought, Brown remarks that 'the worst enemies of such inquiry…were superficiality, the dead-weight of common-sense, habitual stereotypes that made a man cease to be surprised and excited, and thus veiled the most vertiginous complexities with a patina of the obvious'. He notes that Augustine had considered the category of 'time' an apt example, as well as considering the 'veiling' of Scripture as being purposed to engage the reader more powerfully but

[206] C. J. White, *Is it Possible to Discover 'the one' Intended Meaning of the Biblical Authors?* (Scottish Journal of Theology, Vol.67, No.2, May 2014), pp.178-194.
[207] S. E. Fowl, *Engaging Scripture: A Model for Theological Interpretation* (Eugene: Wipf & Stock, 2008), pp.1-31.
[208] W. Brueggemann, *The Creative Word: Canon as a Model for Biblical Education* (Minneapolis: Fortress Press, 2015), pp.1-18.
[209] J. A. Sanders, *Canon and Community: A Guide to Canonical Criticism* (Eugene: Wipf & Stock, 2000), p.22.

indirectly.[210] The distancing caused by the resulting indirectness of knowing was, for Augustine, 'bridged' by the particularly intriguing manner in which Scripture presented its own melee of symbols. The symbol-oriented approach here is inductive, inasmuch as it accepts that 'emphasis upon structure and genre is supported by the consideration that communication never comes as pure content but that form and content are always inextricably bound together in the communicative process'.[211] Indeed, the interest on form and content in this thesis goes beyond that specifically applicable to biblical hermeneutics.

I seek theological aspects of relevance to an engaging scientific context, though not committing myself to any official philosophical position regarding an intellectual co-fraternity between theology and science in biblical terms. With regard to the relationship between possible biblical intent and scientific doctrine, the approach here is broadly *discordist*, but not to the point of suggesting any direct analogy between the 'radical coincidence' of divinity and humanity and the relationship between theology and science.[212] There may be occasional points at which biblical theology and scientific knowledge might speak about roughly the same context in different but complementary ways, but overall each discipline is afforded a greater freedom and integrity if any such concordance is circumstantial rather than assumed. This is in line with Polkinghorne's view, which considers that 'the wisdom writers are the nearest ancient Israel got to anything remotely like a dispassionate scientific attitude'.[213] Considering especially those passages of Scripture, including the Wisdom literature of Job (see below), relating various chaotic but still integrated occurrences within the Creation to the revealing of some pathway by divine preparation, McLeish and Hutchings remark that 'if our world was entirely random or entirely predictable, life as we know it would not be possible, and we could have no hope of any meaningful interaction with either nature of its Creator'.[214] In the context of this thesis, however, the 'pathway' in question is a topological opening within a broader context of participation.

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[210] P. Brown, *Augustine of Hippo: A Biography* (London: Faber and Faber, 1967), pp.260-262.
[211] D. R. Bauer, *Inductive Bible Study: A Comprehensive Guide to Biblical Hermeneutics* (Grand Rapids: Baker Academic, 2007), p.4.
[212] This is considered to have been the direction eventually taken by the priest and theoretical physicist, Georges Lemaître. See De Felipe *et al., Georges Lemaître's 1936 Lecture on Science and Faith* (Science and Christian Belief, Vol.27, No.2, Oct 2015), pp.154-179.
[213] J. Polkinghorne, *Encountering Scripture: A Scientist Explores the Bible* (London: SPCK, 2010), p.25.
[214] McLeish and Hutchings, *Let There Be Science: Why God Loves Science and Science Needs God* (Oxford, Lion Books, 2017), p.125.

The concept of such a pathway inevitably invites an active searching on the part of humanity. Brueggemann claims that to live out canonical relevance in contemporary faith is inevitably to take 'risks' of imagination not in order to make definitive answers to on-going questions of interpretation but primarily to give some extra-commentary motivation to the community of faith to join in a journey of exploration.[215] Such explorative engagement is equally important where scientific relevance is concerned.

Finally, I consider the approach here to be within the hermeneutical guidelines presented by the Catholic Church,[216] and further commend Oeming's placing of 'philosophical premises' at the start of any theological exploration,[217] as I have aimed to do here.

The 'place' of the Word

Given the centrality of some critical, pervasive conception of the Creative Activity of the *Logos* to this thesis a holistic viewpoint is necessary, interpreting theological content over the Scriptural Canon as a whole while keeping hold of the concept of the Word of God as the Incarnate *Logos*, assuming human nature and tabernacling among us. It is therefore necessary to consider the study of the Canon as a Christological exercise. Failure to do so risks provoking an unhelpful disjunction between the 'Word of God' as interpreted over the Canon and that appearing directly in Christ. The ontology of Christ transcends the capacity of the Canon (cf. Hebrews 1:1 and John 21:25) and the potential and motivation to search for a progressively deeper, more holistic interpretation[218] over a canonical process of engagement remains open to our epistemological involvement. Such interpretation must also be relevant to things nominally outside the Canon, informing the 'process'.

In commenting on de Lubac's approach to Scripture, Milbank notes similarly that

> Christ's human nature could not exhibit through divine personification the divine idiom unless literal events of his life were doubled by an allegorical summation of all of the Old Testament and indeed all foregoing reality. Only the metanarrative

[215] W. Brueggemann, *Genesis: Interpretation: A Bible Commentary for Teaching and Preaching* (Louisville: John Knox Press, 1982), pp.1-10.
[216] *The Catechism of the Catholic Church* (London: Burns and Oates, 2003), pp.28-32.
[217] M. Oeming, *Contemporary Biblical Hermeneutics: An Introduction* (Aldershot: Ashgate Publishing, 2006), p.3.
[218] One more fully considering accordance with the whole.

> level of allegory…sustains the narrative coherence relevant to and constitutive of Christianity as such.[219]

Taking seriously the relationship between the relevance of the canonical library of Scripture and the 'Word' made flesh, and given the unity of divine and human natures in Christ, there must also be unity of truthful encounter between divine and human idioms of engagement in any activity through which communicable inspiration may reveal itself, relevance and revelation again being conjugate to each other. The human engagement (in this case through the words) can and should become the subject of all manner of recognized methods of biblical criticism,[220] while still remembering the task of searching for an inspired consonance with a greater, sacramentally pervasive mode of divine engagement and self-communication in the Word.

Balthasar, in considering the temporal movement of the Word through the various stages of human development in the Incarnation, highlights the subtle multi-dimensionality according to which the actions, words and even 'blood' of the *Logos* might be considered to flow and to open themselves to human response and interpretation in engaging with Scripture.[221] The Incarnate *Logos* is prolific in His capacity to draw all things to Himself through His Passion and into an ascended Resurrection by which He loses nothing of all which the Father has given Him. Such drawing together is critical for any holistic "macro-theology" and Balthasar's parallel between the significance of Mary and the Bride that is the Church, the Second Eve,[222] also allows for a microcosmic representation of our critical capacity to conceive (of) the 'place' and significance of the *Logos*. This particular significance of Mary will be revisited at the end of this chapter, invoking the prospect-refuge symbolism in the context of a *theological* stability and its associated 'affordance'.

Balthasar notes the primacy and, even despite becoming flesh, the immutability of the *Logos*, the non-passing of whose hypostasis is considered theologically equivalent to the Resurrection and whose passage through time was/is such that 'he has passing time also in his grip, not through a poetic, legislative transcendence of time, but by dominating the

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[219] J. Milbank, *Henri de Lubac*, in Ford *et al. The Modern Theologians: an Introduction to Christian Theology Since 1918* (Oxford: Blackwell, 2005), pp.86-87.
[220] A proficient account of the variegation and competitiveness involved therein is given in J. Barr, *History and Ideology in the New Testament: Biblical Studies at the end of a Millennium* (Oxford: OUP, 2008), pp.32-58.
[221] H. U. von Balthasar, *A Theological Antrhopology* (Eugene: Wipf & Stock, 2010), pp.239-304.
[222] *Ibid*, pp.309*ff*.

inner time structure'.[223] To reflect a genuine sense of the eternal in the fullness of one's life is truly to have come from God, which, to Balthasar, makes the mission of the *Logos* unique and allows that 'the individual figure as well as the sense of direction are enfolded in the eternal'.[224] This language of 'enfolding' is complementary to that used, in their own ways, by both Cusa and Bohm. The concept of the 'figure' alongside the phrase 'enfolded in the eternal' also accommodates the transfiguring quality of the Creative Activity, a key aspect of which works itself out through the divine idiom of engagement with our creaturely temporality (chapter 4).

Maintaining sacramentality: taking the 'physical' seriously

Given the 'background' sacramentality assumed throughout, one should consider the nature of any sacramental conception in the Old Testament. Moberly, in connection with a commentary on the healing of Naaman and the request for the earth/soil of Israel in 2 Kings 5:17, eloquently remarks that

> He recognizes the particular connection between the LORD and Israel, and so the presence of Israelite soil would have a material specificity that would symbolically represent Israel in such a way as to focus his understanding and identify his sacrifice as directed to the LORD, the God of Israel…The role of Israelite earth within such a logic could arguably be recognized as sacramental.[225]

He hints at an Old Testament sacramentality developing through an awareness of the insufficiency of life and human existence outside of a proper relationship with something beyond the sustenance found purely within created space.

Boersma notes Maximus' participatory viewpoint, seeing creation as sacramental offering, and also the fathers' more general view that 'Old Testament events were sacraments of the Christological reality of the New Testament...It was this sacramental participation that gave the temporal order eternal significance'.[226] Considering such participation to reflect the critical, mutual indwelling towards which the progressive build-up of John's Gospel develops, moving towards its conceptual climax in something not ultimately containable by this cosmos, an important insight is highlighted regarding sacramental time, seeing the

[223] *Ibid*, p.242.
[224] *Ibid*, p.246.
[225] R. W. L. Moberly, *Sacramentality and the Old Testament* in Boersma and Levering, *The Oxford Handbook of Sacramental Theology* (Oxford: OUP, 2015), pp.13-14.
[226] Boersma, *Heavenly Participation*, p.32 and p.39.

Holy Spirit as communicating between "distanced" but still somehow interconnected events or manifestations, especially through human memory and tradition. The significance of one moment of encounter highlights that of another and since 'temporal events have meaning because of their sacramental connection' a purely rational, propositional view of revelation that might fragment or obscure any integrated significance across otherwise separated events is less appropriate.[227] One must also appreciate revealed truth as being inevitably relative to the created space within which such truth is, or is able to become, appreciably received as an *analogia veritatis*.[228] The significance of this inextricably spatio-temporal aspect of sacramental analogy or participation is considered further in chapter 4. Boersma notes Bouillard's distinction between eternal 'affirmations' and temporal 'representations', which highlights the importance of viewing any holistic representation of the 'place' and revealed relevance of the *Logos* as being in itself a dynamic, as stated in the Introduction. The *res* (the mystery) transcends the *sacramentum* that is in this case inseparable from 'the particularity of human discourse' throughout our participative engagement.[229]

Williams presents an angle on natural theology that gets to grips with the fact that revelatory reception takes place within natural, created existence, focusing attention on the very way in which the material world is steeped in subtle and implicit communicability.[230] Such tacit communication, sometimes seeming superficially like 'silence', provokes the emergence of various types and scales of embodiment (arguably even down to inter-cellular communication) which in turn provide the basis for the emergence of linguistic ability and consequent influence upon theological development. The concept of 'God' has an inseparable part to play in this process and the activity of coming to speak about God is inseparable from the process of enhancing our horizons and discerning various epistemological limits. The very concept of 'God' enables or catalyses the uncovering of additional and deeper truths, but without the concept itself becoming a finite predicate or direct object, since Williams remarks that the very definition of contingency could be said to consist in some contextual limitation to a finite predicate, subject to other influences. The 'infinite' is therefore analogised here with the enveloping mood of the infinitive, the

[227] *Ibid*, pp.122-130.
[228] *Ibid*, p.167.
[229] *Ibid*, pp.167-169.
[230] R. Williams, *The Edge of Words: God and the Habits of Language* (London: Bloomsbury, 2014).

very name of the verbal activity in question, not in itself being contingent upon or defined by any one particular grammatical context or structural 'geometry'.

God is incarnationally creative through, among other things, the fact that the development of any language concerning divine nature, and the search for its *relevance* and meaning in humanity, occasions some genuine semantic novelty, pushing our previously established capacity for understanding ever slightly beyond its more immediately natural, contextual limits. Williams' theology importantly does not fall foul of any reductionist or materialist isolationism that might simply serve to make the spoken capacity (and, just as importantly, also the *in*capacity) of language less than relevant to the entire historical interconnectedness of our physical contingency. Theological consideration must properly remain relevant to everything affecting our physical acquisition of the capacity for language and the consequent conditioning of the manner in which we may come to conceptualise any relevant 'terms' or critical categories. There is therefore an evolutionary aspect to the way in which our *appreciation* of revelation emerges, and to how we come to consider what we mean by revelation.

Crystal, as part of a comprehensive survey concerning how language ought best to be viewed and how close-knit its nature is to the conveniences and potentials of our embodiment and our activity respectively, takes linguistic development as resulting from interplay between human ability and cultural requirement.[231] For him too, the theologian is prominent as one whose discipline naturally demands the pushing of language right up to the verge of the non-articulable, pushing human conception beyond previously bearable boundaries.

Meyer notes the debate between Eunomius and Gregory of Nyssa on human language,[232] the former arguing it to be of divine origin and the latter claiming human origin, especially due to its dependence on space and time. He considers that 'while language is a function of intelligence enfleshed, language exerts a counterforce that influences the very shape of flesh itself'.[233] Unlike Eunomius, who sees language as made totally reliable by God, Gregory denies such reliability, asserting that something is always lost in translation and

[231] D. Crystal, *How Language Works* (London: Penguin Books, 2005)
[232] E. D. Meyer, *Language: Naming God's creatures and the Desire of the Discursive Animal* in MacDonald *et al, Genesis and Christian Theology*, pp.103*ff.*
[233] *Ibid*, p.106.

hence the need, especially in Scripture, to multiply images of presentation.[234] This is important, for Gregory, in making God a point of longing rather than an object of knowledge.[235]

Language is in one sense prior to Scripture, in that one could not have any formally written record without it, while Scripture proves significant as a theological source by its role in highlighting certain critical, theological 'domain boundaries', aspects of encounter where language is pushed beyond its more natural capacity or literal implication in order to accommodate the context in question while still pointing towards something critically and conceptually stable.

Our theological capacity is shaped by everything that has contributed to the way in which theological language has come to function, and must accommodate our progressive interpretation of new intellectual contexts. Combining this with the philosophical question of how, in principle, best to 'conceive' (of) the Word, one is drawn to consider how to read the term *Logos* (chapter 3) and to interpret its assumption of human nature, revealing a fuller theological relevance than previously encountered.

The greatest unity of communion between divine and human natures and their associated, operative idioms occurs in the *Logos* made flesh, retaining the distinction and individual integrity of each nature. In a similar vein, in the more partial and varied (Hebrews 1:1) nature of any purported relation between the words of a text and some revealing inspiration through the Word, there must be two distinct but cooperating modes of engagement – divine and human. The operative engagement of divine initiative must itself *enable* interpretative reception on the part of human responsiveness, taken here as consisting in an idiomatically distinct mode of reception formed by all relevant, physical contributions to the relative but critical stability of our finite, conceptual capacity over time. Our responsive perspective develops its distinct patterns of epistemic engagement, informing our appreciation of both our 'place' in and the extent of our spatio-temporal context and 'reality'. This further induces theological consideration concerning the relationship between 'our time' and 'God's Time' (chapter 4).

As to the participatory framework, Psalm 39:6 – 'For with you is the fountain of life, and in your Light we see light' – incorporates the idea of God's idiomatic engagement being

[234] *Ibid*, p.109.
[235] *Ibid*, p.110.

represented by the Light specifically in terms of His economic, revealing Activity, grounding the ability of life to come to 'see' or know anything. Genesis 1 indicates some additional, but distinct orientation according to the various lights in the firmament. Such 'lights' then stand for our means of coming to orient ourselves towards accumulating information, fostering our means of comprehension. The Light is, effectively, that of Day One, while mediation through the sun-moon-stars complex is ascribed to 'the fourth day', providing orientation in accordance with marking out various critical rhythms, patterns and cycles. Once again, such cycles may be associated with stability.

'Unfolding' created order

I am here ascribing allegorical significance to the terms 'heavens' and 'earth' as, respectively, aspects of subjunctive potential (including in this case the possibility, or opening, of some top-down, emergent property) and indicative actuality (emerging through dynamically stabilized, bottom-up, layered hierarchies, whether directly experienced or indirectly discernible by scientific means). These grammatical moods are distinct but united by being aspects of the same underlying grammar. Furthermore, the distinct aspects of 'has been created' and 'might yet be created' may both properly be considered as participating in the broader infinitive category 'to create', along with the participle 'in the process of creating'. Such distinction without separation fits the ethos of this thesis and, in terms of the created heavens-earth unity, defines another dual-aspect bond. 'Heavens' and 'earth' are epistemologically distinct, inasmuch as *we* understand the distinction between potentiality and actuality, yet ontologically united through the opening statement that 'in a/the beginning God created the heavens and the earth'.

This dual-aspect bond is physically relevant in grounding the capacity for the participation of the created domain in that which becomes represented by the Name associated with God's Creative Activity, having the perfect, non-contingent, and (in that sense) infinite freedom simply *to* create. This further fits the biblical conception of participation according to which things or people may be granted holy status but only the 'most holy' ultimately takes initiative in the active impartation of holiness. This is further complemented by the former understanding of the anointing oil as imparting knowledge so as to achieve holiness by the illumination of the mind, bringing the previously 'hidden' into terms accessible to human intelligibility and thereby enabling some knowledgeable (and acknowledgeable) participation in the 'eternal'.

The heavens-earth bond as taken here, including the totality of space-time, is indispensable in defining the context in which humanity is able to come to knowledge or to make intelligible sense of things. This unity is the subject of the first of the *tol$^{e}$dot* of Genesis[236] and provides us with a physically relevant framework *through* which we may participate, as physical beings, *in* the divine Economy. As Kline remarks, 'the heavens and the earth are viewed in their earliest, not perfected state, yet as a totality, this being the idiomatic force in Hebrew of such contrasted pairs'.[237]

The above inclusion of the indefinite article – 'in *a* beginning' – simply serves to highlight the possibility that other intrinsic unities, pertaining to bonds other than this particular 'heavens-earth', could on principle be defining of other 'beginnings', or indeed some new beginning. This accommodates the idea of many possible 'universes', intended here purely as respecting divine omni-potential and creative freedom as opposed to some particular interpretation of quantum theory. This reading also suggests a holistic parallel between *a* beginning and *a* hypothetical created space, together with any associated, interactive topology according to which any creaturely participation may develop.

It is therefore important to distinguish between something consisting '*in a* beginning' and an event occurring '*at/as the* beginning', each provoking potentially different understandings concerning *creatio ex nihilo*. The former suggests some all-encompassing sustainability of continuous, creative efficacy and engagement, while the latter suggests some merely initiating interest or involvement which Christian doctrine has generally preferred to avoid.[238] If this bond of 'heavens-earth' unity is created 'in a beginning' then any renewal of Creation ought to consist in some new beginning, initiated in this case in the *Logos* 'becoming flesh' and clearly of eschatological significance (chapter 4). Keeping the standard translation 'in the beginning', however, arguably emphasizes precisely that which is definitive in terms of its physical accessibility and meaningful relevance to *us*, as products of the particular heavens-earth bond defining this cosmos and as participators both in *Big History* and the divine Economy.

[236] V. P. Hamilton, *The Book of Genesis: Chapters 1-17* (Michigan: Eerdmans, 1990), pp.1-5.
[237] M. G. Kline, in Guthrie *et al. The New Bible Commentary Revised* (Leicester, Inter-Varsity Press, 1970), p.82.
[238] See Craig and McCann, in Hastings *et al. The Oxford Companion to Christian Thought* (Oxford: OUP, 2000), pp.136-139 and 143-144 respectively.

From a Kabbalistic perspective, Smith prefers the translation 'with beginningness', seeing the *Reshit* as referring 'to a continual state of becoming',[239] while Sacks distances the association of *Reshit* from some sharp, chronological beginning, since 'for that biblical Hebrew has other words. *Reshit* implies the most significant element, the part that stands for the whole…the principle'. He declares of Genesis that 'the theology is almost always implicit rather than explicit. What Genesis is, in fact, is *philosophy written in a deliberately non-philosophical way* [italics Sacks]' and he relates its purview to questions of ontology, epistemology and philosophical psychology.[240] This distinction between the implicate and the explicate, seeing created order as something *unfolded* from within a dynamically representative heavens-earth bond, resonates with Bohm's description of an 'implicate order', elaborated in subsequent chapters.

Even an implicate order must have an origin, even if such is infinitely compacted. Taking the idea of a singularity in its scientific sense suggests such infinite compactness, and any hypothetical enfoldedness within which is only discernible according to some expansion. Applying the concept of singularity metaphorically to the theological topology under consideration here, any 'beginningness' is indicative of some dynamically pervasive 'Principle' critically enabling the creation of a (theologically-speaking) finite and compact 'created space'. Just as the Infinite, again theologically-speaking, facilitates the createdness and participation of the finite within it, so, in this respect, any 'something' is facilitated in conjunction with a 'nothing' that, ontologically, may be considered on the same footing as the Infinite. The pervasive *topos* of the *Logos* is irreducible with respect to finite, created space precisely because such finitude is a mark of the contingency of that space upon divine Activity through the *Logos*.

On the subject of *creatio ex nihilo*,[241] Bockmühl distinguishes clearly between this and the act/process of giving form to formlessness, emphasizing that it is the removal of any divine reliance upon anything outside of the divine nature that is most critical and also

[239] D. C. Smith, *The Kabbalistic Mirror of Genesis: Commentary on the First Three Chapters* (Rochester: Inner Traditions, 2015), p.13.
[240] J. Sacks, *Genesis: The Book of Beginnings* (London: Maggid Books, 2009), pp.5-6.
[241] Oord gives a concise presentation of a debate effectively pivoting around the question of those circumstances/contexts in which the theological or scientific mind is drawn to consider the *nihilo* as total 'nothing' and those in which it is either inevitable, or demonstrably constructive, to consider it as a special/unique class of 'something'. T. J. Oord, *Theologies of Creation: Creatio ex Nihilo and Its Rivals* (New York: Routledge, 2015)

noting a possible translation of *bereshit* as 'by a principle'.[242] Formlessness is formed or shaped (by divinity and humanity) through those activities implied by Hebrew verbs such as *asah* and *yatsar* used in addition to, and as distinct from, the exclusively divine act implied by *bara*.[243] Through the *Logos* created space/order is sustained by divine Creative Activity, retaining the potential to have more made (out) of it.

Carroll eloquently remarks that

> The distance between minute fractions of a second after the Big Bang is, in a sense, infinite. We do not get closer to creation by getting closer to the Big Bang…creation is not really an event at all…The 'nothing' in cosmological reflections may very well be nothing like our present universe, but it is not the absolute nothing central to what it means to create; it is only that about which the theories say nothing.[244]

He considers the concept of creation in terms of enduring action, distancing any theology of creation from inert readings of the term 'beginning'. To this principle McGrath adds that 'the laws of quantum mechanics do not actually help us to answer what we might call "ultimate questions". They do not tell us why the universe should be made up of particular kinds of fields…They do not tell us where those fields came from'.[245]

From a biblical perspective Worthington distinguishes between divine creation *ex nihilo* and *ex materia*. One possible common currency is suggested as being that the 'thing' in question does not yet exist in the manner into which divine creative initiative will ultimately bring it, but the most crucial point seems to be a caution over whether the 'nothing' is taken in an absolute sense or relative to the specific, animate quality of living things.[246] Perhaps for God there is 'nothing' – not anything – that is technically nothingness (cf. Psalm 139:12), circumventing any implication of divine inability to make *something* of it, since 'not one thing will be impossible for God' (Luke 1:37, translated literally). Worthington plausibly concludes that 'the first aspect of God's relationship to

[242] M. Bockmühl, *Creatio ex Nihilo in Palestinian Judaism and Early Christianity* (Scottish Journal of Theology, Vol.65, No.3, Aug 2012), pp.253-270.
[243] R. N. Whybray, in Barton and Muddiman, *The Oxford Bible Commentary* (Oxford: OUP, 2001), p.42.
[244] W. Carroll, *Aquinas and Contemporary Theology: Creation and Beginnings* (Science and Christian Belief, Vol. 24, No. 1, April 2012), p.12.
[245] A. McGrath, *Inventing the Universe: Why We Can't Stop Talking About Science, Faith and God* (London: Hodder and Stoughton, 2015), p.87.
[246] J. Worthington, *Creatio ex Nihilo and Romans 4:17 in Context* (New Testament Studies, Vol.62, No.1, 2015), pp.49-59.

*nihil* is his ultimate prerogative to speak, call, label and claim regarding it just as he wishes'.[247]

One biblical image with obvious topological relevance is the moulding of the clay by the potter in Jeremiah. Frese highlights the primary importance of divine initiative in this case,[248] the ultimate sovereignty of the LORD operating from an idiomatically unique purview, transcending the heavens-earth unity. However, while divine engagement retains the freedom to refashion the clay, the result of any finished product or contextual completion 'in earth' remains reliant upon the nature of the clay in terms of its strength and durability. This consideration lends some indirect influence to the created, something integral to its distinctiveness.

Burrell emphasizes God as self-sufficient Being, everything else consisting in some participant mood of existence.[249] Rejecting any pantheist/emanation framework, he then emphasizes the need for a unique form of distinction ('unique' presumably in the sense of being beyond any suitably illustrative, physical analogy) concerning an unchanging, divine, creative essence and a dependent, changing created whole that does not itself effect any ontological change in that essence. This distinction reinforces the principle of transcendence-in-immanence:[250] transcendent in the sense of being beyond any reliance on the created; immanent in the sense of it being declared that 'in him we live and move and have our being [or existence]' (Acts 17:27). Overall, Burrell wishes to establish a non-dualistic approach to this uniqueness conundrum, one which must also leave room somehow to accommodate the Johannine declaration that 'we shall be like him'. Perhaps the *creatio ex nihilo* distinctiveness might most simply be viewed in terms of a supra-cosmic, physically uncaused, uncreated, all-pervasive initiative, revealing or unfolding some enfolded, implicate, creative "pointedness" in Creation through the motioning of the divine Economy.

In any 'unfolding' some degree or interpretation of 'chance' must still have its place. As Hayes notes

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[247] Worthington, *Creatio ex Nihilo and Romans 4:17 in Context*, p.57.
[248] D. A. Frese, *Lessons from the Potter's Workshop: A New Look at Jeremiah 18.1-11*(Journal for the Study of the Old Testament, Vol.37, No.3, 2013), pp.371-388.
[249] D. B. Burrell, *Creatio ex Nihilo Recovered* (Modern Theology, Vol.29, No.2, 2013), pp.5-21.
[250] See Clayton and Peacocke, *In Whom We Live and Move and Have Our Being* (Cambridge: Eerdmans, 2004), pp.137-154 and pp.157-168.

> …to say that the world is intelligible is not the same as saying that there cannot be some contingence and random activity within the history of the world. To take intelligibility to mean absolute necessity is to make the created cosmos equivalent to God. Hence Aquinas could argue that it would be contrary to the nature of the created world if nothing ever happened by chance.[251]

In terms of a biblical account of creation, the defining of some distinct 'space' for an actively engaged, participate, creaturely contribution may relate to the concept of divine 'rest', inseparable from an appreciation of Sabbath as actively empowering, and considering rest in terms of re-creation. Furthermore, with respect to Creation as a whole, atonement is connected with the concept of a Sabbath of sabbaths.[252] In the context of the Incarnation this idea indicates a final completion of Creation in a renewed sense while also constituting an open demonstration of a divine 'resting' among us. It reveals the divine openness towards accommodating and incorporating a distinctively human, creative activity. A renewed space is created for the active involvement of a human nature sanctified through the Incarnation and imbued with *eschatological relevance*. God's 'resting' could therefore be thought of as establishing a dynamic but stable equilibrium of communicability between Uncreated and created, holding together a coherent harmony. Considering such 'rest' as demonstrably held together in Christ, this concept becomes centred upon a fully cooperative relationship between two distinct natures according to the unifying hypostasis, facilitating our more deeply participative, sacramental becoming within divine image.

This is consonant with Augustine's consideration that 'toil' should not be implied by way of contrast to God's 'resting' as if to suggest any previous intellectual toil, a pondering of some 'ought to be' concerning creation of which He is suddenly relieved. Rather, 'rest' signified for Augustine an *accommodation* of the created into God, an enabling of participation especially and most critically with respect to intellectual beings through the gift of divine image. The openness of the 7th Day, not having an evening, indicates God's rest as not in itself being limited, but such can nonetheless be made relevant to our finite

[251] Z. Hayes, *The Gift of Being: A Theology of Creation* (Minnesota: Liturgical Press, 2001), p.47.
[252] Y. H. Kim, *The Jubilee: Its Reckoning and Inception Day* (VetusTestamentum, Vol.60, No.1, 2010), pp.147-151.

context precisely inasmuch as it is revealed through the Incarnation.[253] Relevance and revelation act once again in critical conjunction, in accordance with the pervasive *topos* associated with God's motioning, Creative Activity in the *Logos*. Such Activity is inseparable from any conceivability regarding the *Logos* and is pointed towards 'rest' in Christ so as to bring the created (rather than God) into eschatological 'relief' (returning to Bohm's connection between relevance and relief). In Christ's death on the Cross there is then an important sense of finishing a great Sabbath preparation, highlighting the true Sabbath of sabbaths and opening the way for *re-accommodation* in/as Christ's Body, and an empowering Resurrection Life involving some critical, shared participation in the Mind of Christ. Unification in the Mind of Christ ultimately affords the distinctiveness of our human knowing an eternal, eschatological relevance.

Our incomplete knowing and finite, compromised *topos*

Being and knowing are two categories fundamental to considering our nature. In Genesis 2 these categories could be considered by reference to the focus on the centre of the garden. Von Rad notes that the Tree of Life is only referred to twice in the Old Testament and that the Tree of Knowledge is exclusive to Genesis, suggesting a suspicion that 'the duality of trees in the midst of the garden is only the result of a subsequent combination of two traditions', noting that only the Tree of Knowledge plays a role until a return to a guarded Tree of Life at the end of the narrative.[254]

This duality could still be allegorically significant, however, since the particular focus on the Tree of Knowledge rather ironically detracts from that on the Tree of Life. The eternal significance of the ontology that the Tree of Life affords becomes inaccessible to us (at least on our initiative) upon expulsion from the garden. Having eaten the forbidden fruit on the basis of believing some promise of omniscience, such consumption highlights instead the naked recognition of human ignorance and our need for completion – an imperfect, finite self-consciousness devoid of genuine, complete self-sufficiency.

Adam is cast into some compromised 'reality' in which he cannot in and of himself find true rest for his nature or being. It is the sense of 'fear' in the face of the divine Presence in the garden, involving an attempted covering of his 'nakedness', that becomes for Adam

[253] The build-up of Augustine's argument can be found in Quasten *et al*. *Ancient Christian Writers: The Works of the Fathers in Translation, No.41, St Augustine: The Literal Meaning of Genesis* (New York: Newman Press, 1982), pp.113*ff*.
[254] G. Von Rad, *Genesis* (London: SCM, 1987), p.78.

'the beginning of knowledge' (cf. Proverbs 9:10 and Psalm 111:10). The Incarnation, the Second Adam, is then necessary for providing a context for human completion and eschatological rest. In the New Testament this occurs through a particular means of rebuilding the Temple according to a more deeply, stably embedded *topos*, involving the breaking in of a New Creation.

Our means of coming to knowledge cannot in itself eliminate our naked, finite and relative sense of incompleteness, characterizing our compromised sense of *topos*. Our yearning for completion is arguably represented in the narrative of Genesis 11, the aim of building the tower implicitly involving some arbitrary human authority to say at what point this tower has reached its putative goal. Davidson notes the connection with the building of the Mesopotamian ziggurats to express the power of humanity's piety, noting that 'man unites in the anthem "Glory to Man in the highest" and the outcome is division and confusion. In the fear which prompts this action…there is symbolized man's feverish search for security apart from God'.[255]

Blenkinsopp notes the 'ring composition' of the narrative,[256] the first four verses describing human attitude towards language, choice of settlement, use of building material and intention to build a city, and verses 6-8 then describing the divine reaction to this, pivoting around verse 5 as the LORD 'comes down' to see what humanity's activity of building is like. He further notes that the plural inherent in the collective human discourse leading up to this turning point is paralleled by the deliberative plural of divine discourse. A condition is clearly placed on the manner in which human nature can build effectively, connected, as suggested above, to the nature of our dwelling, our *topos*. The error lies not in the desire to build something up but rather in the assumption of some arbitrary authority to define an ultimate point of completion from our finite perspective. The turning point of the Babel narrative, God's 'coming down', may ironically pre-empt the incarnate basis upon which subsequent up-building may legitimately occur, re-gathering that otherwise scattered and drawing all things to the *Logos*. The Incarnation thereby 'affords' our active, participate involvement an enduring, sacramentally-stable *topos*.

[255] R. Davidson, *The Cambridge Bible Commentary on the New English Bible: Gen 1-11* (Cambridge: CUP, 1973), pp.105-106.
[256] J. Blenkinsopp, *Creation Uncreation Recreation: A Discursive Commentary on Gen 1-11* (London: T and T Clark, 2011), pp.164*ff*.

On the central theme of *stability*, Sylva suggests (with reference to Psalm 93) that 'stability is neither achieved by controlling the unabolished chaos, as in Genesis 1, nor wrestled from a primal chaos, as in the Chaoskämpfe. Stability is a larger reality that includes the chaos'.[257] Whether or not a consideration of chaos is deemed the most suitable approach to a biblical theology of creation, this suggestion contrasts somewhat with a modern, mathematical viewpoint concerning 'chaos', as something *within or according to which* various modes of stability can exist or emerge.[258] If there is a 'larger reality' here, a greater stability including any chaos, then it is something like a structural stability incorporating the entire array of interconnected contingencies and *possibilities* pertaining to the 'topology' of our cosmic reality as a whole. For any absolute point of reference one therefore needs to consider some deeper, theological topology, pertaining to a domain of stability encompassing that 'chaos' within or according to which other modes of relative stability can in turn emerge. One significant representation of such stabilization is, I will argue, hinted at in the implicit biblical relationship between Creation and Temple.

The Creation-Temple parallel

It has been suggested in different ways that the language in the creation accounts in Genesis could be related to certain aspects of temple imagery. From a holistic perspective, Brown compares the hem of God's robe filling the temple in Isaiah 6 with the cosmic parallel of the world being immersed in God's glory.[259] Van Dyk highlights the similarity of genre between Genesis and that of Near Eastern writings regarding the idea that palaces, temples and gardens were seen as earthly copies of some heavenly archetype.[260] Childs considers it 'likely that the idea of a pattern of a heavenly sanctuary belonged to the older tabernacle tradition before it received its stamp from the late Priestly theology',[261] also relating to Near Eastern parallels. As to the idea of some specific relationship between a representation of God's Creation and the tabernacle revelation he acknowledges the importance of the theme while noting the challenge of discriminating between those elements which could properly be taken as symbolic and those that should not. The problem, for him, is that the Old Testament does not contain any verbatim description of a

[257] D. Sylva, *The Rising Naharoth of Psalm 93: Chaotic Order* (Journal for the Study of the Old Testament, Vol.36, No.4, 2012), p.482.
[258] S. N. Elaydi, *Discrete Chaos* (London: Chapman & Hall/CRC, 2008)
[259] See essay on *Presence of God in Genesis* in MacDonald, Elliott and Macaskill, *Genesis and Creation Theology* (Cambridge: Eerdmans, 2012), p.5.
[260] P. Van Dyk, *Mythical Linkage* (OTE, Vol.18, No.3, 2005), pp.872-876.
[261] B. S. Childs, *Exodus* (London: SCM, 1982), p.535.

means of understanding tabernacle symbolism, though he does not deny that such a symbolic dimension is theologically reflected overall.

Considering the two tabernacle accounts in Exodus, the first closing with the sabbath command and the second opening with it, Childs remarks that 'the tabernacle represents the fulfilment of the covenant promise [to dwell among the people]…But the actual sign of the covenant is the sabbath. Therefore, the observance of the sabbath and the building of the tabernacle are two sides of the same reality'.[262] The sabbath being a theme inseparable from the doctrinal content of Genesis 1 it seems therefore that both creation accounts have some distinct relevance, direct or indirect, to the place, purpose and possibly also the structure of the tabernacle, eventually established through the fuller context of temple life and reincorporated in the New Testament.

Beale explores a link between the garden and the temple,[263] including the broader geography of Eden as a whole, and its geographical orientation. He emphasizes the immanence of the eschatological significance in which much of the biblical imagery is steeped and notes certain aspects of possible association between the creation narrative of Genesis 1 and the temple layout, such as the fact that there is a distinct Hebrew word used specifically for the lights of the lampstand and those lights of the 4th Day of creation.

Wenham notes other symbolic aspects suggesting some creation-temple parallel: between the menorah and the trees of the garden, between the jewels and gold of Eden and the temple decoration and priestly vestments, between mention of God walking to and fro – *hithallek* – in garden (Genesis 3:8) and tent (Leviticus 26:12, Deuteronomy 23:15) alike, between the river out of Eden and that of Ezekiel 47, between the Tree of Knowledge and the keeping of the Decalogue inside the Ark of the Covenant alongside the book of the Law, and in the fact of both being approached from the East and being guarded by cherubim.[264]

Barker even suggests a direct parallel between the 'Days' of Genesis 1 and the stages of instruction given to Moses for tabernacle construction[265] while Genesis 2 may relate to

[262] *Ibid*, pp.537-542.
[263] G. K. Beale, *A New Testament Biblical Theology: The Unfolding of the Old Testament in the New* (Michigan: Baker Academic Group, 2011), pp.614*ff*.
[264] G. J. Wenham, *Sanctuary Symbolism in the Garden of Eden Story*, in Hess and Tsumura, *I Studied Inscriptions from Before the Flood*, pp.399-405.
[265] M. Barker, *Temple Theology: An Introduction* (London: SPCK, 2004), pp.13-32.

temple imagery in another way – Adam/High Priest, Eve/Divine Consort, Tree of Knowledge/Ark of the Covenant. Though apparently rather idiosyncratic in her suggestion, such still seems an interesting and potentially extra dimension to the relationship between the theology of creation and the place and purpose of the temple.

Levenson provides, from a Jewish perspective, a quite beautiful insight into the overall significance of Temple *completion*, especially in terms of sacred space and its relation to time. Combining the image of 'cosmic mountain' – with its associated properties of divine meeting place, battleground for a meeting of heaven and earth, and a universal 'moral capital' in Near Eastern literature[266] – with that of the Temple as a microcosm, he concludes that 'the Temple is not a place in the world, but the world in essence. It is the theology of creation rendered in architecture…the centre is not a point in space at all, but the point in relation to which all space attains individuation and meaning'.[267] This is a theologically significant 'architecture' representative of a deep, undergirding stability throughout the dynamic order of Creation.

The structure of created space is opened up within the Uncreated, the Uncreated establishing (and therefore stabilizing) the created heavens-earth unity and conditioning creaturely, sacramental participation. Levenson distinguishes the 'upper tier' of the heavenly Jerusalem that holds 'ultimate reality' from the 'lower tier' of the earthly Jerusalem open to the accidents and fulfilments of history (this idea is briefly revisited in the eschatological discussion in chapter 4). Sinai then becomes a representation of *meaning* given to that history.[268] Importantly, he sees the Mount Zion-Temple-City combination as participating in that which it is supposed to represent,[269] which relates to what is here understood as affording sacramental encounter.

Levenson's reading of Isaiah 66:1 is noteworthy, seeing it as a prophet invoking 'the cosmic dimension of the Temple theology in critique of the mundane Temple building program which produced the Second Temple'.[270] God may find (and thereby define) 'rest' in the world for which the Temple stands, a fact that he summarizes most eloquently.

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[266] J. D. Levenson, *Sinai and Zion* (New York: Winston Press, 1985), pp.11*ff*.
[267] *Ibid*, p.139.
[268] *Ibid*, pp.15-80 and p.141.
[269] *Ibid*, p.142.
[270] *Ibid*, p.144.

> The Sabbatical experience and the Temple experience are one. The first represents sanctity in time, the second, sanctity in space, and yet they are somehow the same. The Sabbath is to time and to the work of creation what the Temple is to space and to the painful history of Israel which its completion brings to an end.[271]

Exploring this theological link between the architecture of Creation and that of the Temple, while considering the Body of Christ as the ultimate fulfilment of the Temple, in/as the Incarnate *Logos* through whom the architecture of Creation came into being in the first place, other parts of the opening chapters of Genesis seem allegorically significant. All creatures were brought to the First Adam to be named, culminating in his recognition of the 'partner' the LORD had made and provided for him. As the Second Adam, Christ enters into created order in the Incarnation, 'motioning' throughout all created order afresh as the true High Priest, redefining and completing it through the inseparably associated breaking in of a New Creation, culminating in the completed formation of an ecclesial Bride fully known by the Bridegroom.

One might also consider the commission to humanity to finish labouring for the completion of both the building and the boarding of the Ark (cf. Matthew 24:36-39), bringing creation through the flood waters. Here all the animals, even the 'unclean' ones (Genesis 7:2-3), are taken into the inventory commissioned to Noah by God, a narrative also notably containing a staged set of instructions for constructing the Ark. Wenham notes the significance of literary structure involved,[272] with Genesis 6:9 to 7:24 containing the sequence: Noah; Shem, Ham and Japheth; Ark to be built; announcing of flood; covenant with Noah; food in the Ark; command to enter Ark; 7 days waiting for flood; entry to the Ark; the Lord shutting Noah in; 40 days of flooding; increase of waters; covering of mountains; prevailing for 150 days. Then the pivotal moment seems to be God's *remembering* of Noah, after which events unfold in a reverse order: 150 days for waters to abate; mountain tops becoming visible; waters abating some more; the end of 40 days; Noah opening the window of the Ark; raven and dove released from Ark; 7 day wait for waters to subside; command to leave the Ark; food outside the Ark; covenant made with all flesh; promise of no more such flooding in future; final mention of Ark; then back to Shem, Ham and Japheth; and finally to Noah (end of Genesis 9). A change in direction

[271] *Ibid*, p.145.
[272] G. J. Wenham, *The Coherence of the Flood Narrative*, found in R. S. Hess and D. T. Tsumura, *I Studied Inscriptions from Before the Flood: Ancient Near Eastern, Literary and Linguistic Approaches to Genesis 1-11* (Indiana: Eisenbrauns, 1994), pp.436-447.

pivots around the 'remembering' of Noah; a change in direction likewise pivots around incarnational involvement with the Creation in Christ, fleshing out a divine 'remembering' thereof (chapter 5 presents a Eucharistic viewpoint on this).

Furthermore, the temple-building commission involves active, contributory formation and up-building rather than passive preservation. Humanity is afforded a genuine (albeit physically-conditioned) contributory potential, and a degree of freedom for influencing the manner in which meaning is generated, augmented, and responded to in Creative Power, as per Sayers' terminology relating to the 'meaning of the work'.[273] As building up the New Temple becomes interpreted in relation to the Body of Christ, there is then a critically inseparable and irreducible potential for 'novelty' in the Mind of Christ. The finite, relative *topos* associated with the human mindscape is thereby 'afforded' an active potential or prospect represented here in terms of contributing towards building up the New Temple and involving a share in the Mind of Christ (1 Corinthians 2:16). The First Adam was tempted to aspire to an inappropriate dominion, *over* the image rather than *as a result* of it; the Second Adam institutes a reincorporated context through which the image becomes perfected, opening deeper participative potential.

The pervasiveness of the implied *topos* is clearly present in the Revelation vision of the New Jerusalem: the temple no longer being localizable or superficially visible and light no longer sourced by some localizable 'sun' but with the divine Light instead pervading the entire space or reality that it thereby defines. This new context of 'affordance', opened to us through the pervasive *topos* pertaining to the Creative Activity of the Incarnate *Logos*, offers the *greater stability* of a reincorporated indwelling. Human nature is established at the 'right hand of the Father' and its active, contributory influence is eternally secured within the Second Person, without ontologically affecting divine nature *per se*. There is notably no actual *seat* in the open invitational space shown in the Rublev icon,[274] no explicit fourth 'place' in hypostatic terms, the invitation is through and in the Second Person. Our creative activity is perhaps therefore best seen as an actively cooperative enhancement of what is revealed both to and within us, not enhancing the divine nature in essence but enhancing the degree or depth of creative, human participation actively known within the divine Economy.

[273] Sayers, *The Mind of the Maker*, pp.37-38.
[274] For a commentary on this icon see E. L. Wilson, *Iconically Speaking: Andrei Rublev, the Old Testament Trinity, Icons and Cathedrals* (U.S.A.: Create Space Publishing, 2015), pp.23*ff*.

This transition (chapter 4) is ultimately a result of divine initiative. As part of an analysis of the presentation of the Glory of the LORD in Ezekiel,[275] Keck concludes that

> In Ezekiel, the unenclosed presence of the Glory serves as a conceptual link recalling Israel's beginnings as a nation. Ezekiel…participates in a re-creation of Sinai, in which the prophet eventually receives a new order for a re-created community, along with instructions for a new sanctuary in the idealized land (Ezek. 43–48). In this re-creation, it is important to remember that 'the initiative is with Yahweh. Ezekiel does not expect Israel to be able to make a new start on her own, to which Yahweh would then positively respond. Yahweh is not waiting for Israel's response, he is creating it'.[276]

This initiative of re-enacting a whole beginning over again in a new form fits with the holistic concept of *Reshit* noted above. This is a key idea: a divinely-initiated, ordained and established *topos* through which human responsiveness can actively be assumed and 'drawn in' without in itself being ontologically initial or ultimate, drawing humanity 'from one degree of glory to another' (2 Corinthians 3:18).

How to interpret our nature?

A critical question remains: how theologically to understand the term 'human nature'. Clearly this is intimately related to an appreciation of divine 'image'. McFadyen[277] looks to Psalm 8, rather than the texts of Genesis 1-3, noting that

> Where thinking about creation is conducted without reference to the horizons of both soteriology and eschatology, there are consequences for both the grammatical mood and tense of anthropological discourse: the present and the indicative predominate. This includes the interpretation of its key theological, anthropological trope and largely explains the tendency to think of the image in static rather than dynamic categories.[278]

[275] E. Keck, *The Glory of Yahweh in Ezekiel and the Pre-Tabernacle Wilderness* (Journal for the Study of the Old Testament, Vol.37, No.2, 2012), pp.201-218.
[276] *Ibid*, p.216.Internal quotation taken from T. Renz, The Rhetorical Function of the Book of Ezekiel (VTSup, 76; Leiden: Brill, 1999), p.113.
[277] A. McFadyen, *Imaging God: a theological answer to the anthropological question?* (Zygon, Vol.47, No.4, Dec 2012), pp.918-933.
[278] *Ibid*, p.920.

According to McFadyen, Psalm 8 properly starts out from God's Mindfulness, such that 'humanity itself is constantly sought by God, not as a fixed and static entity, but in a way that stretches, challenges, and – most importantly – reenergizes the possibility of our being fully human…Here the dominant grammatical moods are the vocative and interrogative, the subjunctive and the optative'.[279]

We are to *conscribe*, according to an active engagement in growing according to divine 'likeness', our fullest and truest humanity rather than merely *describing* it.[280] Nonetheless, we still inevitably require some resourcing, scientific insight regarding the most consistent facets and tendencies of our nature. Consideration of the development of our creative capacity within our operative idiom of creative freedom (chapter 5) is one means of responding to this requirement.

Walton focuses on the assumption of a sacred cosmic space as an accompaniment to divine image,[281] stating that 'the first account sets up the cosmos as sacred space to function on behalf of people; the second account sets particular people in sacred space to function on its behalf'.[282] He emphasizes that

> Adam is given a priestly role, which would involve normal priestly functions: serving as a representative in sacred space, guarding sacred space from the intrusion of disorder and expanding the order of sacred space…This priestly role, not mentioned in the first account, would support an understanding of Adam and Eve as the fountainhead for humanity that may be understood as representational rather than biological.[283]

The question is then how such representation becomes creatively expressed through our physicality. Danger lies in any temptation for dominion over the image rather than searching out the iconic gift resulting from it. Such inappropriate dominion – not actually *proper* to our nature – would render the image static, a false status "distanced" from divinity in an entirely pejorative sense. Conversely, searching out our iconic giftedness through sacramental involvement and encounter affords authentic communication with the Creator. Our positive potential is therefore towards iconic, sacramental maturity and our

[279] *Ibid*, p.925.
[280] *Ibid*, p.931.
[281] J. H. Walton, *Human Origins and the Bible* (Zygon, Vol.47, No.4, Dec 2012), pp.875-889.
[282] *Ibid*, p.877.
[283] *Ibid*, p.878.

negative potential towards the idolatry of attempting to control the image, robbing it of its dynamic. Considering the image as highlighting the theological relevance of our creative capacity, creativity and sacramentality then naturally belong together.

Stenmark asks the question as to whether there *is* such a thing as a human nature at all,[284] and marks the prevalence in modern theological discourse to transfer the question of 'nature' to the relational activities between human beings rather than some attribute or propensity,[285] rightly countering this with the observation that

> If we did not have the capacity to love, we could not enter into loving relationships; if we did not have the ability to think and reason, we could not undertake a commission to be God's stewards on earth. We must have the capacity to relate actively to God, in order that we might relate actively to God…a purely relational view of human nature should be rejected.[286]

Having acknowledged the difficulty in pinpointing the exact content of human nature he nonetheless affirms its existence, especially on the basis that 'Christianity can provide a more attractive and informed metaphysical, epistemological, and ethical framework for understanding human nature in an evolutionary perspective than its secular rival, atheism, or naturalism...'[287] Dupré offers a well-balanced overview of the limits of scientism with respect to questions concerning human nature, especially with regard to self-consciousness and thinking about one's own thought.[288] Such self-relating capacity is the subject of the next chapter.

Torrance digs more deeply into Christian epistemological capacity to make human nature distinct,[289] noting that 'phenomenological approaches to the nature of humanity lack the categories to distinguish between human nature as the object of divine intentionality and its present dysfunctional and, ultimately, subhuman state'.[290] Only the Incarnate *Logos* possesses a fully completed human nature, such 'possession' being for us a matter of eschatological anticipation. This still allows St. Paul to speak of our collective, holistic

[284] M. Stenmark, *Is There a Human Nature?* (Zygon, Vol.47, No.4, Dec 2012), pp.890-902.
[285] *Ibid,* p.899.
[286] *Ibid,* p.900.
[287] *Ibid,* p.901.
[288] J. A. Dupré, *Human Nature and the Limits of Science* (Oxford: OUP, 2001)
[289] A. Torrance, *Is There a Distinctive Human Nature? Approaching the Question from a Christian Epistemic Base* (Zygon, Vol.47, No.4, Dec 2012), pp.903-917.
[290] *Ibid*, p.903.

share in the Mind of Christ, as Head of this Body (Colossians 1:18). The 'share' is not fragmented or individualistic. Its evidence is in some *collective property* of unified, ecclesial emergence, remaining overall a 'sacred mystery' to any individual perspective. The power of significance of the term 'communion' over and above that of 'community' emphasizes an authentic connectedness between even our incomplete human experience and the *Mind of the Maker*, in and through the Incarnate *Logos*. Carter reinforces a substantive understanding of *imago Dei* and its importance to human uniqueness, considering Christ as the perfected image according to which *imago Dei* may then more generally be expressed as humanity 'living with the Mind of Christ'.[291] More will be said on this in chapter 3.

A critical question remains as to how *we* might conceive of any movement towards completion or perfection in/of Creation. It is surely proper to consider the garden context of Genesis 2 as an iconic window on our theological origin, something lying outside of our more routine, temporal conception and *pro-creative* passing on (chapter 5) which begins only in Genesis 4:1 upon expulsion from the garden. Knight (as part of a broader summary of an Eastern Orthodox attitude towards scientific engagement) notes an Orthodox position concerning the Fall, deriving from Origen, as something 'pre-cosmic…[and] *into* our empirical, space-time universe', noting the patristic reading of the 'skins' given to humanity by God in Genesis as standing for our entire psychosomatic dispositions.[292] Nellas expands on this by emphasizing the double role of such skins as protective and as establishing a context in which the iconic image could still on principle flourish even in the midst of the 'unnatural'. He emphasizes Orthodox anthropology as being a 'theanthropology' according to which the Creation attains a sacramental status and through which any human 'movement' towards God is taken as being inseparable from some development in self-knowledge.[293] In our empirical, space-time universe our conceptual context is nonetheless finite, and the finitude of the human person matches that of a corresponding, corruptible nature.

As to the idea of some self-knowing 'movement' towards God, Genesis focuses on the negative association between humanity and the Tree of Knowledge. Having eaten of the

[291] C. Carter, *The Imago Dei as the Mind of Jesus Christ* (Zygon, Vol.49, No.3, Sept 2014), pp.752-760.
[292] C. Knight, *Science and the Eastern Orthodox Church: Historical and Current Perspectives* (Science and Christian Belief, Vol.25, No.1, April 2013), pp.37-52.
[293] P. Nellas, *Deification in Christ: Orthodox Perspectives on the Nature of the Human Person* (New York: St Vladimir's Seminary Press, 1987), p.44, p.120, p.169 and p.187.

forbidden fruit, Adam must somehow respond to the question of his own whereabouts (Genesis 3:9), especially in relation to the divine Presence. In asking, "Where are you?" the LORD poses him an epistemological challenge. What is the nature of any epistemological grasp of his predicament, his true whereabouts or *topos* 'before' or 'in' God, and how might it relate to his ontological status? He is clearly unable to effect his own completeness and the initiative ultimately involved in defining a manifest context for the completion and perfection of human nature occurs instead through the creative 'motioning' of the *Logos* in Christ, something not strictly evolutionary in its roots since the Uncreated is not contingent upon the created. In itself the evolutionary domain of consideration has no means of grasping any definitive criteria relating to true perfection. That is *not* to imply, however, that humanity cannot discern or conceive something of what such 'motioning' involves, especially given the invitation sacramentally to participate in the integrated topology of divine-human communion.

Overall, we find therefore a critical meeting 'place' between a top-down, incarnationally revealed perspective, in which the iconicity of human nature pertains to an eschatological dimension, and a bottom-up, evolutionary perspective in which it is treated in some respect as an emergent property, and for a fuller appreciation of which we may look to the biophysical origins of life itself.

A psychological viewpoint

Finally for this chapter, there is an importantly *psychological* dimension to the transition into the New Temple of the Body of Christ. The Temple, in its historical and eschatological aspects, offers a certain psychological bearing. Hurowitz notes specifically of Ezekiel's Temple vision that it 'is commonly held to reflect in form the First Temple during its final days and as seen by the prophet…an ideal, visionary Temple that mixes reality with imagination'.[294] This imagination is the mark of a prophetic voice feeling justified in moulding and idealizing the natural, mountainous topography of Israel.[295] Joyce also invokes the idea of a mixture of dream and reality,[296] promoting the idea that

[294] V. A. Hurowitz, *YHWH's Exalted House – Aspects of Design and Symbolism of Solomon's Temple*, in J. Day, *Temple and Worship in Biblical Israel*, (London: T and T Clark, 2007), p.67.
[295] *Ibid*, p.68.
[296] P. M. Joyce, *Temple and Worship in Ezekiel 40-48*, in Day, *Temple and Worship in Biblical Israel*, p.147.

Ezekiel was granted his vision halfway through a Jubilee period, standing for an admixture of reality and utopia.[297]

Psychological viewpoints normally suggest an individual focus, but here, given the reinterpretation of the 'place' and significance of the Temple, such individuality is drawn into (and supervened by) the critical *topos* pertaining to the Incarnate *Logos*. Concerning that which is 'drawn into' the legacy of the Word made flesh, Rowland summarizes quite beautifully that

> Readers [of the Letter to the Hebrews] are shown a picture of a heavenly pioneer who opens up access to this other dimension and enters that which transcends the limits of 'the veil of the flesh' to create the possibility of an alternative space for those who…journey with him in search of the eschatological rest 'outside the camp'.[298]

Collective participation is held together according to the pervasive divine Presence. Where the concept of *Shekinah* is concerned, Hayward looks at the LXX translators' treatment of the Pentateuch, translating *škn* as 'invocation'.[299] In practical terms this certainly seems congruent with Old Testament witness concerning a God who, from a psychological perspective, was never to be *provoked* but could nonetheless be *invoked* in covenantal accordance with His own invocation of Israel.

The structure of the tabernacle, or the Temple's sanctified inner space, has also been suggested as a metaphor for some hypothetically perfect psychological balance or constitution. To Randall-Binns the sanctuary is a representation of Christ directly, and therefore a template of the essential human being 'with the accidental characteristics of existential man added as subsidiary phenomena'.[300] He associates the inner sanctuary, the holy of holies, with the phenomenon of the intuitive perception of the unconscious, and the place of union by the altar of incense with the verging of this onto the rational aspect of human mind, then moving towards the inbuilt, instinctive aspects of being the nearer one approaches the veil over the entrance.[301] Though he was writing over three decades

[297] *Ibid*, p.149.
[298] C. Rowland, *The Temple in the New Testament*, in Day, *Temple and Worship in Biblical Israel*, p.477.
[299] C. T. R. Hayward, *Understandings of the Temple Service in the Septuagint Pentateuch*, in Day, *Temple and Worship in Biblical Israel*, pp.386-398.
[300] E. Randall-Binns, *The Archaeology of the Mind: Modern Man in Search of His Roots* (Cambridge: CUP, 1982), p.133.
[301] *Ibid*, p.138.

ago the analogy remains interesting, even if more up-to-date scientific engagement concerning the human mind is required (chapter 3).

One might also consider a psychological perspective on the poetically structured argument between the various voices in the Book of Job, each with their own tradition concerning Wisdom. Represented therein is the relationship between humanity's 'looking up' in awe and wonder and divinity's 'coming down' to search out the uniquely curious, yet inevitable and pivotal novelty inherent in a psychosomatically fostered, human perspective regarding Wisdom. The strength of Job's human perspective may well be weaker than any vulnerability of that which is rhetorically referred to as God's 'foolishness/weakness' (1 Corinthians 1:25), but it is still significantly present. Likewise, our topology of encounter retains genuine theological significance.

In Job one finds a testing dialogue and movement towards some novel encounter with Yahweh specifically, a novelty that Jung, with psychological subtlety, considers to be mutual.[302] In incarnational terms, the kernel of such novelty is again represented here as an irremovable, essential singularity, a topologically irreducible component induced within the divine Economy by the necessarily novel regard pertaining to incarnate encounter in the Mind of Christ.

MacKenzie and Carm discuss the different perspectives (highlighted by the variety of names used for God) involved in the Book of Job, their relation to an understanding of what constituted Wisdom, and how this is challenged by Christ's teaching in the gospels.[303] Jung's psychological perspective is more revealing when focused on the *holistic* structure of the text and its overall developments. Any more specific imposition of psychological criteria onto the happenings or debates in particular verses seems excessive, and MacKenzie and Carm in that sense rightly criticize Jung's lack of consideration of the underlying theological issues involved.

Edinger, however, takes his readers on an illustrated journey of Jung's commentary on Job, based on a series of pictures by Blake,[304] establishing a genuinely relevant psycho-analytical viewpoint concerning the stages through which Job's psyche must journey in

[302] C. G. Jung, *Answer to Job* (London: Routledge, 2007), pp.11-18.
[303] MacKenzie and Carm, in Brown *et al. The New Jerome Bible Commentary* (London: Geoffrey Chapman, 1991), pp.466-468.
[304] E. F. Edinger, *Encounter with the Self*: *A Jungian Commentary on William Blake's Illustrations of the Book of Job* (Toronto: Inner City Books, 1986).

order truly to encounter Yahweh directly. Job is progressively afflicted such that the protectiveness of his conscious personality is weakened. The communication with the raw authenticity of his unconscious, and its connection to some 'transpersonal Self' in which divine image is most starkly and terrifyingly to be discovered, begins to occur. The ego is understood in this case in terms of a covering of the depths (cf. Psalm 130:1) of human potential by some lesser consciousness. First, his outer body having been afflicted, there is an encounter with various peripheral aspects to his personality found in dialogue with his three pseudo-comforters. Then there is an encounter with the 'child' (the young Elihu) of the unconscious, until finally the *numinosum* of direct communication with Yahweh is reached, a climax through which

> It is as though Job's encounter with Yahweh in his raw, undifferentiated form were a conception, a process of fertilization that brings about a new creation…Job's encounter with Yahweh in his uncreated form seems to have the effect of initiating a new creation. This corresponds to the effects we observe when the ego meets the unconscious…A process of creative differentiation often ensues which amounts to a regeneration of the personality.[305]

Such a psychological viewpoint concerning a new creation is relevant here inasmuch as the critical novelty of divine-human encounter most fully and perfectly demonstrated in Christ effects the completed reconciliation of our shared humanity, precisely by being creatively encountered or 'seen' afresh by Christ's divinity. Such re-conciliation fittingly suggests something newly conciliar, a new form of conversation between divinity and humanity that reveals a deeper wisdom (cf. 1 Corinthians 2:6-9).

Given that Job is portrayed as a 'servant' who suffers and, along with the so-called friends, as an outsider who still 'believes',[306] it is inevitable that the figure of the Suffering Servant springs to mind and thereby some consideration of Christ fulfilling this role, bringing in a New Creation associated with a New Wisdom. Human integrity is eternally established while remaining distinct, and similarly 'Job has to insist on his integrity'.[307] I agree with Edinger's general assumption that Job cannot simply admit fundamental error or complete invalidity of his perceptions or conceptual viewpoint, since then the ego would constitute

[305] *Ibid*, p.53.
[306] MacKenzie and Carm, in Brown *et al. The New Jerome Bible Commentary*, p.468.
[307] *Ibid*, p.467.

no form of vessel at all, unable to facilitate any critical encounter with divine nature, hence Job's important refusal simply to submit to the voices of his critics.

As an additional angle on the Wisdom literature, being perhaps (as for Polkinghorne) closest to having any overt scientific significance, McLeish looks to an understanding of Wisdom not as some 'shallow law' but as something more like a reconciled chaos, seeing Job's experience as congruent with the scientific struggle to reconcile humanity to a means of understanding nature. He notes the 'creative task that asks nature the right questions at the right time, questions that open up paths of understanding rather than lead to thickets of further confusion'.[308] The overarching context according to which his argument is developed involves a consideration of the chaotic boundary between the human and the non-human, involving both divinity and non-human matter in a dramatic arena in which divinity draws out the fuller significance of humanity through the mutual engagement of both with the latter. We can, McLeish claims, appreciate something of the evolution of this boundary in conjunction with our developing understanding or wisdom. The presentation of his argument emphasizes a probing of the manner of connectedness both within created space and across the aforementioned 'boundary', and specifically 'how the agenda of reconciliation between the human and the non-human evolves'.[309] That this involves wisdom is again implied by the term 'reconciliation', and such wisdom can at least partially be acquired through scientific pursuit. That such a boundary may 'evolve' may again be related to the central idea concerning a stability that is dynamic rather than static.

Summary

A biblical perspective regarding our nature awakens us to the awkward 'nakedness' of our relative, contingent existence, being unable to complete ourselves in and of ourselves. Human existence, shared by the archetypical Son of Man, finds no ultimate rest simply 'in earth'. Theologically-speaking our mindscape yearns for some deeper stability and eschatological 'rest'. A transfiguring of our collective mindscape is effected through the Mind of Christ (chapter 3), reconciling human nature and enhancing our dynamic, fleshly potential sacramentally to encounter and to cooperate with divinity and to 'move' towards God through a transformed and growing self-knowledge.

[308] T. McLeish, *Faith and Wisdom in Science* (Oxford: OUP, 2014), p.111.
[309] *Ibid*, p.148.

The Creation-Temple parallel is important here. Not only does the *Logos* under-stand the bottom-up aspect of stability within created order, by virtue of its harmonizing role in defining the 'Principle' by which order is established in the first place, but by 'becoming flesh' and transforming the Temple context into that towards which it was already pointed in theological terms, the Incarnate *Logos* institutes a re-understanding or re-hypostatizing of human nature, effecting a New Creation in so doing. This manifests itself according to the top-down induction and revelation of a deeper theological stability, permanently establishing human nature according to its eschatological relevance. This nonetheless occurs in a manner maintaining some proper aspect of connectedness with created order/space as a whole, overcoming or supervening the context of human incompletion in the 'Old Creation'.

In seeking divinity, human prospective is inevitably limited against the fact that the Uncreated is beyond our finite understanding. However, one can perhaps say that, in the Christological encounter of the Incarnation, a greater theological 'affordance' is effected – a *prospective opening* with respect to the Uncreated becomes humanly accessible within created space. Considering the necessary preparation for the Incarnation, an *actively-engaging refuge* could then be seen in the 'overshadowing' aspect of the Uncreated, divine idiom of engagement, in Creative Power. This overshadowing provides the critical, top-down induction of stability in theological terms, enabling a sacramental appreciation of our theological 'prospect'. For an iconic representation of this idea one may consider Luke 1:35, at the heart of the Annunciation narrative, with the Holy Spirit coming upon Mary as the Power of the Most High 'overshadows' her, opening what one might call a "theosynthetic gateway" (adjusting the phrase used by Smith and Morowitz for application in a theological context) through which the *Logos* is conceived in the theologically deepest and physically most significant manner possible.

Our very capacity for conception is itself conceived in accordance with Creation being continually effected and sustained through the *Logos*, and thus the *Logos* plays a suitably active role in its own conception by humanity. Mary needs obediently to "listen" to the Word in order for the critical conception to occur, her life somehow being in conjugation with that of the divine Economy. The active role of the *Logos* (or *le Verbe*) is then seen as being manifest in that Creative Activity by which the 'overshadowing' of the Creative 'Power of the Most High' creates the necessary context for active human responsiveness, a responsiveness (particularly in Mary's case) enabling the reception of *le Verbe* as

relevantly ‘conjugated’ for the particular, participate context of revelation intrinsic to the Incarnation. In having our very conceptual capacity (re)grounded in the conceiving, Creative Activity inseparably pertaining to the dynamic, pervasive ‘place’ of the *Logos*, we may legitimately be considered as being enabled to bear the previously unbearable (John 16:12) and to conceive of some critical aspect of the previously inconceivable, for which Mary’s role or ‘place’ is epitomic.

Having presented this framework, invoking the rich potential of the Creation-Temple relationship as a point of reference regarding theological stability, and noting both its prospective eschatological relevance and its reinterpretation in the New Testament, the next chapter now considers the nature and potential of our physical embodiment and mental capacity, especially the sacramental significance of our self-consciousness or capacity for self-relation.

## ***Chapter 3: Finite Self-Consciousness, its 'Place' and Potential***

Our distinctiveness and potential as humanity is clearly connected to the particular, finite form of our embodiment. This chapter considers the potential inherent in a capacity for self-reference in general, and specifically in emergent, self-consciousness in humanity – in itself a biologically complex, conglomerate form of feedback established in necessary interaction with the wider, cosmic environment. The interest here is twofold: that looking towards the physical connectivity and emergent phenomena of the embodied brain; and that theologically extended to apply, through some appropriate use of terminology, to the Mind of Christ as a critically unifying concept, to which the final parts of the chapter turn attention.

On the one hand there is the scientific approach, concerning a layered and appropriately modulated, hierarchal ordering and communicability. One the other hand there is the theological approach, emphasizing the causal 'first place' associated with the principal, conceiving Activity of the motioning *Logos*. It is then logical to suppose that a critical aspect of interaction between these approaches should occur in the Incarnation, in which a critical *topos* associated with the motioning and conceiving *Logos* becomes newly and objectively manifest through the assumption of those terms inseparably associated with a contingency-induced, hierarchical ordering of mindedness.

### Contemplating consciousness

Given that our sense of self-consciousness is normally remarkably consistent, both consistency and continuity being obviously functional requirements with respect to evolutionary pressure, there must be some undergirding, developmental principles affording such sustainable continuity in our self-identity. The several viewpoints and angles of interpretative approach concerning such a central but intriguingly elusive notion as integrated 'consciousness', not obviously part of any higher class of concept, give the impression of an incomplete, multidimensional jigsaw necessarily held together by something deep but still pragmatic. Weisberg summarizes in some detail the various possible philosophical positions concerning the mind-brain relationship, such as the dualistic, the non-reductive, the mysterian, the functionalist and the higher-order representationalist.[310] He also helpfully distinguishes between 'transitive' and

[310] J. Weisberg, *Consciousness* (Cambridge: Polity Press, 2014).

'intransitive' consciousness: the former being more justifiably synonymous with 'awareness'; the latter being a more general, background quality, with respect to which the transitive is transient.

Singer highlights, largely from a psychological perspective, the barriers to be overcome in treating consciousness as a holistic entity, and whether integration is considered, functionally-speaking, to occur through a centralized or distributed 'agency'.[311] He notes the importance of making a distinction between the largely parallel processing in the brain and a serial interpretation of the world, an interpretation which might be considered inseparable from the activity and effect of consciousness. He also considers the idea that creative, emergent potential is *maximized* in a system whose dynamic lies on the 'edge of chaos'. The appeal to chaos derives from a consideration of iterative systems involving some recursive feedback, and such feedback is endemic to considering self-consciousness. There is an inevitable circularity between those physical features pertaining to our embodiment and that reflective experience which enables us to discern their functional organization, integrating phenomenology and physiology through cognitive approaches in a manner seeking a between-ness that accepts distinction while maintaining overall continuity.[312] This also highlights the important point that consciousness is not something isolated inside the head but exists in necessary connection with the external environment.

Furthermore, our mode of 'realism' changes throughout our development, especially in early infancy and childhood as we come better to coordinate ourselves and to learn a language. Piaget's pioneering work in child psychology saw the infant human as a 'realist' in the sense of there being no rigid boundary between internal and external worlds or realities, exhibiting at first a certain conflation between 'sign' and 'signified'.[313] Here 'realism' is being understood in terms of some degree of conjunction between ontological and epistemological aspects, perfectly conjugate in the case of divinity but not in the case of humanity. One's mode of realism is therefore, at one level, a description of one's potential capacity to define, appreciate and perhaps even deliberately manipulate a means of articulating one's representation of 'reality'. This representation is once again an

[311] M. Singer, *Unbounded Consciousness: Qualia, Mind and Self* (London: Free Association Books, 2001), especially pp.79-124.
[312] See Varela *et al. The Embodied Mind: Cognitive Science and Human Experience* (Massachusetts: MIT Press, 1993).
[313] J. Piaget, *The Child's Conception of the World* (St Alban's: Granada Publishing, 1977), pp.45-76 and 110-119. Original work first published in 1929.

inherently dynamic category, evolving through developing means of learning and observing over time. This relates to the more modern idea of brain 'plasticity' and Johnson and de Haan assess three major schools of thought concerning the nature of cognitive development: *maturational* (gene-focused), *skill acquisition* and *interactive specialisation* viewpoints, with the authors generally favouring the last of these.[314] This viewpoint in particular emphasizes the reorganizational capacity of our cerebral arrangement, redistributing particular functions over particular regions of the brain throughout the developmental process, a good example being the reorganization of certain functions between the frontal and parietal lobes during adolescent years.

With respect to any overarching philosophy of mind many contributory levels of investigation may be required: molecular, developmental, cognitive, behavioural, computational/circuit-based models and lateralization theories. This thesis is not directly concerned with any of these in isolation. Rather, it is interested in the relevance of the *fact* that there are all these levels of contribution and that their mode of integration is critical. Embedding things in an evolutionary context is here considered especially useful for such integrative purposes, relating explicitly to the development of creaturely physicality and cerebral organization across species. Distinguishing properly between micro- and macro-evolution and between strong and weak emergence (depending on whether the underlying *basis* for a particular property is or is not reconfigured),[315] and highlighting the important developmental role of canalization, Roth offers an excellent contemporary summary of an ethological perspective on the origin of mind,[316] also distinguishing between perceptual actuality and some critically elusive 'reality'. Such an ethological perspective enables one to consider more fully how an integrated mental dynamic emerges and evolves in a sustainable manner and is complementary to the material of chapter 1.

Ramachandran has been notable in considering evolutionary demands from the perspective of neuroscience, and the implications for any philosophy of consciousness.[317] He uses the distinction between perceptual and conceptual levels to great effect, especially in his experimental studies of theories concerning synaesthesia, noting that any

[314] Johnson and de Haan, *Developmental Cognitive Neuroscience: An Introduction* (Chichester: John Wiley & Sons, 2015)
[315] In a theological context the New Creation would be a 'strong emergence' in this sense.
[316] G. Roth, *The Long Evolution of Minds and Brains* (London: Springer, 2013)
[317] V. S. Ramachandran, *The Tell-Tale Brain: Unlocking the Mystery of Human Nature* (London: Windmill Books, 2012).

hypothetical boundary between the two is blurred when considered on the neuronal scale. He makes it clear that self-consciousness is a complex combination of many complementing or competing elements including (a) the communication, excitatory and inhibitory, between the two cerebral hemispheres, (b) the discrepancies between different pathways, evolutionarily older or more recent, of communicative input, (c) the relationship between the cerebral representation of our body map, at the boundary between the frontal and parietal lobes, and our holistic sense of 'ego', especially when considered in conjunction with emotional disorders, and (d) whether "free won't" might contribute more to our actual functioning than a sense of free will, including our capacity to block certain, hypothetical 'mirror neuron' effects. Nearly everything in these four points is related to the need for the mind to eschew contradiction and represent the most plausible 'illusion', though Ramachandran explains the reasons for this in a manner more in tune with modern epistemic than the theories of Freud.

Chalmers seems to have been somewhat hasty in his relative side-lining of both evolutionary and quantum mechanical contributions to considering consciousness-related questions.[318] Evolutionary perspective will at the very least provide useful background consideration, and there is nothing unreasonable about looking for effects of quantum phenomena preserved on a classical scale of analysis and encounter. As to a quantum basis for consciousness, even if particular suggestions on this idea have not historically achieved wide following,[319] there have nonetheless been recent, persuasive demonstrations of vital quantum influences being functionally preserved in living environments and over biologically significant timescales.[320] The idea of a classical-scale manifestation of quantum processes is not new, having been around since the explanation of superconductivity.[321] An analogous idea of some super-fluidity of cerebral process, something importantly beyond the out-dated metaphor of classical flow (with respect to neuronal functioning) and somehow either effecting or affecting the conceived 'narrative'

[318] D. Chalmers, *The Conscious Mind: In Search of a Fundamental Theory* (Oxford: OUP, 1996), pp.118-121.
[319] For some varying perspectives on this matter see Penrose *et al*, *Cosmology of Consciousness: Quantum Physics and the Neuroscience of Mind* (Cambridge: Cosmology Science Publishers, 2011).
[320] Al-Khalili and McFadden, *Life on the Edge: The Coming of Age of Quantum Biology* (London: Transworld Publishers, 2014).
[321] For an excellent and simple introduction to this see R. Feynman, *Lectures on Physics, Volume III: Commemorative Issue* (New York: Addison-Wesley, 1989), chapter 21.

(see below) of consciousness as some classical manifestation of underlying quantum influences, seems at the very least to be plausibly intuitive.[322]

An analogy can perhaps be made here with the mathematical formulation of econometric analysis[323] in which distinction is made between that aspect of a proposed model or relationship which corresponds to an *average causal effect* and that which pertains to a *sampling bias* in the way in which the 'observer' has gone about searching for data. In the context of what one might call a neurological economy one could perhaps likewise discriminate between these aspects. An average causal effect could result from some underlying, possibly quantum-based influence, becoming manifest on the classical scale – a scale on which one can legitimately refer to causation. There would then also be an inevitable sampling bias, the evolutionary component of some selective, discriminatory filtering over time, with classical evolution shaping the broader physical contours concerning our mindedness.

Given the reference here to 'motion', I will adopt a particular viewpoint concerning the physical development of our neuro-ecology. Llinás considers the possible development of consciousness, and movement towards self-consciousness, as occurring via the internalization of sensorimotor imagery, forming a centralized control and command centre and incorporating predictive capabilities supporting the development of more complex movement, with selective pressure being placed upon such predictive capacity over evolutionary history.[324] The basic idea is to consider more deeply the remarkably 'plastic' abilities of neurons as their activity is shaped in necessary conjunction with a combination of externally imposed stimuli and internal physiology (including the orchestration of chemical disequilibria). Llinás considers how various modular components may come to function, or be seconded, in integrating motional coordination and fostering greater reliability in generating responses. He helpfully differentiates between the *strategic* aspect involved – leaving its mark through a developing and increasingly innate awareness of biologically accessible *forms* of action, response or

[322] A parallel with this is noted explicitly in Penrose *et al*, *Cosmology of Consciousness*, p.71. Some attempts to see a cosmic and holistic foundation of consciousness do not, however, so much meet on the boundary between classical and quantum worlds as mix the two together: the observer playing a part in making reality, while the same observing mind has been somehow shaped by classical evolution (*Ibid,* pp.17-36 and pp.103-137).

[323] C. Doherty, *Introduction to Econometrics* (Oxford: OUP, 2011). See also Ben Lambert's online graduate econometrics course available on YouTube (accessed 2016).

[324] R. Llinás, *I of the Vortex: From Neurons to Self* (Massachusetts: MIT Press, 2002).

communication, becoming encoded in the form of *fixed action potentials* (FAPs) – and the *tactical* aspect, involving positive/negative feedback and memory-informed influences in order to effect the necessary nuances involved in fitting any given strategy to the uniqueness of the encounter in question as it develops over the relevant timescale.

Llinás' theory involves a deep, biological consideration of motion. Self-referentiality and generativity lie at the core of his conception, involving a representational approach to appreciating how transient sensorimotor images are formed, processed and dispatched (or discarded) internally, and according to which informational content and an internalized, discreet readjustment of context become different sides of the same coin. Part of the process of generating necessary 'responses' can, in the human case, come to involve precisely that generation of *meaning* noted in the Introduction. His theory also allows for a conceptual envelope by which one may follow motional and emotional aspects of development in tandem, emotional triggers being integrated in such a manner as to increase the probability for a speedy or reliable response to environmental demands (a capacity that may involve 'co-opting' or 'exapting' certain traits or modulated functions for new purposes).

The link between motion and emotion is much more than an etymological convenience, and the very title of Llinás' book – *I of the Vortex* – beautifully captures the idea that as creaturely competence to engage more efficiently with a greater proportion of the environment spirals outwards, so too the necessary reintegration and partial rearrangement within the control and command centres effects some corresponding inward spiralling that highlights some internal, subjective sense of self-conscious awareness, most starkly pronounced in our own species. The interconnected compactness involved in environmental encounter, and its deeply generative potential, are clear in the development of his language and he traces the origin of cerebral integration and organization back to a weakly chaotic, intrinsic electrical oscillation associated with interconnected neurons, allowing 'topological reorganization' over time.[325]

From the perspective of a specialist in dream science, Hobson expands on Llinás' insight and, responding to the need for a robust post-Freudian paradigm, advocates an intriguing

[325] *Ibid*, p.59.

theory of *proto-consciousness*.[326] The idea is that, given that evolutionary pressure selects those cerebral organizations more efficiently integrated for the functional demands of some quasi-typical habitat (for which certain patterns of response have become robustly encoded in a developmental program), the pre-natal period of formation becomes increasingly critical, especially in more cerebrally advanced species, for ensuring proper readiness and stability upon being exposed to a sea of sensory input at birth. In the human case especially, Hobson suggests a parallel between pre-natal formation being a pre-requisite for presenting a proto-conscious mind to its first-awakened experience of the sensory world, and REM sleep being part of a necessary preparation for the next waking period, especially considering that recently born babies and young infants need a greater proportion of REM sleep over a nocturnal cycle than older children or adults. This suggestion is interesting in highlighting the complex manner in which dynamic stability comes to involve an integrated conglomeration of feedback cycles in order for our sense of self-consciousness to become practically and consistently reliable in so seemingly automatic and flexible a manner. The theme of stability thereby remains integrated across physical and mental domains of consideration.

Dennett's approach

It was realized from Freud's time that 'psychoanalysis cannot situate the essence of the psychical in consciousness, but is obliged to regard consciousness as a quality of the psychical, which may be present in addition to other qualities or may be absent'.[327] Consciousness should not become some general synonym for either *attention*, given the evidence of change blindness (and, conversely, blind-sight experiments),[328] or *intention*, given such evidence as demonstrated in the Libet-Hayes experiment, suggesting that what we think we are conscious of as our moment of decision-making is in fact subsequent to observable evidence of neuronal firings in our brains that seem already to have effected the required conditions for the action in question, implying that some decision has already been made subconsciously.[329]

[326] A. Hobson, *Psychodynamic Neurology: Dreams, Consciousness and Virtual Reality* (Boca Raton: CRC Press, 2015).
[327] J. Strachey, *Sigmund Freud: The Ego and the Id* (London: W. W. Norton & Company Ltd, 1989), p.4.
[328] Gallagher and Zahavi, *The Phenomenological Mind* (Abingdon: Routledge, 2012), especially pp.51-76.
[329] A fairly crisp philosophical critique of the premises and conclusions involved in this type of experiment is given in Bennett and Hacker, *Philosophical Foundations of Neuroscience* (Oxford: Blackwell Publishing, 2003), pp. 228-231.

Blackmore, in an introduction to the subject, notes the more recent shift towards appreciating the co-existence of many processes within the brain that are neither necessarily in nor out of consciousness.[330] Among the theories mentioned, Dennett's centre of gravity illustration, by which is intended the centre of *narrative* gravity articulated concerning the conscious conception of self, seems apt in taking the 'movement' towards self-consciousness as being inseparable from a developing potential for articulation, beyond some more primitive, behavioural gesticulation. This thesis affirms the position that robust self-consciousness, distinct from some broader, qualia-steeped consideration of consciousness, is a development that is inseparable (perhaps inevitable) from the process leading up to the emergence of language.

The general term 'consciousness' encompasses a multi-level emergence, through which a co-developing linguistic capacity may act as a catalysing, organizing force, in tandem with a movement towards self-conscious articulacy. Dennett makes an importantly required emphasis regarding the often counter-intuitive difficulties concerning any contemplation of consciousness,[331] including anticipating change blindness. He emphasizes how difficult it is entirely to shake off the pseudo-intuitive, internal observer viewpoint concerning the mind, looking instead towards spatially and temporally distributed components of some possible cognitive content, each potential component deriving from some manner of *impression* upon the embodied brain. This results in his 'multiple drafts' proposal concerning possible, prospective interpretations of any content that ought best to be associated with a particular combination of inputs, received at slightly different times. Such drafts need integrating, but the means of such integration is somewhat obscured by the fact that time is represented cerebrally in an ambiguous manner owing to the predictive pressures of survival over the course of evolutionary history. Capacity for ongoing revision is therefore intrinsic to our 'operational epistemology', to return to the vocabulary of chapter 1.

The ongoing development of such a capacity is dependent on the possibility of one aspect of cerebral function becoming liberated from some previous requirement and seconded to another, as may be required by the developing or evolving context of encounter to which our mental 'narrative' might need fitting. This requires that the most frequently

[330] S. Blackmore, *Consciousness: A Very Short Introduction* (Oxford: OUP, 2005).
[331] D. C. Dennett, *Consciousness Explained* (New York: Penguin Books, 1991)

encountered forms of change are at least semi-predictable given our environment, such that integrated readjustment is realistic. Furthermore, it emphasizes the importance of the insight from cognitive psychology that perception is a process in which the mind is specifically *active*, making use of particular memory cues in order to piece together the most plausible representation corresponding to the perceptual whole in response to particular stimuli.[332]

Dennett's centre-of-narrative-gravity metaphor moves away from the Cartesian theatre model of the mind, towards one involving an informative focussing of many 'coalitions' of neural organizations, competing for dominance amidst a thicket of signals and functionally-modulated regions of connectivity. While there are still 'theatre' metaphors for the mind that avoid the problems of the Cartesian setup, such as Baars' *Global Workspace* model,[333] Dennett's model enlarges on how embodied intelligence may have been formed in necessary accordance with environment encounter and engagement, in turn influencing how we come to perceive that environment and stimulating the developing capacity for conscious awareness in so doing. We may label such a feat by the blanket term 'consciousness' owing to the summarizing power of reference that language affords us. However, this power of language to label may then cause emphasis upon things that, as Dennett cautions, prove ultimately less helpful in understanding the subject of consciousness, in both senses of the word 'subject'.

Bracketing the subjective aspect of self off to the category of phenomenology of mind, Schrödinger ended up considering the idea of subjective self as a scientifically irreconcilable paradox owing to the apparent absurdity of being reliant for its emergence on a reality that it itself had brought into some representative conception in order to explain its own origin.[334] The possible defect in this case seems to be the absence of any consideration of a hierarchical, higher-order representational view of our mindedness – a position certainly fitting best with the framework here. This viewpoint emphasizes a layered architecture in the constitution of our mindscape. The narrative form we generate through our developing, subjective sense of *strategic* relation to the world exists in a relationship of dynamic, two-way influence with such 'architecture', and there is, as

[332] R. L. Gregory, *Eye and Brain: the Psychology of Seeing* (Princeton: Princeton University Press, 1997)
[333] S. Blackmore, *Conversations on Consciousness* (Oxford: OUP, 2005), pp.11*ff.*
[334] K. Wilber, *Quantum Questions: Mystical Writings of the World's Greatest Physicists* (Boston: Shambhala, 2001), pp.86-91.

Dennett acknowledges, an important distinction between the more opaque means of narrative construction, as here construed, and those architectures which are specifically designed or controlled on the part of a human artist/author.

Simpson supports Dennett's view as compatible with modern, psychological views of the self and a good explanation for the phenomenological legitimacy of 'self-loss' experiences, when attachment to the narrative is systematically defocused.[335] This raises an important point regarding the distinction between consciousness and self-consciousness, especially considering the implicit dissociation of subject-object 'boundary' in the first case. The centre-of-narrative-gravity conception carries an epistemological accentuation by virtue of its narrative description. Our creative activity necessarily engages with an emerging interpretation of self and our *topos*, part of a self-knowing process inseparable from our physical capacity to 'move' or, in theological terms, our iconic capacity for being moved.

Any centre-of-gravity, taking the metaphor at face value, is located (for a complex object) via the point of intersection between various lines of force implied by the suspension of the object from different points on its surface. These lines of force could perhaps be analogized with the nature of the competing demands from the perceived environment. There is, furthermore, an inevitable circularity involved, inasmuch as it is *approximately* that which we experience the need re-interpretatively to nuance, namely our self-consciousness, which itself acts as a catalysing force behind any reinterpretation.

Such approximation indicates a lack of completion. Williams asks 'what is the world that art takes for granted?' and answers that 'it is one in which perception is always incomplete'.[336] This parallels the *approximate* nature of our self-consciousness, something that will never fully "find itself" as such by its own skill. The word 'approximate' implies some means of considering or defining proximity, noted earlier as involving an entire hierarchy of potential conditions, from the more flexible to the metrically strict, and according to which the nature of a topological space may be better appreciated. Our approximate sense (or degree) of self-recognition, psychologically-speaking, could therefore be considered *part of* the complexly interconnected 'topology' in which our

[335] W. Simpson, *The Mystical Stance: The Experience of Self-loss and Daniel Dennett's "Center of Narrative Gravity"* (Zygon, Vol.49, No.2, June 2014), pp.458-475.
[336] R. Williams, *Grace and Necessity: Reflections on Art and Love* (London: Continuum, 2005), p.135.

environmental interaction consists, and one through which, among other things, we are able to discern and appreciate art (see below).

Williams expands his observation by considering the complex tension between literal impulses, that may or may not be deciphered, and an overall sense of significance and symbol in the mind. The relationship between the literal and the symbolic will be expanded upon below, through a consideration of how our sense of semantic significance may be thought of as structured according to the 'topology' of our mindscape. In the case of some narrative centre of gravity, linguistic development could be argued to contribute to reliably stabilizing the 'centre', which must be converged upon within functionally practical bounds.

One might ask "what is my perception of myself?" or "am *I* in control of myself or my actions?" Is there here some equivocation between subject and object,[337] or between the way in which one intends the word 'my' as some perceived, possessive pronoun and that in which one is supposedly imagining (in as far as it can be conceived as an image at all) any objectified concept of 'myself'? Does our subjectively experienced egocentricity control or manipulate some objectively abstracted perception in such a way as to generate an approximately accurate representation of the subject, or is such re-presentation always some form of illusion? The key word is surely 'actions', being inseparable from the specifics of our physical embodiment. It is only an overall consideration of such physicality, and the specifics of its interconnectivity, that ultimately allows our sense of subjectivity to establish a greater congruence with any more objective representation.

If self-consciousness ultimately derives from some sophisticated basis of illusion, naturally conceived through some resultant psychological force and possibly arising according to some fine-tuned bi-product of our evolved responsiveness to environmental pressure, then it relies on a continuous shifting or nuancing of the dynamic centre-of-narrative-gravity. Like the constant shifts in posture necessary to maintain bipedal balance our brains must constantly correct – in functional association with relevant physical

[337] This question should clearly be posed *after* the individual has grown sufficiently to develop the necessary differentiation between exteriority and interiority, allowing for the recognition of the possibility that externally perceived objects are 'projections' of interiorly impressed qualities, and the consequent need for a *reflective* objectification of one's own degree of conscious oversight in order to adjust to corrective information. See M-L von Franz, *Reflections of the Soul: Projection and Recollection in Jungian Psychology* (Illinois: Open Court, 1995), pp.1-28.

actions or alterations – for any imbalance between our critical sense of subjectivity and the changing conditions encountered in our environment, the nature of our response to which will inevitably influence our more objective means of self-conception. It would then be a logical part of that correction process that, over time, cerebral (re)organization evolved or developed in such a way as for particular parts of the brain to be so appropriately interconnected as to accommodate the potential for developing a specific, autobiographical sense of self-consciousness. This conception importantly correlates with the aforementioned readjusting and reweighting of Polanyi's 'tacit coefficients'.

All-in-all, Dennett's conception seems to make an important contribution to addressing further the critical question regarding the maintenance of a functional, dynamic stability concerning the human mindscape.

McGilchrist's contribution

Jung suggested that archaic humanity was far more interested in seeking broader, more general explanations of experience, while modern humanity differentiates things mercilessly into individual causes of events. This has, he claims, turned the world of archaic man upside down.[338] Yet he goes on to assert that

> Nothing goes to show that primitive man thinks, feels, or perceives in a way that differs fundamentally from ours. His psychic functioning is essentially the same – only his primary assumptions are different.[339]

Humanity has both the means of taking an intellectually holistic, integrated or tacit approach and also the ability to differentiate explicitly between concepts and respond to the degree of complexity involved (as per Polanyi and Vigo).This capacity to differentiate in turn requires some physical differentiation within the brain itself. Kaufman *et al.* examine the neurobiological aspect to human thought and creativity, allowing novelty to occur either in the task itself or in the means of approach, looking to a theory in which creative thinking might have a holistic origin in right-hemispheric activity of the brain, but requiring the 'technical competence' of the left-hemisphere in order to receive such

[338] C. G. Jung, *Modern Man in Search of a Soul* (London: Routledge, 2008), pp.127-130.
[339] *Ibid*, p.131.

stimulation as an outworking, propositional activity, requiring inter-hemispheric communication.[340]

McGilchrist's work on the hemispheric division of the lateralized human brain is significant here for appreciating another aspect of our cerebral integration and stability. His underlying thesis is that the mode of the left hemisphere has come over time to dominate the state of Western civilization and culture,[341] and he begins by noting the residual asymmetry in the nature of our reality, arguing that it applies to the 'inner structure of our intellect' just as much as to the physical universe[342] and emphasizing the phenomenological and ontological uniqueness of consciousness, lacking anything better understood by us to which we may compare it.[343] Noting the topography of the typical hemispheric opposition in the human brain, and ascribing to the left hemisphere a general preoccupation with the question of 'what' in contrast to the 'how' of the right hemisphere (the hemispheres being used mainly as *metaphors*), he looks back to evolutionary roots, suggesting in particular that

> Clearly we have to inhabit the world of immediate bodily experience, the actual *terrain* in which we live…Yet at the same time we need to rise above the landscape in which we move, so that we can see what one might call the *territory*. To understand the landscape we need both to go out into the felt, lived world of experience as far as possible, along what one might think of as the horizontal axis, but also to rise above it, on the vertical axis.[344]

If one abstracts this landscape imagery into the developing formation of human mindscape there seems to be a link between this dual demand and the insistence of de Bono that…'Lateral thinking enhances the effectiveness of vertical thinking. Vertical thinking develops the ideas generated by lateral thinking'.[345] De Bono sees lateral thinking as

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[340] Kaufman *et al.*, *The Neurobiological Foundation of Creative Cognition*, in Kaufman and Sternberg, *The Cambridge Handbook of Creativity*, pp.216-228.
[341] I. McGilchrist, *The Master and his Emissary: The Divided Brain and the Making of the Western World* (London: Yale University Press, 2010). Interestingly, Ford suggests that digital culture might actually enable the possibility of right-left hemispheric integration, combining a more holistic interactivity with a particular means of presenting objective rationality in a given context, and a consequent 'return from exile'. D. Ford, *A Theology for a Mediated God: How Media Shapes Our Notions About Divinity* (New York: Routledge, 2016), especially pp.103-108.
[342] *Ibid*, p.13.
[343] *Ibid*, p.19.
[344] *Ibid*, p.21.
[345] E. de Bono, *Lateral Thinking* (London: Penguin Books, 1990), pp.12-13.

having dual patterns of restructuring (insight) and novelty provocation (creativity) operating in tandem. In McGilchrist's terminology, the lateral component could correspond to the *terrain* awareness and the vertical component to a more *territorial* focus. Given that different degrees of lateralization are observed to occur in different individuals, which McGilchrist recognizes, I shall here prefer (unless quoting McGilchrist directly) to refer to the domains of 'terrain' and 'territory' on the basis of their more general validity, and their more obvious appropriateness to the landscape-mindscape dynamic.

McGilchrist's use of the language of lateralization is more informed than that used in more popular parlance. He responds to his critics on his website, freely acknowledging the additional effect of 'top-bottom' differences in cerebral functioning – another evolutionary dimension – but still affirming the undeniable evidence of asymmetry in left- and right-hemispheric functionality through all of 'size, weight, shape, surface structure, cell architecture in some areas, grey to white matter ratio, response to endocrine hormones and …neurotransmitter profile'.[346] Despite his warranted rejection of the looser left-brain/right-brain parlance seemingly advocated in popular science books, Kosslyn (one of the critics) nonetheless concedes that

> Without question, the two hemispheres engage in some different kinds of information processing…the left preferentially processes details of objects we see, whereas the right preferentially processes the overall shape of objects we see. The left preferentially processes syntax (the literal meaning); the right preferentially processes pragmatics (the indirect or implied meaning).[347]

As to self-consciousness, McGilchrist notes the close interconnection of the territory-focused domain with itself, compared to the cross-connections more characteristic of the terrain-dwelling domain. The territorial aspect is heavily 'self-referring' and 'deals with what it already knows, the world it has made for itself'.[348] Choosing the example of music as something of which between-ness is a defining quality concerning the relation among notes, forming a tension between notes and the silence sandwiched by them, he relates the

[346] http://www.iainmcgilchrist.com/exchange_of_views.asp#content (accessed 2016)
[347] From his contribution in Brockman, *This Idea Must Die*, p.301.
[348] McGilchrist, *The Master and His Emissary*, p.33 and p.42.

holistic nature of musical appreciation to the function of the 'terrain' domain, one whose 'utterances are implicit'.[349]

Left-hemisphere activity is more explicitly definition-dominated. Although noting left-hemisphere engagement with metrical rhythm, probably associating with a different evolutionary requirement from right-hemisphere attention to harmony, McGilchrist explicates his thesis concerning the breakaway of the territorial emphasis (the 'emissary' forsaking the 'master'). The underlying idea is that 'while we are gathering new information, the right hemisphere is responsible, but once whatever it is becomes thoroughly "known", familiar, it is taken over by the left hemisphere'.[350]

Our capacity for specific definition needs to relate its potentially enriching means of categorization and denotational abstraction – the "what is it?" aspect – back to the terrain-grounded domain. What began (in evolutionary terms) as a relatively open, though superficial 'simplicity' must progressively interconnect with the relative compactness and closedness of definitional complexity, self-referring and linguistic abstraction that is involved in mapping out the multi-dimensional perspective of our 'territory', enhancing our overall appreciation of the relief and relevance of our 'terrain'. A greater, deeper 'simplicity' thus results. The danger is in the temptation to confine the complexity of our territorial construction to a particular regime of self-interest. The two domains or hemispheres must cooperate, offering something far beyond original split-brain advantages, such as birds having one eye for peripheral and one for focal vision controlled by different sides of the brain, without damage to one impairing the other.

Looking to various specifics concerning the historical, physical formation of living creatures and their struggles and needs, McGilchrist notes that in the human case

> Certainty is also related to narrowness, as though the more certain we become of something the less we see…the fovea of the human eye, a tiny region in the retina at the centre of gaze, is the most pronounced of that of all primates…This is where the narrow focussed beam of left-hemisphere attention is concentrated: what is *clearly* [italics McGilchrist] seen.[351]

[349] *Ibid*, pp.72-73.
[350] *Ibid*, pp.74-75.
[351] McGilchrist, *The Master and His Emissary*, p.83.

He regards it as a general philosophical disposition to scrutinize 'the life of the right hemisphere from the standpoint of the left',[352] suggesting that such scrutinizing needs in part to be responsible for undoing any damage. As here, he does not see language, in the verbally-articulated sense, as being necessary for the genesis of thought-process, but rather as a more firmly fixing bi-product of that thought. He appeals to the distinction between the sense of knowing implied by *connaître/kennen* and that implied by *savoir/wissen*,[353] the latter being arguably at least partially reliant on some form of language basis but not the former. Within the development of language, however, the criticality of self-referring feedback is made clear by the fact that 'if it is the case that our understanding is an *effect* of the metaphors we choose, it is also true that it is a *cause* [italics McGilchrist]: our understanding itself guides the choice of metaphor by which we understand it'.[354]

The correlative basis to our generative thought-process, deriving from first impressions of environmental encounter, is initialized in the terrain-grounded domain, while the more strictly referential use of language develops through the more literally familiarized, territorially focused domain. Such terrain-grounded initialization supports the case for an original, holistic capacity for musical appreciation and coordinated rhythm leading to the specialization of language rather than vice versa, agreeing with Barrow's aforementioned assessment of the evolutionary advantages therewith associated. McGilchrist considers the referential use of words as an imposition of structural boundary on the way we are able to interpret things.

> Language is necessary neither for categorization, nor for reasoning, nor for concept formation, nor perception: it does not itself bring the landscape of the world in which we live into being. What it does, rather, is shape that landscape by fixing the 'counties' into which we divide it, defining *which* [italics McGilchrist] categories or type of entities we see there – how we carve it up.[355]

He describes the tension between left-hemisphere/right-hand *grasping* and right-hemisphere/harmony-oriented *dancing* in the progression towards developing language.[356] The grasping, territorial fixation is suggested as being written into our language in such words as attend, contend and pretend, in which the *tendency* is symptomatic of possessive

[352] *Ibid*, p.89.
[353] *Ibid*, p.96.
[354] *Ibid*, p.97.
[355] *Ibid*, p.110.
[356] *Ibid*, pp.115-126.

focus expressed through the pointing and shaping activity associated with the right hand in most humans. Such linguistic heritage could also, for that matter, be seen in the word *grasp* itself, considering the earthly emphasis on struggling, shaping, territory-defining toil inherent in other such *gr-* words as *grind, grapple, grope, graft, granulate, (en)grave, grist, grip, group* and *graph*, each implying some defining of the contours by which a sense of reality is differentiated and subsequently articulated. The *dance* metaphor, by contrast, understands communication as being holistically-embodied, stemming from an engagement with the bodily gestures and motions of one whom the infant instinct motions to emulate, fuelling early emotional development in so doing.

McGilchrist's work makes considerable impression, while providing here another dual-component bond as between the 'terrain' and 'territory' aspects of our environmental encounter. He provides an important additional dimension for considering the dynamic, functionally stable 'approximation' of our finite, incomplete but developing and becoming sense of self-consciousness and understanding.

Consciousness as 'cosmic'

Material evidence of cosmic history now generally goes back some 13.7 billion years, which in Haught's view makes the arrival of subjective consciousness not less important but ever more intriguing, the cosmos having been somehow pregnant with the potential for self-consciousness. Haught neither trusts purely physicalist theories of mind nor does he accept that many casual invocations of the word 'emergence' do more than exchange total reductionism for some general sense of 'magic',[357] though one might well ask what alternative paradigm to emergence one could realistically or responsibly advocate.

Our creative capacity has been fostered through a particular form of embodiment, a progressively incorporated means of seeing and communicating inseparable from our evolutionary background, and further affecting our appreciation of intelligible structure and whether we interpret such as 'design'. If we consider, say, symmetry in a *static* manner, then overall we find an underlying brokenness or perturbed symmetry in nature. Any interpretation of 'design' should more responsibly be seen as a *dynamic* rather than as a static glimpse or structural cross-section. In fact, the tendency to do the latter is precisely what Haught deems a central problem of the scientific community's evolutionary dispute

[357] J. Haught, *Is Nature Enough? Meaning and Truth in the Age of Science* (Cambridge: CUP, 2006), pp.130-132.

with Intelligent Design advocates, owing to the refusal of both sides to see any design in the unfolding dynamism of diversity, descent, drama, direction, depth and even death – the themes of his respective chapters.[358]

Peck emphasizes that, through now known biological tendencies towards individuation, communication, niche construction and emergence, new forms of life and living opportunity are able to emerge in non-reducible ways without any pre-set Platonic goal or fixed evolutionary path. Creativity, he concludes, is something written into the very basis of communicative niche construction and emergent potential, and while he agrees that Darwinian evolution can explain complexity and variety it cannot explain the nature or origin of any thereby postulated 'design space'.[359]

In relation to our consciousness, the dynamic of any non-pre-set 'design' is something of cosmic proportions, scientifically-speaking. Theologically-speaking, this dynamic is somehow 'representative' of the pervasive, harmonizing and ordering 'place' of the *Logos*, through whom created space and cosmic order derived, as noted in the Introduction. The development of our consciousness is, furthermore, inseparable from the fact that such dynamic itself grounds our capacity for conception in the first place. The cosmic scope also offers an obviously *natural limit* to the aforementioned 'terrain' and 'territory' aspects associated with the engagement of our mental domain, especially as we become capable of considering the entirety of the cosmic context that formed our finite, embodied perspective.

The nature of consciousness is taken here to involve interplay between bottom-up and top-down components. It is considered that the domain or faculty *according to which* any top-down component may become influential may well have evolved as some broadly 'epiphenomenal' property, but not in the philosophically stricter sense of the term. Specifically, an evolutionary by-product may prove sustainable by emerging in such a way as naturally to "pay" for the resourcing of its own upkeep, in this case by interacting with lower operational 'levels', right down to the most basic perceptual level, in a manner aiding that continuous reintegration which is critical to our unified perception of self (at least in the absence of perturbing neurological dysfunctions or psychiatric disorders). This

[358] J. Haught, *Making Sense of Evolution: Darwin, God and the Drama of Life* (Kentucky: Westminster John Knox Press, 2010).
[359] S. L. Peck, *Life as Emergent Agential Systems: Tendencies without Teleology in an Open Universe* (Zygon, Vol.48, No.4, Dec 2013), pp.984-1000.

would have obvious survival and developmental benefits, while shirking harder epiphenomenal interpretations in which top-down causation is outlawed. Such causation need not be overtly direct but it must in some sense be indirect. It could, for instance, conceivably operate by influencing certain variables that may in turn affect the distribution of probability factors concerning occurrences on the molecular level. All this is ultimately the product of interactive formation throughout *Big History*.

As to any brain-mind unification theory the critical idea of a dual-aspect monism is taken here to state that the science lying behind the embodied brain on the one hand, and any philosophy of mind on the other, should be considered as two inseparably complementary ways of seeking one underlying unity, 'substance' or 'stuff'. The key question then becomes the nature of such 'stuff'. If we accept the ultimately cosmic connectedness allowing both for the formation and for the necessarily interactive operation of our consciousness, then the next logical step becomes to say that any 'unity' should be traced ultimately to the origin of the 'pregnant' cosmos itself. Taking a scientific perspective on this, perhaps considering a quantum or zero-point field as the original 'stuff' pertaining to some critical, monistic integration in physical terms, might offer a basis for considering the cosmic 'background' for consciousness without straying into panpsychism.[360]

Bohm considers an 'implicate order' within which various stably perceivable structures prove consistently re-levant as explicate approximations concerning a more deeply enfolded reality, approximations necessarily fitted to a given context of encounter. He believes that a cosmically 'enfolded' view of consciousness properly belongs to the implicate order, whose 'measure' is implicit according to the nature of interactivity within the interconnected whole (for which he appeals to the popular metaphor of the hologram for an analogical basis). He relates the enduringly structural properties of human understanding to a conscious appreciation of a continuous 'movement' that is 'sensed' through the co-presence of 'many different but interrelated degrees of transformations'. He therefore considers thought-process to be a motion in its own right, since 'there is a basic similarity between the order of our immediate experience of movement and the implicate order expressed in terms of our thought'.[361]

[360] It is difficult, in my opinion, to avoid converging towards a pantheistic framework if panpsychic approaches are to be considered in relation to any underlying theological significance.
[361] Bohm, *The Implicate Order*, pp.248-255.

From a physical perspective the search for cosmic unity, and ultimately stability, involves many different components of consideration. Any postulation in physics regarding *creatio ex nihilo* concerns not only energy considerations but also the question of information creation, while acknowledging the incompleteness of any model still requiring initial conditions as an input.[362] The new potential for a quantum-influenced view of the cosmos, as advocated by Bohm, is significant, especially where considering cosmic origin is concerned. As part of an argument for taking seriously the idea of consciousness having cosmic resonance and potential, Nelson remarks that

> As physicists developed the means to probe finer scales of nature, their familiar concepts of physicality, certainty, locality and time ceased to conform to their commonsense…The emerging physics reintroduced the apparent necessity for meta-physics. The world it described was an unseen realm of potential out of which the classical world mysteriously coalesced. In this deeply interconnected and holistic reality, notions of choice, information and knowledge emerged as indispensable concepts.[363]

It is relatively undeniable that a substantive space-time (chapter 4), an entire array of material particles, many different forms of energy and that relatively curious entity known as 'information' did indeed all somehow 'coalesce' in a classically causal manner out of this original, hypothetical quantum unity. Furthermore, without any one of these components we would *not* now have the conscious sense of the cosmos that we do. The various components can interact and in some cases even interconvert, even if a robust info-dynamics or scheme of relation between energy and information is still largely lacking. Nelson actually speculates whether information might 'be the nexus between mind and matter, containing intrinsic aspects of both?'[364] However this question might be resolved, interactive coalescence defines an energetically and informatically non-trivial architecture relative to which we may experience that critically compacted sense of proximity interpreted as our mental *topos* or mindscape.

Laszlo also picks up on the information component, noting speculation regarding some extra, fifth ingredient of physics on top of the four better known force-describing fields,

[362] Lincoln and Wasser, *Spontaneous Creation of the Universe Ex Nihilo* (Physics of the Dark Universe, Vol.2, No.4, Dec 2013), pp.195-199.
[363] A. D. Nelson, *Origins of Consciousness: How the Search to Understand the Nature of Consciousness is Leading to a New View of Reality* (Nottingham, Metarising books, 2015), p.168.
[364] *Ibid*, p.36.

and a possible fifth entity, in addition to space, time, matter and energy, that would, he argues, be something like a cosmic evolution parameter, unfolding through the progressive encoding of some 'memory function' allowing for the maintenance of physical consistency and connectedness over time.[365]

The fact remains that the emergence of our conscious awareness and the focusing of our self-conscious identification both ultimately derive from some primal, cosmic unity according to a mysteriously *stabilizing* form of coalescence, the various components of which interact as the cosmos expands and diverges, coalescing and differentiating further on various levels and scales. Modular components or domains of self-organization are thereby able to emerge and further to develop according to some degree of communication between bottom-up and top-down aspects of influence or operation. As such developing unity, ordering and coalescence may then be related theologically to the critical conception of the harmonizing *Logos* it is appropriate to relate such emergent consciousness to our iconic capacity for making such conception, for seeking patterns and generating meaning, and for discerning the relevance of the spatio-temporally diffusive *topos* associated with our mental dynamic (see below).

The ability to self-refer: language, metaphor and sacramental significance

Viewed dynamically, the sacramental significance of the suffering, Incarnate *Logos* and Cosmic Christ[366] manifests itself through a dynamic 'design' of reconciliation of truly cosmic relevance (as per Haught), a design that must be seen in temporally-engaging terms from our perspective. Our self-conscious engagement concerning such perspective is steered and augmented by our developing language, being both dynamically expressive over time and a means by which our intellect may "auto-catalyse" the aforementioned generation of meaning, inseparable from our search for rational intelligibility and ultimately held together, theologically-speaking, through the *Logos*. Through the *Logos* the divine Economy grounds and establishes the complexly connected and dynamically ordered architecture necessary for any creaturely discernment of its 'motioning' and any

[365] E. Laszlo, *The Whispering Pond: A Personal Guide to the Emerging Vision of Science* (Shaftesbury: Element Books, 1996).

[366] Louth is helpful in promoting the important theme of the Cosmic Christ and its association with the pre-existent *Logos*, something he sees as central to Orthodox theology. See A. Louth, *Introducing Eastern Orthodox Theology* (London: SPCK, 2013).Such proves extremely useful, arguably indispensable, to any attempt to integrate a theological framework (systematic or otherwise) with 21st Century scientific epistemic and cosmology.

relevant reception of revelation. In the Incarnation the *Logos* therefore self-refers in a critical sense through an engagement from within created space. Language itself also possesses a critically self-referential aspect, able to draw philosophical insights concerning its own nature and limits. Indeed, the conceptual 'space' that any active development and use of language somehow inhabits can itself come to be considered part of the relevant 'topology' or 'architecture' overall (see below).

As noted in chapter 1, we cannot deny that there is some respect in which we 'make' the world as represented in our mindscape, and that we may sometimes surreptitiously determine the shape of an outcome.[367] Even given the definitional determinacy of our mathematical reasoning, formally represented in notational and axiomatic terms, there still remains a certain indeterminacy regarding our intellectual engagement with our cosmic environment and 'reality'. In Bohm's 'implicate order' the implicate is understood as accommodating many potentially re-levable and contextually re-levant, explicate aspects of encounter, all ultimately interconnected in a manner that is not in itself precisely measurable – or rather, does not correspond to any externally imposed or more strictly locality-preserving 'measure'. Bohm contrasts the 'algebraic terms' in quantum theory, understood to correspond to physical observables, with those terms that are to be 'considered as extensions of the general language' in which, especially as mathematized in modern number theory, such terms become 'undefinable symbols' in the sense that 'the meaning of such a symbol is never directly relevant…only relationships and operations in which these symbols take part are relevant'.[368] Representative correspondence therefore becomes the mark of something made explicate, while the implicate order remains uncommitted in itself to any systematic attribution or 'measure' of relevance. Implication suggests some in-folding, something not unreasonably analogized with a topology, not being necessarily constrained to any *one* explicit measure or metric, accommodating many possible, 'explicate' geometries.

Natural language must also, for its very development, allow for some semantic flexibility with respect to terms first used as markers to keep track of a particular semantic *quality* (in contrast to mathematical quantity) over the course of a developing discussion or thought-process. The manner of understanding indicated by that quality may develop in accordance

[367] Williams notes the irrational and self-determined amazement of the Israelites casting the Golden Calf in Exodus. R. Williams, *Open to Judgement: Sermons and Addresses* (London: DLT, 1994), p.9.
[368] Bohm, *Wholeness and the Implicate Order*, p.206.

with the connotation most naturally accessible or immediately useful to the developing *dynamic* of the context, argument or conversation in question. This is an inevitable fact about how language is, or it would never have developed very far at all. Furthermore, in addition to connotational and denotational aspects of language, it is important to acknowledge a more 'silent', annotational aspect that may further nuance implication.

While ardent formalists sought an abstract scheme of notation that is purely self-consistent and logically infallible, expressed simply through a collection of symbols and rules of operation concerning them, such a system would remain incomplete, as highlighted by Gödel's great insight that certain statements can be consistently contained in formal systems but without being *provable* purely in terms of the rules belonging to the system itself.[369] In this context one is presented with a mutual exclusivity between completeness and consistency. Gödel's intellectual achievement arguably adds to mathematical potential, making truth a more powerful concept than proof, perhaps even accommodating the possible generation of additional axioms (which one might parallel with novelty of insight in the context of natural language). Likewise, in the biological context underpinning self-consciousness, demonstrating the potential inherent in a layered, hierarchical, dynamically-ordered stability and forming a basis for functionally effective communicability, has become a more powerful concept than an overtly mechanistic determinism.

Hofstadter expounds a possible relationship between the implications of self-reference, as occurs in Gödel's illustrative mathematical sentence 'I have no proof in this system', and the phenomenal emergence of our self-consciousness. He suggests an analogy with computer programs, and meta-programs translating other programs, the levels of translation between program and meta-program enabling emergent phenomena to occur as something not reducible to the sum of its parts. He uses the phenomenon of superconductivity as a physical illustration (involving Cooper pairs, polarons, electrons and phonons, virtual photons and positrons all interacting on different levels).[370] He suggests an intriguing analogy between the worlds of *self-reference* in a system of formal mathematical logic and *self-replication* in molecular biology,[371] with such parallels as the

[369] K. Gödel, *On Formally Undecidable Propositions of Principia Mathematica and Related Systems*, available online in PDF.
[370] D. R. Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid* (London: Penguin Books, 1980), pp.285-309.
[371] *Ibid*, pp.495-534.

genetic code and the Gödel code, an amino acid and a quoted symbol of typographical number theory (TNT), strands of DNA and formal strings of TNT symbols, and finally between proteins and statements of meta-TNT. Once tutored in the notational representation used by Gödel, Hofstadter's analogy is efficiently compact, revealing a philosophically intriguing connectedness across what might, at first, seem relatively independent disciplines – comparing the nature of interrelatedness involved in various self-referring feedback systems, or in abstract representations thereof.

While there is ongoing debate between realist and nominalist viewpoints in mathematical philosophy,[372] it is possible, from a more theological perspective, that mathematical principle or pattern could be a reflection of the ontology of the *Mind of the Maker*, according to the 'image' of which we have an iconic capacity for conception. Here it is worth noting Penrose's view that

> There is something important to be gained in regarding mathematical structures as having a reality of their own. For our individual minds are notoriously imprecise, unreliable, and inconsistent in their judgements. The precision, reliability, and consistency that are required by our scientific theories demand something beyond any one of our individual (untrustworthy) minds. In mathematics we find a far greater robustness than can be located in any particular mind. Does this not point to something outside ourselves…?[373]

He states further that

> The Mandelbrot set [on which fractal geometry is based] was certainly no invention of the human mind. The set is just objectively there in the mathematics itself. If it has meaning to assign an actual existence to the Mandelbrot set, then that existence is not within our minds, for no one can fully comprehend the set's endless variety and unlimited complication.[374]

Furthermore, visual displays of mathematical art – such as fractals – are generated by an *iterative* operation. Such iteration indicates a certain critical feedback, the centrality and potential of which for life has already been noted. Applicability of referential language or

[372] See D. Bostock, *Philosophy of Mathematics: An Introduction* (Chichester: Wiley-Blackwell, 2009), pp.261-308.
[373] R. Penrose, *The Road to Reality: A Complete Guide to the Laws of the Universe* (London: Vintage Books, 2005), p.12.
[374] *Ibid*, pp.16-17.

symbolism in general therefore consistently highlights the intriguing and potentially enhancing complexity that a capacity for self-referring feedback can induce.

In the spirit of Popper, Penrose puts forward his own three-world system, the realms of the physical, the mental and the Platonic-mathematical[375] in which the physical world derives its scope entirely from a small section of the Platonic-mathematical world, the mental world derives its scope entirely from a small section of the physical world (which Penrose acknowledges as controversial) and, somewhat surprisingly at first, the Platonic-mathematical world derives its scope entirely from a small section of the mental world. He then offers another similar possibility, in which the condition of 'entirety' is significantly relaxed.[376] The most striking thing about his suggestion, for this thesis, is the mutual within-ness that these interrelated 'worlds' seem to define among themselves. Although still removed from the fully intrinsic interrelation postulated of the perichoretic dance of the Persons of the Trinity, this nonetheless points to the potential inherent in such mutual interrelatedness and integration.

As to an integrated, methodical viewpoint concerning the development of language, Lonergan seeks a means of understanding the method behind linguistic use and development as part of a universal pattern – a pattern necessarily in tune with those already existing, stabilizing patterns that influenced the nature of our embodiment in the first place.[377] Developing this idea, and assuming that 'by inquiring, intelligence anticipates the act of understanding for which it strives', he distinguishes the *form* of such anticipation from those properties involved in the process of developing or generating the relevant conceptual *content*. He also emphasizes the dual complementarity of classical and statistical investigations, according both to types of knowing and to the type of thing consequently known.[378] Classical investigation anticipates the systematic while statistical investigation anticipates some non-systematic manner of deviation therefrom.

Lonergan draws out of these considerations a universal theory of 'emergent probability', finding an integrated worldview in which 'classical and statistical laws can coalesce into a

[375] Penrose, *The Road to Reality*, p.18.
[376] *Ibid*, p.20.
[377] Crowe and Doran, *Collected Works of Bernard Lonergan, Vol.3: Insight* (Toronto: University of Toronto Press, 2013)
[378] *Ibid*, pp.127*ff*.

single unified intelligibility'.[379] The nature of such coalescence (comparing the use of this term to that in the previous section) is then articulated through various terms and conditions by which 'schemes of recurrence' may become established. This resonates with a layered view of stability and Lonergan remarks particularly on the trade-off between stability and development, on the basis that 'schemes with high probabilities of survival tend to imprison materials in their own routines. They provide a highly stable basis for later schemes but they also tend to prevent later schemes from emerging'. The resolution, for him, is to distinguish between a probability of *emergence* and that of *sustenance*, allowing for a context in which the probability of the first is high relative to the second, providing a critical compromise between the sustainable resourcing of some underlying basis for stability and the tendency to surrender certain resources for the purposes of further emergence.

Such emergent probability, forming part of a developing and universal program of human insight, is part of what Lonergan calls a 'world process', which in this context is open and non-deterministic. The intelligibility of this means of considering the development of the relevant 'schemes' is considered to be 'immanent' in such world process and 'since empirical method aims at such an immanent intelligibility, emergent probability is a view of world order within the limits of empirical method'.[380] In conceptual terms, language is similarly reliant, both for its development and for its sustainable consistency of usefulness, on various levels or schemes of stability, not least grammatical stability.

In a contemporary review of the legacy of Lonergan's philosophy, Beards eruditely remarks, on the context of *any* philosophical debate regarding meaning, that

> The operational condition of possibility of all such debates is the basic, flexible yet pervasive conditional and evaluative structure that Lonergan outlines, identifying recurrent semantic structures…further situated in structural anthropological patterns of pre-conscious and conscious kinds that have their place in the genetic and dialectical unfolding of communal meaning and meaninglessness…[381]

The capacity for reflection on language and meaning is likewise taken here as something deeply integrated with our anthropological development, the consideration of different

[379] *Ibid*, pp.140*ff*.
[380] *Ibid*, p.151.
[381] A. Beards, *Lonergan, Meaning and Method: Philosophical Essays* (London: Bloomsbury, 2016), p.258.

qualifications of 'consciousness' and some appreciation of the finite limits to our capacity for making sense.

The twentieth century saw various contexts of debate concerning language, from Frege's axiomatic system of reference and semantic value, to challenges based upon distinction between semantic value and sense, questions concerning the subjunctive, the empirical demand for verification and the potential ambiguity of translation from one linguistic basis to another.[382] For present purposes, however, the key point remains that language, being naturally applicable in a self-analysing manner, is an obvious elucidatory tool for highlighting the possible consequences of a capacity, albeit finite, for self-reference.

Sayers suggests that 'all language about everything is analogical; we think in a series of metaphors. We can explain nothing in terms of itself but only in terms of other things'.[383] This is only partially helpful, however, as it doesn't seem to allow for any cogent means of considering something to be 'literal'. By juxtaposing the word 'explain' with the word 'think' Sayers is also presumably intending by 'thought' that which can, on principle, become specifically articulated through speech – articulating a thought-process whose roots are subliminal.

As to considering the nature of metaphor, Lycan expresses the context of the problem as the need to find a compromise between two refuted extremes, one claiming metaphor as being a convenient, shorthand alternative to a literal, referentially symmetric simile – A being to B in the same way as B is to A – and the other transferring the nature of the comparison to a psychological causation.[384]

In an in-depth analysis, Soskice notes the Greek conception of metaphor as, in its root meaning of 'transference', an extension or decoration of language, and couches this conception within a linguistic context that must realistically be a blend of the 'natural' and the 'conventional', which cannot act against the 'natural' to too great a degree. Definitional problems then occur in applying the idea of speaking about one thing in terms indicative (but not necessarily representational) of another, given that the context may not necessarily afford the *exclusive* situation of metaphor in either the physical or the mental domain. Metaphor must, most simply, usefully apply one context to another and Soskice

[382] See A. Miller, *Philosophy of Language* (London: Routledge, 2007).
[383] Sayers, *The Mind of the Maker*, p.23.
[384] W. G. Lycan, *Philosophy of Language: A Contemporary Introduction* (New York: Routledge, 2008), pp.175-190.

considers that metaphor is not syntactically well-defined, not necessarily pertaining to any one definitive conceptual structure or order.[385]

She refers subsequently to an 'irreducibility' regarding metaphor, particularly in the context of religious metaphors and those that 'can only be redescribed by other metaphors'.[386] In relation to scientific language, she also notes the distinction between homeomorphic and paramorphic models: cases in which, respectively, the subject of the model acts as its own source or it does not.[387] The homeomorphic case is of particular interest in the context of self-reference, and both concepts of irreducibility and homeomorphism are topological classifications – the latter indicating the possibility of making one shape into another by continuous reformation such as bending or stretching, but not tearing or puncturing.

Appealing further to the idea of 'closure', a concept relevant to set theory and topological analysis, one might (metaphorically) apply this concept to a situation in which the aforementioned 'transference' relates back to the subject providing the basis for such transference, closing the referential domain in question in such a way as to *enhance* any 'decoration' of language or manner of representation. This is similar to Lewis' aforementioned illustration of the Sun shining on a representation of itself and relates to the question of how sacramental significance becomes encounterable, a signifier not just being brought into significant effect by that being signified, but rather with the means of signification being actively enhanced and transformed by the communicating activity of the signified.

Given the accumulation of topologically applicable terminology, one could extend this linguistic analogy to consider orders of topological 'genus'. Any one genus is not continuously deformable into another, so a metaphorical application of this term to considering various levels of representative significance would suggest some layered stabilization over a hierarchy. Of relevance to the conceptual 'topology' of our mindscape, one could therefore consider a semantic hierarchy. The *literal*, or the surface impression, indicating the effect of those physical 'impulses' stimulating our more innate capacity for representation, would then constitute the lowest genus in such a hierarchy. Above this would lie the genus of the *symbolic*, something one step removed from the 'literal'

[385] J. Soskice, *Metaphor and Religious Language* (Oxford: OUP, 1985), p.1 and pp.15-19.
[386] *Ibid*, pp.93*ff*.
[387] *Ibid*, pp.102-103.

according to a more overtly deliberated, re-represented analysis or evaluation of contextual relevance. Above this would lie the representationally enhancing genus of the *sacramental*, bringing in a deeper sense of participation. Beyond even this lies the genus of the *eschatological*, something only indirectly appreciable to us now. Finally, everything still ultimately remains overshadowed by that which is immanent to divinity, *unimaginable* to us on theoretical principle.

One could then think of the particular 'topological class' pertaining, in this analogy, to metaphor as being able to accommodate a whole family of grammatical or syntactical 'geometries'. This fits with Soskice's general treatment of metaphor, while further suggesting a means of analogy between the topological and the semantic: representing linguistic relations and interconnectedness in topological terms and suggesting analogously qualified levels of stability in the conceptual, linguistic domain of our mindscape. Taken as a whole this ultimately collective and interconnected mindscape is open and indeterminate, a product of bottom-up emergence (as represented, for instance, through Lonergan's 'world process') and top-down bestowal in terms of its iconic capacity for theological conception and active participation. This 'topology' then supports our appreciable generation of meaning.

Theologically, our entire capacity for such appreciation ultimately originates through the *Logos*, in accordance with the 'motioning' of the divine Economy. Through the Incarnation the *topos* associated with such Creative Activity becomes sense-objectified and the sacramental significance of the temporally-engaging, Incarnate *Logos* is once again taken here as inseparable from a dynamic, pervasive 'design' of objective reconciliation – a reconciliation made manifest through some collectively renewed conception (cf. 1 Corinthians 2:6-10). Before considering this dynamic more fully from a theological perspective, something ought first briefly to be said about the anthropological origins of the concept of *logos* and its special relevance to us as linguistic and theological creatures.

The developing concept of *logos*

Linguistic capacity is inseparable not only from genetically indelible, formational history but also from various second-order activities believed to be an additional aid to survival, maintaining and developing community once rudimentary language, mainly gesticulatory

at first, emerged. Such activities might occur under the broadest and most general description of 'ritual'. In a seminal study, Rappaport determines to

> …"unpack" a definition of ritual, in the course of which the sacred, the numinous, the occult, the divine, and the Holy, will be derived, and it will further be argued that social contract, morality, a paradigm of creation, the conception of time and eternity…and those orderings of the world that we shall call *logoi*…are all entailments of and are generated out of that form.[388]

It could be that our most basic symbols, natural and lexical, are more the product of first-order evolutionary struggle for survival while grammatical consideration is more closely attached to second-order, ritualistic habits over human history.[389] Like Appleton and Dutton, Rappaport sees the development of language's attachment to 'worlds parallel to the actual' as a fundamental step forward in the speedier, linguistic aspect of evolution and considers that language forms us as much as we form it.[390] Furthermore, the nature of information carried by such symbolism is different from that carried by genes.[391] Ours is an inherently self-relating world, and over time the fixed aspects of our conceptual capacity run the risk of imprisoning us, not dissimilarly to McGilchrist's concern, in what Rappaport calls 'the great inversion'.[392] Language may inform or reinforce our sense of self-consciousness while the context of our self-consciousness in turn influences our use of language. Rappaport distinguishes between a symbol and an index – the latter being a sign genuinely brought into effect by the thing being indicated.[393] Where consciousness is concerned, this understanding fits Greenfield's emphasis on the importance of establishing *indices* that relate specifically to consciousness, things that are not present unless consciousness is also present.[394]

Rappaport defines ritual as 'the performance of more or less invariant sequences of formal acts and utterances not entirely encoded by the performers'[395] and claims that this 'logically entails the establishment of convention, the sealing of social contract, the

[388] R. A. Rappaport, *Ritual and Religion in the Making of Humanity* (Cambridge: CUP, 1999), p.3.
[389] *Ibid*, p.4.
[390] *Ibid*, pp.5-7.
[391] *Ibid*, p.8.
[392] *Ibid*, p.9.
[393] *Ibid*, p.14.
[394] Blackmore, *Conversations on Consciousness*, pp.92*ff*.
[395] Rappaport, *Ritual and Religion in the Making of Humanity*, p.24.

construction of the integrated conventional orders we shall call *logoi*'.[396] Ritual is seen, historically, as shaping some communally accepted means of understanding, establishing forms of activity that produce variegation either by conforming with, or rebelling against, some accepted convention. At first Rappaport relates his discussion of *logoi* to the self-correspondence of some putative, unquestionable liturgical postulate, in which a truth value that would usually be relative to an investigation of something lying outside of itself is made absolute simply by corresponding *to itself*, so that 'the correspondence theory of truth remains intact but…"stood on its head"'.[397] 'Logos' is then, singularly, taken to refer to an unimpeachable, 'divinely ordained cosmic order' against which all aspects of convention may be judged to be in, or out of, congruence.[398] This fits with the conception of the *Logos* as the image of harmonious cosmic rationality.

The historical progression in the meaning of the term is noted, from 'collection/gathering' through 'constructed speech' to 'ground/reflection' and, in its interaction with mathematics, 'order/measure'.[399] Theologically the concept is relevant both to the Greek understanding of truth as non-concealment and to the Hebraic understanding of all-encompassment, a harmony guaranteed ultimately by the fact that God is the one 'speaking' or 'seeing'. Rappaport notes Heraclitus' illustration of bow and lyre, in that

> In both there must be forces working in opposite directions if they are to perform as bows and lyres. This harmony, being a harmony that contains flux, conflict and tension as well as easy agreement, is hidden; nevertheless, it is in its true nature ultimately accessible to those who will heed it, that is, hear it and follow in order.[400]

Recalling the aforementioned 'tension' of interaction between Uncreated and created, such tension may likewise be taken to relate to a partially 'hidden' harmony, a theologically significant 'implicate order' unfoldable or revealable with respect to human encounter according to some proper 'order' or 'measure'. Such encounter is ultimately defined according to the 'measure' of the *Logos* through whom created 'order' derives, and most profoundly so in 'becoming flesh'. This shaping and directing of our conceiving encounter is considered here in terms of the settling of some critical, eschatologically-orienting

[396] *Ibid*, p.27.
[397] *Ibid*, p.344.
[398] *Ibid*, p.346.
[399] *Ibid*, p.347.
[400] *Ibid*, p.349.

'trajectory' (returning to Wood's phrase) with respect to the motioning of the divine Economy throughout created space. The aforementioned created *bond* securing cosmic harmony and stability in physical terms must therefore be considered in terms relevant to a Christological framework. In order better to relate this framework to the aforementioned dynamic design of reconciliation – considered holistically as a dramatic, cosmic *artwork* – an appropriate dual-aspect bond/dynamic will be borrowed from the philosophy of art through a consideration of form and content.

Form and content

Some engagement with the philosophy of art forms a natural corollary to considering the creative mind. One needs to ask what it is *in* art that arrests our attention to consider something *as* art. 'Attention' is neither a unitary nor a trivial matter. Engle makes the distinction between alerting, orienting and executive attention in terms, respectively, of readying, selecting/discriminating and finally controlling the *content* of focus.[401] Attentiveness is a changing, dynamic process, with semantic interpretation coming through that dynamic and memory playing an importantly active role, as noted above.

While most artistic representation is obviously in some way reliant upon a distribution over space, one must also consider distribution over time (chapter 4), allowing music and problem-solving as forms of art. Furthermore, when taking a cosmic perspective, the spatio-temporal inextricability of relativity theory may well have both logical and eschatological bearing if the Artwork of Creation is considered holistically.

Taking the *Logos* as the principal, rationalizing, formalizing and harmonizing factor or dynamic 'Principle' – any 'conception' of which must consist in, and occur throughout, some representative dynamic – the associated hypostasis is not merely some inert "container" for rational structure. Rather, it acts as Mediator, according to the kenosis of God's Creative Activity, of a wider theological intelligibility concerning the relationship of God to all that is not God, thereby acting as 'the foundation of analogy' by virtue of which theological relevance may be witnessed according to a distinct, finite, creaturely freedom. The 'difference' or 'distance' between Creator and creature is here interpretable as an *opening* or 'excess' such that 'in the relation of creature to Creator difference

[401] R. W. Engle, *Working Memory: The Mind is Richer than the Models*, in Roediger, Dudai and Fitzpatrick, *Science of Memory*, pp.159-164.

increasingly opens out – as space for movement, not as alienation'.[402] This communicative interconnectedness, facilitating creative opening, is consonant with the topological model here. Our physically contoured, finite, actively participating and theologically proper *topos*, capable of generating meaningful content, is furthermore appropriated by divine nature in the Incarnation.

The principles of active, communal contemplation, of 'seeing the form' of revelation, of cosmic dimensionality and of the narrative interaction of divine-human encounter, enveloping the view of theology as drama, constitute hallmarks of Balthasar's theology.[403] His approach suggests, as does that of Sayers, some complementary philosophical consideration of the nature of an artwork, in this case with respect to a supra-cosmic initiation of such drama.

Balthasar's approach is couched within a framework of 'tension between immanence and transcendence – a tension that is fundamental to human existence in the world, and especially to the issue of how contingent human creatures can be said to act in freedom'.[404] To Balthasar, creaturely freedom needs to become 'appropriately oriented to that greatest horizon of meaning, the eschatological', with such orientation occurring through Christ but in such a way that 'Jesus is aware of the formal scope of his mission, but uncertain of its content'.[405] A philosophical consideration of art in such a context would therefore do well to base itself upon the concepts of form (or that which is formal or formalizing) and content. The word 'content' suggests something being 'held together' and therefore poses the question as to what effects or contributes to the holding, or stabilizing. In the case of some living art this holding, stabilizing aspect must, furthermore, provide a reliable basis in accordance with which any contributory content may progressively be generated as 'from within' the artwork itself.

From a philosophical perspective, Carroll rejects the sufficiency of representational and expressivist theories of art, owing to their respective ignorance of abstract art, music and dance on the one hand and purely noetic pleasure on the other.[406] He looks at the original

[402] R. Williams, *Balthasar and the Trinity*, in Oakes and Moss, *The Cambridge Companion to Hans Urs von Balthasar* (Cambridge: CUP, 2004), pp.37-43 and 47*ff.*
[403] B. Quash, *Theodrama*, in Oakes and Moss, *The Cambridge Companion to Hans Urs von Balthasar*, pp.143*ff.*
[404] *Ibid*, pp.148-149.
[405] *Ibid*, pp.149-150.
[406] N. Carroll, *Philosophy of Art*: *A Contemporary Introduction* (London: Routledge, 1999).

development of twentieth century formalism, considering its weakness to have been that consideration of 'content' was not treated in a manner sufficiently inseparable from any significance of 'form'. He moves therefore towards a neo-formalist approach involving *form-content interaction*. This form-content philosophy will be nuanced here to enable a clearer relation to be made with key theological principles, especially the Incarnation and the Transfiguration.

The working out of the Incarnation, involving an associated transformation or transfiguration, is here considered inseparable from a proper theological contemplation of a cosmic, form-content dynamic. The word 'transfiguration' is arguably more particular than 'transformation', a *figure* being more clearly specific to a particular function (something specifically *configured*) than some generic 'form'. In this sense trans-figuration might suggest a re-configuration of the living dynamic, 'drawing' human nature and the cosmic Artwork of Creation into a new domain, 'fit' for eternal life. Considering the active, preparatory, prefiguring involvement of divine Creative Activity for the Incarnation and its transfiguring outworking, Balthasar's theology of the place of Mary is again noteworthy, summarized by Gardner as 'a type of the Church...prefiguring us for us'.[407] The transfiguring initiative itself is here specifically on the 'side' of divinity.

It can be difficult to define precisely what is intended by form or content. An obvious, somewhat superficial attempt is to relate form to something like a champagne flute and content to the champagne within.[408] This idea seems, in one respect, theologically appealing. One could see the realm of material existence 'in earth' as lacking independent definition in itself, being at first a formless entity only given shape by divine, formalising Activity. A little thought, however, should convince us that there are issues with this representation. One central problem is that in many, if not most, practical artistic applications it is very difficult to distinguish precisely between the contained and the container. As Carroll points out, content of joy and elation in the reception of a piece of music cannot really be separated from the underlying musical structures, neither can it necessarily be said to be contained by them.[409] In the flute-champagne example the two are separable, in the musical example they cannot be.

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[407] L. Gardner, *Balthasar and the Figure of Mary*, in Oakes and Moss, *The Cambridge Companion to Hans Urs von Balthasar*, p.68.
[408] Carroll, *Philosophy of Art*,p.126.
[409] *Ibid*, p.126.

The theological case adds an additional consideration. On principle the *Logos* as a divine hypostasis has being regardless of whether or not there is a materially manifest creation, but not vice versa. The formalising or form-giving factor is, on this reckoning, essentially independent of *physically manifest* form or content.

Another unhelpful temptation is to conflate content and meaning, seeing form merely as the way in which meaning is presented. Any sentence, artistic or otherwise, may broadly fit this idea, as Carroll notes.[410] Any philosophy of art then pivots on how one might define an appropriate relation between meaning and its manner of (re)presentation if something is to be considered an artwork, inevitably leading to some positions that are arguably too narrow and others that are too inclusive.

The sentence analogy is also potentially misleading. Is it really appropriate to conflate meaning with content when clearly the grammatical form of a sentence in itself carries semantic implication, and therefore potential content, just as much as it shapes or presents it? Each word could be seen as an element of any content while also having its own grammatical or formal classification: noun, verb, preposition etc. Form carries semantic aspect in itself, relatively independent of context though difficult (or impossible) fully to define in its absence. Meaning is, furthermore, not just some inert, hypothetical content. Artistically-speaking, considered over a temporal process, it has a self-influencing life of its own, especially considering the interpretative participation of both artist/author and audience. Overall the most sensible view might be that meaning is the product of particular modes of *interaction* within an otherwise inseparable form-content bond or dynamic. Different types of interaction then produce different types/levels of meaning, as common to interpretative experience.

The problem remains, however, as to what particular understanding to assign to the individual terms 'form' and 'content'. Carroll notes the danger of conflating these terms,[411] something which would involve a disastrous loss of distinction within many theological contexts of application. Perhaps the champagne example can yet prove useful, however. Is it true to say that the champagne has no form in itself? Clearly that is only the case if form is understood solely in the narrowest sense of solid, geometric, visible property. A theological analogy of such an understanding would be rather like claiming

[410] *Ibid,* p.127.
[411] *Ibid,* p.138.

not that the *Logos* was able to assume a human nature, but that it was *unable* to have any form apart from that visible in the Incarnation, begging serious questions regarding its nature or status in priority to the Incarnation, and any 'pre-existence' of Christ. The *Logos* is necessary to give form to 'the earth' rather than vice versa. In the above analogy, however, the champagne has a chemical form, and for that matter some formula, or admixture of formulae, something 'hidden' in the sense of not being directly visible through the external context of its appearance. Keeping the concepts of form and content distinct, there are two ways in which one could therefore conceive of an 'artwork' of champagne.

One could consider form in terms of the underlying molecular structure, dictated by the physical chemistry, and any content as emerging through the context in which the champagne is viewed, whether as a jagged mass in mid-air or as a puddle on the floor (no glass now being necessary). Such content is not the 'meaning' as such but more generally an aspect of mental *impression*, while the form remains, superficially speaking, in some hidden chemical consistency.

One could, conversely, view the form as the visible shape of the flow, still inseparable from the physical laws producing it, and the content as some acquirable (or already assumed) knowledge of chemical property and its physical consequences, limiting the array of possibilities for how any hypothetical 'flow' could on principle be *expressed*. In the case of the cosmic Artwork, acquiring some degree of knowledge regarding at first hidden properties is inseparable from appreciating some greater, *collective context* lying behind all those various patterns, of whatever degree of meaningfulness or relevance, that are expressible or explicable, on physical principle, within the Artwork.

Both of these perspectives provide a certain insight with respect to forming a vocabulary suitable for distinguishing, rather than separating, form and content within a dynamic unity of interaction. In relation to the theological context concerning the *Logos* and its Incarnation one may of course prefer that 'form' should not be understood in a physically confining or outwardly superficial sense. Theological viewpoint would more naturally conceive of form (as an overarching or undergirding concept) as some at least partially hidden property, invisible to us in any absolute sense, but nonetheless open to partial discernment by our particular, iconic mode of investigative intelligence. Such 'discernment' operates from within the very same created domain to which the Creative

Activity of the *Logos* grants a possible plethora of explicate structures, outwardly visible 'forms' held together according to some deeper, dynamic and implicate formality or order.

Equally, such 'discernment' necessarily occurs through an appreciation of many possible *contexts of impression* we might encounter, and their affect on any evaluation of 'relevance'. As our attention mechanisms are contextually transient, the various foci of such attentiveness also need to be integrated over some relevant time period. Together, as a whole greater than the sum of its parts, these contexts may facilitate some macroscopic impression of cosmic, theologically significant content, generated in necessary accordance with our operative idiom of engagement. The overall plethora of outwardly visible forms or structures ultimately shares some common origin 'in a/the beginning'. One might compare this to the big goal in physics to find certain initial conditions pertaining to the cosmos back at the stage at which all the natural forces of our present cosmic era might have been unified in one single force.

Within this pervading, holistic view of cosmic unification, any overall associated content is only truly discernible according to some overall impression, integrated over the spatio-temporally differentiated array of contexts that are physically expressible or explicable (and thus encounterable) in created space. Furthermore, such overall association of content should properly be considered ultimately according to a *shared impression*, something 'afforded' to a collective consciousness or mindscape pertaining to human nature as a whole and relevant to its eschatological dimension. Such collectiveness is argued here as being sacramentally manifest and enhanced according to our communing participation in the Mind of Christ, in whom the aforementioned 'formalising factor' submits to novelty of encounter or 'impression' in the Incarnation.

Considered in any non-sacramental framework such impression would be fragmented owing to the many possible, individual contexts influencing subjective interpretation or generation of meaning. Even in this case, however, the predominantly shared dynamics of our embodiment might suggest that, to a large extent, some overall impression could still reasonably be postulated as being shared by humanity collectively, and a participative, sacramental framework further enhances the significance of this. Therefore, just as one may distinguish between more superficial, outer structures and some deeper inwardness of form – something genuinely participated in or according to – so too one may distinguish a more superficial content, relating to subjective impression, from some greater, objective

content generated (or even regenerated) according to an integrated impression made upon a sacramentally connected and collective consciousness overall. This could then be understood theologically in the declaration of the Incarnate *Logos* that, when He was lifted up from the at first formless 'earth', He would draw all things to Himself.

In Genesis, appreciation of outer forms, types or structures is facilitated by a differential act of separation and some filling up of the resulting domains. Through the Creative Activity of the *Logos* differentiation and integration are held in perfect balance, hence the harmonious rationality. The 'lifting up' of the Incarnate *Logos* then makes the transfiguring effect of the outworking of the Incarnation a focal point of theological *relevance*. The consequent drawing together of integrated, meaningful content then constitutes a plausible basis for appreciating the effect of the Transfiguration: all relevantly generated 'content' being reconfigured in accordance with it being encountered, or 'seen' afresh by divinity in a unique manner through the assumed and perfected humanity of Christ – an encounter encompassing everything of relevance to the physical formation and dynamic stability of human nature and its iconic capacity for theologically meaningful encounter. This effectively develops the Baluwski/Watkins idea noted in the Introduction. Our collective share in the Mind of Christ indicates something far greater than a sum of parts, in the world but not of the world, sustained according to a 'remembering' Eucharistic activity (chapter 5) that is not merely a passive recollection but an active invocation, involving participate human self-consciousness and memory.

Communal memory is not fully accessible by any one individual, but something 'known only in part' (cf. 1 Corinthians 13:9). Likewise, any overall, collective content is not graspable as-a-whole by any one individual. However, just as the many different types or aspects of any healthy individual's memory somehow manage cooperatively to interact so as to present just *one* overall sense of self-identity, one personality and one autobiographical memory; so too one might suggest some greater integration accommodating just one autobiographical self-identity in the Church as the Body of which Christ is the Head. Such integration is enabled by the Holy Spirit, advocating, witnessing and re-minding. The Transfiguration therefore promises a revelation of those 'greater things than these' (cf. John 1:50 and 14:12) which are already latent in the prospective content of what Christ has achieved for and initiated in the Church. The critically unique topology of connectedness pertaining to the incarnate Mind in question is one uniting the impartial, undifferentiated regard of divinity with the operational idiom pertaining to the

creative mind of the creature. Our potential for generating meaningful 'content', more deeply appreciating our theological 'prospect' in so doing, is enabled by and drawn into that in which our creative activity participates.

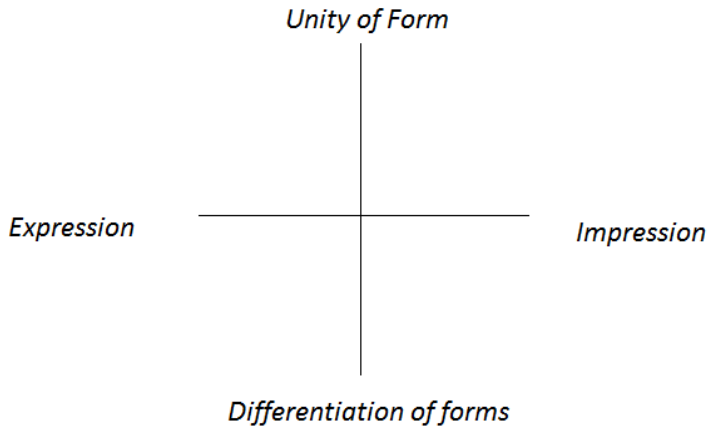
Returning to the understanding of types/levels of meaning emerging from different modes/dimensions of interaction within an inseparable form-content bond, one may define some **formal (or formalizing) aspect** as manifesting itself within a proper balance between integrated unity and differentiated diversity. One may then define an inseparable, complementary **contential aspect** as manifesting itself within the necessary balance between *impression* and *expression* with respect to any context of encounter. Where any overall, holistic content is concerned this balance may be considered sacramentally enhanced inasmuch as an original creative 'expression' through the *Logos* is 'drawn' back into the *Mind of the Maker* as a result of being (re)encountered as a critical 'impression' upon the Mind of the Incarnate *Logos*. The bi-directionality implied by the respective prefixes *im-* and *ex-* is then similar to the bi-directional 'tension' postulated in the working definition concerning a basis for sacramentality in the Introduction.

Given this use of vocabulary it is noteworthy that Torrance uses the term 'intelligible impression' in discussing the manner in which medieval theology considered the 'active intellect' to provide a grounding for the necessary objectification of some received image.[412] The interpretative freedom of such active intellect is graduated in conjunction with those formal features or structures manifest within the created domain. From our perspective therefore, formal and contential aspects are inseparable from one another. I have chosen this nuanced redefinition, attaching the notions of 'form' and 'content' as attributive, adjectival qualifications within a dual-aspect dynamic, partly in order to accommodate the aforementioned dynamic inherent in the inevitably shifting aspects of human attentional focus. However, the above formulation also arguably skirts around Carroll's objection to neo-formalism on the grounds that 'not all works of art possess content'.[413] Furthermore, the term 'aspect' emphasizes the inherently holistic overview, one aspect occurring in tandem and dynamic unity with the other, not dissimilarly to the history of the proverbial, content-pregnant egg developing in tandem with the formal changes in that which produced it. Dynamic, evolutionary inseparability between the two produces a particular, symbiotic co-evolution. The holistic, creative relationship between

[412] Torrance, *Theological Science*, p.77.
[413] Carroll, *Philosophy of Art*, p.153.

*Logos* and cosmos may conceivably be considered according to a not entirely dissimilar dynamic – a theologically-accentuated form-content bond.

The summary diagram below represents formal and contential aspects as orthogonal but still inseparable axes.




Rather than risking some purely psychological subjectivity or pretending any unbridled objectivity, one could (like Frege) appeal to the permissible manner or sense in which something is communicable to human cognition.[414] Any 'contential aspect' to cognitive activity is related to the manner or sense of impression upon the human mind, provoking and mediating some responsive expression of the same mind through resulting, self-conscious behaviour. As to this 'expression' potentially having, in turn, any impressive theological influence, any such influence should be seen as a participating invocation rather than a provocation.

The suggested formulation can be related to Sayers' analogy inasmuch as the formal aspect may relate to the fact that the integral Creative Idea is communicated through the Creative Activity in a manner accommodating a dynamically representative, harmonious differentiation within created space. The contential aspect may then relate to the fact that the Creative Activity impresses itself, in Creative Power and in terms of its effect within

[414] C. Tolley, *Kant on the Content of Cognition* (European Journal of Philosophy, Vol.22, No.2, June 2014), pp.200-228.

created space, in a manner inducing some meaningful expressiveness from human nature, evoking a 'response in the lively soul'.[415]

Balthasar refers to the 'impress and the shadow of Trinitarian life in all realms of the world' as playing a major part in the developments of Western theology, 'trusting in the inferential development of the created mind'.[416] Here such 'impress' is related to our cognitive ability to attend, focus and generate meaningful conceptual content. The above representation is I believe complementary to Balthasar's theology, especially considering the influence thereon by Maximus. Balthasar sees in Maximus' work a collection of polarities, including that between participator and participated, indicating some 'inner movement...the underlying rhythm of being in the world...the precise place where God is present, where his incomparable otherness appears'.[417]

Complete otherness is a hallmark of negative theology but such still requires complementary, positive input in order to bring the implications of its claims into more robust accordance with a lived experience of revelation. Human experience or perspective must, however, be distinguished in terms of its concentrated attention, its focal compactness and the composite nature of our physical embodiment. Divine Being is then the origin of all compositional synthesis while in itself being non-compositional and beyond the synthetic. Balthasar looks to Maximus' development of cosmic synthesis, beginning with the classical triad of *genesis*, *kinesis* and *stasis*, and with the concept of motion being understood as expressing the distinction between origin and goal for any creative process of transition towards an eschatological identity in which Alpha and Omega, initial and ultimate, are in unity.

In relation to our epistemological capacity, considering knowing and unknowing as part of a dialectic between motion and rest, the ultimate source and destiny of such 'rest' is that which is unimaginable or inconceivable in its necessary absoluteness, pertaining to that peace passing all creaturely understanding.[418] Here the *Logos* is represented according to the dynamic behind the 'dawning realization of all things'.[419] The at first paradoxical

[415] *Ibid*, p.38.
[416] H. U. von Balthasar, *Cosmic Liturgy: The Universe According to Maximus the Confessor* (San Francisco: Ignatius Press, 2003), p.97.
[417] *Ibid*, p.87.
[418] *Ibid*, p.93.
[419] *Ibid*, p.95.

conceivability of the economically revealed *Logos* remains topologically central, and as Balthasar comments (on Maximus)

> Even if his style of thought is...one of a progressive synthesizing of poles, tensions, limited differences, all of which – when thrown into the melting pot of the Logos – are meant to rise from his fire as complete, simple wisdom: still he realizes, with utter clarity and certainty, not only that this unity can never be the result of our own laborious intent, but also that God always remains something infinitely other than the unifying idea of the world.[420]

Theologically our contemplative or conceptual engagement involves an 'imagination' or *doxa* that is 'the Platonic opposite to causal explanation, since causality in God can never be obvious or accessible to our minds'.[421] In the Incarnation, however, we are able to discern the inconceivable as being active in economically manifesting its own self-conception in as far as such is possible in physical, finite terms.

Finite motion always relates to some concept of 'interval' and intervals are contained according to a finitude represented (for Maximus) by the fundamentally ontological category of space, while time is seen as a 'scattering of being that inevitably accompanies finitude' and effects an inevitable contrast between composite, synthetic being and pure, 'simple' Being.[422] According to a modern scientific outlook, chapter 4 will consider space-time as an ontological category that is substantively influential, having consequences for our reception and appreciation of revelation. Any infinite Motion, or Self-Motioning within the Immanent Trinity, then pertains to a fundamentally distinct, humanly inconceivable ontology.

The God-cosmos relationship consists in the economic communication pertaining to divine 'motioning'; the humanity-cosmos relationship emerges through the compositional contingency of our finite, becoming 'movement' in space-time. An interactive, bi-idiomatic cooperation between these two in Christ then opens the way for the revelation of our fuller theological relevance, the ultimately *conceivable* 'prospect' of which is the eschatological establishment of all meaningful, becoming content generated within the objectifying limitations of the finite. Such limitations are inseparable from those formal

[420] *Ibid*, p.96.
[421] *Ibid*, p.104.
[422] *Ibid*, pp.137*ff*.

principles giving necessary definition to the finite – principles derived and established through the *Logos*.

Maximus considers temporal fulfilment according to a form of closure, but with divine initiative 'elevating the creature' into the inevitable beyondness implied by such closure. Closure, in this sense, defines the manner by which we are able to appreciate the *openness* of what lies beyond, again a topological conception. Balthasar gleans from Maximus the treatment of a 'nature' as some 'organized motion', a harmony ultimately centred on the *Logos*. Theosis is then initiated from beyond such a nature, made newly effective through the Incarnation and highlighting an eschatological openness with respect to our contingent and relative closure 'in earth'.[423]

A balance between macro and micro contexts of consideration is maintained according to a reciprocity between universal generalization as a 'real ontological condition' and individual particularity, for which the universal is both the ground and the result in Maximus' thinking. Balthasar notes that the 'changeless stability' of universal being (or unity) is continually regenerated or reintegrated, as from below, by the 'developing stability' pertaining to differentiated particularity – something interpreted 'on the level of ideas' rather than over time as some strictly linear progression.[424] From a scientifically-engaged perspective, however, time clearly cannot be separated from our developing capacity for engagement through particular principles and ideas. Some scientifically tenable conception of a *physically* 'developing stability' over time is therefore an importantly complementary consideration in this respect (chapter 5). As described earlier, such developing stability allows our compositely embodied means of conceiving to emerge. The meaningful relevance of any 'content' thereby generated may then be drawn and held together through a Christ-oriented 'motioning' towards eschatological rest, a motioning having the aforementioned 'changeless stability' as its source.

Rest does not imply absence of content, 'the quieting of the heart's urgent quest does not at all have the character of self-abandonment, in Maximus, but contains in itself the full truth and positive implications of motion'.[425] While the psychological goal of rest ultimately transcends finite motion, Maximus' view of grace is as the transcending of a 'self-contained nature'. Balthasar summarizes that 'the being that has been projected into

[423] *Ibid*, p.151.
[424] *Ibid*, p.159.
[425] *Ibid*, p.142.

existence cannot achieve for itself the condition of rest...it can only assimilate to itself the ontological direction of its own being'.[426]

The polarities of universal-particular and subject-object are equally weighted or valued on either side for Maximus, and the macrocosm is a unity that provides a natural limit to differentiation, indicating some final synthesis. Any proper *topos* relevant to our participation therein must be appropriately interconnected according to the entirety of this unified whole.[427] This complements the above consideration of consciousness as physically connected and imbued with a cosmic dimensionality and significance. The macrocosm is mirrored in the microcosm, in a critical balance of association between the material and the intellectual. Balthasar remarks that

> Man, as an intellectual and material microcosm, thus appears both as the midpoint of a universe arranged in a polar pattern and as its final synthesis. Insofar as he is at the same time the subject of his knowledge, through his intellect, and its object, through his body, he becomes both the world's axis and its system of coordinates, where its horizontal and vertical polarities cross. He stands in the middle...drawn into the internal mechanism of the macrocosm.[428]

In the above representation of formal and contential axes, if considered now as polarities, we already have a unity-differentiation polarity regarding the material realm. The intellect, fostered according to some material impression, may then express itself in such a manner that influences the material cosmos and the form of impression made upon it. The human being can therefore be considered a microcosmic centre of appreciation and activity within a macrocosmic Artwork, dynamically representing it according to having the capacity for a particular idiom of encounter and operation within it – an encounter whose ultimate significance must be integrated over all participating generations. This integration occurs with the deepest theological relevance in the perfected humanity of Christ.

As noted previously, Bohm considers thought-process as a collective movement, by which memory is impressed upon by the 'general environment' and may in turn express itself through a reciprocally influential impression upon the same environment. He thinks of our mindscape in terms of a mental 'dance' and states that 'thought is a material process

[426] *Ibid*, p.145.
[427] *Ibid*, pp.171-173.
[428] *Ibid*, p.175. Divine intention for humanity is macrocosmic in Maximus' thought. See O. Clément, *The Roots of Christian Mysticism* (London: New City, 2002), p.78.

whose content is the total response of memory, including feelings, muscular reactions and even physical sensations that merge with and flow out of the whole response'.[429] As to the stability of any flux or movement regarding our thought-process, Bohm emphasizes the relativity of such stability with respect to the physicality of the process. Furthermore, thought itself is, for Bohm, very much to be viewed as art, maintaining that 'ultimately, the actual movement of thought embodying any particular notion of totality has to be seen as a process, with ever changing form and content'. Formal aspect, in his description, is indicative of an 'order of movement', something providing a 'disposition needed for the mind to engage harmoniously in such a movement'.[430] Content is then inseparable from the emergent effects of such engaging 'disposition' and it is argued here that this disposition is re-posited through the re-hypostatization of human nature by the *Logos* – through whom 'form' and the 'order of movement' derived in the first place. The next section now focuses on the implication of this doctrine where the centrally important concept of the Mind of Christ is concerned.

The Mind of Christ

The concept of the Mind of Christ is clearly of theological and doctrinal import. In considering the influence of Christological doctrine on the way we might study and appreciate the human mind, Noll regards the 'come and see' of John 1:39 as being in itself an invitation to the scientific community.[431] The criticality of the Mind of Christ for theological doctrine is made all the starker by the Church's claim to have a participative share therein. Torrance criticized the Roman Church for its (to him) uncritical identification of its own consciousness with the Mind of Christ, something in his view generating a self-evolving conception rather than exhibiting a genuinely deeper freedom within the discursive aspect of human reasoning.[432] Here the 'place' of the Incarnate *Logos* is being taken as central to a dynamic, topological representation of created space in terms of its relation to the Uncreated, and the significance of the Mind of Christ and the 'opening' it affords is considered within this framework.

The Mind of the Incarnate *Logos* must logically be open in two respects: firstly, to the entire array of interconnected principles whose interrelation corresponds to intelligibly

[429] Bohm, *Wholeness and the Implicate Order*, p.74.
[430] *Ibid*, p.80.
[431] M. A. Noll, *Jesus Christ and the Life of the Mind* (Grand Rapids: Eerdmans, 2011), pp.99*ff*.
[432] Torrance, *Theological Science*, p.79.

discernible patterns (or meaning) with respect to the human intellect, actively constructing and representing from the perceptual level upwards; secondly, to that idiom of operation corresponding to what it means to create *as God*, distinguishing the *topoi* pertaining to Uncreated and created 'perspectives'. In the first instance the 'reasonable soul' and the convergent, focused and contingent mode of human intellectual activity are emphasized; in the second instance the hypostasis of the *Logos* is emphasized, under-standing the critical divine-human unity. Once again the *Logos* is taken as the dynamic, Principal Principle upon whom all communicable, created principles are contingent. This double-sided openness is argued here to define an hourglass topology, according to which the 'sides' of subject and object (see below) could be taken to constitute yet another critical dual-aspect unity in this case.

An anhypostatic, two-nature Christology is maintained here with a clear distinction between 'nature' (human nature being fully assumed by the Second Person in Christ) and 'Person', pertaining emphatically to the divine hypostasis of the Second Person of the Trinity. Human nature can still be spoken of as 'in-personal' but 'theologians must deal with the fact that although the Mediator has both a human and divine consciousness He possessed only one self-consciousness' while also bearing in mind the obvious difference between the collective property of human nature and a particular personality, one of many possible, variegated dispositions to perform or live out this nature in some way.[433] Gockel provides a good defence of the necessary complexity of any anhypostatic/enhypostatic discussion, and its presence both in Aquinas and in Protestant scholasticism, highlighting some of the disagreements to which different readings of a given prefix to the term *hypostasis* can give rise.[434] The key, for him, is the simultaneous creation of the human nature of Christ and its institution as subsistent in the one hypostasis of the pre-existent *Logos* in one and the same divine act. The consideration of how human nature becomes united with divine nature in one divine hypostasis involves considering the relation between 'flesh' and *Logos* in a way that safeguards divinity against any suggestion of becoming 'accidental'.

Sumner examines how the anhypostasis-enhypostasis conception was useful to Barth in safeguarding total divine freedom with respect to the total Activity of the Source, in the

[433] Quotation from http://www.reformedonline.com/view/reformedonline/Incarnation.htm. Originally accessed in 2011.
[434] M. Gockel, *A Dubious Christological Formula? Leontius of Byzantium and the Anhypostasis-Enhypostasis Theory* (Journal of Theological Studies, Vol.51, No.2, 2000), pp. 515-532.

*Logos*, assuming a human nature that is then contingent for its identity upon the Second Person in such a way that the Word is in no sense a passive object and Christ is in no sense 'adopted'. Thus 'the inconceivable becomes conceivable' while God's 'realization of one possibility and the concomitant elimination of all others is not a restriction on divine freedom but its execution'.[435] He even suggests elsewhere that the notion of 'fallenness' might, in an anhypostatic framework, be drawn into the assumption of human nature in Christ without implying any problematic lack of impeccability.[436]

Some interpretation of our 'fallen-ness' is necessary in relation to the terms 'nature' and 'person'. It is the contention here that the negative aspects of any individual personality or disposition (seeing the 'skins' once again as standing for our entire psycho-somatic mode of existence) indicate that which has been 'fallen into', here the finite personality itself, blurring divine image and compromising the overall integrity of our nature. The *finitude* of our nature is inseparable from some negating or constraining aspect of *definition*, which provokes or highlights various dispositional characteristics. The Personhood of Christ always has its infinite Source in the Second Person of the Trinity and hence, one could argue, with no corruption of any thereby assumed, hypostasized nature.

As per Baluwski/Watkins it is asserted here that there is, in the objectified context of the Incarnation, a mutual novelty of encounter, a critical oasis of symmetry irreducibly induced within the broader asymmetry of the Uncreated-created relationship. This avoids, however, the more wholly symmetrical framework of Process Theology, in which divine nature is somehow open to human influence in direct balance to the openness of human nature to divine influence. This oasis of symmetry, having its basis in divinity sharing in the humanity-cosmos relationship through the Incarnation, corresponds to the aforementioned, topologically irreducible 'singularity' – an ineradicable potential for generating and manifesting genuine novelty, actualized in terms of a new creation eschatologically established by divine initiative through the Incarnation.

As to finding any 'model' of communicative cooperation between divine and human idioms of creative freedom, the fact that human consciousness is something re-instantiated, or literally re-generated, as from one generation to the next must be taken into

[435] D. O. Sumner, *Karl Barth and the Incarnation: Christology and the Humility of God* (London: T and T Clark, 2016), pp.89-95.
[436] D. O. Sumner, *Fallenness and Anhypostasis: A Way Forward in the Debate Over Christ's Humanity* (Scottish Journal of Theology, Vol.67, No.2, May 2014), pp.195-212.

account, emphasizing the theological importance of some overall, sacramental integration in the Mind of Christ. One must then distinguish between the divine and the human with respect to the central conception of self-consciousness.[437] On the one hand there is the completely *intrinsic* and *fully self-communicating* relationship pertaining to divinity, in pure, absolutely stable and perfectly balanced Being of Trinity-in-Unity and Unity-in-Trinity, not conceptually containable within our finite and compactly enfolded domain of reference. On the other hand there is the *extrinsic* and *partially self-replicating* activity pertaining to created life, variously passed on over many generations as part of a relative, quasi-stable existence, distinct from pure Being.

Interesting from a Trinitarian perspective is the idea of considering the hypostases as three 'centres of consciousness',[438] although this leaves open the question as to whether or not the general term 'consciousness' is automatically identical to self-consciousness in divine nature. Is it appropriate to speak of three centres of self-consciousness or must there be *one* self-consciousness within which these three 'centres' mutually and fully participate as a result of their perfect interrelation among each other, pertaining to an infallible divine identity? Not 'seeing' from divine perspective we cannot answer this question in any *psychological* sense, but we can rightly say that there must be just one self-consciousness in the united identity between divine and human consciousness in Christ.

Schechter argues, with particular reference to cases of split-brain patients on the one hand, and, on the other hand, to the prolific ability of the normal functioning of the brain to integrate concepts into such a form that the conscious mind can handle them, mostly by impeding communication between contradictory inputs, that there is a clear distinction between speaking of a *unity* of consciousness on a semantic level of overall coherence – such as matching a sense of personal intention to a capacity for responding to our environment – and speaking on a more obviously enumerated level, involving countably distinct 'streams of consciousness' becoming somehow *singular* in their affect.[439] She thus

[437] The very fact of self-consciousness, in the human case, is deemed by Nicholl to be logically as far as evolution could bring us, and, although not in and of itself part of the evolutionary domain, not even the involvement of the Incarnation could push any sacrifice beyond the very offering of self. D. Nicholl, *Holiness* (London: DLT, 2004), especially pp.13-17.
[438] G. Van den Brink, *Social Trinitarianism: A Discussion of Some Recent Theological Criticisms* (International Journal of Systematic Theology, Vol.16, No.3, July 2014), pp.331-350.
[439] E. Schechter, *Two Unities of Consciousness* (European Journal of Philosophy,Vol.21, No.2, June 2013), pp. 197–218.

distinguishes clearly between unity and singularity, as the theologian is also well advised to do.

One could attempt to define self-consciousness with respect to some semantic coherence in individual self-perception, bearing in mind potential impediments to this in cases of mental disorder. One might then venture to extend this conception to self-consciousness in Christ, defined by some fully coherent self-perception 'moving' in complete harmony and *unity* with the other Persons of the Trinity. Meanwhile, any 'irreducible *singularity*', representing the critical, mutual novelty of encounter in the Incarnation, neither contradicts such unity nor is it synonymous with it. At the very least this analogy offers a useful vocabulary for making a necessary distinction. The Personhood according to which divine and human natures are united in Christ defines the unity, since, as Gregory Nazianzen put it, 'the higher perfection dominated'.[440] While this unity is manifest through the hypostasis of the *Logos,* divine and human 'streams' of consciousness remain 'countably distinct' but singular in their effect in the sense-objectified life of the Incarnate *Logos*.

The question of the two wills stands at the heart of any consideration such as this. Balthasar emphasizes, again from Maximus, the importance of 'the foundation of an intimate community of being and of shared operation (συνεργάτισάρξ). This symbiotic interpenetration is the basis for the possibility of an "interconnected exchange" of the names that belong to the two natures'.[441] The hypostasis of the *Logos* is a supervening by the 'higher perfection' rather than any superposition or imposition since the natures and the associated hypostases are in one sense infinitely different or 'distant'. As will be argued, however, they are nonetheless sufficiently 'proximate' in a topological sense by virtue of the image. The implication is of two, ontologically distinct *topoi,* with the topology representing the relevant contours pertaining to created, human encounter being embedded within a broader, distinct and "transcendent" topology pertaining to uncreated, divine encounter, strictly inconceivable from our perspective but nonetheless immanent to our very created existence. Such 'embedment'[442] preserves the uniqueness defining the

[440] As quoted and translated in Clément, *The Roots of Christian Mysticism*, p.43.
[441] Balthasar, *Cosmic Liturgy*, p.258.
[442] Wilkinson borrows the term 'embedment' alongside embodiment to articulate the relationship between physical and divine environments. This term is apposite with respect to a consideration of the Uncreated-created relationship as occurring through some mode of participation, and also suggests a mathematical

novel and para-doxical (with respect to an imagination operative in created space) *topos* assumed by the *Logos* in becoming σάρξ.

Balthasar continues

> This synthesis and its effect – a kind of indirect identity of God and man – remains the world's supreme miracle, for it incarnates within itself the most decisive "contradictions". Because it cannot be self-contradictory, however, these contradictions must be both preserved and overcome within it.[443]

This divine-human or Uncreated-created 'tension' is in a different conceptual class from the other dual-aspect bonds or dynamics considered here. The 'bond' metaphor might arguably be taken to imply a change rather than an exchange of corresponding attributes, and to think instead of 'mixing' or 'interpenetration' (as Balthasar does) seems more appropriate. The metaphor of diffusion springs to mind, and rather than maximizing entropy the 'mixing' in this case attains maximization according to the supervening supremacy of perfect freedom in God. As to the novelty of the thereby "synthesized" *topos* Balthasar remarks

> This place of God's self-emptying is precisely the place of his holiest divinity, of love's highest freedom: a freedom that stands at once beyond both "natures", makes both into an expression and sign of itself, and is genuinely capable of achieving a "coincidence of opposites", in the sense of Nicolas of Cusa.[444]

He refers to the 'supreme paradox of a hypostatic centre of freedom that is both in and beyond all natures – a centre of freedom that is the fulcrum of the world's whole history'.[445] This hypo-static centre is induced through the under-standing of the *Logos*, sense-objectified as an expression of divine love in its deepest and most holy 'place'. In one respect divinity and humanity are in equilibrium, inasmuch as 'just as far as the decisively human remains in force is as far as God appears...just as far as the two wills

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analogy concerning the embedding of one space or manifold within another. See D. Wilkinson, *Science, Religion and the Search for Extra-Terrestrial Intelligence* (Oxford: OUP, 2013), pp.146-147.

[443] Balthasar, *Cosmic Liturgy*, p.258.

[444] *Ibid*, p.259.

[445] *Ibid*, p.260.

remain themselves, unconfused, is as far as they can be united in a single (μοναδικως) activity'. This results in a 'theandric activity' specifically with respect to the hypostasis.[446]

The finite activity of any finite being is de-fining of that being in as far as any 'natural freedom' is established.[447] In this finite context, nature and person must be taken on the same ontological level and nature must not be relegated to the status of a mere 'marionette'. In fact, the equal footing of nature and person could be said to ensure the necessary stability of being. As Balthasar puts it, 'for Maximus...person is the realization, the concrete living out, of a rational nature; and because every realization points back to a real source, it is the original, functional centre of the rational nature itself, the radiant inner expression of its being'.[448]

Bulgakov traces the history of dogmatic contemplation and synthesis concerning formal Christology, from Apollinarius to the Calcedonian formulation and into the development of the *enhypostasis* viewpoint of Leontius and John of Damascus, struggling with how human nature could be fully assumed and hypostasized by the hypostasis of the *Logos* without either suppression or absorption of its distinction, integrity or freedom of participation. His principal caution is that

> As soon as [one] tries to define the mode and meaning of this deification more precisely, there arise – despite the dogma of the two wills and two energies – propositions of a monophysitic character, attesting to the absorption or suppression of human essence by the divine essence.[449]

He picks up on the possible ambiguity of whether 'will' refers to the psychological or the ontological and the importance of distinguishing between divine and human 'subjects', upholding the 'fundamental idea, that is, the duality of the self-determination in the case of unity of life'.[450] He enlarges on the context of the theological challenge in that 'having two natures, the one hypostasis of Christ lives a "composite" life ("without separation and without confusion"); and it thus realizes its life simultaneously and in parallel in the two essences in the case of the unity of the living hypostatic self-definition'. He then refers to

[446] *Ibid*, p.262.
[447] *Ibid*, p.261.
[448] *Ibid*, p.263.
[449] S. Bulgakov, *The Lamb of God* (Grand Rapids: Eerdmans, 2008), p.73.
[450] *Ibid*, p.76.

such life in terms of a theological 'centre of gravity',[451] and the link with the analogy used above with regard to human self-consciousness is interesting here if one considers a united, theandric 'narrative'.

The divine will is beyond any opposition between freedom and necessity, while creaturely freedom is 'expressed in voluntary, creative goal-setting and self-determination, corresponding to the state of *becoming* [italics Bulgakov] that is proper to creaturely being'.[452] Bulgakov remarks of the wills that 'one surely cannot fail to see the imprecision and incompleteness of these definitions ("does not contradict", "follows", "is subordinate to"), especially if one remembers that the question is of the relation of the *creaturely* [italics Bulgakov] human will to the divine omni-wisdom and omnipotence'.[453] This leads him into his Sophianic approach in which divine self-consciousness is defined as proper to a subjective "I" that declares 'I AM that I AM', perfectly self-understanding and thus self-hypostasizing, in and as a tri-hypostatic unity. Elsewhere he states that 'God's nature is thoroughly hypostatized by the divine hypostasis'.[454] Divine nature is perfectly self-understood and 'darkness' cannot in any way supervene or 'overcome' this nature, since it cannot cause it to be 'understood' in any alternative way (cf. John 1:5). There is no strict analogy of this in human self-consciousness. Human freedom, at the psychosomatic level, is based on a partially *reflective* form of self-awareness, of 'seeing darkly'. Considering some encounter of genuine novelty by divinity, in assuming human nature, ought therefore to require the qualification of a *newly reflexive* means of self-identification, manifesting itself with the required consistency throughout its engagement within the created domain.

The 'becoming' of creaturely humanity is seen as corresponding to the dynamic of the divine 'Proto-Image': living, moving and having its proper being in divinity, having thereby 'a particular creaturely eternity and even uncreatedness'.[455] This is consistent with an eschatological interpretation of human nature as a dynamic, collective property. Like Torrance, and consistent with the approach taken here, Bulgakov sees Creation and Incarnation as theologically inseparable, such that 'God's pre-eternal design manifested His love for creation, which did not stop at creation but went beyond it; as the act of the new creation of the world, it determined the descent into the world of God Himself, that is,

[451] *Ibid*, p.77.
[452] *Ibid*, p.78.
[453] *Ibid*, pp.86-87.
[454] Bulgakov, *Bride of the Lamb*, p.128.
[455] Bulgakov, *The Lamb of God*, p.91.

the Incarnation…[and] one can even say that God created the world…for the sake of His Incarnation'.[456]

The idea that consciousness is cosmic in its origin and significance, both theologically and scientifically, is congruent with Bulgakov's view of the ideal human person as an iconic 'microcosm' and 'the creaturely Sophia'.[457] The Incarnation must furthermore involve the Creative Power of the Third Person in tandem with the *Logos*, effecting both the 'introduction' and 'reception' of the divine hypostasis with respect to human nature. Noting the reliance, for the consistent possibility of such reception, on the original essence of humanity being already *intentionally* divine-human, Bulgakov maintains that 'as far as the in-hypostatization of the Logos in man is concerned, the postulate of the Incarnation is a certain primordial identity between the Divine I of the Logos and the human I; this identity, however, does not exclude the essential difference between them'.[458] The fundamental distinction between humanity and the rest of creation is then seen as being in the influence of that uncreated component originating in 'God's breath'.

For Bulgakov, it is therefore in the *Logos* that the critical communion between divine and creaturely Sophia principally consists, Sophia being seen in turn as 'the heavenly humanity…the proto-image of the creaturely humanity; inasmuch as she is eternally hypostasized in the Logos, she is His pre-eternal Divine-Humanity'.[459] While for Adam there was originally intended some primordial uncreated-created interpenetration and communication, in Christ our creaturely constitution is supervened by (or re-placed according to) the *Logos* fully assuming the psychosomatic nature pertaining to finite humanity.[460] This opening of proper divine-human communion is possible precisely by virtue of the fact that the Proto-Image makes the hypostasis of the *Logos* sufficiently 'proximate' to that established by original intention for Adam that a 'topological neighbourhood' indicative of such communion may be established. Bulgakov's framework therefore seems congruent with the topological framework here. He acknowledges that, given the 'equilibrium' by which the three 'centres of consciousness' unite in one divine Subject – one "I" pertaining to the triune God – the key question becomes how to unite the

[456] *Ibid*, p.169.
[457] *Ibid*, p.174.
[458] *Ibid*, p.186.
[459] *Ibid*, p.187.
[460] *Ibid*, p.188.

Immanence with the Incarnation-imbued Economy[461] (a distinction for which he helpfully, for this thesis, uses the term 'aspect').

Part of the issue is a necessary translation between eternity and temporality, and 'it is precisely eternity that is the true foundation for revelation in time…in its positive content, temporality is adequate to eternity and, in the end, merges with it'.[462] This idea is explored further in the next chapter.

The negative Calcedonian formula still leaves space for some positive synthesis or definition,[463] and this is where Bulgakov invokes Sophianicity as a uniting factor. Sophia stands for the interconnected unity of all 'images' of divine self-revelation and is inextricable from the *Logos* (as hypostasis) inasmuch as 'the Logos pre-eternally reveals the Father as the Word of all words…of all the divine ideas and images in all their unity'.[464] In this respect the *Logos* is arguably predisposed to draw all truthfully generated meaning, anything relating to any revealingly relevant or relevantly revealing 'idea' or 'image', to Himself. In engaging fully with a creaturely mode of becoming God properly receives such becoming by, in a sense, becoming that becoming. The *participation* of the hypostasis of the creaturely Sophia is still, however, necessary for the Incarnation itself. Again, Mary receives the 'strength' or stability with regard to her necessary role in conjunction with the Creative Power of the Most High overshadowing her.

Here one could again conceive of the *Logos* in terms of a Principal Principle while seeing Wisdom or Sophia as constituting an inseparable Witness 'regarding' the interconnected entirety and unity of all contingently ordered, *created* principles deriving from God's Creative Activity through the *Logos*. A critical aspect of Sophia, in her role and relevance, could therefore properly be considered as 'created', 'formed' or 'possessed', depending on the translation, 'as/at the beginning' of God's creative Work (Proverbs 8:22). Such Witness is supra-cosmic while relating, in creaturely terms, to the context of the Incarnation. There is furthermore a critical double-sidedness involving divine and creaturely Sophia where 'perspective' or 'encounter' is concerned.

Bulgakov proceeds to tackle the key question of how to avoid Christ's individuality 'knowing' ontological limitation, being instead '*equally* [italics Bulgakov] close and

[461] *Ibid*, pp.190*ff*.
[462] *Ibid*, p.191.
[463] *Ibid*, p.196.
[464] *Ibid*, p.197.

accessible to anyone who scrutinized Him closely…the Neighbour for every man'.[465] Once again the suitability of the vocabulary here to the topological framework is transparent. He considers the original, intentional ontology of personhood to be unlimited by egocentricity, and how to find a theological 'centre of gravity' in Christology that is mutually compatible with biblical witness, the historical Jesus and the cosmic Christ then becomes part of an, as yet, not fully resolved or transparent vitality. To Bulgakov the 'capital' contained in the idea of a 'theandric energy' is indispensable but only finds 'partial application' in the doctrine of *communicatio idiomatum*.[466] One must avoid any static sense of juxtaposition that obscures dynamic, theandric interaction.

Emphasizing *kenosis* as a dual-aspect event or process, of both heavenly and earthly relevance or sidedness, and taking Sophia as expressing the unity of Creator-creaturely mediation, Bulgakov argues that God has the power of self-limitation such as to 'change' the mode in which *for Himself*, economically-speaking, His Essence is lived out ('out' being here a proper indication of the 'outwardness' of revelation by the divine Economy). He avoids any instrumentalism or human passivity by seeing divine-humanity as consisting in a *correlation* of the divine and the human, a kenotic manifestation able properly to effect an internal regeneration of humanity.[467]

Divine-human self-consciousness remains, subjectively-speaking, that of the "I" of the hypostasizing *Logos*, perichoretically united with the other hypostases whose interrelation constitutes the Trinitarian Life. Objectively-speaking, there is a '*real conditionedness* [italics Bulgakov] of the life of the Divine I by the psychosomatic life of humanity'[468] that must maintain its integrity by being allowed the correlative freedom to grow or 'become'. A critically irreducible, dynamic 'equilibrium' identity is thereby sustained between the Son of God and the Son of Man who has 'nowhere to lay His head'. This identity constitutes a uniquely integrated *topos* correlating with the psychosomatic life of humanity: something fully assumed, newly 'understood' and thereby newly created and completed by a divine hypostasis, as fully embedded and participant with respect to the Uncreated as is possible on physical principle. The divine hypostasis supervenes according to the necessity-identifying freedom of the 'higher perfection' but not in an instrumentalist sense.

[465] *Ibid*, pp.203-204.
[466] *Ibid*, p.209.
[467] *Ibid*, pp.251*ff*.
[468] *Ibid*, p.273.

The manner in which Bulgakov fleshes out this idea with appeal to biblical witness is insightfully comprehensive and impressively detailed. One gets from his analysis a clear sense of the mutually encountered 'novelty' or critical 'singularity' affording humanity an active, contributory *modus operandi* with respect to the integrity of its distinctive, idiomatic mode of encounter. A unique aspect of symmetry is induced through the necessary cooperation and correlation between God-cosmos and humanity-cosmos relationships in the Incarnation, while Alpha and Omega dynamically coincide in a manner fully incorporating temporal, creaturely becoming. The next chapter develops this with regard to the sacramental significance of such temporality.

Lonergan takes a more densely methodological approach to the question of the Mind of Christ, starting, by reference to Aquinas, from the position that

> Once the divine essence is understood…being is understood in its totality, both because God by comprehending the divine essence understands perfectly every being whatsoever, and because the blessed in heaven seeing God's essence behold both God and other beings in God in proportion to the perfection of the vision they possess.[469]

Finite essence, however, does not in itself contain the infinite or infinitive 'to be' – an Infinity for which 'being by essence is being whose essence is its own 'to be'…in cognitional terms, it is being through the understanding of whose essence being is understood in its totality'.[470] Divine nature consists in perfectly conjugate identity between ontological and epistemological aspect, between being and knowing.

Within the creaturely domain there is instead the radical, 'dynamic orientation' of an intellectually rational consciousness tending towards 'natural finality', referred to by way of 'intention' but still in the *process of intending* in as far as it does not yet constitute knowledge in and of itself.[471] Sapiential knowledge is then properly 'intended' to know how all things are ordered as a whole, as already noted in reference to Bulgakov, and a key question becomes what 'primitive terms' (which may perhaps be compared to Bulgakov's talk of 'images') are necessary for defining those principles or ideas according to which

[469] M. G. Shields, *Collected Works of Bernard Lonergan, Vol.7, The Ontological and Psychological Constitution of Christ* (Toronto: University of Toronto Press, 2014), p.9.
[470] *Ibid*, p.11.
[471] *Ibid*, p.13.

'all true conclusions are deduced' in the created domain.[472] The *Logos* both effects and sapientially holds together these principles and their associated, created 'terms'.

Lonergan considers that 'the intending intention of being is part of human nature and common to all'[473] and he distinguishes the term 'person' as something subsisting in an intellectual nature. Importantly, infinite persons are seen as being 'constituted' by relations while finite persons have relations as a 'consequent property' resulting from 'operations which are necessarily accidental'.[474] Furthermore, 'determining the constitution of a finite person means (i) assigning the intrinsic causes by which it is composed and (ii) applying the laws that govern the composition of a unit out of these several causes'.[475]

Moving to the core of operative but accident-imbued human intellect it is then necessary to distinguish between that towards knowledge *of* which the intellect 'proceeds as to its goal' and that *by* which the intellect 'is moved to understand'.[476] Knowledge of God is mediated to us through our being 'moved' in theological terms. Science, meanwhile, is considered as 'moved' according to creaturely, corporeal mediation.[477]

As divinity is neither essentially compositional nor resolvable into causes

> …the philosopher begins with concrete being, the theologian with revealed truth; the philosopher proceeds by resolution into causes, the theologian by the illumination of reason; the philosopher arrives at an understanding of composite being, the theologian at an imperfect understanding of revealed truth.[478]

However, 'the many truths we know about God are interrelated in such a way that one truth is understood as being the reason for another'.[479] There is therefore the extremely important corollary that 'common contingent truths predicated of God add nothing to the divine essence except a relation of reason, but imply an appropriate created term outside God', since in order for the appropriate correspondence to be maintained 'a contingent truth cannot be predicated of God unless God is related at least conceptually to a

[472] *Ibid*, p.15.
[473] *Ibid*, p.19.
[474] *Ibid*, p.41 and 43.
[475] *Ibid*, p.59.
[476] *Ibid*, p.77.
[477] Lonergan considers mediated knowledge to be either natural revelation, predominantly discerned through some collective universal order and measure, or 'formal supernatural' revelation.
[478] *Ibid*, p.81.
[479] *Ibid*, p.83.

contingent being'.[480] This implication concerning 'created terms' highlights a necessary aspect of the dynamic involved in the Uncreated-created relationship. Lonergan summarizes verbatim

> God is not a finite being such as would prevent God being something else besides God; rather God is an infinite being that by way of eminence includes in itself all the perfection of all beings both actual and possible. Furthermore, just as God by the same infinite act knows not only necessary but also contingent realities, and just as God by the same infinite act wills not only necessary realities but also contingent ones, so also God by the same infinite act of existence not only is necessarily God but also is what God has contingently become.[481]

He proceeds to resolve revealed truth into 'divine reasons' – incorporating both the potency and the act of assuming 'on the side of the assuming subject' – and 'created causes' which ground, 'on the side of the object', the 'potency enabling it to be assumed and the act by which it is assumed'.[482] After using this resolution to establish various proper parameters and corollaries regarding the hypostatic union he then considers the question of human consciousness, although it is not made clear what, if anything, he considers to distinguish consciousness and self-consciousness. He defines a 'strict' understanding of the term 'experience' as 'a preliminary unstructured sort of awareness that is presupposed by intellectual inquiry and completed by it'.[483] Such unstructured experience forms a *basis* for inquiry into the 'what' and 'why' which in turn forms the basis for asking whether such distinctions genuinely pertain to how things actually are. This basis constitutes the 'formality' overarching our existential subjectivity, 'for we experience external or internal data in order that through inquiry we might understand and through reflection we might judge'.[484] Consciousness is seen more strictly as experience on the side of the subject than any 'percept' on the side of the object and

> …this type of experience is not described but only indicated. Description supposes intellectual inquiry and includes what is known through insight and conception. But consciousness-as-experience is indicated inasmuch as a method is described by

[480] *Ibid*, p.95 and 97.
[481] *Ibid*, p.103 and 105.
[482] *Ibid*, p.107.
[483] *Ibid*, p.157.
[484] *Ibid*, p.163.

> way of which one can go from an experience structured by understanding and conception back to that experience itself in the strict sense.[485]

Such indication squares with the idea of indices concerning consciousness, brought into genuine effect by consciousness being present. Lonergan considers consciousness-as-experience to present a far less ambiguous basis for Christological application than consciousness-as-percept and highlights what he considers 'three different levels of the same knowledge of the same reality': firstly, the subject *as conscious*, 'known on the side of the subject and under the formality of the experienced'; secondly, the subject *as conceived*, 'known on the side of the object and under the formality of the intelligible and definable'; thirdly, the subject *as affirmed*, 'known on the side of the object and under the formality of the true and of being'.[486]

In Christ there is then a relation between human consciousness and the beatific vision, which requires a clarification regarding a divine consciousness that 'must be predicated of God analogically [since] In God, the subject that is conscious, the act by which it is conscious, and the primary object of this act are…one and the same. Nor is God conscious through a multiplicity of acts, for in God there is but one act, an act that is infinite'.[487] God's perfect freedom is, in this sense, interpretable as an infinite capacity for the accommodation of all necessary truthfulness, as held together according to one 'regard'.

Lonergan distinguishes knowing on the side of the object from consciousness on the side of the experiencing subject. Consciousness as subject-sided and experience-formalized is seen as safeguarding 'the truth of the assumed humanity',[488] but any process involving understanding, of asking "what is it?" and passing into judgement (in temporal terms) as to whether any 'it' actually *is* as such, then needs to be considered in such a manner as also to safeguard the unity of the natures. Lonergan achieves such safeguarding through the 'beatific knowledge' since 'Christ as human not only sees the triune God and incarnate Word on the side of the object but is also conscious of himself on the side of the subject; hence by a combination of knowledge and consciousness he understands and judges himself to be the incarnate Word'.[489] This resolution highlights what Lonergan considers

[485] *Ibid*, p.173.
[486] *Ibid*, p.177.
[487] *Ibid*, p.193.
[488] *Ibid*, p.205.
[489] *Ibid*, p.207.

the crux of the problem, namely that '*through a consciousness that is truly and properly human, a divine person is conscious of a divine person*',[490] to which he suggests that

> …a human being attains himself or herself under the formality of the experienced through his or her human operations and in proportion to the perfection of these operations. But in Christ the man the divine person of the Word senses, desires, understands and wills by way of finite human operations. Therefore the divine person of the Word subsisting in a human nature is conscious of himself as sensing, desiring, understanding and willing in a human manner.[491]

The caveat is that, on the side of the divine subject, there is no need for God to 'attain himself' under any formality pertaining to the definable or intelligible, or of being in any finite, creaturely sense of the term. Lonergan considers that 'kenosis is certainly not a laying aside of the divine person or of the divine nature or of the consciousness that belongs to a divine person and nature. Rather, this kenosis consists in a certain acquisition, in that he who is God has also become human in the true and proper sense'.[492] His overall viewpoint therefore becomes

> …that the one person of the Word is the ontological and psychological subject of both his divine consciousness and his human consciousness. It is clear, moreover, that these two consciousnesses mutually communicate on the side of the object, so that Christ as God knows himself to be this human being and Christ as man knows himself to be the natural Son of God.[493]

He argues for psychological as well as ontological unity of self-knowledge in the hypostasis of the *Logos*, on the side of the subject, a 'side' that it is clearly difficult to say anything about from our psychological perspective. The key question is whether too direct an analogy has implicitly been assumed between divine Personhood and the human person with respect to any attribution of psychological subjectivity to the divine. It might be argued that psychological subjectivity ought to be particular to the psychosomatic nature associated with the finite human person, such finitude not being existentially active in defining the hypostatization of human nature in the Incarnation.

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[490] *Ibid*, p.211.
[491] *Ibid*, p.213.
[492] *Ibid*, p.223.
[493] *Ibid*, p.243.

If, however, ontological unity is sufficient to establish the "simultaneity" of divine Personhood being conscious of the assumption of human nature and the subjective human consciousness being (or becoming) aware of being the Son of God then, in terms of coming to knowledge both in and of the uniquely objectifying context of the Incarnation, the postulated mutual novelty of encounter could still be argued as being fully secured, regardless of how one might consider it best to regard any 'formality' according to which the psychological constitution of such unity might manifest itself.

As long as ontological unity is properly secured the critical 'singularity' is manifestly preserved, able to effect some transfiguring novelty of encounter and represented here as defining the "neck" in an hourglass topology according to a conceptual convergence effected in turn by virtue of the associative unity of all relevant, interrelated, created images or 'terms' (borrowing Lonergan's phraseology again) corresponding to proper, contingent truths with respect to divine engagement with created space and sapientially united through their inseparable, collective association with the *Logos*. All genuinely creative human activity, generating authentic meaning and contingent truths from within created order, may then be considered to be 'drawn' into, and channelled through, that *theandric* conceptual capacity manifest through the uniqueness of a double-sided but mutually coherent objectification in the Incarnation. The consequent, transfiguring process of engagement then occurs in necessary correlation with those contingently interconnected 'created terms' according to which any contingent truths are, on principle, accessible within the created domain. Beyond the 'neck' the topology opens onto that genus of semantic significance pertaining to *eschatological relevance* and beatific vision.

The iconic image in humanity is perfected in the Incarnation, recapitulated according to a divine hypostasis, and this Incarnation is primarily possible by virtue of the fact that the same image, intentionally bestowed according to the original creation, affords sufficient 'proximity' to divinity as to become, in Christ, the basis for defining the 'neighbourhood' of divine-human communion. This effects a fuller 'connectedness' of sacramental participation according to a "diffusive" pervasion concerning the *topos* of the Incarnate *Logos*. All truthful, meaningful, creative activity pertaining to our conceptual capacity is thereby sanctified through the Mind of Christ in as far as it must relate in some manner to the same *Logos* upon whom any coherence in such activity is ultimately contingent.

While Lonergan considers that any of the three divine hypostases could on principle have hypostatized the assumed human nature, it is nonetheless quite legitimate to ask instead whether in fact the *Logos* was the only option for 'identifying' with the particular, precise necessity in question, especially considering the distinct *modus operandi* therewith associated: that of actively harmonizing those created contingencies necessary for establishing the required context for the Incarnation in the first place. In this respect the *Logos* is again active in its own conception. Taken as a conceptual and contextual whole there is in the Incarnation a critically subjective correlation among the natures, ensuring the truthful correspondence (Lonergan) and correlative necessity (Bulgakov) associated with the assumption of a distinctive, creaturely mode of becoming: involving an evolving freedom (chapter 5).

Summary

This chapter has emphasized the complexity of the stabilizing requirements necessary to sustain our remarkable capacity for self-conscious identity, in tandem with our mental development. Through the development of our language this may further develop into a sense of communal consciousness and identity, a development involving both the enhancing potential of a capacity for self-referring feedback and the development of communal appreciation with respect to the concept of *logos*. This development ultimately accentuates the prospective, eschatological dimension of our appreciation regarding theological relevance. Traced back over *Big History* this capacity in humanity is both the product of a cosmic interconnectedness and necessarily continues to engage with such interconnectedness. The physical cosmos forms a natural limit to the 'terrain' aspect of our encounter, in accordance with which we idiomatically explore our sense of 'territory'.

Given the cosmic scale of consideration, a conceptually dynamic means of appreciating 'art' has been suggested and applied theologically to the 'Artwork of Creation', and the significance of the Transfiguration has also been considered in this context, an interesting conceptual basis for which could be seen in terms of a deepening of humanity's theological *relevance* as our finite nature is *elevated* and reconfigured through the Incarnation.

A potential theo-logic has then been considered regarding the cooperative interaction between our (re)generative, imperfect, creaturely mood of contingent participation and that perfect unity, self-relation and unimpeachable conjugacy between being and knowing

constituting divine identity, especially noting the genuine novelty of encounter actualized in the sense-objective, unified context of the Incarnation. The next chapter develops the idea of cooperation between divine and human idioms of engagement, paying particular attention to the sacramental significance or our temporal *modus operandi*.

## ***Chapter 4: Towards a Model of Divine-Human Cooperation***

When considering temporal process it is not just the physical stability of any motion or operation *over* such process that is relevant, but also, from a theological and eschatologically-pointed perspective, the sacramental, participate and 'developing' stability of that which is drawn *out of* the integrated totality of such process according to the deeper 'motioning' of the divine Economy through its idiom of engagement with Creation.

Where the particular, communicative engagement with humanity is concerned, the divine image bestowed upon human nature not only establishes the critical 'proximity' considered in the previous chapter but also represents a distinctly theological dimension regarding the sustained communication of a crucial, top-down stability concerning our proper *topos* – that 'dwelling place' upon which our temporal capacity for any enduringly effective up-building or generation of meaning is ultimately contingent.

With regard to our active, participatory involvement, Sayers refers to the 'reading' of the Book (the creative Artwork) in Creative Power, related to 'the image of the indwelling Spirit'. The Father is beheld through a particular way of 'seeing' the Son (John 14:9) or of conceiving and receiving the *Logos*. 'Seeing', like 'reading', suggests some epistemological engagement. Human nature, taking the concept in its ontological wholeness, has been argued to indicate an eschatological potential, actualized 'at the right hand of the Father'. The phrase 'we will see him as he is' then arguably connects our epistemological capacity – our means of seeing, hearing, reading, knowing and believing, and consequently of engaging creatively – to such eschatological prospect, with any associated ontological transfiguration occurring through divine initiative. Our contributory potential is fulfilled, in Sayers' terminology, by humanity becoming able to know/appreciate the nature of the Creative Idea as fully as is *on principle* possible. In the context of seeking theo-scientific integration, a potential fittingness regarding her particular vocabulary of 'Creative Energy/Activity' and 'Creative Power' will be suggested below.

In conjunction with the advocated topological framework, this chapter develops the cosmic scope of consideration suggested in the previous chapter, focusing on the nature and significance of our temporal perspective with respect to the divine idiom of engagement with created space. Given this consideration it then advocates a panentheistic

development of the framework in question and considers how an eschatological perspective might preserve some necessary degree of continuity in physical and therefore scientifically relevant terms.

Considering the identifying communication between Trinitarian Immanence and Economy, Moltmann is notable in his keenness for a dialogue between the 'inwardness' of the Immanence and the 'outwardness' of the Economy by which Trinitarian 'impress' upon the created domain may be discernibly revealed, especially over the temporal course of salvation history. Indeed, for Moltmann, an active engagement with history in such terms constituted an important aspect of our doxology.[494] He emphasizes the importance of a place for communication from 'without' back 'within', from time into eternity, and considered this to occur critically and centrally in the passion of the crucified Christ,[495] involving a consequent 'transformation of meaning'. The idea of time being held together or integrated 'in eternity' is likewise important to what follows here.

Torrance's insight

Before considering the concept of time more fully, it is worth reviewing Torrance's important insight regarding the effect that particular means of considering space and time might have on theological development. He begins with the important clarification that

> God dwelling in heaven is essentially a theological concept like 'God of God', and no more a spatial concept than God dwelling in Light – even if we could conceive of a heaven of heavens we could not think of this as containing God. It is the biblical way of thinking that is employed here, for God is the transcendent Creator of the whole realm of space and stands in a creative, not a spatial or a temporal relation, to it.[496]

Here this clarification is essentially absorbed into the manner in which God's operative idiom of creative engagement is treated. Torrance proceeds to track developments through the influence of Plato – seeing space as that which permitted a sensible configuration of that lying beyond it, incorporating copies rather than the archetypes and allowing for the construction of mathematical hypotheses as a means to enhance understanding – into

[494] J. Moltmann, *The Trinity and the Kingdom of God: The Doctrine of God* (London: SCM Press, 2005), pp.151-162.
[495] *Ibid*, p.159.
[496] T. F. Torrance, *Space, Time and Incarnation* (Edinburgh: T and T Clark, 1997), p.3.

Aristotle's rereading (or misreading) thereof, seeing instead the introduction of a more volumetric, quantified view of space, in which 'place' becomes 'the immobile limit within which a body is contained', the notion of a void becomes meaningless and attention is focused on 'the innermost unmoved limit of the container' according to which everything can be related to some centre of absolute rest. He further considers the Stoic importation of the 'body' – 'that which is' – as the 'active principle' (in contrast to the void) and motion generator, 'making room' for itself and according to which space becomes a functional domain and the cosmos is seen as a 'sphere of operation'.[497] As Torrance remarks

> The material universe is not held together, then, as Aristotle thought, by an exterior continent or an upper sphere which forces the parts to stay together, but by an interior cohesion or tension…or by an immanent reason (λογος), which manifests itself in the laws of nature as the determinate and rational structure of the universe.[498]

Whether thought of as 'God' or 'body' this 'physical principle of rationality...could appear equally as mind or as matter'.[499] This way of speaking clearly has potential relevance to an embodied conception concerning the Incarnate *Logos* and its 'place' regarding the communication between Uncreated and created. The danger in the Stoic approach, however, was a pantheistic tendency, losing the sense of the transcendental and risking a conflation between theology and cosmology. In terms of traditional Greek conception God was to be considered as containing the universe in terms of a creative relation, 'by His *power* [italics Torrance]'.[500] Not only does this eliminate the need for any infinite void but it means that 'space and time, and indeed all the structured relations within the universe, have to be understood *dynamically* [italics Torrance], through reference to the creative and all-embracing power and activity of God'.[501] This power was then related, by Origen, to the oversight of God's 'creative comprehension', by which the rational structure of the universe was grounded.[502] According to such rational structure theological statements could acquire 'their objective and cognitive reference to God' and Torrance notes the

[497] *Ibid*, pp.4-9.
[498] *Ibid*, p.9.
[499] *Ibid*, p.10.
[500] *Ibid*, p.11.
[501] *Ibid*, pp.11-12.
[502] *Ibid*, p.12.

similarity between this viewpoint and that of Plato in terms of the role that the conception of space plays in our cognizing of 'the correlation of events...through which we trace their reference objectively to the abidingly real'.[503] It was still vital, however, to bridge any separation between the 'sensible' and the 'intelligible' or 'real' (cf. Lonergan's distinction between 'experienced', 'intelligible' and 'true') and to find a manner in which we could be considered able worthily to theologize in accordance with the divine bestowal of rational character upon this world/cosmos. Reconciliation of this tension was then sought in the Incarnation, uniting heavenly and earthly *topoi*. As Torrance summarizes

> The Incarnation means that He by whom all things are comprehended and contained by assuming a body made room for Himself in our physical existence, yet without being contained, confined or circumscribed in place as in a vessel. He was wholly present in the body and yet wholly present everywhere, for He became man without ceasing to be God.[504]

By the creative engagement of the divine Economy the stable basis for our capacity to generate meaning through our spatio-temporal encounter is dynamically held together through the *Logos*. Our capacity for comprehension, however, remains contingent upon the finitude, compactness and interconnectedness of our embodied *modus operandi* within this cosmos.

Torrance affirms, as here, that any distinction between Uncreated and created pivots on the potentially awkward concept of separation and the paradox of applying the concept of *topos* with respect to the Incarnation. He emphasizes the forcing of theology 'into the construction of a sort of *topological* [italics Torrance] language in order to express the dispositional and dynamic inter-connection between *topos* and *topos* [pertaining to divinity and humanity respectively]…This requires a differential use of concepts in which the ordinary and natural concept of place or space [has] to be adapted'.[505] God takes ontological initiative in manifesting a genuine openness to our distinctive, finite, creaturely 'place'. Here it is noteworthy that 'the concept of space which we use in the Nicene Creed is one that is relatively closed, so to speak, on our side where it has to do with physical existence, but is one that is infinitely open on God's side'.[506] This fits with

[503] *Ibid*, p.12.
[504] *Ibid*, p.13.
[505] *Ibid*, p.6 and pp.15-16.
[506] *Ibid*, p.18.

the relative closed-ness with respect to human initiative as presented here (inasmuch as created space is considered in ontological terms) while allowing a conditional openness to the active involvement of our operational epistemology. It is also congruent with the hourglass topology.

Theological pursuit, in its process and purpose, is ultimately geared towards revealing the eschatological consequences, on 'our side', of such openness of conception on 'God's side'. Torrance sees proper talk of the Ascension 'from place to place' as 'adopting the open and differential concept of space developed by the Church Fathers, interpreting 'place' differently in accordance with the nature and activity of God on the one hand and [that] of man on the other hand'.[507] The Ascension, on 'God's side', does not lose anything assumed or achieved by the Incarnation in either spatial or temporal terms. As a caution against the problems of theologically misconstruing space, Torrance notes the receptacle notion of space as being especially illustrative of the potential pitfalls inherent in considering oversimplified conceptions of space and time in a theologically accentuated manner. He notes Luther's understanding of being 'at God's right hand' as representing a connectivity with divine omnipotence rather than being a particular *topos*, beneficial in terms of the dynamism that could thereby be imported into the theology but potentially less helpful when speaking of 'the place where God wills to be present for us', which became reduced to the sense of a 'mathematical point'.[508] As Torrance notes, 'without doubt an idea of a spatial presence that ignores time, such as we can find in Medieval thought, tends to lapse into magic, but it is no answer to that to reduce spatial relation to a mathematical point, for that is still to exclude time from our relations with God'.[509]

Here I am taking any centred-ness of divine 'motioning' to be a topological centred-ness, appreciable according to some irreducible property pertaining ultimately to the *whole*, and with the nature of its manifestation 'to us' being relevant to the entire interconnected dynamic of created space in theological terms. This avoids any unhelpful literalizing of terminology or any predominantly spatial representation over and above the necessary allowance for our distinctive temporality and its relation to the creative engagement of the divine Economy.

[507] *Ibid*, p.31.
[508] *Ibid*, pp.33-34.
[509] *Ibid*, p.35.

Torrance seeks to avoid any dualistic disjunction between Christ-in-Himself and Christ-for-us. He is concerned, as here, with a relation between Creation and Incarnation theology, cautioning against the receptacle notion of space, whether finite or infinite, as potentially opposing a more relational notion.[510] Human knowledge of God, involving 'created rationalities', must furthermore remain connected to the concept of God's Mind[511] since truthful, created knowledge inevitably embodies something of its necessary *relation* to that divine rationality that grounds, enables or even compels our conceptual activity in the first place. In this respect the Incarnation is 'to be understood as the chosen path of God's rationality',[512] not dissimilarly to the aforementioned note concerning Wood's economic 'trajectory' becoming settled in created space. Theologically, space and time need to be interpreted with respect to some 'motioning', and the primary context for such interpretation is provided, created for us, according to the 'path' chosen in the Incarnation.

Scientifically, the interconnected four-dimensional geometry of relativity allows for space-time to take a natural place in the order of things, meaning that the study of geometry must be pursued in 'indissoluble unity with physics'. Torrance parallels this with the idea that the proper place of natural theology is to provide a 'theological geometry' within the objectivity of revealed knowledge of God, articulating 'the inner material logic of knowledge of God as it is mediated within the organized field of space-time'.[513] Once again, any metrically explicit geometry may be couched within a broader topology.

Any analogy involving topological language, such as physicists might use 'to represent the difficult elastic connections between the dynamical and geometric aspects of things or between quite different kinds of space',[514] ought, to theologians, to suggest some coherent connection between divine and human *topoi* somehow united in the critical and categorically unique context of the Incarnation. Torrance notes John of Damascus' attempt to make such connection by means of 'mental place', offering 'a way of linking up physical space with divine space through the concept of energy or non-observable activity'.[515] Sayers' vocabulary will be applied below in precisely this respect, relating to the categories of 'energy' and 'activity'.

[510] *Ibid*, p.56.
[511] *Ibid*, p.65.
[512] *Ibid*, p.67.
[513] *Ibid*, pp.69-70.
[514] *Ibid*, p.81.
[515] *Ibid*, p.82.

Torrance eloquently summarizes that

> Topological language can be used to express the relation of place in the physical sense, as spatial and temporal location, to the whole of space-time through the consideration of some field of energy or action, and through the extension of the kind of connection that emerges in it.[516]

He challenges the biological field to adapt to this more interconnected level of thinking, so as to 'supply historical science and theological science with more apt analogues than those which are now available in physics'.[517] One can only hope that he would have approved of recent breakthroughs in this area, especially considering the aforementioned work of Smith and Morowitz. The manner in which a topologically inspired level of thought, and its associated vocabulary, is developed in a particular field of inquiry – including the establishment of its necessary, conceptual domain boundaries – will in itself define the form of questioning most meaningfully and properly to be undertaken in that discipline, whether physical, biological or theological. With this in mind I shall proceed to consider the significance of the temporal more fully within the framework of this thesis.

Focusing on the nature of time

Our temporality is clearly theologically significant. The author of the Letter to the Hebrews states that God has never said to any of the angels "*today* I have begotten you" (Hebrews 1:5), perhaps because of the uniqueness of such temporal language to humanity. Humanity has a unique, personal self-consciousness and idiom of creative freedom in this respect. Regardless of how one interprets the concept or significance of the angelic host, there is something about our particular existential dynamic in time that, to the writer of the Letter to the Hebrews, affords humanity an importantly distinct theological significance,[518] perhaps even advantageously so thanks to the Incarnation.

The divine-human relationship might further be contemplated and developed through some consideration of the temporal progression of human becoming and creative freedom (chapter 5). It is indeed according to a certain congruence with this domain that the 'trajectory' pertaining to the 'motioning' of the divine Economy must settle. Here there are two idiomatic engagements with temporality under consideration, and before it is

[516] *Ibid*, pp.83-84.
[517] *Ibid*, p.85.
[518] B. Witherington, *Letters and Homilies for Jewish Christians* (Nottingham: IVP, 2007), p.127.

possible to try and relate human temporal engagement, referred to through normal use of the word 'time', to divine engagement, distinguished by a capitalized reference to 'Time', it is necessary to be explicit about what, in respect of our *creative* freedom, is being intended by the former.

Early Christian tradition spoke of 'duration' in regard to time, while looking to a God who 'transcends his own transcendence, so that he may not be lost in abstract nothingness, but may give himself'.[519] This suggests a relation between time and something beyond timelessness. Modern science, meanwhile, offers a somewhat variegated viewpoint. Wilkinson acknowledges the scepticism surrounding an enculturated Newtonian view of time,[520] especially in the wake of general relativity, quantum theory and chaos theory, as well as imaginary notions of time invoked in quantum field theory[521] and those appearing in cosmic origin theories. Theologically, he notes the challenge posed by the concept of Sabbath to the conception of time, while maintaining the importance of the idea that 'eternal time involves temporal movement without entailing the loss of the before as one moves on into the after'.[522]

The conception of time needs here to be relevant to human creative propensity, a propensity fostered and formed rather than automatically or inevitably inherent in some instant. Taking a linear view of such development is quite logical in this case, and, where the generation of novelty is concerned, it is worth noting Wilkinson's remark that

> The regenerating cycles of nature and the rhythms of the body do not sustain life without their interaction with linear time. As the cycles interact with linear time then novelty arises…It is extremely difficult to argue for novelty without some form of linear time and without other things passing away. Novelty in the universe cannot be separated from the increase of entropy (disorder), which gives time a linear direction.[523]

Penrose highlights the problem of the reversibility assumption of Newtonian time, given that such would imply an increase in entropy in both past and future directions from

[519] Clément, *The Roots of Christian Mysticism*, p.31.
[520] D. Wilkinson, *Eschatology and the Physical Universe* (London: T and T Clark, 2010), pp.34-35 and 122-124.
[521] Ryder, *Quantum Field Theory*, pp.154*ff*.
[522] Wilkinson, *Eschatology and the Physical Universe*, p.34.
[523] *Ibid*, p.35.

wherever one happened to be. Instead, he extends a cyclic notion of time to the cosmic scale by investigating carefully what is meant by the idea of entropy,[524] noting the surprising effectiveness of the concept given the vagaries entailed in defining it. For the purposes of looking at human creativity our temporality should of course be considered in terms accessible to creative experience. Any more physically-involved or specific scientific considerations regarding time are, for this purpose, deemed relatively independent of the revealing or emergence of our creative thought over a timescale sufficient to produce something tangibly articulate.[525] 'Our time' is thus taken here to be

> *That which facilitates (and according to which we recognize) change in our searching, focussing perception, enabling conceptual processing and an increasingly informed application of variously juxtaposed signs and symbols, the generation of meaning and the development of our creative freedom.*

This highlights a linear sense of temporal direction and the working definition is deliberately phrased so as to be grounded in the relevant language of mentally 'tokened' (to use Fodor's phrase) representative symbols or states, possibly encoded directly as retrievable memories and certainly of psychological import. Indeed one might well ask

> …what is it that measures change and how? Augustine's answer is that changing bodies, of whatever kind, leave traces in the mind, and it is these that the mind measures, so that past, future and present are extensions (*distentio*) of the mind, as recollection, anticipation based on present causes and perception.[526]

As part of a contemporary commentary on the philosophy of space-time,[527] Dainton clarifies the importance of distinguishing properly between mathematically-focused, *notational* representations of time as a parameter, and consciousness-related, *notional* presentations of temporality as defining our experience. One could refer to the former as *instants*, duration-less in and of themselves but defining intervals when considered relative to one another – a purely mathematical postulation facilitating a complementary language

[524] R. Penrose, *Cycles of Time: An Extraordinary New View of the Universe* (London: Bodley Head, 2010), especially pp.11-55.
[525] Otherwise the material would quickly diverge. It is not my intention to enter into any discussion on the specifics and possibilities found in the wake of developments such as the mathematics of chaos and complexity. For a good summary of many of the questions aroused by such, see Russell, Murphy and Peacocke, *Chaos and Complexity: Scientific Perspectives on Divine Action* (Notre Dame: University of Notre Dame Press, 2000).
[526] G. Loughlin, in Hastings *et al. The Oxford Companion to Christian Thought*, p.707.
[527] B. Dainton, *Time and Space* (Durham: Acumen, 2010).

of ‘events’, ‘reference frames’ and ‘relativity’. Then one could refer to the latter as *moments*, having subtle duration, arguably a sense of direction, and, as the description suggests, carrying some psychological ‘momentum’ of impact upon human perception and interpretation.

Lonergan offers a crisp review of this difference and the problems of understanding that can result from presuming too facile a mode of connection between the two, especially recognizing the absolute necessity of abstraction when considering what can and cannot properly be considered ‘invariant’ in any geometrical view of space-time. To him ‘concrete extensions and concrete durations are the field or matter or potency in which emergent probability is the immanent form or intelligibility’.[528]

The concept of ‘emergence’ might not merely apply over the process of time but to the status of time itself, although this is perhaps less important than it might at first seem. Concerning the critical search for a coherent relationship between the language of General Relativity and that of Quantum Mechanics, including their different approaches to time, Dainton emphasizes that

> …if it does turn out that time is absent from the equations of quantum gravity theory…There will be a clear sense in which time is not a fundamental feature of the universe…If this should prove to be the case, time will have the status of an *emergent* phenomenon…even if the status of time is thus diminished, its *existence* [italics Dainton] is scarcely threatened, for at the macroscopic level the distinction between spatial and temporal dimensions remains perfectly real. Cats are emergent entities; are they illusory?[529]

Bohm makes a similar point in a different way, according to his vision of an enfolded, implicate order, such that

> The *whole implicate order* is present at any moment, in such a way that the entire structure growing out of this implicate order can be described without giving any primary role to time. The law of the structure [as a compound of order and measure] will then just be a law relating aspects with various degrees of

[528] Lonergan, *Insight*, pp.163-195.
[529] Dainton, *Time and Space*, p.43.

> implication. Such a law will, of course, not be deterministic *in time* [italics Bohm].[530]

In his discussion on space-time metaphysics,[531] Dainton makes a strong and important case for the substantivalist side of the substantivalist-relationist debate – the substantivalist position treating space-time as having real physical presence or effectiveness. This thesis also finds affinity with the substantivalist perspective, especially owing to its greater theological potential for accommodating a sacramental framework in terms that are more obviously physically relevant and engaging. Furthermore, the general difficulty in trying to separate container and contained in the context of General Relativity, especially given space-time's possession of a gravitational field of its own, is similar in principle to the previously argued form-content inseparability.

Importantly, Dainton notes the difficulties arising from one possible relativistic conclusion that there is 'no ontological difference between past and future'.[532] Clearly a purely mathematical conception of space-time is in this case being taken in isolation from any psychological relevance. Of particular relevance here, however, is that if one considers some communicative relationship between two distinct, operative engagements regarding the temporal domain, divine and human, then such a relationship could be considered to give both rise and theological significance to the psychological aspect of our perception, inasmuch as it is inseparable from our *participation*. This induces a genuine distinction between past and future, facilitating an authentic directionality and progression regarding our living, creative engagement.

The helpfulness of thinking in terms of two idioms of operative engagement, and their associated relationships to both temporality and a-temporality, is also illustrated by appeal to the idea that God can be both everywhere in space-time and also 'simultaneously' nowhere.[533] This is far easier to appreciate if one qualifies the 'everywhere' as concerning God's operative idiom of engagement with Time and the 'nowhere' as concerning the pinpointing and focused perspective of our time – divine Activity not being confinable in such terms.

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[530] Bohm, *The Implicate Order*, pp.194-195.
[531] Dainton, *Space and Time*, pp.368-386.
[532] *Ibid*, p.37.
[533] R. Jackson, *The God of Philosophy: An Introduction to the Philosophy of Religion* (Durham: Acumen, 2011), p.16.

Overall, space-time is taken to constitute a substantive dynamic that we operate *within*. What God effects, through Creative Activity and with Wisdom (cf. Psalm 136:5, Jeremiah 10:12), constitutes a 'beginning-ness' *within* the creatively sustained expansion of which our temporal appreciation and conscious experience is embedded and our creative capacity is enabled and directed.

Considering the divine idiom of engagement with Time is clearly no trivial task, being as it is fundamentally distinct from our movement in time. Williams remarks that

> John's Gospel is haunted by the idea of the 'time' or the 'hour' for which Jesus waits. There is a moment at which the purpose of the Father will be fulfilled, the glory of the Son made manifest; and that moment is signalled in the nineteenth chapter of the Gospel as Jesus dies with the cry, 'It is accomplished'.[534]

The compression of temporal focus into this theologically critical 'moment' is striking in the overall layout of John's Gospel, and Williams succinctly continues

> If we understand that it is the time of *judgement*, discovery and conversion that Jesus speaks of here, we may see why he says to his sceptical brothers, "Your time is always here"…For his brothers…their history and their world's history does not move to judgement and mercy…They are not conscious of *waiting* [italics Williams] for the moment of God's truth; their 'time' is simply whatever happens to be going on...In this world, the truth of God's Word never appears…no one is called to recognize a time that is God's time…[535]

Once this is recognized we may further experience a 'dawning awareness that our hope in Christ is not just about a future event'.[536] The participle-like process of 'dawning' emphasizes that our appreciation of the prayerful (human) and revelatory (divine) conversing between our development *in* time and God's idiom of creative freedom *with* Time is not manifest as some lightning occurrence.

As to that 'time that is always here', Stannard notes the distinction between conscious, mental time and physical time measured by clock ticks as being necessary in order to

[534] Williams, *Open to Judgement,* p.47.
[535] *Ibid*, p.48.
[536] R. Williams, *Meeting God in Paul* (London: SPCK, 2015), p.81.

allow for a coherently articulable perception of flow.[537] He does in fact commend the relativistic placing of time and space (mathematically-speaking) on an equal footing, appealing to the idea that as all points in space may be considered to exist at each point in time, therefore all points of time might intuitively be considered to exist at each point in space, being then 'always there' in a rather different sense. This conception is not necessarily forced by the mathematics, however, especially since General Relativity involves a greater degree of complexity than the contextually simplified case of Special Relativity on which Stannard spends most of his argument. Nonetheless, the overall distinction between what are here referred to as the 'idioms' of engagement is hinted at in Stannard's remark that

> Now we discover that even we creatures, confined to live out our lives within space and time, can nevertheless discern intimations that there might be another way of regarding space and time…Space-time does not, of course, manifest itself to us in this fashion…But perhaps it presents itself to God directly in that fashion.[538]

Some divine ability to know any spatio-temporal 'slice' directly (with any 'change' then being, to divine nature, universal and necessarily prehended) might be suggested by way of articulating God's creative, operative association with Time: something pervading any humanly conceivable representation, or interpretation of sets of available data through such geometrical constructs as volumes, lines, points, intervals and so forth, but without itself being conceptually grasped or confined according to such conception. This consideration will now be expanded by reference to Russell's analysis of Pannenberg.

Russell's 'Creative Mutual Interaction'

Russell presents a framework of relationship between theology and science that he calls 'Creative Mutual Interaction'. As the background to his production of this framework was the result of many years' work and, in the second half of his book on the subject,[539] he considers particular technical details beyond the scope of this thesis, the salient points of relevance alone will be summarized here.

[537] R. Stannard, *God in and beyond Space and Time*, in Clayton and Peacocke, *In Whom We Live and Move and Have Our Being,* p.115.
[538] *Ibid*, p.114.
[539] R. J. Russell, *Time in Eternity: Pannenberg, Physics and Eschatology in Creative Mutual Interaction* (Notre Dame: University of Notre dame Press, 2012)

The framework involves a "flow chart" representation of the manner in which theology and science may mutually provide an informational context for one another.[540] Science presides over a 'network of theories' and these are informed, from within the scientific discipline, by a cycle beginning with defining a context for observation. The data in question are then collected, and models or analogies (that such data subsequently inform or nuance) are developed in conjunction with various philosophical assumptions. This theoretical network informs theological pursuit via (i) philosophical assumptions influencing theological tradition or reasoning, (ii) a consideration of the form of 'data' that ought to influence theological interest or methodology, and (iii) science-based analogies that could be helpful to theological thinking. In turn, theological pursuit may influence those philosophical assumptions, illustrative analogies and selection criteria that contribute both to a more robust interconnectedness and to a more judicious pruning over the entire network of scientific theories and candidate hypotheses.

Russell applies this framework to Pannenberg's theology of eternity as being a *source* of temporality. The underlying idea is that such a source provides the context for the manifestation of temporality as a differentiated unity. Creaturely temporality ordinarily involves, experientially-speaking, both distinction and assumed separation between perceived events over long periods of time, but eternal temporality provides a context whereby the present can be understood not as an ontologically isolated point but rather as a unity of duration (albeit only psychologically sustained for a 'moment' where human experience is concerned) in which distinction from past and future is maintained but without separation. In the New Creation a particular economic giftedness is argued as resulting from God's simultaneous 'prehension' of the whole of space-time at once, the effectiveness of such giftedness being made manifest 'proleptically' inasmuch as eschatological context provides an aspect of future causation (interpreted by Russell as a unique, creative mode of engagement) 'reaching back' to the Resurrection of Christ. An aspect of continuity is thereby maintained between that which is relevantly established in eschatological terms and that creative, temporal engagement within created space which contributes to the formation of any positively enduring, constructive aspect of created order. Ultimately only those terms allowing for what Russell calls 'natural evil' (among which he counts entropic decay) are lost.

[540] *Ibid,* pp.72-75.

There is, fittingly, a distinctively topological background to this idea, since, to use Russell's own words, prolepsis introduces

> a strikingly topological view of the relation between creation and the New Creation…This reaching back is not within the topology, or spatial structure, of the universe as we know it…it is a more extensive topology, one that connects the universe as creation with the New Creation where the New Creation is thought of as emerging through God's radically new action starting at Easter and continuing until its consummation in the global eschatological future of creation.[541]

He fleshes this out through reference to different ways of representing singularities in space-time, noting the relativistic requirement that the existence of even *one singularity* requires a description in terms of at least *two distinct temporal perspectives*. Ultimately he considers this to have the consequence that 'the relation Pannenberg describes between the eschatological future and the present is not a "path" in the ordinary space-time of this world but a separate spatio-temporal connection between two different realms of this world'. He maintains that this involves a domain of more complex topology than linear time, as considered through an appeal to ordinary experience or classical physics, but that such is *not* something that 'the musings of theoretical physics and cosmology' cannot somehow 'prefigure'.[542] Precisely what such scientific input might help us, to a certain degree, to prefigure regarding eschatological outlook is then relative to what the special, proleptic mode of divine engagement, in accordance with God's universal 'prehension', might transfigure through the Incarnation and Resurrection. This question will be revisited in what follows.

Russell seeks to avoid the static conception of space-time inherent in the denial of any effective, unambiguous ontological distinction between past, present and future. He notes that Einstein's theory is built upon a relational view of space, and that, while any geometrical space implies divisibility, such divisibility is in turn conditional upon some relational unity. In God, relational unity is indivisible such that the Infinite is an ultimate condition upon the operation of the finite. Specifically

> Pannenberg asserts that these two views of space – space as relational/geometrical and space as undivided – though seeming to form a dichotomy, can actually be

[541] *Ibid*, p.15.
[542] *Ibid*, pp.185-193.

> brought at least partially together if relational space is used to refer to created space and if undivided space refers to God's omnipresence. Still, maintaining their difference is crucial if we are to avoid the pantheism of Spinoza.[543]

This is consistent with that stated in the Introduction. The distinction between God's operational engagement with, and 'prehending' perspective on, space-time and the scientist's ability to construct knowledge regarding any geometry or even topology of space-time as a whole is further maintained by the fact that 'within God's eternal knowledge of the temporal process, the difference between temporal events and the specific past and future for each event is preserved'.[544] This has the feel of an extended topology, only fully prehensible according to a unique, externalized perspective regarding some holistic *configuration* space, again suggesting a basis for transfiguring engagement. Undivided, infinite 'space' and 'time' are 'prior to the world' in Pannenberg's theology and we are afforded our particular experience – formally articulated according to a parameterizable, measurable, finite context – through an act of divine creation *with* such an infinite context.[545]

What Russell refers to as the 'causal priority of the immediate future'[546] (according to prolepsis) may relate in this case to our theological 'affordance' or eschatological 'prospect'. The maintenance of a proper ontological distinction between past, present and future requires, for Russell, a theological input rather than a purely philosophical one, a claim concerning divine action that 'gives meaning to the ontological difference between an event as a cluster of indeterminate potential future states and an event as a concrete, unique and actually real present moment'.[547] Eschatology then needs relevantly to relate to such present moment.

God could be said economically to manifest measurable time (or space-time), from the 'side' of the eternal. It is necessary again to distinguish properly between Immanence and Economy. At one point Russell remarks that 'the passing and irreversible sequence of separated events that we experience in time is constantly comprehended by eternity as an attribute of the differentiated unity that is Trinity'.[548] One must recognize here that any

[543] *Ibid*, p.105.
[544] *Ibid*, p.107.
[545] *Ibid*, p.108.
[546] *Ibid*, p.55.
[547] *Ibid*, p.131.
[548] *Ibid*, p.97.

'differentiated unity' pertains, with respect to time and space, to the divine Economy: to that aspect of divinity whose idiomatic engagement outwardly communicates and reveals all those contingently discernible, interconnected truths that collectively and dynamically inform and 'geometrize' (returning to Torrance's metaphor) our theologizing. In as far as its effects can be made manifest within created space at all, God's Creative Activity identifies with the entire necessity that the opening of such a distinct, created space involves with respect to its distinct ontological integrity. The pinnacle of such engaging involvement is then the novelty of divine self-identification in the Incarnation, a novelty having the effect of re-manifesting and transfiguring the totality of all relevant, contingent and interconnected 'created terms' in the New Creation.

Russell rightly views eternity as more than either static timelessness or infinite temporal 'extent', considering instead 'the boundless temporality of the Trinitarian God, a lavishly rich "supra-temporality" that is both the source and fulfilment of the temporality of creation'.[549] Here this 'eternity' is again related specifically to the economic aspect that I will refer to as 'God's Time' or, more precisely, the divine idiom of creative engagement with the temporal domain, creatively manifesting and holding together the holistic context that *we* know as space-time in accordance with our participate, temporal status therein. This 'supra-temporality' is then that *with which* (or from the 'side' of which) God economically creates the context for our temporal engagement and participation. To speak of divine Eternity is then taken here to refer to that immutable, undifferentiated, Uncreated "Space" as such is known only to God *as* God in His Immanence.

The divine Economy creatively effects, defines and holds together a physically substantial framework, involving a particular, integral mode of connectedness – a 'topology' of created space – that is not in itself *purely* relational but manifests a substantive, quasi-stable domain of physical operation accommodating our idiomatic, temporal distinctiveness. Nonetheless, owing to a unique mode of communicability being possible between divinity and humanity, our temporal participation constitutes, theologically-speaking, an iconic *modus operandi*. This is 'drawn' towards its complete eschatological relevance by the particular creative engagement of the divine Economy through the Incarnation, Resurrection and Ascension, and in accordance with that aspect of futurity (noting the 'I *will* draw' of John 12:32) that is, as Russell contends, proleptically

[549] *Ibid,* p.5.

determining[550] and transfiguring. Furthermore, this occurs in such a manner as for which God has pre-emptively grounded the particular, physical context within which the necessary conditions for catalysing such transfiguring prolepsis are *already latent*.[551] This provides another means of considering the stability of that which is drawn out of a process of temporal engagement. Finding a framework for this engagement that is both theologically and scientifically salient is then an important consideration.

Considering a panentheistic framework

Stannard endorses a panentheistic outlook to accommodate the idea of time being 'in God' rather than vice versa.[552] Once again I will distinguish between our 'movement' *in time* and God's 'motioning', idiomatic mode of creative engagement *with Time*. The discernible effects of such engagement are made manifest as economically communicated from that infinite, supra-cosmic context lying somehow beyond space-time, and in which the existential entirety of our interconnected cosmic context then participates in theological terms. Theologically we 'move and have our being' in God; scientifically, we are created and exercise our idiom of operation in space and time.

The panentheistic framework is not unambiguously defined. Gregersen[553] treats it in a manner not entirely unlike Penrose's consideration of entropy, both entropy and panentheism turning out to be malleable but critical conceptions, both of which must be considered holistically. Specifically, Gregersen identifies the key features of panentheism as (i) a wish to balance transcendence and immanence, (ii) the sense of a world somehow 'contained' in God,[554] and (iii) some 'return' of the world into divine life. I will refer to 'cosmos' in place of 'world' both for its congruence with scientific perspective and for its etymological richness. Gregersen then distinguishes three Western flavours of panentheism within these general requirements: *soteriological panentheism*, in which the cosmos is in God as a gift moving towards an all-in-all eschaton; *expressivist panentheism*, in which God's self-relating by the Spirit allows the effect of divine motioning in created space to be (re)accommodated by the divine life; and *dipolar*

[550] A determining nonetheless *open* to our developing and becoming 'movement' into the future.
[551] *Ibid*, p.80.
[552] Clayton and Peacocke, *In Whom We Live and Move and Have Our Being*, p.120.
[553] N. H. Gregersen, *Three Varieties of Panentheism*, in Clayton and Peacocke, *In Whom We Live and Move and Have Our Being*, pp.19-35.
[554] Careful to note the importance of not making any 'container' metaphor spatial, since God presides over 'unimaginable roominess'. *Ibid*,p.20.

*panentheism*, in which the Process Philosophy view of a split between timeless and temporal 'poles' of divine nature comes into play, the latter evolving along with the cosmos.[555]

Gregersen notes that the first version qualifies the *pan*- component according to the problem of the non-allowance of evil within God, while the second version qualifies the *en*-component, through the implication of some final completion of a cycle somehow returning back *into* its divine source. The dipolar version may arguably require some qualification of the *-theism* component, but nonetheless the potential ambiguity inherent in pan-en-theism is evident.

There is clearly a responsible caution in the soteriological position, though it needs to say something about a specific model or means of interaction that can combine eschatological and teleological considerations, acknowledging the present, practical inseparability between human potential towards good and that towards evil. The expressivist position also has its attraction, especially here, inasmuch as any expressiveness may relate to the 'contential aspect' described in the previous chapter, emphasizing the potential role and contributory importance of our engagement, while also relating to the idea of 'drawing' in. One should nonetheless be cautious of the idea of our finite mood of activity 'enriching' divine life *per se*. It is still the case, however, that the Incarnation provides a critical context for nuancing the manner in which divine nature might communicate 'back to' itself, especially considering the words of Isaiah 55:11 in relation to the *Logos* (something revisited in the Conclusion).

While a broader Process Philosophy, with one 'pole' representing some God-cosmos interactive symmetry, is broadly rejected as contravening the overall Uncreated-created asymmetry, a reclassification of terminology may be possible, especially given the novelty of the Incarnation, divine nature being united with a human nature whose psychosomatic quality *does* pertain to some humanity-cosmos symmetry of interaction. Any symmetry advocated here stems entirely from the incarnational engagement of divinity with a two-way humanity-cosmos relationship, our physicality and consequent mode of encounter or engagement being itself the product of a particular cosmic interconnectedness. In fact, the Incarnation could arguably be considered necessary for demonstrating the fullest 'expression' or revelation of divine omni-potential and omniscience (see below). At the

[555] *Ibid*, p.21.

very least it implicitly represents an engagement with the cosmic totality of interconnected contingencies upon which our physicality depends.

Gregersen considers that 'without the Creator becoming a creature…and without God being an emergent property of the world, God creates the world as if from within'.[556] This illustrates the tension between created space being facilitated or opened within the Uncreated, and the Uncreated becoming conceived or revealed within created space. Such consideration is congruent with the required transcendence-immanence balance. As in Gregersen's 'expressivist panentheism' the 'in' component needs qualifying.

Gregersen considers three ways in which this preposition could be understood.[557] First, the literal sense, which he sensibly rejects; second, the mathematical sense of *possibilities carved out of a broader context*; and third, the qualitative sense of being 'in' by relationship. He prefers the third position owing to its relation to Trinity and Communion. Without wishing to denigrate the importance of this I nonetheless remain, as indicated above, slightly suspicious of purely relational viewpoints with respect to the physical, created domain inasmuch as they still face the challenge of demonstrating some specific continuity of physical relevance regarding our substantive *capacity* for relating. In the context of considering a model of integration between theological and scientific domains of consideration I will instead work with the second of the above options, especially given that background framework here derives from a metaphorical extension of a mathematical conception – the 'broader context' of a topology of connectedness, whether among actualities or possibilities.

In order for the following section to make better sense, it is worth being clear about how the 'eschatological' is being understood in the context of its relevance to creative, human involvement. Eschatological consideration will be understood broadly as involving some *consideration of how best to extricate oneself from one's 'own time'.* Such consideration must further be related to that self-knowing relevant to a 'movement' towards God, being 'drawn' into something more authentically endemic to our theological nature and emancipating us from the relatively superficial confines of 'our time'.

The term 'extricate' is chosen deliberately with Sayers' analogy in mind, since she suggests, with analogical reference to the mathematician's four-dimensional conception of

[556] *Ibid*, p.23.
[557] *Ibid*, p.24.

space-time and the difficulties involved in 'seeing' it as if from without, that in order to discern the threefold structure of the creative image of divinity within humanity the creative artist must seek to 'extricate himself from his own activity' to appreciate the whole as far as possible, as if 'from without'.[558]

With this in mind, and emphasizing the important role of memory regarding our temporal context, I now suggest a thought experiment involving another analogy with a mathematician's activity, and relating to Gregersen's second, mathematical option concerning how one thing can be considered to be 'in' another.

A mathematical thought experiment

Human accumulation of knowledge (or self-knowledge) is inseparable from semantic memory, communicating with episodic memory as necessary for the formation of a robust autobiographical memory. A particular means of reinforcing the acquisition of knowledge, enhancing the effectiveness of memory in so doing, is peculiar to the more formal approach of the mathematician – namely, the construction of a proof. I would like to suggest a hypothetical scenario concerning the process involved in such construction that may highlight potential theological significance. It should again be borne in mind that our very capacity to engage analytically in a consistently structured and intelligibly reliable fashion is already contingent upon a particular configuration of cosmic interconnectedness of which we are an active part.

The process of proof construction might be considered participatory, participating in some 'reality' structured by eternal value, validity or even by some intricately interconnected hierarchy of truths, each relative to some particular context of definition as being sufficient for its derivation, whether by deduction or induction.

As to the form of engagement lying behind proof construction, Lakatos takes his readers on a journey through the thicket of complexities that may be involved, represented as a dialogue between teacher and pupil.[559] This dialogue involves some toing and froing as the pupil is guided along a constructive path, part of which involves considering what is likely to constitute an appropriate method of approach for the problem in question: contradiction, induction, geometric representation or otherwise.

[558] Sayers, *The Mind of the Maker*, p.36.
[559] I. Lakatos, *Proofs and Refutations: The Logic of Mathematical Discovery* (Cambridge: CUP, 1999)

Consider a mathematical theorem, such as that of Pythagoras, for which *more than one possibility* for proof exists, remembering that commitment to a specifically defined, Euclidean space has been made. Imagine that a mathematician has already established a proof of this theorem, the final form of which demonstrates a series of steps of reasoning, each step constituting some episodically memorable unit of logic. Completion of this proof amounts to a successful recognition of the validity of the approach in question. At this point of realization, some overall semantic appreciation, acknowledging the overall *Gestalt* of 'proof' is established, including the registering of personally engaged achievement in the autobiographical memory. The proof's validity is recognized as eternal or *a*-temporal, despite the necessarily temporal process involved in establishing the correct sequence of episodes of logic pertaining to the chosen methodology, worked out through a particular juxtaposing of signs, symbols or representations.

Now imagine, purely hypothetically, that this mathematician subsequently loses his/her episodic memory, while retaining semantic memory. The validity of the theorem overall is still known as an a-temporal truth, but he/she must now work through some possible reconstruction of the proof from scratch, perhaps involving a different methodology and episodic sequence of steps – demonstrating another equally valid approach. This variegated array of possible forms of proof, all nonetheless converging on the same unity of truthful demonstration, might then be compared to the 'formal aspect' discussed in the previous chapter.

Moving sequentially through some episodic structure may then stand for the sense of our time which is 'always here'. The moment of realization involved in any subsequent completion of some possible, alternative proof, already faithfully anticipated according to the semantic memory, may cause some resonance in the mind concerning the a-temporal validity of the underlying truth in question. Through a particular method of approach in 'our time', a result now already known to be 'yet to come' may become newly appreciated. By this analogy, one could consider some consonant (and iconic) verging of *our sense* of a-temporality or 'eternity' onto the economic, idiomatic mode of engagement referred to here as 'God's Time', something already postulated as enabling our appreciation of both temporal and a-temporal aspects of reality.

Here an illustrative return to Sayers' analogy proves useful. In her Book metaphor, the Book-as-a-whole in one sense 'contains' an artistic theme, inseparable from an internal

demonstration of some ‘proof’ of its artistic quality. Yet, in another sense, the theme transcends the Book-as-published, since it could on principle exist in the *Mind of the Maker* without being committed to material expression, even though it remains immanent to the potential for any physical manifestation or demonstration of its art.

In the case of the divine Artist, Absolute Truth is immanently self-communicated ‘within’ uncreated, divine nature, while a contingent, created space may still be economically effected, manifest according to a particular interconnectedness and such that distinct, non-contradictory and contextually relative truths may emerge from differently explicable aspects and possibilities within the dynamic of the space in question, impressing themselves upon a creaturely intellect formed in accordance with the effects of those truths in the first place. The illustration involving the mathematician’s array of possible proofs is then part of a generation of ‘content’ through an explicating engagement with this dynamic, contingently interconnected reality or with an underlying and partially hidden formality of ‘implicate order’. Such proofs are further contingent upon the order, measure and structure of some representational, abstract basis space explicitly defined and selected as being most ‘relevant’ to the context of inquiry in question. This is consonant both with Bohm’s outlook and with Lonergan’s contingent ‘created terms’ necessarily pertaining to any revealed but contingent truth, especially those interrelated truths regarding the creative engagement of the divine Economy, discernible (or receivable) from within created space.

An interactive model

As to the intricately enfolded ‘reality’ corresponding to the ‘Artwork’ of the created space in question, imagine that the Author of such knows or creatively intends that some particular property should emerge and/or become explicitly revealed at some point in the work, while some other detail, that will prove critical for that property is expressed at some other point. In the case of the divine Artist, this fits Russell’s insistence on divine pre-emption. If a human author were ‘perfect’ in the artistic sense, then *every* aspect of his/her creative activity, whether of direct or indirect significance, would have to relate in some way to *all other* relevant developments, forming a coherently interconnected, harmonized whole – a completely thorough artistic ‘topology’, as it were. Considerable skill would be required to ensure the most appropriate balance in moving towards, while in another sense already latently and openly ‘containing’, some subsequent, meaningful outworking, to be made manifest through some explicitly recognizable emergence.

The case of divine Authorship is even more involved, since creaturely emergence within the Artwork is gifted an iconic significance and afforded a distinct idiom of creative freedom, collectively and actively generating meaning in a manner conditioned by the overall theme and parameters of the Artwork. Furthermore, the Perfect Artist's Creative Activity must presumably be 'perfect' both *with* God's Time and *in* or throughout our time, though not necessarily according to our finite conception of perfection.

Here I am arguing that one of the things upon which the proper functioning of our iconic capacity is reliant is precisely the consonance between our sense of eternity (or the a-temporal) and God's operational, creative and revelatory engagement with Time, as indicated by appeal to the previous thought experiment. This allows for some proper ascription of temporal association to divinity while still maintaining an overall asymmetry regarding the Uncreated-created relationship. Such temporal association does not, however, represent an involvement directly or exclusively analogous to that of human experience. The 'consonance' should be seen rather as sacramental facilitation, enabling proper participation in accordance with the Uncreated-created 'tension'.

Sayers expands the scope of her analogy to approach a philosophy of origin concerning Good and Evil,[560] invoking the Thomist position of Good and Evil being, to God, related purely by mutual, intellectual negation. Although the existence of Evil is inevitable as the potential negation of created Good, God would know it only by pure 'intelligence', never actively and creatively engaging in a manner granting such negation an ontologically effective status. Humanity, however, according to an imperfection or blurring of divine image, exhibits a double-sided propensity with regard to relative good and evil.

I want to suggest an extension of this idea in relation to our temporality. God, as *Absolute Self-Truth*, can call forth both created time and a created aspect of engagement with eternity, accommodating our participative capacity for both temporal and a-temporal aspects of appreciation. Humanity, having the double-sided potential for *relative self-truth and self-untruth*, is incapable (ontologically speaking) of calling eternity into active effect on our own initiative. Nothing we ourselves can physically make is itself eternal, and divine initiative is ontologically necessary in order to afford human nature both its contingent physicality and its eschatological relevance.

[560] Sayers, *The Mind of the Maker*, pp.95-107.

Our a-temporal awareness accords with our capacity for semantic appreciation, known according to our distinct, iconic mode of intelligence, but in and of itself it is largely passive. Put another way, we appreciate a-temporality in terms of some negation of that sense of passing that we more normally associate with our temporal experience. God, however, actively 'prehends' both His operative engagement with Time and the ordered totality of that complexly connected set of interrelations facilitating a revelatory 'verging' onto our participate conception of eternity (or eternal validity). He actively effects 'our time' and submits to being in some way affected by it in the Incarnation. His Eternity remains distinct, pertaining strictly to the incommunicable *ousia* of the divine Immanence, in which any internal or intrinsically associated 'Motion' or Self-Motioning is qualitatively distanced and categorically distinct from that 'motioning' whose effects are economically appreciable by humanity.

While Bulgakov considers an uncreated aspect pertaining to the original, iconic intention with regard to human nature, the divine idiom of engagement referred to here as 'God's Time' could be considered to manifest a created aspect inasmuch as its outward economic sense is contingent upon having something created (whether potential or actual) upon which to 'verge' or within which to reveal. This 'something' consists initially in some intentionally specific, holistic 'beginning', held together 'by a principle' (chapter 2). In the case of this cosmos, the sustained expansion of its physical beginning was such that an appreciative, self-conscious and reflective intelligence was able to emerge through a sufficiently stabilized hierarchy of interconnected contingencies.

The aspects of Time and Eternity here associated with the divine idiom are, furthermore, beyond any mutuality of negation, the one not being some logical opposite of the other. Both have active ontological effectiveness but with one being associated with the Economy and the other with the Immanence. Our *co-operative* participation is then sacramentally facilitated in communication with that operative aspect pertaining to the Economy and to 'God's Time'. The non-negation between these aspects further guarantees a complete absence of any divine self-contradiction.

God's Eternity is sublime, pertaining solely to divine nature's Self-understanding integrity of Being, incomparable with respect to anything intelligible to created perspective. When sublimation occurs in chemistry a particular phase is bypassed. Somewhat analogously in the theological case, for something to be sublime suggests a bypassing of any sense of

comparative, highlighting instead a relationship between some elusive, transcendent superlative and some attributive to whose existence it is (mysteriously) immanent. Such relationship may best be considered according to a participative model.

With the above in mind a scientifically relevant extension to Sayers' particular use of vocabulary can be developed. The phrase 'Creative Power' might afford some metaphorical appeal to the scientific definition of power as a product of energy and inverse time. Considering our biologically functional embodiment as being largely based on a life-supporting, evolutionarily fine-tuned, metabolic efficiency, it seems that the sustainability of any living, dynamic system is dependent upon a particular relationship between some threshold availability of the right form of energy and the critical rate or tempo according to which it is consumed or converted over time – a dynamic, living 'power'. The terms 'power' and 'life-giving' are also characteristic attributes used to speak liturgically about the Holy Spirit, and the language involved in this means of considering *life* therefore offers a fitting, intuitive connection between a theological standpoint and those intricate scientific principles underlying the emergence and sustainability of life.

If a particular energy-time relationship is essential to the living dynamic of the biosphere, then perhaps a theological relationship might be suggested between the 'Creative Energy' (to use Sayers' alternative term for the Activity) associated with divine motioning through the *Logos* and the divine idiom of creative engagement with 'Time' – a relationship essential for the proper sustenance of any participate aspect regarding the Creation, and in particular for actively 'drawing' it into eternal life. Put another way, while some energy-time association corresponds to the functionality of biological 'motion', so some Creative Energy-Time association could be considered theologically to correspond to the *modus operandi* according to which the divine Economy 'motions' throughout created space in order to settle the critical 'trajectory'.

Finally, while space and time are being treated here as ontological categories, they clearly have epistemological consequences. An analogy with the physics of light is apt here. Considered *in vacuo* there are properties, such as light's constant speed and independence from any particular inertial reference frame, which must be intrinsic to any mathematical representation (such as Maxwell's equations). They are essential properties. In the theological case, for which the light is considered metaphorically, there is likewise some

essential, ‘unapproachable’ aspect (cf. 1 Timothy 6:16), pertaining here to some hypothetical, qualitatively distinct ‘topology’ concerning the Uncreated “Space”.

Anything that is economically communicated from the ‘side’ of the Uncreated, however, must manifest itself in or throughout a medium/space that is connectively particular to the intelligible capacity of created observers. One might here consider an analogy between many possible universes and many possible media into which physical light might propagate. The ‘constants’ of nature constituting the interacting parameters of each ‘universe’ are then analogous to the refractive index defining the effect of a given medium on the propagation of light. While there can be no fundamental *ontological* alteration of divine nature in these possible created spaces, there must be some *epistemological* refraction or diffraction[561] – a necessary “translation” through various contingent ‘created terms’ (borrowing Lonergan’s vocabulary again). Any verging, iconic interface onto the medium/universe in question is importantly seen here not as some bounding surface but in terms of the pervading sacramental consonance noted in the Introduction, as one topology embedded within another.

This light-based metaphor may also relate to the objectifying consequences of the Incarnation, especially with regard to our deepening participation in the Mind of Christ, ultimately transfiguring us ‘from one degree of glory to another’. Ontologically this should be interpreted as topologically expansive rather than strictly additive. Divine nature is not added to, but we have something more akin to the magnification suggested in the opening line of the *Magnificat*, fleshing out the biblical witness of Christ that ‘I have been glorified in them’ (John 17:10b).

There is here yet another relation to Bohm’s ‘implicate order’, which has no visible ‘interface’ as such with any context-specific, re-levated, explicate order or measure – no more than occurs between a ‘veil’ of analytical symbols and some ‘reality’ beyond, as Eddington noted.[562] Replacing the idea of an ‘interface’ with the all-pervading ‘tension’ constituting the consonant, background basis of sacramentality, according to a participatory framework, makes intuitive sense here. Bohm introduces a parameter that stands for the ‘order of implication’, effectively representing a measure of one’s ‘proximity’ to making explicate (or relevantly unfolding) some particular aspect of the

[561] Torrance, in *Theological Science*, p.103, uses this refraction metaphor with regard to a boundary between natural knowledge and ‘natural theology’ as he understands the term.
[562] Wilber, *Quantum Questions*, pp.181*ff*.

universal, implicate enfolding. He considers this parameter more significant than that mathematically representing time and suggests that any relationship between the two can only be hypothesized 'in a contingent manner'.[563] Applied to the model suggested here one could say that the theological relevance of 'our time' is only contingently related to 'God's Time' while our degree of appreciation regarding the latter constitutes a far more significant 'parameter' or 'index' with respect to the unfolding of revelatory Activity, disclosed to a created context of reception that is in one respect 'distanced' but in another respect still critically 'proximate', as argued previously.

To sum up, some 'extrication' from our more familiar activity or experience into a new, but still accessible, mode of awareness (or 'dawning realization') is necessary in order coherently to appreciate the dynamic of revelation. This also relates to what is here understood as enabling 'eschatological consideration'. The consonance necessary for such iconic, 'verging' appreciation is not static but inherently dynamic, constituting the basis for the pervasive 'design' of reconciliation noted in the previous chapter. Our recognition of such remains partial within this present cosmos, 'seeing darkly' according to some 'diffraction pattern' within a created space yet to be fully reconfigured or transfigured.

It has been emphasized that divine, ontological initiative is necessary for establishing and manifesting eschatological relevance. Furthermore, such is an *ultimate initiative*, a phrase emphasizing the idea of an end in a beginning, and Christ as both Alpha and Omega. The next section considers such 'eschatological relevance' with regard to its physical dimension.

Eschatological relevance

Eschatologically established stability and relevance is, as argued, ultimately contingent upon some ontological actualization by divine initiative. The 'bi-idiomatic cooperation' inherent to the critical topological 'neighbourhood' of divine-human communion is made manifest through the Incarnation, and the primary communicating initiative is on the 'side' of the Uncreated. This communication occurs through an idiom of creative engagement verging on our iconic capacity for theological appreciation in a sacramental sense. Such creative engagement and initiative enables both our participation in the divine Economy and our capacity for conceiving (of) and receiving the *Logos*, coming to recognize

[563] Bohm, *The Implicate Order*, p.194.

something of its critically pervasive *topos*. Inseparable from such capacity – especially from a physically relevant, scientific perspective – is a developing appreciation of the cosmic nature of our interconnectedness. Eschatological relevance, in as far as its nature is presently discernible, is ultimately established and revealed though a transfiguring of such interconnectedness.

Complete eschatological consideration would therefore require some transfigured means of appreciating life, something somewhat beyond any present, more evolutionary sense we might have of continuing formation. Wilkinson highlights the need to look towards both continuous and discontinuous aspects of any transformation.[564] If one considers two major metaphors relating to transformation, namely those of the *phase transition*[565] and Kuhn's famous *paradigm shift*, and then considers the continuity and discontinuity aspects of each, then one already has four aspects of consideration. This thesis posits that the phase transition metaphor is more appropriate for the consideration of divine initiative, while the paradigm shift is more suitable for consideration of human initiative. The concept of any overall, eschatologically-pointed 'formation' is then a product of some interactive means of cooperation between the two.

In terms of the heavens-earth representation of chapter 2 it is clear that if the former heavens-earth unity is created in 'a beginning' then any re-created or renewed heavens-earth bond, a new *syndesmos* applying to a new creation and new 'beginning', must likewise occur as a unity. Any mood of 'becoming' can only be transformed if that of being – grounded in this case on indicative, *stabilizing* principles concerning sustainable physicality, and committed within a particular framework of laws/contingent truths – is also correspondingly transformed. In the allegory advocated here, a 'new heavens' comes, in this sense, automatically with a 'new earth', consonant with the vision in Revelation 21. Here the coming down of the New Jerusalem may stand for a new communication between Levenson's upper and lower 'tiers' (chapter 2). This eschatological mode of communication is beyond any formational chaos, with no 'sea' in the Revelation vision. There is no longer the double-edged potential for active expression of Evil as well as for

[564] Wilkinson, *Christian Eschatology and the Physical Universe,* pp.94-101.
[565] Polkinghorne especially uses this metaphor in terms of its continuous and discontinuous aspects across the phase boundary from 'old' to 'new'. See J. Polkinghorne, *Science and Providence: God's Interaction with the World* (London: SPCK, 1989), especially p.49, and J. Polkinghorne, *The Way the World Is: The Christian Perspective of a Scientist* (London: SPCK, 1983), pp.55-56.

Good, and no double-edged sword guarding the Tree of Life (cf. Genesis 3:24). As Bulgakov remarks, 'there is no more good in its relativity...only the tree of life remains'.[566]

Here the significance of transfiguration over transformation is again important, considering the enhanced functional effectiveness of an overall re-configuration. With regard to the form-content dynamic, the two aspects are transfigured in tandem. Even if we consider divine initiative predominantly to effect an ontological reconfiguration with respect to the 'formal aspect' of the Artwork, the inseparability between this and any 'contential aspect' means that the nature of any generated content is also transfigured (and thereby enhanced) but very much still accommodated. I would actually argue that the nature of the divine initiative, respecting the integrity of created order, should be considered as allowing the 'content' of the Artwork to play an actively influential part in the nature and the result of the transfiguration process.

Invoking the topological imagery of mindscape once more, human nature could be considered as being 'motioned' or elevated towards a higher, distinctive *genus* of meaning or relevance.[567] Cognitive formation begins with an encounter with the 'literal' first impressions made according to our basic environmental context (genus-0). It develops through a deepening conceptual appreciation of variously juxtaposed signs and symbols, promoting those more consciously deliberated aspects of meaning pertaining to some metaphorical, transferred significance (genus-1). We may then come more fully to recognize and appreciate the enhancing effects of sacramental encounter and engagement (genus-2). Finally, we are called beyond even this into the *eschaton* (genus-3), permanently established according to the Mind of Christ at 'the right-hand of the Father'. These categories are no more reducible than are the distinct topological classifications in the mathematical analogy from which the metaphor has been borrowed.

We do not, however, live in a cosmos *made* of language or semantic significance in and of itself, but one in which the nature and emergence of such language is substantively inseparable from the subtleties of our embodied physicality and its engagement with external, environmental structure in its quest for intelligibility. Likewise, to assume a human consciousness is representatively and dynamically to engage with the interconnectedness of the entire cosmic background and significance with regard to such

[566] Bulgakov, *The Bride of the Lamb*, p.523.
[567] In the context of Christology, Higton refers to 'human life lifted by God to its proper height'. M. Higton, *Christian Doctrine* (London: SCM Press, 2008), p.114.

consciousness (chapter 3). Some obviously continuous and *physically relevant* aspect is therefore required of any eschatological viewpoint.

Saudek presents a helpful overview of contemporary, physical perspectives on eschatology.[568] He is acutely aware of the possible problems caused by a future eschatological timescale being potentially far greater than that of entire human history thus far, and considers nine distinct eschatological positions broadly summarized as follows:-

1. 'Physical eschatology falsifies theological eschatology'
   This predominantly atheistic position usually combines a reductionist paradigm with the notion of an inevitable heat death, tending to see meaning (or its lack) as some static ultimate, without consideration of any deeper significance inherent throughout the dynamic process related here to the reconciling 'design' of the Incarnate *Logos*.
2. 'Physical eschatology is compatible with theology's notion of an eschatological goal of the universe as long as one does not conceive of the eschaton literally as the end of time and the transformation of the physical universe…'
   This is noted for its popularity both with Process Philosophers and, perhaps rather unfortunately, with those seeing theology and natural science as constituting entirely non-intersecting languages.
3. 'Future development of the cosmos will be cut short by divine action'
   This raises questions of timescale and discontinuity, perhaps even allowing different eschatologies for different physical or cosmic domains. It also requires some coherent understanding of what is being intended by 'divine action'.
4. 'Short physical eschatologies'
   This viewpoint forecasts some natural, cosmic end during human lifetime, perhaps falling foul of the temptation to suppose that *our* presence and initiative defines the fate of the entire physical cosmos rather than vice versa. The degree of distinction between this and the previous viewpoint is also potentially debatable.
5. Cosmic transformation is considered to lie entirely within the domain of human action.
   This, although an idea touched upon in the next chapter, inevitably verges upon some post-humanist outlook, outside the purview of this thesis.

[568] D. Saudek, *Science and Eschatology in the Open Universe* (Science and Christian Belief, Vol.23, No.2, Oct 2011), pp.133-157.

6. ‘Optimistic emergentism’
   This often manifests itself as some statistical analysis of cosmic potential, as pondered by such thinkers such as Teilhard de Chardin.
7. There is no physical dimension to eschatology.
   This seems to imply complete discontinuity, about which one cannot really *say* very much, and eschews all truly scientific discussion.
8. A Popper-like ‘many worlds’ outlook (similar to the aforementioned suggestion of Penrose).
   Here eschatological emergence or revelation occurs through some uniting interaction.
9. The optimistic ‘don’t know’ position.
   This, depending on one’s viewpoint, either speaks for itself or does anything but.

In relation to the above model relatively few of these viewpoints seem to fit. The first seems to nullify any real theological engagement. The third and seventh are too emphatic of discontinuity, the seventh furthermore ditching any enduring sense of committed physicality. The sixth, by contrast, says nothing explicit about any discontinuity-aspect in as far as this may be distinct from the possible vagaries of the term ‘emergence’ (although this position remains intellectually respectable in its ambition). The ninth clearly has no particularly meaningful contribution to make, especially if it *is* truly all that one can legitimately say. The fourth is vulnerable to a short-sighted and culturally-conditioned geo-centricity, the only philosophical paradigm justifying it with any optimism being some strongly contorted idealism. While I am not denying that a certain idealist consideration is important to a Christian understanding of collective mindedness – a ‘catholicity’ according to the whole – the aim remains to relate the potential inherent in such consideration to the *physically relevant* transfiguring of contingent interconnectedness.

The fifth viewpoint, though worthy of exploration from a teleological perspective, seems to take the idea of subjunctive possibility open to human control and use it, and it alone, to transform that aspect of the physical cosmos over which we might exercise any dominion. ‘Earth’ and ‘heavens’ aspects are not therefore renewed in conjunction with one another within a theologically interactive model. This way of thinking serves again to highlight the difference between having simply a physical transformation and having a physically relevant theology of transfiguration, the significance of which is inseparable from the

uniqueness of the 'figure' of Christ, the genuine novelty of incarnational encounter and the distinctive collectedness and connectedness pertaining to a share in the Resurrection Life and the Mind of Christ. Through such transfiguration any dual-aspect bonds such as potential-actual, form-content and mediate-immediate[569] are reconfigured *together* as an integrated whole, rather than in isolation. The topological interconnectivity of the framework here is therefore especially important in this regard.

That leaves the second and eighth viewpoints. The second needs to make a concerted effort to find an appropriate link between scientific and theological schemas of thought in order to advertise credibility (for which a focus on stability is suggested here). The eighth begs the question of how each of the 'worlds' might be *involved* in contributing to the nature of any eschatological transfiguration. The 'worlds' must interact, avoiding any separatism that might imply, for instance, some materialist eschatology in one 'space', 'world' or 'aspect' and some idealist eschatology in another. Contradiction, as opposed to some ultimately *creative* paradox, contrast or tension, needs to be eschewed.

If one were to replace the term 'world' (or 'cosmos') with the term 'idiom' – something collectively fostered, in our case, through a particular means of physical formation according to the parameters of precisely this particular 'cosmos' – then one would need instead to say something explicit about how our idiom of engagement may be embedded/accommodated within that of the divine Economy, cooperatively interacting with it. In conjunction with promoting a particular, integrative basis for a theo-scientific outlook, such is indeed a concern at the core of this thesis. One must, however, still find an appropriate means of distinguishing between those continuous and discontinuous aspects resulting from any engaging, transfiguring process.

Summary: the Incarnation as a (necessary) phase transition?

Considering different sides of a phase boundary, any aspect of continuity across the boundary consists in some underlying holding together, as for example through the consistency in chemical formula between states such as water and ice, while some discontinuity is evidenced in terms of an organizational change, and its consequent effects. Theologically, in a metaphorical application of this idea, one must assume the ontology of divine essence as always consistent and thus 'continuous', but something about the

[569] The Uncreated-created tension is once again treated in a conceptual class of its own in this respect.

economic manner in which divine communication is both possible and organized may change, both according to the aforementioned 'diffraction' in created space and in conjunction with some transfiguring initiative involving the union of divine and human natures.

As the phase transition metaphor is being used here in relation to divine, ontological initiative, and as the language associated with the phase transition concept is relevant to the topological framework, there is a good argument here for viewing the Incarnation itself (and importantly in the *totality of its relevance* from conception to Ascension) as manifesting a theological phase transition, defining the critical theological topology lying at the core of this thesis. If the metaphor is to be taken seriously then it is necessary to identify analogies for aspects of continuity and discontinuity, and also for an order parameter. The continuity aspect has already been suggested, while the discontinuity aspect is induced both by the 'diffraction' and in accordance with the physically-conditioned, sense-objectifying assumption of an incarnate 'perspective' (chapter 3), according to which divine 'regard' engages with the *relative symmetry* of the humanity-cosmos relationship. Though not in itself altering any propositional statements concerning divine ontology, such engagement may redefine or reconfigure the 'prepositional' aspect of our theological involvement and encounter, to reuse a term coined in the Introduction. This effectively re-instantiates, or transposes, the nature of our *topos*, initiating the process of drawing it into a deeper relevance and stability. The theological transition is subsequently developed through the transfiguring effect of the Resurrection, an effect carrying physical consequences and involving a certain aspect of continuity, worked out in necessary accordance with various preparatory terms already 'latent' – to return to Russell's argument – in the cosmic context accommodating the Incarnation.

The 'order parameter' then becomes that which makes this process inseparable from the revealing of a new, reordered creation. In relation to the earlier discussion on the uniqueness of the Mind of Christ, this parameter is indicative of the re-membering (see chapter 5 for the origin of this phrase) of created space into a newly ordered domain. In comparison to Lonergan's insistence that to speak in terms of 'percept' is distinct from a stricter view of subjective experience, being instead something 'on the side of the object', one might consider such reordering from a perceptual standpoint, especially with regard to an active engagement of memory therein. Far from merely constituting some most plausible 'illusion' (borrowing a metaphor from cognitive psychology's contemporary

viewpoint concerning the active involvement of our brains and memory systems in forming relevant perceptions) such sense-objectified re-membering – through the unique mode of encounter associated with the Mind of Christ – instead actively *defines* the deepest and most authentic reality in which humanity is able to participate. Eschatologically-speaking, our idiomatic mode of engagement is thereby transfigured to 'see' such reality as it really is (1 John 3:2).

Acknowledging the difficulty of understanding any 'motioning' on the part of the Creative Power of the indwelling Spirit, Sayers suggests the analogy of trying to follow the motion of one's eyes in a mirror.[570] Considering this analogy from an eschatological perspective, one could conceive of a divinely-initiated, eschatologically-focused transfiguration of that metaphorical lens through which we 'see darkly' (1 Corinthians 13:12), transitioning into something topologically distinct, something enabling us to understand or 'see' our proper *topos* in a manner that was previously either impossible or 'unbearable' (cf. John 16:12). Through this transfiguring process our idiomatic mode of engagement, though still remaining distinct, attains deeper significance and more cooperative consonance with that of the divine Economy, as human nature is elevated to and re-established at 'the right hand of the Father' and its relevance thereby attains eschatological stability. In this analogy both our 'eyes' and the 'lens' are interconnected aspects with respect to created space. We do not of ourselves define any formality according to which created space is held together – whether 'from within' or 'from without' – but the dynamic of our nature is nonetheless defined in such a manner as to afford us the potential for active contribution, participating in the generation of meaningful content. This activity remains eschatologically pointed and relevant owing to the sacramental nature of our stability in theological terms.

If the Father is considered as the Source of Creation, the *Logos* as the Image of rationality and dynamic maintenance of order behind and within Creation, and the Holy Spirit as 'giving' and formatively empowering the meaningful life of Creation, then the concept of God's ordering, formalizing Creative Activity becoming flesh, creatively suffering, and being resurrected in a subtly distinct mode of embodiment from that originally assumed at His conception (in other words, not merely "resuscitated", remaining consonant with the concept of transfiguration), then this subtlety of distinction must carry consequences concerning the *re*ordering of Creation.

[570] Sayers, *The Mind of the Maker,* p.115.

As to the necessary, physically relevant aspect of continuity concerning such reordering that 'might lie within the province of science', Russell appeals to Polkinghorne's *ex vetere* view of God's transfiguring involvement in the Resurrection to suggest that such continuities 'include the significance of relationality and holism; the concept of information of a "pattern-forming kind" in addition to the familiar ideas of matter and energy; mathematics; and a dynamic view of reality as "open becoming".'[571] This is an important insight, aspects of which were considered in chapter 3 in relation to a cosmic viewpoint regarding consciousness. The relevance of energy has also been considered, including the suggested possible significance of a relation between 'God's Time' and the 'Creative Energy' with respect to any revelation of transfiguring, 'Creative Power'. It must, of course, be to those attributes of order accessible to our physically-formed capacity for rational intelligibility that we look in order to consider any candidate entities that might be involved in establishing any aspect of continuity regarding our physical eschatology, ultimately secured through the drawing of all creatively constructive relevance to the *Logos*.

As to the idea that the Incarnation is an inevitable necessity – not confined to soteriological consideration alone – it should be recognized that the Incarnation allows for a more complete demonstration of divine omnipotence and omniscience. Considering a classical philosophical conundrum such as "can God create a stone he couldn't lift?",[572] one must be careful to distinguish uncreated and created aspects. The Uncreated "Space" from which God creates with (or motions according to) 'His Time' is fundamentally distinct from that in which one might attempt to lift any created stone in our time. Implicit even in the word 'lift' is an understanding of a certain corollary within created space, one in which the laws of physics come to function in a particular way, with implications for the structure of space-time and the relationship between matter and energy, as well as accommodating a life-form able to grasp and to effect the concept 'to lift'.

The Incarnation readdresses this challenge by redefining the notion of omnipotence in dual terms of 'power to lay down' and 'power to take up' (cf. John 10:18). Divine omni-potential is then that potential inherent in remaining consistent with any implicit boundaries concerning overall creative integrity, with no self-contradiction occurring even when the *Logos* 'becomes flesh'. In this respect the Incarnation could be considered

[571] Russell, *Time in Eternity*, p.70.
[572] See P. Mercier, *Night Train to Lisbon* (London: Atlantic Books, 2009), p.136.

necessary for the deepest demonstration of complete omni-potential and, for that matter, omniscience – 'all things' additionally being 'known' by God-as-Man, encountered through that 'diffraction pattern' induced by the topology according to which we 'see' in created space.

By its very nature the Light gives definition. Taking the notion of a 'thing' to imply some contingently defined finitude it becomes somewhat tautological to say that 'not one thing will be impossible for God', since in order truly to qualify as a 'thing' is then precisely to be contingent upon a definitional basis ultimately deriving from the creative engagement of divinity through the Light. One such 'thing' is then both the potency for, and actuality of, the assumption of human nature. That this is not impossible for God must then openly be demonstrated in the created domain as the ultimate expression – in *this* particular created space – of divine omnipotence and omniscience. The Light shines in the darkness and the darkness neither under-stands it nor over-comes it, neither hypostatizes it nor supervenes it. The Light does the defining and any subsequent redefining. On this reckoning, and specifically in the contingent context of the created domain, hypostatizing and supervening are two sides of the same coin. That which offers a renewed, under-standing, definitional basis for an enhanced human *topos* is mirrored by an overarching or 'overshadowing' supervention, revealing a higher 'refuge' and deeper stability.

## ***Chapter 5: Genres within an Idiom – the Evolution of our Creative Freedom***

Our dynamically stable capacity both for conceiving the 'motioning' engagement of the divine Economy and for meaningfully responding thereto has been central to emphasizing the critical development of our *topos* and its active involvement in the dynamic design of reconciliation, especially as assumed in the Incarnation. Reference has already been made to that 'developing stability' which represents a continual reintegration of (sacramental) connectedness with respect to the overarching 'changeless stability' ultimately pertaining to the prospect of eschatological 'rest'. This chapter considers the evolution of such 'developing stability' in terms that are more scientifically relevant to the concept of our anthropological development over time. It takes a holistic view of such development, expanding the concept of our developing 'idiom' of creative engagement into a consideration of component genres representing critical aspects or stages involved therein. As a guiding metaphor one might think of such developing evolution in terms analogous to the expansion of a particular, representative volume of phase space, especially given the relevance of such a concept to a dynamic consideration of stability. Such 'expansion' may then be seen in terms of an increase in our overall freedom if such is taken as being indicative of the depth or potential of our *capacity* for effective, creative engagement.

### Inhabiting 'reality'

Although not necessarily identical, there is some congruence between the reference in scholastic theology to a human *habitus* and that made here to a human *idiom*. Coulter, in comparing Eastern and Western approaches to human nature and its potential transformation, considers the Latin *habitus* tradition as referring to a particular way of coming to inhabit reality.[573] The aforementioned scientific *ressourcement* has informed us more deeply about the physical specifics and complexity of such *habitus*. For all that the scope of science's informing capacity has significantly increased over the last century, and will continue to do so, there will equally be aspects of consideration for which the theological discipline is either more suitable or importantly complementary. In theological terms, a sacramentally stable *habitus* is critical, especially if theological and scientific insights are to work properly in conversation with respect to our vital association with the *Logos*.

[573] D. M. Coulter, *The Whole Gospel for the Whole Person: Ontology, Affectivity and Sacramentality* (Pneuma, Vol.35, No.2, 2013), pp.157-161.

The Incarnation points beyond our present sense or direct experience of *habitus*, as well as making of that *habitus* an ultimately collective, communal phenomenon and establishing a renewed means of inhabiting 'reality' – a deeper reality in conjunction with an enhanced *topos*. The Incarnation indicates a way of being that is not so *directly* tied to the effects of our baser, earthly heritage, but neither is it irrelevant to such heritage. It re-conceives human potential through the fullest possible involvement therewith, fully engaging with the 'bottom-up' emergence associated with our natural development.

On the 'side' of human perspective the most urgent pressure comes, at least at first, from our immediately encountered environment. Over time, however, humanity gains greater operational stability, gradually developing more robust or effective forms of engagement. Our conceptual or intellectual development may furthermore become extrapolated into plausible, abstracted representations of 'reality' – in some sense 'illusory' or 'seeing darkly' but not necessarily delusory in any more fundamental sense. The noetic aspect of our environment expands and becomes better defined, and we invest a certain degree of faith in its reliability. This development affords us a deeper appreciation of the nature of our freedom, though such can never entirely be divorced from those indelible influences that first shaped our anthropological heritage. While chapter 1 considered *one* plausible means of articulating the dynamic of our holistic mental process, this chapter develops that dynamic over the course of an evolution in our creative freedom.

Considering the nature of our freedom is inseparable from considering that of our *topos* or 'dwelling', which is in turn related to our sense of inhabiting and belonging. Such a sense may change or deepen over time in perhaps quite unpredictable ways that do not appear to resemble any smooth, linear progression, but perhaps the one aspect of our deepening sense of *habitus*, idiom or influence that could justifiably be considered in linear terms is that relating to a more scientific perspective on our developing awareness and capacity. This could still be a complex task, however, given the inseparability between our sense of *topos* and the complexly-connected 'topology' shaping the nature of our environmental, and ultimately cosmic, encounter.

In his theological commentary on the work of Dostoevsky,[574] Williams insightfully highlights the destructive, deeply-rooted flaw in any artificially compartmentalised outlook on the world, and the problems associated with any worldview that lives by facile

[574] R. Williams, *Dostoevsky: Language, Faith and Fiction* (London: Continuum, 2008)

and ultimately unjustifiable presumptions, refusing to accept the richly interwoven, multidimensional tapestry of interconnected signs, symbols and indices playing a relatively complex role in orienting our appreciation regarding the topologically non-trivial nature of our 'dwelling', inhabiting or belonging.

Treating cosmic reality as a whole involves a sense of authentic belonging being made meaningful through the formation of a complex but honest system of exploration within it. Here I mean emphatically a *constructive complexity*, upon whose vital degree of organization and stability all potential life depends right down to the most basic physical level, as opposed to some random, meaningless *complication*. Such constructive complexity characterizes any 'reality' in which physical life can sustainably flourish and, in the case of humanity, with the capacity to generate intelligible meaning (chapter 1). To fail properly to appreciate the complex connectedness of our environment may, furthermore, lead to the degrading exploitation of environmental resource. If, however, we seek honestly and authentically to discern such complex but constructive connectivity then even a broken image retains a venerably iconic aspect, and, as Williams remarks

> Inexorably, the Christological question returns. The icon that is recognizably anchored in the actual world of decision and change, yet carries an abundance that inducts us into a larger world is...an appropriate sign of the primordial icon, the eternal image of God which is embodied in time in the flesh and blood of Christ.[575]

Here, such Christological consideration is deemed critical to a broader and deeper consideration of our proper *topos* and of the appropriation of our *modus operandi* in the Incarnation. The development of our creative freedom ought, theologically, to be related to Christ's invitation to 'come and see' where He is 'staying' – an invitation likewise pointed towards a deeper freedom as a sacramental sharing in the *topos* appropriated and recapitulated by the *Logos* in the Incarnation.

Evolving freedom

From a more scientific perspective the concept of 'freedom' needs here to be considered in the context of that nested, modulated and stability-qualifying hierarchy which is indicative of a dynamic, layered development over *Big History* – a development attaining in particular that critical, complexly-connected 'topology' suited to the sustainability of life

[575] Williams, *Dostoevsky*, p.207.

and the biosphere as an integrated whole. This fits with the idea that (as for Bulgakov) correlative freedom ascends in various degrees and qualifications to the human person. Furthermore, I am in agreement with Dennett that the concept of freedom is one that, from our perspective, must necessarily evolve.[576] An evolutionary framework emphasizes that, in conjunction with a necessary degree of cooperation, some form of competition is intrinsic to the emergence of certain aspects of freedom in the created domain, including the fostering of human capacity over time. This tension between cooperation and competition (see below) highlights a certain incompleteness to our freedom overall. Our freedom is what it is precisely *because* it is part of an evolving process.

In the case of divinity, where freedom 'identifies' with necessity, the notion of 'perfect freedom' is constituted by the requirements of self-consistency, self-completeness and self-sufficiency while not being limited by them in any ontologically finite sense. Given Gödel's insight that, in any rigorously formalized presentation of logic, the requirements of consistency and completeness are mutually exclusive, one might suggest that one key aspect of distinction between the respective idioms of creative freedom is that this exclusivity is absent or bypassed in the divine case. Divine freedom ought not, however, to be thought of as some boundless independence, but rather in terms of the perfectly cooperative and entirely non-competitive interdependence of Trinity-in-Unity.

Given the background idea of a 'bi-idiomatic cooperation' between divine and human idioms of engagement with(in) created space, the conception of freedom advocated here in more theological terms adopts a 'concurrence' viewpoint regarding divine-human co-operation.[577] This avoids any conception of 'competition' between divine sovereignty and the created integrity of creative, human self-consciousness, and seems especially apposite – if not essential – where considering the Incarnation is concerned. I would advocate the two-idiom 'model' as expanding the concept of concurrence within a framework whose language is holistic enough to be of general theological relevance and scientific enough to be of particular contemporary interest. For Kant, the concept of concurrence had its starkest relevance and application precisely to a consideration of freedom. Even though our understanding of those physical principles according to which particular degrees of freedom are mediated has accelerated since Kant's time, the conceptual centrality of such freedom still remains.

[576] D. C. Dennett, *Freedom Evolves* (London: Penguin Books, 2004)
[577] See C. J. Insole, *Kant and the Creation of Freedom: A Theological Problem* (Oxford: OUP, 2013), pp.192*ff*.

One must however be cautious as to how the notion of human freedom is interpreted. Couenhoven notes 'the theological insufficiency of associating freedom with the vagary of choice, rather than a definite orientation to the good',[578] and on this basis freedom will be related here far more to the idea of an overall *capacity* than to qualifications involving 'choice'.

Equally, given its evolutionary nature, our freedom is inherently graduated and contextualized. The process of moving through a succession of different aspects or degrees of freedom will, in requiring some readjustment to environment, influence our means and effectiveness of response to subsequent encounter (relating back to Siegel's 'experienced mandates' in chapter 1).

Overall therefore, any holistic sense or appreciation of 'freedom' is taken here simply to constitute a conceptual 'index' – again in the sense of being actively brought into effect by that freedom which is being indicated. The *stability* of this 'index' is then proportional to the extent of our *capacity* to understand, respond to and, in some cases, emancipate ourselves from the relative constraints of our environment. Ultimately, one could theoretically reach the point at which only necessarily irreducible constraints remain, those inevitable natural boundaries in accordance with which our capacity for appreciating and articulating our evolving sense of freedom develops. Generally speaking therefore, a greater depth of self-conscious awareness, capacity or ability then indicates a greater overall degree of freedom. Emerging self-consciousness enables us more capably to relate to our own roots, fostering a deepening awareness of our potential.

An obvious way of appreciating that the creative freedom associated with our idiom of engagement *necessarily* evolves is to consider our reliance upon some inter-generational process of passing on (see below). From a scientific perspective evolutionary journeys are rarely, if ever, smooth. The notion of progress is neither equally-spaced chronologically, in terms of transitional moments, nor is it geometrically progressive, in some smoothly accelerated sense, towards some predictably final but potentially rather artificial 'Omega Point'.[579] Although this concept will be considered below, it will be seen that it is not easy

[578] J. Couenhoven, *The Necessities of Perfect Freedom* (International Journal of Systematic Theology, Vol.14, No.4, Oct 2012), p.400.

[579] Given a specifically selected interval of *Big History*, one might argue that the run up to one *particular* transitional moment, especially in anthropological history, might seem smoothly to accelerate towards the point in question. However, the *set of all the transition points themselves* may not distribute so smoothly over time.

to reconcile the idea with the messier context of materially-evolving life. Furthermore, from a theological perspective, any prospective eschatology should not be isolated in its significance to some future event or limit, bracketed off from present relevance. Rather, its future causation is relevant to our creative potential and freedom of engagement *now*, as Russell suggests in quite substantive terms. The relevance of God's on-going, sustaining and creative engagement is at least partially discerned *through* our creative and cooperative involvement therein: the 'topology' associated with our engagement and its dynamic stability being embedded within a broader and deeper topology associated with the creative engagement of the 'motioning' divine Economy. The enveloping of a higher environing, within the broader context of which our associated freedom of engagement evolves *and* acquires prospective eschatological relevance, becomes more transparent in the context of this framework.

Developing the 'compact' context of our dynamic stability

The development of our idiom of engagement and its associated creative freedom is expanded here in terms of three component genres which are, chronologically-speaking, dependent upon one another: the most basic genre forming the basis for the emergence of the next. In their chronological order of development the genres in question, as described in the Introduction, are referred to as the *pro-creative***,** the *re-creative* and the *co-creative*. Ultimately these co-exist and (I will argue) offer an appropriate compound lens through which to consider the aforementioned complexity that constitutes our authentic belonging and developing *modus operandi*, indicating a coherent means of appreciating a sense of directedness regarding the dynamic stability of our idiom or *habitus*. Once again, this is just *one* possible way of considering the stages involved in such development, from an intentionally holistic perspective fitting to the framework and language of the thesis overall.

Chapter 3 distinguished between the perfect self-relation pertaining to divinity and our imperfect, incomplete self-replication – something that seems to be a consequence of the necessary prior development of a critical, hierarchical arrangement of qualified levels of stability, acting to promote further development as necessary for the sustainable emergence of higher forms of life and, most importantly in this case, the dynamic stability of our mindscape and creative intelligence. From a scientific perspective, Barrow and Tipler offer a good discussion on the parameters involved in the cosmological process that

resulted in the necessarily finite and fine-tuned compactness of our particular physical constitution and its associated *modus operandi*.[580] Such development is again contingent upon critically sustainable conglomerations of feedback cycles, and our deliberated, expressive response to environmental impression may in turn influence our environment, for better or for worse. The form of environmental feedback involved in developing our creative activity therefore constitutes another aspect of iterative closure.

Paramount to our sense of creative freedom is the collective, formational influence of those natural boundaries defining the limits to our operational potential. In addition to physical and biological constraints there is also, where our mindscape is concerned, the influence of linguistic or even psychological constraints, considering what can or cannot effectively be conceived or sensibly be expressed as a possibility. Such constraints may be relatively numerous, but the degree of freedom consequently defined by their interrelation may nonetheless become so intensely *specific* as also to become very *efficiently precise* in its functional potential. Human creativity, even in its finitude and its imperfection, may thereby prove contextually potent.

Although largely constrained to build upon things already existing, we may nonetheless develop some genuine, accentuating influence that may ultimately work itself out as a *co-creative* potential. It is according to this co-creative genre of our activity, emerging through the successive development of the pro-creative and the re-creative, that we come most fully to 'extricate ourselves' from our baser first impressions of 'reality'. Such extrication affords us an enhanced appreciation regarding meaning, purpose and our theologically proper nature. Theologically-speaking, through the Incarnation, this ultimately involves our *topos* or 'dwelling' being elevated (or re-levated) in the Incarnation, and thereby made more profoundly relevant.

Scientifically, we need to search for the *best means* by which our increasingly informed expressiveness might make the most appropriate impression on our environment, enhancing our overall capacity for creative engagement while contributing to the content of the aforementioned 'Artwork' in so doing. This is clearly a critical challenge for 21st Century humanity. Consideration of our best means of humanizing an increasing proportion of space, an activity that has already proved critical to our participation in *Big History*, forms an interesting potential component of this challenge (considered below).

[580] Barrow and Tipler, *The Anthropic Cosmological Principle* (Oxford: OUP, 1986).

First, however, it is necessary to move through a consideration of the pro-creative and re-creative genres in order better to appreciate the emergence of the co-creative as here understood.

The pro-creative genre: induced by survival necessity

The pro-creative genre of our operational activity brings into focus the shaping of our earliest-conditioned freedom in conjunction with that environmental pressure shaping our most fundamental survival necessities and causing various cognitive processes more instinctively to resonate in our developing consciousness. Our idiom of operation is inescapably inter-generational, inevitably needing to hand things on to others, dying in order to make space for new life. The pro-creative genre represents the basest and most primitive freedom with regard to *how* things are passed on – the level of operation that is most strongly instinctive. Our intuition is to be considered primitive in this genre, facing an as yet un-analysed approach with respect to our survival necessity. It is the genre dominated most clearly by those 'indelible influences' connected with our early formation as a species (chapter 1), incorporated in Polanyi's 'tacit coefficients' and progressively reweighted in response to (often unpredictable) changes in environment encounter.

In this genre any *strategic* awareness or conception is at its most basic, something largely written into those fixed action potentials noted in the discussion on Llinás' contribution (chapter 3). It is the product of the natural progression through Bermúdez's levels of rationality (chapter 1) prior to the deeper influence of more robustly articulate uses of language and more contextually abstracted or formally investigated modes of conception. The context of focus is primary, showing the strong influence of Siegel's 'experienced mandates' (chapter 1) and a lower order *re-representation* of information already re-presented in the act of perceiving (cf. Appleton). It demonstrates the most basic level of creative conception and interpretation regarding our 'terrain' (as per McGilchrist's terminology). Our relatively self-stabilizing capacity for conception plays a central role in the framework of this thesis, but the 'corrections' necessary for the integrated development of our mental dynamic according to this genre are relatively haphazard: stumbling, reweighting adjustments concerning our tacit, mental coefficients. The need for such an intricate balancing act was highlighted in chapter 3, but here the word 'stumbling' has been chosen specifically with another input in mind.

The scope of our pro-creative activity is relatively narrow, partly because the way in which we 'choose' one option over another is not necessarily by conscious searching, but rather by 'stumbling upon'. This phrase is borrowed from Gilbert, who uses it to highlight what he considers to be the naïve assumption of the human mind that it knows best where it ought to be steering for 'happiness'.[581] He exposes the naivety by highlighting three major defects in any attempt to predict our emotional future: first, a sketchily-labelled recollection of past events by which our memory is forced to fill in the gaps in the most plausible manner; second, being deceived to an extent by some spatially-stimulated imagination concerning the passage of time, involving a projection of the present as one might project spatially in cases of separation; and third, a failure to take account of some synthetic induction of a feeling of happiness as part of what he calls a psychological 'immune system'. We do not know the best course to steer because we do not know how the course will later seem to any future, interpretative framework, nuanced and adapted largely according to hindsight. In this sense a *residue* of the pro-creative genre – an evolution-induced necessity – is a certain reliance on 'stumbling upon' beneficial traits or forms of action largely according to circumstance, requiring innately embedded mechanisms to be called, or possibly co-opted, into particular roles so as to increase our capacity for speedy and reliable readjustment in response to possible challenges.

All other functional developments are built around this inherited basis. The seeds are sown for a later, analytically more capable community, cooperating through more developed social dialogue, but such potential is not necessarily realized at this point to any greater extent than is forced upon us. To give but one example, it was noted as early as the 1950s that due to the heavy supervisory demands of cooperative labour placed upon the obligatory maintenance of canals, dams and dykes for the sustaining of irrigation, in conjunction with the need to resolve disputes over water rights, a prerequisite of organized stability in society was placed upon those living in such a region, and hence why some of the oldest-known, ordered civilizations emerged from the region of Egypt and Mesopotamia.[582]

Inherent to procreation in the more literal, biological sense is a necessary cycle of dying and bringing forth of new life. This idea also applies to the development of our capacity for mental conception: some concepts or methods of approach have to give way to more

[581] D. Gilbert, *Stumbling on Happiness* (London: Harper Perennial, 2007).
[582] W. F. Albright, *From Stone Age to Christianity* (Baltimore: Johns Hopkins Press, 1957), pp.145-146.

robust means of understanding, or to a deeper *strategic* awareness as our idiom of creative freedom evolves. Gombrich presents a thorough review of the fuelling of one artistic style, whether in the representational medium of a canvas, architecture or sculpture, by a previous one, in a manner partly continuous and partly discontinuous, occurring right from the art of the primitives for whom 'there is no difference between building and image making as far as usefulness is concerned'.[583] Indeed, a critical transition point with respect to the emergence of the re-creative genre of creative activity could well be considered as being the point at which a practical difference does become permanently established between the actual usefulness of that which is built to serve a particular function and the potential usefulness of what might emerge from the human imagination (or our capacity for the construction of appropriately representative images and models) through more abstracted means of analysis. This constitutes a key sign of extrication or emancipation from the more urgent demands of our surroundings into a more detached and scientifically effective manner of considering our situation and purpose.

The manner in which we are able to hand things on to new generations may thereby become more robustly encoded through more abstract means of conceptual representation and communication, and an altogether greater understanding of the nature of the 'territory' that we explore. A complementary, strategic sense resulting from the development of such insight may then more freely assert its influence, beyond those originally incorporated fixed action potentials that had granted us the previously necessary level of stability and adaptability concerning our capacity for effective and (increasingly) creative response.

As to the idea of conceptual evolution occurring through the dying of older or less robust means of conception, Hitchcock considers an analogy between the developmental journeys of mathematics, science and ecosystems in terms of a dying to offer new life, effectively invoking the idea of paradigmatic shift in such a way that 'the old passes, not away, but into the new. For this the commonly used images of scrap heap, rubbish tip and archaeological strata are totally inadequate and misleading. Far more appropriate are the organic images of compost, forest floor humus and peat-bog'.[584]

He remarks that 'concepts [of which he notes such examples as Hamilton's quaternions and Peacock's *Algebra*] combine to create a fertile medium in which other superseding

[583] E. H. Gombrich, *The Story of Art* (New York: Phaidon Press, 2010), p.39.
[584] G. Hitchcock, *Good Death: A Common Pattern in the Evolution of Mathematics, Science and Biological Organisms* (Science and Christian Belief, Vol.23, No.2, Oct 2011), pp.120-121.

concepts can take root and develop'.[585] Among more physical examples, the death of the ether hypothesis is noted as still having provided Hamilton and Maxwell with a critical conceptual framework.[586] In fact, the idea of intellectual influences needing somehow to 'die' or at least 'be retired' to make way for future progress is one coming increasingly into focus, especially given the 2014 *Edge.org* question posed by Brockman concerning what leading academic figures considered to be the ideas most in need of such retirement, leading to the 2015 publication *This Idea Must Die* (referenced earlier).

The above illustrates how the emergence and development of our re-creative potential occurs through continuing involvement in those aspects of life pertaining to our pro-creative activity and its response to variously impressed necessities. Such relative emancipation and developing capacity for more efficient methods of abstraction and representation increases the freedom of flexibility, and yet also the contextual *precision*, with which we may "package" our importantly acquired insights and hand them on to others. There is an inevitable interplay between the basic human need on the one hand to focus for clarity, and yet, on the other hand, to expand for the sake of interest and broader awareness. Clarity then becomes to our developing appreciation of mental 'refuge' what interest, or even the 'affordance' of a novel means of conceiving or understanding, becomes to our sense of 'prospect'. Appleton's terminology therefore proves useful in keeping track of our evolving mental development over time.

Conceptually-afforded prospect might, for instance, reveal itself through our developing capacity (and therefore freedom) for selecting the most promising means of representation or language use for responding to a particular context of challenge. In itself this involves some evaluation of the prospective 'content' of focus that might be associated with such a selection. The 'index' corresponding to our developing sense of freedom and capacity may further be developed through the progressive availability of different strategic methods or structures of reasoning, each stimulated and made relevant according to the memorable processing of some particular form of 'impression' upon our mindscape. There is therefore an intuitive connection between the references made to 'prospect', 'content' and 'impression' – complementary means of considering the nature of that 'affordance' to which our means of responding to our environment causes our attention to be drawn, with

[585] *Ibid,* p.121.
[586] *Ibid,* p.129.

the familiar and reliably encountered aspects of such engagement becoming innately embedded and encoded in our long-term memory.

Our need for mental refuge in this sense is made clear given the practical need for concluding various channels of exploration, a process offering more relevant, reliable and perhaps permanent mind-marks collectively defining the contours of such 'refuge' and continuing to inform our more authentic, 'inhabiting' sense of prospective potential. Such dynamic prospect-refuge interaction is clearly still somewhat unpredictable in its progression over time, but the more developed our conceptual compactness and interconnected sense of awareness becomes, the greater also becomes the potential for what our evolving intellectual and creative freedom might achieve. The seconding of relevant correction mechanisms then becomes more actively deliberated and significantly less haphazard. Selective, evolutionary influence acts primarily upon those traits whose development pertains most strongly to our pro-creative activity, literal and metaphorical, and its influence on those properties developing more lucidly in conjunction with the emergence the re-creative genre is therefore significantly more opaque.

The re-creative genre: emancipation into a new freedom for invention

Dennett suggests, I think correctly, that good scientific method involves, to a certain extent, making that which was previously too close or familiar sufficiently distant or abstract as to enable one better to comprehend the nature of things. We are obviously close to, and familiar with, the relative vagaries of our incomplete self-perception, especially as immersed in our pro-creative activity (again, literally and metaphorically). This poses the question as to how we might best distance, abstract or 'extricate' ourselves from such a perception in order to allow for an enhanced, better articulated, self-conscious understanding, challenging certain previous assumptions.

In terms of Dennett's language,[587] the emergence of the re-creative genre challenges the manner in which any evolutionary 'rationale' could even conceivably be considered 'free-floating', now regarding a more consciously deliberated, creative activity rather than a more rootedly instinctive, relatively automatic process of copying or emulating. One may develop the tools-of-the-trade or rules-of-the-game learned from one's predecessors all the more effectively the more one becomes capable of emancipating oneself from the more

[587] D. C. Dennett, *Breaking the Spell: Religion as a Natural Phenomenon* (London: Penguin Books, 2007)

purely instinctual forms of expressiveness pertaining to the pro-creative genre. Furthermore, some 'games' or 'trades' within the intellectual and creative potential of our *habitus* will lend themselves much more readily than others to the noting of variations, upon which evolutionary principle (in Dennett's view) strongly relies.

In a significant emancipation from environmentally-provoked, pro-creative activity humanity develops towards a new threshold of opportunity creation, securing the opportunity for more consciously and effectively deliberated investigation and possible invention, which in turn opens up further opportunity. Such development may be 'indicated' through a manner of activity that is potentially both *recreational* (as connected with some personally sought recreation) and also *re-creative* (as developing from a fresh, mental processing of something already latent in our heritage or memory, but in a newly represented or abstracted form). In the second of these senses such is effectively a *re-re-representation*, adding as it does at least one significant extra 'layer' of analysis or evaluation to that re-representation endemic to our more basic, pro-creative capacity for mental conception. The re-creative is therefore a genre more concerned with hypothetical possibility and abstract thought experiment.

A good case study for illustrating some of the characteristic features associated with this genre of creative activity is the invention of, and involvement in, the *Game of Chess*, taken here as consisting in a strategic emergence from of a set of arbitrarily defined, freely invented rules. This is chosen for four reasons: first, because it is helpfully analogous to the analytical emergence of, for example, various branches of mathematics, involving more formal, axiomatic, rule-based systems; second, because it is clearly *not* the product of any obvious or immediate sense of survival necessity, and in that sense becomes a recreational pursuit; third, because it is, in many ways, a re-creation of the already latently familiar concept of a battleground and of social relations within society's 'army'; and fourth, because I have over twenty years' active experience of tournament chess and consequently a relatively deep understanding of the mind of a chessplayer.

Shenk provides a thorough examination of the importance of the game's history,[588] asking what was instrumental in attaching this game to the continuing intrigue of the human mind over a 1,500 year period and noting not only the many historical examples of famous

[588] D. Shenk, *The Immortal Game: A History of Chess* (London: Souvenir Press, 2008).

figures taking to and using chess in some way but also his sense of fascination for a game which

> …seemed to have been present in every place and time, and to have been utilized in every sort of activity. King's cajoled and threatened with it, philosophers told stories with it, poets analogized with it, moralists preached with it. Its origins are wrapped up in some of the earliest discussions of fate versus free will. It sparked and settled feuds, facilitated and sabotaged romances, and fertilized literature from Dante to Nabokov.[589]

He describes how chess had appeared in many myths and fables told about a nation or society's past, and its prevalence in bringing abstract truths into a finite context of understanding that people could appreciate directly before their eyes.[590] Chess had broken away from the previously fate-based aura suggested by the forerunning dice games, migrated along busy trading routes and found, at first, different forms of rules and different representations of pieces according to the nature of its interaction with different cultures and times.[591] Such relative emancipation and cultural variegation, at least in the earlier stages of development, may be considered typical to this genre of creative activity.

Its regional forms being both revitalized and reunited under the influence of various strong 15th-16th Century European queens, the full power and potential of what we now know as the modern game burst forth onto the world scene.[592] Many master players developed, analysing through many games in search of the best means of evaluating or strategizing. This lead to a succession of schools of thought, from Count Philidor's pawn-structure centred strategy, through the Romantic emphasis on tactical combination and sacrificial attack, into Steinitz's more scientific approach, and then finally the seemingly radical, hypermodern conception of counterstrategy by Nimzowitsch and Réti. This is indeed comparable to paradigmatic shifts in other intellectual journeys through human history.

The re-creative genre involves such open, more self-consciously creative engagement, the initial motivation for which may simply be some particular degree of intrigue, perhaps fuelled by competitive intent but increasingly explored for its own sake and for the benefit of gaining *expertise* within that avenue of exploration. Part of this intrigue lies in the

[589] *Ibid*, p.6.
[590] *Ibid*, pp.14-20, p.34 and pp.45-46.
[591] *Ibid,* pp.51-59.
[592] *Ibid*, pp.65-75.

power of abstraction. Shenk notes that 'we all take in a surprising amount of practical knowledge from abstraction: abstract reasoning, according to many experts, is what defines human intelligence. By removing ourselves from the morass of functional detail, we can isolate goals, tactics, strategies, patterns – meaning'.[593] It is not difficult to translate the abstracted prospect-refuge symbolism into terms relevant to this invention: 'prospect' emerging through a combination of the spatial degree of freedom (defined by the board) and the combinatorial degree of freedom (allowed by the rules); 'refuge' being definite knowledge of certain key concepts and variations, ones reaching decisive evaluation, established in the memory of the more advanced chessplayer. Any experienced chessplayer will be aware of the tension between these two aspects in working their way through the complications of any critical position that is new to them.

The use of the Game of Chess as an analogy also requires appreciating the balance between the capacity of any individual player and the state of knowledge of the chess world as a whole at any one time – an awareness of some 'chessic' tradition. As presented here, the re-creative genre inevitably involves some degree of involvement with already-existing, communal knowledge. The individual chessplayer relies on the wealth of previous communal, officially-recorded chess experience for the formation, to take one key example, of a personal opening repertoire. Only a sound understanding thereof can afford the chessplayer a confident and reliable grounding for future participation in the Game of Chess in general. There is open potential for on-going invention, since an opening variation may selectively be studied purely for the sake of improving one's ability to play the game, any 'freedom' to learn and to play chess well in practice being once again more a question of overall capacity than of abundance of choice.

Any degree of freedom is defined according to its dependence upon some boundary or bounding structure. Freedom therefore presupposes conformity with certain enabling principles. Defined in its rules, and searched out in its more advisable and reliable strategies, chess is made what it is by the bounding limits of an eight-by-eight board. The pieces and the rules governing them might need to be changed were officials to deem the current setup too constraining, replacing it instead by a ten-by-ten board, resulting in a fundamental shift in the chessplayer's 'mindscape'.

[593] *Ibid,* p.109.

Only superficially black and white, chess has survived the test of time precisely because of its continuing greyness, lacking obvious transparency as to any one, definitive strategy. Emergence of any expertise or confidence in this genre of creative activity and pursuit is the result of many layers of work, building on previous representations (or iterations of representations). The word *strategy*, though deriving from the Greek word for a commander of an army, also interestingly suggests a possible connection with the idea of being stratified or layered. Just one letter different, *strat-ergy*, would imply 'layered work'. Strategic up-building – incorporating a particular degree of stability or reliability – is just as hierarchical (and arguably modular) over the course of our mental development as the evolving biological 'strategy' undergirding the dynamic stability of the biosphere. Different 'layers' correspond here to different, functionally accessible forms of response, awareness or understanding, the coherent integration of which then allows for an appreciation of some overall increase in our strategic capacity.

Arriving cold to a particular position causes one to speculate how that position might have occurred. Only one variation has actually been played out, but there have been perhaps tens of others considered and, for whatever reason, rejected. One might compare this previous, unseen mental labour to the many layers on an artist's canvas or even to some benefit inherited from the labouring of previous generations as they adapted in accordance with the intellectual demands of their environment.[594] This inter-generational transference constitutes an important reminder that the development of any indices of freedom through our re-creative activity is not divorced from pro-creative influence but supervenes in certain critical respects.

Establishing a critical cooperation

The chessboard defines a shared arena of spatial resource, outside of which no player can trespass. As a particular game unfolds, material imbalance can develop, often by deliberate design, and progressive assessment of the game's developments is critical. With high standard of play and evenly-matched opponents an interesting equilibrium may develop, allowing a strange sense of *cooperation* to develop amidst the competition. The deeper one's analytical awareness, the less likely one is to be a slave to an opponent's

[594] With regard to our theological heritage in Scripture it is important to consider *why* various sorts of things were said and done by those who had grappled with trying to discern and respond to a theological context of challenge and encounter before us. See R. Williams, *Being Christian: Baptism, Bible, Eucharist, Prayer* (London: SPCK, 2014), pp.21-39.

unpredictability. When two strong players are sufficiently, mutually convinced of the correctness or criticality of a means of proceeding, even if still uncertain as to the final outcome, each may correctly predict the other's responses. An affirming co-operation may thus develop between them, each surreptitiously agreeing with the intuited thought-process of the other.

Cooperation is deeply engrained in the symbiotic dynamics of evolutionary progression (chapter 1). The classical evolutionary question "whom does it benefit?" forces some consideration of how past heritage might prove relevant or adaptable to present context. One must reflect on precisely what is most responsibly to be deemed 'beneficial' and 'damaging' and why. Benefit and obstruction may change somewhat relative to environmental context, though limited in their overall divergence according to symbiotic communication and feedback. Most biologically beneficial and sustainable developments over time consist, as previously noted, in circumstantially convenient arrangements of various quasi-stable cycles and feedback mechanisms, which can on principle be broken and/or reconfigured by external or internal perturbation. Such a process of evolutionary formation clearly carries a relatively low predictability factor, and the extent to which we can potentially engineer our way around this limitation is a question connected with recent advances in *Game Theory*.

The idea involves an evaluative engagement with strategic models and scenarios made purely for the sake of increasing our understanding concerning the manner in which the dynamics of living processes might work themselves out. This could be seen as a key point of entry into the appreciable emergence of a scientifically relevant, *co-creative* engagement, actively learning from natural strategy or process. Game Theory has been used, among other things, to study the evolution of co-operation within systems having lasting properties of biological emergence. Frank makes a good mathematical summary of the tense state of play between different dependents sharing a common resource or space,[595] noting in particular the inevitability of having 'conflict and cooperation in constant tension and never separable'.[596] Taylor and Nowak see cooperation as being as indispensable to evolutionary principle as mutation and selection, and analyse the parameters within which evolutionarily stable pay-off with respect to such cooperation

[595] S. A. Frank, *Evolutionary Foundations of Cooperation and Group Cohesion* in S. A. Levin, *Games, Groups and the Global Good* (Heidelberg: Springer, 2010) pp.3-38.
[596] *Ibid*, p.25.

may theoretically occur, considering five separate model scenarios each pertaining to differing theories concerning the mechanisms of evolutionary development.[597] It is shown that some sustained cooperation is theoretically possible in all cases, simply by modifying the underlying matrix dynamics. Maskin further allows for the event of mistakes being made in any playing strategy, leading to *mutant strategies*, and shows that living systems are, on principle, capable of sustaining themselves against such strategies.[598] This relates to the concept of 'structural stability' noted earlier.

A key element of this analysis is that, even in the case of a very low probability that an environment might, mathematically-speaking, present for the emergent potential of any evolutionarily stable, cooperative dynamic, the tightness of the required parameters (involving a very specific and energetically costly use of available resources) is potentially offset by the magnitude of positive payback or benefit. Once such *strategic stability* is established and sustained within a particular environment the capacity for further development may become increasingly open.

Game-theoretical consideration is normally based on the idea of some common resource being competed *for*, involving an interplay between competition and cooperation. In the holistic context of this thesis a common created 'space' is instead being engaged *with(in)*, involving two distinct idioms of engagement cooperating according to the complexly-connected 'topology' of such space. With this is mind, and before moving to consider the co-creative genre, it is worth briefly extending the chess example for the purposes of promoting this key concept of cooperation in a participatory framework, something which I believe constitutes an interesting analogy for theological consideration.

The Game of Chess, participation and an eschatological analogy

The Game of Chess, as an abstract whole, offers the possibility of an interesting analogy concerning eschatological consideration. There is a clear difference between *the* Game of Chess and *a* particular game of chess played out between two particular opponents and recordable for posterity, somehow 'participating' in the allowance of the Game of Chess as a whole. There are two methods by which a beginner may, on principle, develop a working 'opening repertoire' or increase his/her overall capacity, expertise or 'freedom'.

[597] Taylor and Nowak, *How to Evolve Cooperation*, in Levin, *Games, Groups and the Global Good*, pp.41-52.
[598] E. Maskin, *Evolution, Cooperation and Repeated Games*, in Levin, *Games, Groups and the Global Good*, pp.79-83.

The ineffective method is to pick up the latest volume on opening theory and read it through, choosing only the most immediately pleasing parts. Inevitably, the variations with the most positive evaluations for White or Black after a certain number of moves will stem, over the course of the volume as a whole, from different move orders and opening systems that are incompatible with each other within the context of one, consistent repertoire. One is unable thereby to incorporate all the potential lines leading to the most positive evaluation for a particular side, especially if maintaining a consistent individual style.

The effective method is to start playing plenty of games, getting a feel for how strategic awareness and tactical formation develops, recognizing certain common sequences and transposable orderings regarding various combinations of opening moves, and coming to find that style of approach with which one's developing understanding or intuition proves most naturally and psychologically congruent. In so doing, and in searching out intelligible patterns, the chessplayer may *generate* meaningful competence. At this point one may more profitably consult the openings manual and compare assessments of theoretical status on the part of masters both past and contemporary.

One might compare this means of repertoire formation, through which one may strategically and creatively develop, to that of becoming initiated into an appreciation of sacramental participation. Such initiation is likewise most effectively achieved through active involvement and in conjunction with the communal heritage lying behind our creative activity, according to our idiomatic means of generating meaning through our search for consistent forms of intelligibility. However, there is also something beyond this. Evidence from the very top chessplayers indicates that, eventually, an advanced chess-playing mind becomes sufficiently cognisant with the contours of the Game as a whole that, increasingly, such *cognisance* becomes demonstrated relatively independently of any one fixed, personal style, incorporating a far wider potential repertoire. The theological analogy here might be of an advanced, cooperating participation beginning to *recognise* with greater assurance, though not idolatrous familiarity, some aspect of that which transcends and grounds our sacramental participation – a recognition pertaining to some eschatological aspect, prospect or hope. Those 'contours' with and according to which the master chessplayer becomes sufficiently cognisant could then be compared with the

aforementioned economic 'trajectory' being settled in a context in which it is at least partially recognizable on the 'side' of human intelligence.

The direct analogy of the eschaton, in the chess example, would perhaps be the suggestion of *the* 'perfect game' – in which any 'perfection' is demonstrated throughout the entirety of the game in question and from both sides. This hypothetical concept of the perfect game *mediates* between the notion of the Game of Chess as an abstract, conceptual whole and the many possibilities for particular games that could be played out in practice, involving a conceptual topology of interconnectedness over the various possible subsets of such games. Any reasonably and responsibly attempted evaluation or 'recognition' of such a hypothetical game would therefore be inseparable from participative involvement in, and memorable experience of, the Game as a whole, and according to the intelligible principles involved.

One must, however, be healthily sceptical as to what basis might exist for even contemplating the existence of such a perfect game. On what exterior, communally agreed standard of evaluation would such an ascription of 'perfection' be based? What basis *do* we have for contemplating the notion of an eschaton with genuine intellectual integrity? I think the chess analogy is helpful here. Working for the moment on the assumption that 'the perfect game' could on principle exist, discerning the critical property (or properties) of such would then be inseparable from a proper consideration of what general principles would need to play a part in weighting any evaluative criteria – criteria requiring communal acceptance at the appropriate level. There is an intuitive connection here with Lonergan's note (chapter 3) concerning 'sapiential knowledge' as properly considering the *ordering of the whole*, an inseparable question then being what 'primitive terms' are required in order to define those necessary principles whose interrelation indicates or truthfully corresponds to such ordering, or in order to stipulate the relevant, contingent truths involved in any proper consideration of the whole.

Furthermore, if the 'perfection' necessarily corresponds to some *dynamic entirety* – accommodating everything, from both sides, contributing to its justification given the entire collective memory and recorded experience of the chess world's expertise or tradition – then such an attribution would refer to *a game* that somehow demonstrated, in proper balance, all the epitomizing features/principles potential to *the Game* as a whole. The activity of playing out such a game would then consist in 'participating', in the fullest

and deepest possible manner, according to the proper interrelatedness among all its truth-indicating principles. As argued earlier, the concept of 'design' is seen most properly throughout such dynamic entirety, something that (as in the chess example) is ultimately demonstrated through the establishing and/or discerning of some optimal, enveloping 'strategy' in accordance with an idiomatic engagement over time. Theologically the 'establishing' may be considered as occurring on divine initiative while the 'discerning' is open to the secondary, conditioned initiative of humanity, ultimately involving a bi-idiomatic unity of cooperation.

The chess-playing community is actively involved in searching out the various, relative truths somehow contained in the Game of Chess as a whole but only intelligible through the practice of playing out particular games. Such involvement, especially concerning the development of evaluative criteria, is important to recognize with respect to the argument here concerning the contributory potential of the human idiom and its prospective eschatological significance. It is precisely through such formation, involving the imparting of certain information, that the community becomes better equipped to consider any *prospective* criteria according to which even the hypothetical concept of some 'perfect game' might realistically be considered. The ecclesiastical counterpart to this would be the necessary contingency of our eschatological discernment upon some developing, participate involvement – something healthily iconic rather than presumptuously idolatrous.

A final analogy can then be made between the 'created space' and the medium in/through which particular games (literally or hypothetically) may be played out and formally recorded. Uncreated "Space" would then correspond, on principle, to the *source of the conception* of the Game of Chess as a whole, not in itself contingent on anything that might emerge from the chess-playing community's subsequent involvement, being transcendent to any one possible game but still immanent to the potential for any such game to become actualized. The connectedness between the two, dynamically represented here through the 'mediated immediacy'[599] of the (hypothetical) 'perfect game', then logically correlates with the topologically central and sacramentally pervasive 'place' of the (hypostasizing) *Logos* in the theological context, fully communicating between Uncreated and created.

[599] The 'immediacy' derives from the eternal latency of its 'perfection' while the 'mediation' occurs by virtue of that process by which its 'dawning realization' may be received by the chess-playing community.

In summary, if even considering the *hypothesis* of some 'perfect game' necessarily involves acknowledging (a) some oppositional 'tension' owing to a double-edged two-sidedness, (b) the potential for cooperative emergence amidst any apparent 'competition', (c) that design or artistic quality is something most properly discerned or interpreted over some dynamic entirety, and (d) the importance of a proper awareness of some tradition of past participation, then the analogy seems apposite to a theological context and might suggest something quite profound. One question, of course, would be whether to interpret any 'oppositional tension', in the divine-human context, principally as a product of some fallen-ness or more simply in the sense of an inevitable 'otherness' by which each nature maintains its own distinct integrity. The latter of these options arguably relates more efficiently to the suggested working definition of sacramentality, especially in a Christological context. Any idea of 'competition' would likewise need redefining or circumventing, achievable through the principle of concurrence. It is also noteworthy that at *no* point in this discussion has it proved necessary to speculate concerning the static, quantitative aspect of any final outcome – whether the 'perfect game' would end in a victory for one side or a draw. Fittingly, the Christological context could well be considered to stand theologically for a mutual victory achieved through proper divine-human union.

Theological context is also concerned, however, with the *active revelation* of that according to which the 'bi-idiomatic co-operation' under consideration is made manifest. Such actively concerned engagement with that which may be considered 'revealed' brings us naturally to consider the transition into the *co-creative* genre of our activity.

The co-creative genre: searching for a 'maximum' in creative potential

The above analogy suggests a possible correlation between something humanly created and something creatively revealed to humanity. This possibility forms the kernel of what is here expressed as the co-creative genre, focussing on an active, co-operational and contributory participation, having potential eschatological relevance. This genre of activity has before it the hypothetical possibility of a 'maximum' in our creative potential. In as far as this may be of more strictly *scientific* relevance, genuine progression involves an evolving process of optimization concerning our means of response to environmental challenge, based on previously accumulated expertise and on an informed intuition regarding where best to focus attention for the increase or application of such expertise.

Our co-creative engagement may seek this hypothetical 'maximum' in order for our creative activity to achieve greater practical significance, both beyond those considerations pertaining to more immediate survival and beyond any perspective on our 'environment' that risks relative self-isolation over deeper, more authentic belonging and the potential for some higher cooperation. This is where theological consideration concerning the suggested 'bi-idiomatic co-operation' becomes especially important. Co-creativity, imbued in this case with a theological dimension, involves searching for this 'maximum' in our overall, iconic potential, properly engaging with contemporary scientific *ressourcement* regarding what this might most responsibly involve and how it might be stably sustainable. We may thus discern more fully our proper *topos* as co-operating with that Creative Activity inseparably associated with the harmonizing *Logos*.

This clearly requires communal cooperation, involving some responsible assessment regarding where best to focus our resources and concentration in order to discern the best direction(s) in which to progress. This 'maximum' remains hypothetical in the sense that we have no definitive criteria for assessing when or how we might reach such a point (not dissimilarly to the aforementioned 'perfect game'). However, the active, creative process of searching and researching remains inseparable from our potential for, and calling towards, such necessary cooperation. Our capacity for such co-operation will inevitably co-evolve with our means of searching out, making sense over time.

Some sense of co-operation with our natural, physical environment clearly accompanies an emergence from the pro-creative into the re-creative. Such is not therefore the sole feature distinguishing our co-creative genre of activity. The term 'co-creation' is taken here, particularly in its prospective scientific relevance, to imply an actively and communally deliberated initiative of engagement in responding to what we learn about our environment, consciously and positively engineering the manner of our participation therein as part of our calling and responsibility. It is more than simply some double negative of "not interfering", as if our way of being would then somehow automatically resonate with the natural world.[600] We must actively respond, for instance, to the knowledge we have of the dynamic of the biosphere and the part we take in it.

[600] Megré seems to think of co-creation in this way, laying more emphasis on optimising the context of our procreative activity, and without much genuine engagement with science. See V. Megré, *Co-creation* (Kahului: Ringing Cedars Press, 2000)

The ‘cosmic’ relevance of this is then highlighted by the fact that the natural limits to the scope of our mental ‘terrain’ and ‘territory’ alike are laid down by the extent, structure and topology of the cosmos as a whole. Our co-creative capacity and endeavour, becoming more aware of the nature and scope of these bounding factors, could therefore be said to seek to establish, or otherwise occupy, a deeper and more intrinsically *stable niche*. This concept is amplified in its significance by virtue of our iconic capacity to conceive of a higher sense of environing (and freedom therein). Progression through the component genres as suggested here drives our creative activity towards a more deeply integrated appreciation of a critical *stability* that is both theologically and scientifically relevant.

There are obviously both important theological and scientific considerations concerning how such a ‘niche’ is to be interpreted or sought out. Scientifically, we might apply the compact, conceptual interconnectedness of our developing expertise to a consideration of the potential cosmic significance of our *topos* (see below). Both scientifically and theologically we may search for the discernible effects of the ‘motioning’ of the divine Economy in Creation.

The co-creative in physical practice

I used the phrase ‘searching for a maximum in creative potential’ in the title to the previous section quite deliberately, since to find a maximum, mathematically-speaking, requires some *differentiating* operation. This fits quite suitably with a creation whose order is diversified and whose ‘space’ is differentiable. We may turn to science’s prolific ability to analyse and evaluate various aspects of our environment through some form of differential analysis in order to begin to appreciate how its contribution to our co-creative potential might work out in practice.

Given the chess analogy, consider an extension to computer chess programs. The point behind programming a chess computer is to enable its distinct means of processing to *co-create* solutions to the demands of analysis in a way that may be compared to, and contrasted with, the specifically human ability to play the game. In a sense, one invention (the computer) is being superimposed upon another (chess). Walls has studied the possibility of various human conceptions, referred to as ‘beauty heuristics’, being used to enhance the analytically brute-force heuristics mostly used by computer programs, demonstrating that, in comparison with a program of standard heuristics, a ‘beauty heuristic’ enhanced program could be operated to achieve, on average, a 25% increase in

analytical speed and a 33% reduction in the number of nodes evaluated for a given position.[601]

There is an engagement here between two distinct means of analysing, one 'natural' and one 'artificial'. Now consider the case in which the operation of the computer program is combined not with the arbitrary invention of the Game of Chess, but rather with our knowledge of, and cooperative engagement with, our environment. This is purview of the area known as *Digital Biology*. Bentley, a pioneer in this field, examines the idea of using our knowledge of the *strategies* found in nature to enhance both what our computers can do and what they might in turn tell us about the potential of the natural world. One could potentially find some optimum from a series of hypothetical, self-organizing possibilities by means of a computer analysis enhanced by principles gleaned from the study of strategies employed in naturally evolving systems.[602]

The advantage of the natural archetype in question is that many components may interact with each other on different levels, while 'digital universes' are held separate by the demands of having one set of rules per program. Bentley uses the term 'universe', as applying digitally, to indicate that which 'is made from a set of rules that define outcomes [and in which] at least one of the rules must be defined in terms of another universe. This two part definition acts as a key that opens the door to other universes'.[603] A digital 'universe' may then expand through inputs from other digital universes. Not entirely dissimilarly, the human mind is most creative when it most openly draws upon things from outside a set of parameters confined to one particular context of focus.

The possibility of relating the lessons emerging from our epistemological involvement with the natural world to some enhanced algorithmic potential provides a helpful insight for any communally deliberated program of co-creative engagement within the scientific community. The potential for enhancing computer-processing power through programming techniques more in tune with a natural simulation of the processes of our physical environment is perhaps one key step towards realizing another threshold moment in *Big History*. The inner principles of life's natural environment are opened up within digital space, while calculations in digital space may be reapplied to interpreting, perhaps

[601] B. P. Walls, *Beautiful Mates: Applying Principles of Beauty to Computer Chess Heuristics* (Published by DISSERTATION.COM, 1997).
[602] P. Bentley, *Digital Biology: How Nature is Transforming Our Technology* (London: Headline Publishing, 2001).
[603] *Ibid*, p.17.

even actively engineering, some means of optimization regarding environmental potential. We could, on principle, digitally evolve forms of solution to problems that would otherwise remain beyond us.

This area is strongly related to the recently flourishing conception of *bio-mimetics* after the pioneering work of Benyus,[604] looking to learn from nature as to the best ways to grow food, cure disease, store information and harness energy (to name but a few key examples). Patek has described a means of bringing bio-mimetics into a quantitative analysis within an evolutionary framework,[605] while Snell-Rood has illuminated the far broader canvas offered by the evidences of biodiversity than current engineering focus is necessarily embracing.[606] Scobey-Thal also offers a brief, concise summary of the timeline of biomimetic development.[607]

A sense of idiomatic progress: developing through the genres

In the transition from the pro-creative to the re-creative, the obvious effecting feature came through emancipation from immediate survival necessity, accompanied by a more flexible, epistemological capacity concerning the manner in which things could be 'handed on'. Our situation gradually emancipated itself from the heavily-conditioned, largely forced interplay between conscious life and its environment, developing an increasing capacity actively to influence the manner in which any intellectual legacy inherited from our ancestors might subsequently become co-opted to serve a somewhat different function than that according to which such legacy was originally fostered. Both genres are still active in their influence, however, necessarily co-existing in an abstract, conceptually creative 'symbiosis'.

In the transition from the re-creative to the co-creative, our control over such mental legacy becomes increasingly efficacious and focused. Our sense of mental prospect continues to derive from our prospective appreciation of what the potential outcome or 'content' of our creative engagement might involve, but this appreciation (including our predictive ability) is now increasingly informed by the results of our active discernment of natural process. In tandem, our sense of mental refuge correlates with the increased

[604] J. M. Benyus, *Biomimicry: Innovation Inspired by Nature* (New York: HarperCollins, 1997)
[605] S. N. Patek, *Biomimetics and Evolution* (Science, Vol.345, No.6203, Sept 2014), pp. 1448-1449.
[606] E. Snell-Rood, *Interdisciplinarity: Bring Biologists into Biomimetics* (Nature, Vol.529, No.7586, Jan 2016), pp. 277-278.
[607] J. Scobey-Thal, *Biomimetics* (Foreign Policy, No.209, Nov 2014), pp. 20-21.

reliability and stability of those more rigorously formalised structures of reasoning or understanding coming more appreciably to inform, or even constitute, our *modus operandi* over time, both enabling and 'buffering' our evaluative and analytical capacity.

Any development of our idiomatic engagement within created space demands some reorientation of human nature towards a higher appreciation of physical 'environment' or theological 'environing', affording us a deeper and theologically more meaningful sense of 'proximity'. The participative model advocated here further accommodates the potential for active cooperation with divinity. Considering the Incarnation it can equally be seen that divine engagement therein relates to all three of the genres. Our *pro-creative* activity is engaged with in order to prepare the way for the conception and birth of divinity within humanity, something one might compare to St Paul's elegant description of the creation waiting 'with eager longing for the revealing of the children of God' (Romans 8:19). Our *re-creative* activity, a deeper capacity involving our more abstract, conceptual means of searching, processing and, for that matter, theologizing, and fostering our iconic ability to conceive something of the *Logos*, is 'drawn into' the Creative Activity of the Incarnate *Logos*, transforming the 'place' represented by the significance of the Temple and effecting a Jubilee-like liberation, a theological emancipation into a re-creation 'set free from its bondage to decay' (Romans 8:21). Our *co-creative* activity is then ultimately established as having eternal significance and eschatological stability. It is the genre of activity according to which the aforementioned 'developing stability' is most obviously engaged with through direct, active cooperation. Divine initiative ontologically attains and maintains the active incorporation of a fully cooperative human nature in Christ, *developing* according to our idiomatic engagement and *completed* according to that of divinity.

The 'Mind of Christ' then represents the most theologically responsible means of integrating divine and human idioms of creative self-consciousness and self-conscious creativity. Self-consciousness is immutable and intrinsically creative in and of itself on the 'side' of divinity, while on the 'side' of humanity it evolves or develops according to an engaging creative process and means of discernment. The idea of human mindedness being treated as some collective property is not new. Dennis looks back to older traditions of spiritual belief by which human beings were considered united to each other's thoughts, in perfect tune with the mysterious motions of the universe, while noting that

> Breaking out of our many and varied social conditionings requires that a whole new system of perception be brought into being. It calls for mental, emotional, and energetic reserves of concentration that can replace a person's old conditioned terms of reference for new terms of reference…[608]

Here such 'replacement' (a term etymologically fitting to a consideration of *topos*) could be related theologically to the recapitulation of human nature, and the reordering of Creation as a whole, through the Incarnation. The necessary 'reserves of concentration' could equally be considered in terms of a gifted prayerfulness inasmuch as it allows for the maintenance of a functional liturgical space, involving the collective 'work' of a species whose nature has been assumed, sanctified and eschatologically-established. This liturgical aspect also relates to the question of our Eucharistic activity.

Eucharistic significance

The history of Eucharistic development and interpretation as liturgical practice is thoroughly charted by Dix,[609] but I would like to suggest a complementary means by which we might come to appreciate our Eucharistic involvement from a contemporary, cosmic perspective, and in terms of the genres of creative activity proposed above. Eucharistic context requires some appreciation of what precisely it *is* that we are purporting to 'offer' through our liturgical involvement. Communally-speaking, I would like to suggest the offering of precisely the unique distinctiveness of our collective idiom of engagement, an offering 'sanctified' in the Incarnation.

Our unique capacity to consider our *topos* in terms of a communal sense of embodiment and connectedness is highly significant. Our humanity is only engaged in its entirety if the totality of our communally-embodied capacity is ultimately invoked. The roots of our collective striving are aptly represented in the gathering and grinding together of grain and grape as a basis for the offered Eucharistic gifts. In one sense such 'work' precedes the critical transition point in the Eucharistic unfolding; in another sense it is assumed as part of the liturgical process. A distinct mark of human nature upon our Eucharistic offering is symbolically imposed in the process of transition from grain/grape to bread/wine; while

[608] K. Dennis, *The Struggle for Your Mind: Conscious Evolution and the Battle to Control How We Think* (Rochester, Vermont: Inner Traditions, 2012), p.221.
[609] G. Dix, *The Shape of the Liturgy* (London: A & C Black, 1993), especially pp.1-11, 48-102 and 238-267.

that transfiguration from bread/wine to the Body/Blood of Christ is clearly representative of the divine idiom of engagement, manifest through the Incarnation.

Given the above, the manifestly Christological context of the Eucharist is one in which each of the genres of our creative activity acquires, I think, particular liturgical significance as pertaining to the 'work of the people'.

1. Our *pro-creative* activity (literal and metaphorical) relates to the laborious involvement of human toil, necessary for survival and growth, a critical product of which is represented in the offerings of grain and grape presented by the people at the altar.
2. Our *re-creative* activity relates to that ordering and reordering, patterning and re-patterning according to which our communal search for stable intelligibility generates distinct meaning and significance, something we wish to hand on and have *remembered* by our progeny, instigating a developing process of emancipation. The significance of the Incarnate *Logos* drawing all things to Himself then in turn affords us a theological emancipation, something now to be honoured 'in remembrance' of Him. Furthermore, an authentic context for human completion is demonstrated in Christ's Passion and declared in those immortal words 'it is finished' (John 19:30). As a fulfilment of the seemingly paradoxical divine 'rest' the possibility is open for our humanity to be fully (re)accommodated in/as the Body of Christ, bringing in a new creation. The double association between re-creation and recreation can therefore in a sense be applied to divine engagement in the Eucharistic context – a new creation being effected in conjunction with a fulfilment of divine 'rest' in Christ.
3. Our *co-creative* activity then relates to the relevance of our grain/grape offering being trans-figuratively taken up (or elevated) as an acceptable 'flock offering' through the Lamb of God (cf. Genesis 4:2-5 and Hebrews 12:24). This happens, in the Eucharistic context, through the activity of *consecration* – a liturgically creative activity in which humanity, through/as some ordained membership, co-creatively participates and co-operates. As such cooperation is enabled from the 'side' of divinity we do not have any direct, epistemological understanding concerning any consecratory 'mechanism', but we should not deny the ontological dimension of such in our Eucharistic theology, since such denial would effectively forsake this critical accommodation of active, co-creative participation. This seems

consonant with a proper view of consecration which Fagerberg notes, in reference to the theology of Paul VI, as *not* implying some exclusive divine reservation away from the 'profane'. He summarizes this as meaning that 'to consecrate the world is to re-establish it in its proper relationship to God'.[610] This is precisely the theological goal of our co-creative activity – a full and proper incorporation of the bi-idiomatic cooperation between divinity and humanity.

4. Finally, eschatological relevance is 'motioned' towards, in the Eucharistic context, by the act of consumption or communication, anticipating an opening beyond 'the veil that is the flesh' in accordance with the suggested topology. Furthermore, Christ's establishment 'at the right hand of the Father' allows humanity to 'draw near to the sacred mysteries' in the topological sense of 'nearness'.

This layout is complementary to other Eucharistic viewpoints. Firstly, it is relevant to the idea our 'motioning' coming to dynamic, eschatological 'rest' in Christ. Secondly, the importance placed on how things may be passed on or 'remembered' may relate to Mayne's suggestion that the act of Eucharistic re-membering is just as much in opposition to dis-membering as to any sense of forgetting.[611] In the Passion such dis-membering is represented in terms of the violent assault on the Body and the scattering of the disciples. In the same context the penitent crucified next to Christ asks to be 'remembered' when Christ comes into His Kingdom, ultimately re-membering created space/order by drawing all things to Himself. To be co-creative in a Eucharistic sense then involves some share in this re-membering activity.

Thirdly, there is the importance of the categorical uniqueness of the (re-membering) Mind of Christ. This relates to Williams' suggestion that our communion is one of a mutually recognized aloneness. Christ, as the Incarnation of Absolute Truth, becomes the archetype of a unique 'aloneness', being deserted in a manner totally unique to the theological context of the Passion.[612] While being the Incarnate *Logos*, referred to in John's Gospel as 'the way and the truth and the life', guaranteed perfect communion within the Trinity, it also determined a critical distinction from us, especially in the power to lay down life and

[610] D. W. Fagerberg, *Consecrating the World: On Mundane Liturgical Theology* (Kettering: Angelico Press, 2016), p.3.
[611] M. Mayne, *Pray, Love, Remember* (London: DLT, 1999), p.128.
[612] Williams, *Open to Judgement*, pp.143-149.

take it up again. As Williams remarks, 'the solitude of Our Lord and God, by some great divine comic dénouement, [is] made into the means of our communion'.[613]

The 'point' of focus to which this critically irreducible 'singularity' draws our attention is an eschatological pointedness, and something ought finally to be said regarding the manner in which we might consider our *embodied activity* as being drawn towards/into this 'pointedness' in terms relevant to scientific engagement.

Considering an 'Omega Point'

Despite opposition and scepticism among his contemporaries, Teilhard de Chardin's evolutionary insight[614] was in a sense ahead of its time. Even if some aspects of his language need revising in the wake of subsequent scientific advance, other aspects are remarkably pre-emptive. He looks to the origin and totality of cosmic 'stuff' – something he sees in different ways as a 'system', a 'totum' and a 'quantum' – and considers, in agreement with what was said in chapter 3, that 'order and design do not appear except in the whole. The mesh of the universe is the universe itself'.[615] Within the expansion of the cosmic framework he considers domains of stability as a combination of top-down and bottom-up influences and seems in many respects to foresee later developments concerning the significance of emergent, nested, modulated hierarchies pervading nature's ability to transition between various operative domains, and the necessary interaction between various geospheres for this to be possible.[616]

He uses some familiar vocabulary, including terms like 'fibres', 'bundles', 'layers' and 'levels' and refers to the 'exhaustion' of various energetic processes of organization on certain scales as therefore requiring an openness to new domains of organization on other scales. However, he also coins some rather idiosyncratic terminology, such as cooperating 'liberties'[617] (in place of evolving freedom) and his famous presentation of energy in terms of 'tangential' and 'radial' components. Ultimately, consciousness is the focal point of his attention, developing, for him, by virtue of properties concerning conformation, curvature and relative closure, generating the required complexity of interaction across various semi-permeable boundaries. Accordingly, the 'without' aspect of things, more directly

[613] *Ibid*, p.149.
[614] P. Teilhard de Chardin, *The Phenomenon of Man* (London: HarperPerennial, 2008)
[615] *Ibid*, p.45.
[616] *Ibid*, especially pp.79-102.
[617] *Ibid*, p.62.

accessible to physical science, nurtures a gradual increase in richness regarding the 'within', again providing a critical context of stability.

His vocabulary remains, to an extent, of significance to this thesis. I have suggested considering 'strategy' as a dynamic accumulating over some 'layered work'. As well as thinking very much in terms of such 'layers', Teilhard de Chardin notes that 'the organism…is able to find room inside itself to lodge the countless mechanisms *added successively* [italics Teilhard] in the course of its differentiation'.[618] The development of any phylogenetic line is ultimately *successful* if it has been able to build *successively* on that already laid down by previous adaptation and/or innovative rearrangement. This goes hand-in-hand with the 'layered work' of enduring, biologically 'strategic' development, also requiring some capacity for self-attenuation in order to maintain the required degree of compactness. Teilhard seeks to find in this developmental process

> …the particular coefficient which empirically expresses the relationship between the radial and tangential energies of the world in the course of their respective developments…Obviously [this pertains to] *arrangement* [italics Teilhard], the arrangement whose successive advances are inwardly reinforced…by a continual expansion and deepening of consciousness.[619]

This reinforces the idea of a dynamic architecture and an arrangement ordered in conjunction with many competing influences, including energy and information requirements. The critical 'concentration' of consciousness, his main theme, is measured against a point of 'paroxysm',[620] whereby particular manifestations of 'consciousness' (through the progressive incorporation of what we might now think of as innate, fixed action potentials) become solidified in a manner making them more functionally adept but potentially inhibiting further internal expansion and flexibility, owing principally to a lack of available volume. The 'particular coefficient', which in this case indicates the degree of internal flexibility pertaining to the 'arrangement' in question, therefore has different manifestations in different organisms. In this respect, Teilhard's approach seems to connect the aforementioned (and, in historical terms, subsequent) insights of Polanyi and Llinás. Primates come to present the correct conditions for the critically required

[618] *Ibid*, p.107.
[619] *Ibid*, p.143.
[620] *Ibid*, p.111 and p.155, synonymously referred to on the same page in terms of the canalization of instinct.

'concentration' at which Teilhard considers that 'thought is born'.[621] Fittingly, given the language used here, he sees the ascent of consciousness through such transitional development as being a 'movement of movements'.[622]

Thought then further concentrates itself through reflective capacity, effecting 'noogenesis' and the emergence of the 'noosphere'. This is where the above genres find particular relevance, by providing a means of considering the 'layered' development of the noosphere. Teilhard uses the term 'groping', interpreted as some 'directed chance',[623] to refer to what is here expressed as the pro-creative struggle for the more basic sustainability of a living niche or domain. Not dissimilarly to the above mention of 'stumbling' happenstance, this 'groping' takes us across a critical threshold into 'reflective' thought. Society then develops beyond such 'groping' and into higher forms of 'invention'.[624] This is where the re-creative genre emerges, producing some mental expansion in connection with such reflective capacity. It is also where we become capable of appreciating the concept of the sacramental, as here understood in terms of enhanced representation.

For Teilhard the biggest and most enduring imprint of evolutionary heritage can be found in the crystallization of various 'maxima' that have proved able to accumulate an evolutionarily critical 'mass' within what he sees as variously discernible 'fans' in the development of phenotypic lineages. Somewhat analogously, having accumulated a critical intellectual 'mass' or 'volume' (recalling the phase space analogy), our co-creative activity could then be thought of as a freedom indicated by our capacity to search for a hypothetical 'maximum' regarding the development of the noosphere. Teilhard expresses such a maximum in terms of a hypothetical *Omega Point*. A critical component of this 'concentration of consciousness' is a re-evaluation of *that to which* we consider the dynamic of our nature to be 'proximate'.[625] Trajectories in the development of the biosphere that might otherwise simply diverge can converge in a closed noosphere owing to the 'effect of reflection and the recoils it involves'.[626]

To Teilhard, this critical concentration also relates to the concept of Personhood. He considers a connectedness through some 'hyper-personal' dynamic, 'beyond the

[621] *Ibid*, p.160.
[622] *Ibid*, p.174.
[623] *Ibid*, p.110, 118 and 189.
[624] *Ibid*, pp.222-223.
[625] *Ibid*, pp.216*ff*.
[626] *Ibid*, p.251.

collective' and according to which closedness and centredness become critical properties. To use Teilhard's own words one final time, the idea is that

> …by structure, the noosphere (and more generally the world) represent a whole that is not only closed but also *centred*. Because it contains and engenders consciousness, space-time is necessarily *of a convergent nature* [italics Teilhard]. Accordingly its enormous layers, followed in the right direction, must somewhere ahead become involuted to a point which we might call *Omega*, which fuses and consumes them integrally in itself.[627]

In the vocabulary of this thesis, however, any such 'centredness' is regarded in terms of topological irreducibility and an associated stability. Such stability in turn provides a basis for interconnectedness and longer-range communicability. As iconic image-bearers (an 'image' attaining its greatest efficacy when considered as a collectively bestowed property, reincorporated and perfected in Christ) with a focused, compact mode of concentration we may be afforded some critical appreciation of the immanence of that to which we are, in theological terms, most genuinely 'proximate'. This critical, iconic capacity for being able to appreciate some deeper sense of immanence connects with that which is transcendent, transcendence and immanence being intricately connected concepts.

The topology of the framework towards which Teilhard motions would certainly benefit from being made more explicit. For all his well-intentioned enthusiasm and advanced insight, he is arguably a little too eager for the material world to conform to a certain poetic elegance.[628] Some of his metaphors are used in a manner too far removed from actual scientific context, including his apparent determination to view evolution in smooth, geometrically progressive terms. The unity of the *Omega Point* is represented as a higher 'paroxysm'[629] towards which the concentration of a collective consciousness is convergent. In one respect this concludes quite lucidly his previous use of language, but beyond this the presentation becomes somewhat tenuous and sentimental, arguably contorted in order to preserve the conceptual coherence of individuality. Part of the difficulty derives perhaps from his not being particularly specific in distinguishing divine

[627] *Ibid*, p.259.
[628] See P. Teilhard de Chardin, *Hymn of the Universe* (London: Collins, 1965)
[629] Teilhard, *The Phenomenon of Man*, p.262.

Personhood. The theology becomes disappointing in comparison to the in many respects highly insightful scientific build-up.

Tipler developed the *Omega Point* theory,[630] and as a professional cosmologist he made the physical inclusivity that is ultimately important to Teilhard's conception more robustly apparent, also making more specific, mathematical appeal to topological properties concerning the cosmos. Irrespective of what one may make of his suggestion on a practical level, his conceptual impact should not be underestimated. Tipler's original vision went all the way to the aforementioned 'natural limit' concerning the potential for conscious exploration of the cosmos: namely, the case in which such a living engagement incorporates the entirety of cosmic interconnectedness. As he had already looked, with Barrow, at such contingent interconnectedness with respect to our physical origins, it was logical for him to try to extend such consideration to futurity.

While I am cautious of Tipler's effectively materialistic identification between 'God' and some *Omega Point* singularity, there is something in his underlying motivation that is appealingly reasonable. His determination to involve all of space-time in the outworking of any co-creative participation is especially striking, provoking profitable questions concerning our capacity for such involvement up to whatever its realistic limit might be. This motivation remains of interest here, accepting that empirical justification proves, as Tipler later acknowledged, somewhat wanting.

He was clearly convinced that Judaeo-Christianity constituted a differently informed way of regarding physics and its future projection. He presents theology in terms that he considers relevant to empirical science,[631]and his earlier work formed a framework in which

1. There is a counteraction, or potential cancellation, between unconscious, residual cosmic chaos and conscious, intelligently engineered chaos.
2. The mind/soul is seen as a program run on a brain/computer in a body/machine, a concept that is extended to some 'spiritual body', seen as the current body at 'enhanced implementation'.
3. The cosmos is seen as possessing an indefinite capacity for supporting life.

[630] F. Tipler, *The Physics of Immortality: Modern Cosmology, God and the Resurrection of the Dead* (New York: Doubleday, 1994)
[631] F. Tipler, *The Physics of Christianity* (New York: Doubleday, 2007), pp.1-6.

4. A future tense translation of "I AM that/what I AM" is taken, as per Luther, as "I WILL BE what I WILL BE" (Exodus 3:14) in support of the *Omega Point* theory.
5. Theology is taken to be equivalent to physical cosmology combined with an assumption of overall immortality of life.
6. Ultimately a closed, re-collapsing universe is assumed, couched within a multi-verse reality.[632]

Tipler acknowledges that this framework makes no systematic appeal to revelation, proceeding instead to defend the scientific credibility of future technological advance giving us the means to colonize other areas of the galaxy, and ultimately perhaps wider reaches of the cosmos, before any cosmic contraction phase commences.[633] He hypothesizes a combination of natural changes in the material structures of the cosmos during this time and the possibility of intelligently engineered influence upon the way in which it collapses along different directions. The theory, of course, still rested on the question concerning the ultimate fate of the universe.

Arguably Tipler's cosmic viewpoint represents something rather more like a 'universe' in the digitally-modelled sense of the term given by Bentley. The actual content of his suggestion, involving some pre-programmed colonization strategy, may inevitably develop into some post-human vision, which Teilhard seems more eager to avoid. The idea that each individual human cell may be said to contain the genetic information for the entire organism seems to be extended to an idea that each individual life-form ultimately *knows* everything that all others know, such that any cosmic strategy eventually becomes a perfectly worked out teamwork, a superlatively strong condition of universal mindedness.

While this has potential theological resonance, it is (in Tipler's materialistic terms) far from obviously feasible or realistic, given the wake of an evolutionary history known to be chaotic and unpredictable, messy and circumstantial, involving the chance-necessity interplay evident in an extinction-punctuated, biological history of interaction within a changing environment. Even active engineering would surely have an implausibly large challenge overcoming this, and evolution would indeed need to be almost entirely engineered in Tipler's system. It is, in the end, as united an effort as is possible *now* which would be necessary for empowering even the genesis of such a venture. Although moving

[632] Tipler, *The Physics of Immortality*, pp.*ix-xii* and pp.1-17.
[633] *Ibid*, especially chapter 2.

beyond our present frontiers is very probably possible, and even necessary in certain respects,[634] human expansion and engineering will not suddenly become sufficiently predictable in its impact or its sustainability just because technology may bring it within certain practical bounds of long-term possibility and cost-effective vision.

Post-human development (not the focus here) would be the only obvious way of controlling or redefining evolvability in any longer-term manner. Furthermore, Tipler's original requirement of a closed, Big Crunch scenario was called into significant doubt by subsequent discovery of the accelerating expansion of the Universe. There is also an inherently pantheistic convergence upon a material *Omega Point* implied in his description. In his closed-universe model, any notion of faith is replaced with that of *logic* and reasoning, through an appeal to overall statistical likelihood. Holistic, statistical 'necessity' is then ultimately treated according to quantum physics – some cosmic wavefunction that Tipler analogizes (if not even actively identifies) with the Holy Spirit, and even then his viewpoint is certainly not explicitly Trinitarian.

He rightly advocates, in his own language, the important potential for active contribution on the part of self-organizing life, although the overall form of 'enhanced operation' remains decidedly post-human. His *Omega Point* is focused, occurring on the boundary of all time, with any sense of 'flow' being bypassed by the quantum treatment inherent to his approach. Life is defined in terms of *information processing*,[635] together with the

[634] Difficulty in conceiving an *Omega Point* does not in itself mean that an extra-terrestrial expansion of human frontiers should not prove a valuable aspect of our co-creative activity. Any venture towards space colonization would necessarily relate to (a) the pro-creative aspect of our future survival necessity, (b) the re-creative aspect concerning our future competence for technical invention or analytical innovation, and (c) the co-creative aspect regarding how we might actively engineer the manner in which we work in tandem with our environment with greatest efficiency. The case for such expansion has been argued persuasively by Smith and Davies, from an anthropological perspective, based on the evolutionary hindsight we now have of some 3.8 billion years of life. They claim that the consequent 'humanization of space' will ultimately be necessary, through an argument centred on three main areas of consideration: firstly, a detailed consideration of biological and cultural spheres of evolution; secondly, a consideration of how some form of bio-mimicry could help us in our designing of exploratory technology; and thirdly, a focus on creativity as the fundamental core of human intelligence. They emphasize the importance of the fact that change occurs not just *by* evolution but *in forms of* evolution, with consequent implications for niche construction. Their argument is, furthermore, not explicitly post-human, although it is suggested that colonists in space would, over time, develop their own distinctive anatomy and behaviour. See Smith and Davies, *Emigrating Beyond Earth: Human Adaptation and Space Colonization* (New York: Springer Books, 2012). Arguments for some necessary expansion of our frontiers in this manner are also presented, from scientific and theological perspectives respectively, in R. Zubrin, *Entering Space: Creating a Spacefaring Civilization* (New York: Tarcher/Putnam, 1999) and J. D. Heiser, *Civilization and the New Frontier: Reflections on Virtue and the Settlement of a New World* (Malone: Repristination Press, 2010).

[635] Russell, *Time in Eternity*, p.63, notes Dyson's application of a similar information-processing definition of life. In fact, Dyson's work on the future potential of life as information-processing was originally conducted

substitution of faith by logic. Patterns in such processing have their variation bounded by persistent feedback or iteration. Time becomes a rate of information processing and the 'test' of the theory is based on whether our universe statistically satisfies the conditions for it to be possible on principle. The theory suggested specifically that 'when life has completely engulfed the entire universe, it will incorporate more and more material into itself, and the distinction between living and non-living matter will lose its meaning'.[636] According to his information-based definition life attains omniscience by gaining complete control over informational organization, being omnipresent in the material cosmos and hence omnipotent regarding what might, again on principle, be achievable with such organized information. There is a clear eschatological connection, in Tipler's thinking, between the created order as a whole and some ultimately shared participation in a means of *knowing*.

In this thesis such participation is considered to be in accordance with the Life of the Economic Trinity, but I share the above interest in information patterning and processing, and furthermore in an operational epistemology that may generate meaning in a physically and theologically significant manner. If life is evaluated in terms of some patterned 'arrangement' or information-processing capacity, then there is an automatic and direct relationship between the way that life *is* and the manner in which it may come to *know* through a particular organization of information. This maintains a proper, dynamic interrelation between ontological and epistemological aspects of consideration.

Tipler's emphasis on logic and rationality, on bounded forms of information-processing and patterning, and on some ultimately shared, organized knowledge affording active, contributory influence and significance on a cosmic scale is, in a sense, not that far removed from the interest and conceptual focus here. What this thesis promotes, however, is a suitable theological framework with respect to which, given the material problems concerning Tipler's original vision, something of the underlying interest may nonetheless

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on the assumption of an *open* universe, published some years before Tipler's. His vision is likewise post-human, postulating the indefinite continuation of life in informational terms on the basis of a scaling law. Life and consciousness are seen as being based more fundamentally on a particular *structure* than on a specific type of matter, and the critical scaling law depends on this assumption. Interestingly, Dyson's analysis makes use of the distinction between some purely parameterized, psychologically inert 'physical time' and 'subjective time', the latter being measured according to 'moments of consciousness' which are subsequently applied functionally in order to define a rate of entropy production, indicating the consequent 'complexity' of the creaturely dynamic in question. For details, see F. Dyson, *Time Without End: Physics and Biology in an Open Universe* (Review of Modern Physics, Vol.51, No.3, 1979), pp.447-460.

[636] Tipler, *The Physics of Immortality*, p.154.

be maintained but in a reconfigured manner. The theological and topological representation of created space advocated here has the important advantage that it offers an intuitive means of considering some 'end' as being already latently, intentionally and dynamically embedded 'in a/the beginning', something to be 'drawn out' or 'unfolded'. In terms of a 'movement' towards the ultimate establishment of their mutual 'relevance', Alpha and Omega can then be considered dynamically coincident throughout the critically irreducible, sacramentally pervasive *topos* inseparably associated with the 'motioning' of the divine Economy in its engagement with the 'Artwork' of Creation. In particular, the 'radical coincidence' of Uncreated and created in the Incarnate *Logos* is accommodated and 'elevated' therein. There is no need here to import a speculative, panpsychic model or viewpoint in order to achieve the required connectedness. Individuality is likewise accommodated, although communal significance is still considered 'greater'.

I am suggesting here that fuller appeal to a *Logos*-focused theology not only circumvents the material complications in Tipler's original suggestion but secures an eschatological outlook within an acceptable panentheistic framework. Furthermore, the *Logos* may 'draw all things to Himself' even in a cosmos whose physical expansion is accelerating. The language here explicitly has its roots in Trinitarian thought, and the consideration of a form-content dynamic is a logical accompaniment to the artistic analogies used by both Balthasar and Sayers. The *Logos* becoming flesh, as opposed to what is arguably vice versa in Tipler's framework, further allows for the transfiguring novelty of encounter and involvement that brings in the aforementioned eschatological 'pointedness'.

Summary

In the holistic, topological framework promoted here it is not some pinpointed, theo-scientific 'solution' that is being indicated, but rather a pervading resolution, involving the settling of that 'trajectory' pertaining to the motioning of the divine Economy throughout created space. Such pervasion ultimately 'draws out' the New Creation, establishing it according to a higher 'genus' of relevance through the combined effect of the Incarnation, Resurrection and Ascension of the *Logos*. In this context no contingently relevant, truthful conception is lost if it genuinely contributes to some actual, enduring formation, especially that of our idiom of engagement within created space. A particular, scientifically significant aspect of such 'developing stability' has been considered here in terms of an enlarging 'capacity' and evolution of collective freedom through our pro-creative, re-

creative and co-creative genres of activity. Given the sacramental significance given to such activity through the Incarnation our scientific development can be seen in at least covertly sacramental terms and is just as relevant to the overall framework as theological contemplation and formation.

The cosmos clearly presents us with certain physically-conditioned horizons. From a philosophical perspective, Hemming emphasizes Tradition as, properly speaking, going ahead of us as well as coming before us, such that we can become the 'horizon' of its actualization and 'faith becomes the conditioning mode of making something real'.[637] He compares and contrasts this 'mode' to the 'mood' implicit in Heidegger's *Dasein*. Given the advocated form-content dynamic, applied theologically to the multi-dimensional, complexly interconnected Artwork of Creation, our physical participation and potentially enduring contribution to any associated 'content' goes far beyond any mere resignation to inevitability, instead discovering a new 'mood' of freedom through our capacity for appreciating a higher sense of 'environing' and encountering a new 'horizon' through *cooperation* with divinity.

Our anthropological journey requires us collectively to bear a growing self-knowledge, acquired through an increase in our ability to 'extricate' ourselves from that which is too familiar or 'close' in order to further our understanding thereof (both scientifically and theologically). In particular we may develop beyond our less meaningful first impressions regarding any perception or conception of our *topos*. Theology should emphasize to science that our proper, iconic *topos* does constitute a genuine reality, embedded in the engaging, dynamic context pertaining to the divine Economy. It is not some illusory invention of the human mind, but something with which science can genuinely engage, and with potential eschatological relevance. *Any* authentic investigation of our 'place' in created order must, in some way or another, be relevant to our means of conceiving the Activity of the *Logos* through whom that same order is ultimately established. Science, in turn, may examine more thoroughly the nature of the interconnectedness and contingency in the created order, better articulating the context of our anthropological challenge in the 21st Century and encouraging the theological community responsibly and open-mindedly to incorporate the consequences of such understanding.

[637] L. P. Hemming, *Nihilism and the Grounds of Redemption*, in Milbank *et al. Radical Orthodoxy*, chapter 4.

## ***Conclusion***

Summary of the argument

While it necessarily starts from a holistic viewpoint, maintaining a proper balance between immanence and transcendence, theology must be developed within a framework allowing it most concisely to 'say something about everything', especially with respect to the focused engagement of scientific pursuit regarding contingent truths – truths which are ultimately interrelated on the basis of shared origin. This thesis has effectively assumed that there is – indeed, must be – a deeper order of stability circumscribing and giving ultimate definition to the cosmos, or 'created space' in general, than is directly discernible by scientific approach. Nonetheless, the relative, contingent and dynamic stability according to which our iconic intelligence creatively engages allows our scientific pursuit actively to participate in such a way as for it to be proper to consider such activity as at least covertly sacramental. In terms of participation, the 'topology' of interconnectedness according to which we encounter 'reality' and engage within created space is embedded within the deeper context of the 'motioning' engagement of the divine Economy.

A theological view of stability ought, given the transcendence-in-immanence framework, properly to be something which both undergirds and overarches created space and order. All aspects of bottom-up emergence (and *contingent* top-down emergence or feedback) are then ultimately derived from its undergirding basis, while being upwardly convergent in terms of an eschatological 'pointedness' towards an overarching stability mirroring that undergirding basis. Such overarching stability is, however, additionally representative of the completion or perfection of the top-down bestowed 'image' through its recapitulation in the Incarnation – an encounter transfiguring our relative, contingent mode of stability and encounter through the Resurrection and Ascension, establishing an enhanced *topos*. The 'convergence' is then understood as being upon a higher 'topology' of connectedness and encounter rather than as a geometric convergence on a point or locus. Such convergence is ultimately guaranteed by the fact that if certain contingent principles, manifest through various indicative and interrelated 'created terms', collectively and truthfully correspond to a revelation of divine, creative engagement then such truthfulness remains consistent even, if not especially, through that encounter associated with the incarnate Mind of Christ. This convergent continuity is then represented by the node or

‘neck’ in the hourglass topology, opening the way into a New Creation and an eschatological stability.

Scientifically, stability is a quantified (with respect to perturbative effects) and qualifying property of hierarchically layered and functionally modulated systems, dynamically self-integrating and self-organizing in the case of biological systems so as to enable reproducible patterns of stability over time. Bottom-up development leads to emergent properties that may in turn produce top-down feedback, the results of which may beneficially be incorporated into the evolving dynamic of the system in question.

Theologically, stability may be qualified according to a consideration of ‘motion’ and qualifying in terms of the depth and significance of any participate activity. Such stability is here considered sacramental in its nature and manifestation. The motioning of the divine Economy throughout created space becomes centred on the irreducible and sacramentally pervasive *topos* of the *Logos*, through whom the same space and order is created in the first place. This constitutes the basis of the ‘theological topology’ and the engagement of God’s Creative Activity through the *Logos* becomes sense-objectified through the Incarnation, by which a discernible ‘trajectory’ becomes settled.

Inasmuch as the conscious human person may be considered as a microcosm, having the capacity mentally to represent the cosmos according to a particular mental impression, the dynamic, developing stability of our mindscape becomes a key aspect of focus. The reliability and stability of our conceptual capacity and our ability to develop articulate and constructive thought processes are dependent upon the particular ‘topology’ of interconnectedness according to which we perceive ‘reality’, resulting in a convergence on various universally relevant ‘categories’ acting as mind-marks that collectively foster the development of our mindscape and our various accompanying forms of language. Given that such dynamic, conceptual stability is contingent upon an entire layered hierarchy of undergirding levels and domains of stability, the idea of considering the intricate and complexly connected topology of created space or order as being embedded within a broader theological topology – supporting a sacramental view of stability according to a participatory model with respect to the Uncreated – seems to provide a suitable framework within which theology can demonstrate universal relevance in an integrated manner, while allowing scientific pursuit actively to influence the direction of theological development.

Order parameters and topological properties both contribute to the establishing of various domain-bounded scales of convergence and stability. The ancient concept of *logos* as implying arrangement or order is something that can clearly be applied both theologically and scientifically, and therefore our capacity for conceiving something of the 'place' and relevance of such seems a good focal point for such theo-scientific integration, especially given the convenient etymological association where the very word 'topology' is concerned. The theological representation of the 'architecture' of Creation in the Temple may be quite different from a mathematical representation of cosmic order and stability, involving as it does an entire, interrelating array of terms. However, in 'becoming flesh' and recapitulating the iconic *topos* associated with a human nature (and representational mind) created in divine image, the *Logos* conception is simultaneously relevant to both of these representations, the New Temple now being a re-embodiment and renewal of Creation as dynamically established through the *apex theoriae* of divine-human encounter in Christ.

In assuming human nature the Incarnation is furthermore implicitly relevant to the entire interconnected array of contingencies necessary for the emergence of our bio-physicality and the dynamic stability of our mindscape, now collectively and sacramentally shared in the Mind of Christ. The assumption of human nature therefore ultimately has the effect of drawing together all relevant, interrelating 'created terms' – corresponding to the contingency of that nature, its idiomatic engagement and its manner of conceiving – into the critical encounter of the Incarnate *Logos*. The novelty of such encounter then effects a transfiguring of created order, as now being 'seen' afresh on the 'side' of divinity in a unique way.

The 'artistic movement' towards eschatological establishment is therefore considered to consist in a transfiguring, or reconfiguring, of that complex interconnectedness among all the physically contingent, created terms that collectively comprise a latent substrate for any revelation in the created domain. While this transfiguring is, ontologically, on divine initiative, our sacramental and creative activity can nonetheless contribute to the generation of content within the divine Artwork – 'content' dynamically held together in accordance with the 'formalizing', ordering role of the *Logos* – owing to our iconic capacity for conceiving something of the *Logos* and the inseparable, revealing engagement of the divine Economy. Our potential for such active involvement and contribution is likewise formally contained in necessary conjunction with those explicate structures and

forms that we may encounter, which are in turn held together in a harmonious, implicate and interrelating whole through the *Logos*.

While our physical being or 'dwelling' is contingent upon the pre-requisite, layered stability necessary for our bio-physical emergence, our capacity within the created domain for contributory up-building is also theologically contingent overall upon a deeper aspect of 'dwelling' – upon a *topos* defining the sacramental participation of the finite, compactly embedded within the Infinite. In this context the Incarnation dynamically represents a topologically central 'point' of theological focus: an irreducible, novelty-inducing 'singularity' necessary for the context of establishing unity among divine and human natures. The net, eschatologically relevant effect of the 'bi-idiomatic cooperation' between these natures is to bring the newly established Creation to 'rest' in the Incarnate *Logos*. Our distinct, idiomatic capacity for the creative generation (and inter-generational passing on) of meaning attains cooperative relevance in conjunction with that idiomatic engagement pertaining to divinity, involving the integration of all relevant activity throughout the entirety of 'our time'. Such 'relevant activity', part of a 'developing stability', also becomes progressively explicated over time – a process incorporating our increasing capacity in more scientific terms.

The iconic aspect of our nature affords us a certain mysterious 'proximity' to divinity (cf. Acts 17:27) despite the 'distance' between Creator and creature. Such proximity has been interpreted here according to broader topological conceptions of 'nearness' and 'neighbourhood'. The 'implicate order' inherent in this topological framework enfolds the potential for various forms of communicability, whether implicit or explicit, within created space, requiring this broader conception of proximity. Such subtle communicability sustains our participative, embodied mode of being, as it is 'moved' towards a deeper, more significant mood of participation 'according to the whole'. Various aspects of this whole are revealed in the cosmos (physics), the biosphere (biology) and the *ecclesia* (theology). Each of these relatively and contingently determines some aspect of the associated embodiment but not so as to deny our creative, creaturely freedom.

The path of discipleship involves a continuous process of prayerful learning, something necessitating an increasingly fuller and proper association between our way of being (in faith) and our way of coming to know (through our beliefs), enabled according to our

participation in the divine Economy.[638] An important aspect of such learning is related to our capacity to 'conceive' concerning the 'place' and relevance of the *Logos*, through which the creative engagement of the divine Economy is discernible. Such conceivability is itself part of a dynamic 'movement' here associated with the development of our collective, participating mindscape. Being assumed and newly encountered in the Incarnation, in and by which the *Logos* is conceived in a critically unique manner, this mindscape becomes sacramentally enhanced and eschatologically pointed. This critical phenomenon of human involvement occurring in the Mind of Christ is considered inseparable from a dynamic and cosmic 'design' of reconciliation.

Finally, the Incarnation has been argued (within the topological representation here) to be at root a theological 'phase transition', arguably necessary for the fullest possible demonstration of divine omnipotence and omniscience. Considering the Incarnation within the terms of a phase-transition analogy provides a robust metaphor incorporating a proper consideration of continuity and discontinuity aspects regarding God's transfiguring engagement. The Incarnation is here considered to indicate a pervasive engagement with the whole Creation, renewed by being drawn back into and through the same *Logos* through whom it was derived in the 'first place', in accordance with a primary *topos* or principal, uniting Principle. Appropriate, physically relevant aspects of continuity ought therefore properly to be incorporated in any eschatological consideration of the New Creation. This relates to the example of the hypothetical perfect game in the chess analogy, any even partial discernment of which must develop through active involvement with that interconnected set of 'terms' pertaining to the Game of Chess as it came originally to be established.

Additional observations

The framework here highlights the principle of dynamic interconnectedness, and the theological importance surrounding the principle of distinguishing between crucial, interrelating aspects within some deeper unity. The consideration of stability with respect to the Creation in general and to the role played by the development of the human mindscape in particular has been expanded, respectively, according to the interrelating, dual-aspect bonds of form-content and refuge-prospect. The form-content dynamic was argued as being a natural philosophical accompaniment to regarding created order as an

[638] R. Williams, *Being Disciples: Essentials of the Christian Life* (London: SPCK, 2016), pp.1-18.

Artwork. The refuge-prospect dynamic was argued to be a helpful means of considering more holistically the dynamic development of the compositional nature of our intellectual evolution.

In each case, the two aspects are considered to be in a relationship of necessarily mutual influence (rather like the physical interaction between space-time and momentum-energy). In the mindscape context our sense of 'prospect' correlates with a particular perception and evaluation of some 'affordance' regarding our specific environmental context of encounter, which becomes conceptually translated into an articulation of some prospective 'content' emerging from our engagement therewith. This progressively contributes to any developing conception of our 'place' both in Creation and with respect to divinity. The divine idiom of engagement with Creation is argued as being *open* to our contributory, generative activity. At the same time our sense of mental 'refuge', indicating our very capacity to develop our thought and language according to various conceptually stable categories of focus (à la Vigo), is contingent upon the 'formal aspect' of the Artwork, or upon those parameters or 'terms' seemingly written into or constituting created order in its dynamic stability. Even slightly influencing the nature of such parameters is something largely (if not entirely) *closed* to our initiative in ontological terms, and any transformation of such formality occurs on divine initiative. Furthermore, in necessary accordance with the formalizing Activity of the *Logos*, humanity has the iconic capacity actively to contemplate a higher 'refuge', some sense of 'overshadowing' or 'environing', and such capacity necessarily involves a certain distinctive freedom.

In terms of relative openness and closure where our initiative of engagement is concerned the layout below may be helpful for thinking about the interrelation of vocabulary used here.

| Form (or 'formal aspect') | Content |
|---|---|
| Refuge | Prospect |
| Immediacy | Mediation |
| Mathematical ontology | Scientific epistemology |

In the left column are those aspects that are largely or entirely closed to human initiative – ontological *givens*. In the right column are those aspects that are on principle open to contributory human engagement. The final row above relates to Penrose's contribution noted in chapter 3.

As a final note, any pantheistic framework runs into the challenge of how appropriate distinctions are to be maintained between the natures and their associated idioms of engagement. A panentheistic framework seems better suited, both for the fact that it can be presented in different ways, as Gregersen shows, and for the fact that any all-in-all eschatology is intrinsically panentheistic. The framework suggested here arguably corresponds best to an expressivist flavour of panentheism, while remaining open to soteriological concern in the sense that the transfiguring process assures that the result of being 'drawn' to the *Logos* is ultimately that of a fully stable, embedded relationship between created and Uncreated. It is important to discriminate here between a static and a dynamic stability. A rigid, fixated conceptual framework or outlook can be statically stable in an often unhelpful and unhealthy way, just as (psychologically) madness may result from becoming imprisoned in an inflexible and inaccurate logic peculiar to an individual or group.[639] Such static stability is here considered non-contributory in the above sense, and eschatological relevance and stability likewise remains dynamic, albeit according to a distinct 'mood' of dynamism reflecting the 'higher topology' involved. The challenge is then how to distinguish our present 'mood' of participation from that more properly pertaining to the eschaton. One possibility suggested here is to consider the transfiguring process as re-creating and deepening the context of creaturely participation, ultimately inducing a topological transition into a higher 'genus' of theological relevance and elevating its associated physicality in so doing.

Inasmuch as God is not confined by our imagination He can freely recreate, but it also needs to be appreciated that this freedom is a *precise* freedom, identifying with necessity. The deepest and most engaging act of recreation is precisely that which 'sees' creation afresh from the necessarily unique, double-sided but united perspective of the Incarnation, in union with the actively engaging imagination of an assumed human nature thereby perfected and completed. Our communion 'share' in the imagination sanctified in the Mind of Christ then becomes dynamically representative of a transfiguring or reconfiguring of our engagement within created space, ultimately accommodated in terms of some newly embedded 'space' pertaining to our eschatological 'place'.

If the Resurrection first focuses our attention on the transfiguring Light of Christ's divinity and – after some period of adjustment with respect to our blurry, unclear and at first

[639] See G. K. Chesterton, *Orthodoxy* (Massachusetts: Hendrickson, 2006), pp.9-24.

disoriented focus – then moves into the 'transition' of the Ascension, where the Light illuminates that which we instead come to behold because of it,[640] then a critical aspect of what we subsequently 'see' remains consistently related to the *way* in which all relevant 'things' are drawn together by the Incarnate *Logos* lifted up from 'the earth'. If there can properly be said to be any affect with respect to the 'side' or 'aspect' or 'idiom' of divine engagement then one could perhaps think of the Ascension as the drawing up of a perfectly fashioned 'lens', both by the Father and to the Father, establishing the relevance of that idiomatic engagement made on the 'side' of humanity in its fullest possible magnification, and consequently a new 'degree of glory'.

Overall, there is a connection well worth exploring between those topologically qualified, geometrically reinforced stabilization processes pertaining to the scientific domain of inquiry or interest, and the topologically defining manifestation of a critical, sacramentally stable basis for participation pertaining to the theological domain of consideration. Both involve a necessarily hierarchical consideration of the dynamic in question, according to their own context, language and methodology. Such hierarchy allows for the possibility of different levels or qualifications of 'motional' complexity, freedom and participative involvement. This is, I think, a profitable framework for exploring a more holistic theo-scientific integration, avoiding the danger of looking for any model concerning divine-human interaction according to some physically reductionist paradigm, such as looking for inspiration exclusively in the uncertainty of the quantum regime.

A unifying theme for scientific involvement

Various areas considered here could be united through a *Logos*-focused, theological consideration of *information*, remaining scientifically relevant to contemporary engagement given especially the aforementioned priority of bioinformatics principles over any secondary, selective evolutionary filtering. Given the complementary importance of energetics and informatics regarding a scientific perspective on stability, one might consider the complementary concepts of 'efficacy' (or sufficiency) and 'efficiency' from the perspectives of energetics and informatics. Neurologically, for instance, these could be

[640] Williams, *Open to Judgement*, pp.81*ff*.

regarded in terms of a cost-benefit consideration regarding the energetic sustainability of particular domains of informational organization over particular developmental periods.[641]

The informational aspect is hard to describe fully, owing to the contextual dependence regarding how information comes to be evaluated at different levels of consideration (a photon, a gene, a nerve impulse, etc.). Yet information still constitutes an indispensably critical link in a broader chain or hierarchy. Starting with the concept of *Logos*, the Principal Principle necessary for any theologically proper giving/consideration of *form*, one may ask how this 'formalizing factor' in and beyond created order might best be appreciated from a scientific perspective. In terms of 'settling a trajectory' one could consider a 'motioning' through developing, cosmic *formation*, a process progressively incorporating more deeply integrated *informational* components, encoding various functionally robust domains. Eventually we reach the point of a living, quasi-stable means of knowing and *self-informing*, accommodating the possibility for creative intelligence, linguistic ability and openness to cooperation with divine nature through the divine image. This enables a deepening participation in the self-knowledge of God and a more profound, *Sophianic* appreciation.

Such *Sophianic* appreciation then sees the completion of a stable, theological cycle, returning to the original centrality of the *Logos* by virtue of the conceptual inseparability between the *Logos* and *Sophia*. The latter is considered here as the Principal Witness to the ordering of Creation, representative of a sharing in the 'perspective' of the *Logos* on the 'side' of divinity that mirrors our share in the Mind of Christ on the 'side' of humanity. This cyclic consideration, the *Logos* conceiving Creation while in turn being open to being conceived in a particular manner by a particular aspect of that Creation, and sharing in that process through the Incarnation, might then be related to Isaiah 55:11 – 'so is/shall be my Word that goes forth from my mouth, it shall not return to me fruitless/empty, but it shall accomplish that which I purpose, and succeed in the thing for which I sent it'.

Scientifically, it might be possible partially to integrate energetics and informatics approaches through consideration of *configuration space*, acknowledging the effect of additional, conformational properties as particular geometries of interaction become established on particular scales. This might enable us better to understand the biological

[641] A good analysis of efficiency at the neurobiological level is given, with respect to synaptic organization, in G. M. Shepherd, *The Synaptic Organization of the Brain* (Oxford: OUP, 2014).

significance of topological properties of (self-)organization and how various transitional developments and emergent properties come about.

If scientific language involving configurational, conformational, phase-transitional and topological properties could be incorporated into a set of demonstrably interconnected principles concerning biophysics or bioinformatics then the potential for a theological application of critical concepts such as *Logos* and transfiguration could conceivably be far richer in its physical relevance. While Russell applies his *Creative Mutual Interaction* schema chiefly to a consideration of space-time metaphysics it would be interesting to apply it instead to some consideration of bio-theology, since the integrative potential of bioinformatics seems to offer a rich, contemporary channel for a possible scientific development of theological ideas. Furthermore, there is the liturgical consideration of what it means to be an embodied, information-organizing 'worshipper'. Overall, I consider that a modern engagement with theology along these lines should have significant potential for making a lasting, valuable contribution to 21$^{st}$ Century theology-science conversation.

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