Relationality and Health: A Transversal Neurotheological Account

with Pat Bennett, "'Landscape Plotted and Pieced': Exploring the Contours of Engagement between (Neuro)science and Theology"; Pat Bennett, "'Things Counter, Original, Spare, Strange': Developing a Postfoundational Transversal Model for Science/Religion Dialogue"; and Pat Bennett, "'All Trades, Their Gear and Tackle and Trim': Theology, Cognitive Neuroscience, and Psychoneuroimmunology in Transversal Dialogue."

"LANDSCAPE PLOTTED AND PIECED": EXPLORING THE CONTOURS OF ENGAGEMENT BETWEEN (NEURO)SCIENCE AND THEOLOGY

by Pat Bennett

Abstract. This article—the first of a linked set of three outlining the development and practice of a different approach to science/religion dialogue—begins with an overview of some persistent tensions in the field. Then, using a threefold heuristic of encounter, engagement, and expression, it explores the routes taken by James Ashbrook and Andrew Newberg to develop a dialogue between theology and neuroscience, discussing some of the problems associated with these and their implications for attempts to further develop neurotheology. Finally, it proposes a different way of thinking about this enterprise and points toward a new methodology for supporting this endeavor.

Keywords: James Ashbrook; cognitive neuroscience; neurotheology; Andrew Newberg; relationality; science/religion dialogue; theology; transversal spaces; J. Wentzel van Huyssteen

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Glory be to God for dappled things . . .
Landscape plotted and pieced—fold, fallow, and plough

Gerard Manley Hopkins

Over the last half-century, science/religion[1] has emerged as a fully fledged and stable academic discipline with the institutional manifestations,

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research centers, teaching courses, conferences, journals, and critical mass of scholars which are recognized markers of an established field. Nevertheless, despite this reassuring bulk and seeming solidity, certain tensions and "unresolved battles" (Clayton 2014, 437) remain deeply embedded at its heart, and with them important questions about the nature of the enterprise itself. Moreover, as Michael Burdett (2017, 247) notes, the field is currently undergoing a transition as a new generation of scholars assess its past movements and identify its future trajectories.

This first of three linked papers—based on my doctoral thesis—is a contribution to this process from the perspective of interaction between theology and the neurosciences. Set against the background of some of the tensions alluded to above, it explores the shape and results of the connections established thus far and asks whether a different approach to dialogue might result in the generation of more complex and textured understandings of aspects of humanness—one to which both science and theology can contribute as equal partners. The second paper (Bennett 2019b) deals with a proposed methodology for enabling and supporting such a dialogue; the final one (Bennett 2019c) gives a brief account of its employment to explore—through a series of engagements between theology, cognitive neuroscience, and psychoneuroimmunology (hereafter PNI)—whether the experience of human relationality[2] can directly moderate immune function and thus affect health outcomes.

The issue of how to construct differently productive dialogues between disciplines is becoming ever more acute as we become increasingly inundated with data at both individual and institutional levels (Frodeman and Mitcham 2007, 507). Since information does not equate to knowledge, this deluge has merely served to heighten an escalating problem whose roots go back to Descartes' *Rules for the Direction of the Mind*, *viz.* that of progressive fragmentation and hyperspecialization within disciplines and departments. Simultaneously, the capacity and ability to integrate the resulting specialized data across these heightened boundary divisions is declining—not just due to their sheer volume, but also because of the underlying *Weltanschauung* itself. The problem has been compounded by the ongoing disjunction, also with Cartesian roots, between the humanist and scientific cultures. Against the accompanying rise of Wolfgang Janke's "praecisio mundi"—the world where only what can be precisely calculated, presented, measured, and made available counts as real (Janke 1999, 12)—this has seen the explorations and outputs of the former discounted by the latter as a valid contribution to objective knowledge about the world, with a consequent contraction and impoverishment of understandings. Thus, a pressing question we currently face is how to avoid simply "stockpiling endless information that fails to inform our ignorance or our responsibility" (Le Guin 2014) and instead develop ways of reconnecting this ever-increasing volume of information: how do we build knowledge in a

way that recognizes and responds not just to the inherent complexity of the natural world investigated by the sciences, but also to the ever-present and increasing complexity of human lived reality, as explored and articulated by the humanities?

At first sight, the field of science/religion studies would seem to be perfectly placed to undertake this kind of reconnection, and indeed to be doing fairly well at it. However, a certain *dis*-ease persists at the heart of the field regarding purposes, methodologies, target audiences, articulation of outcomes, and so on. Moreover, epistemological parity through shared critical realism, though confidently claimed, is not generally accepted outside of the dedicated field. Even within it, the accompanying declarations of bidirectional flow and mutual expansion (e.g., Polkinghorne 1991, 75; Newberg 2010, 54) are difficult to substantiate, with theology inevitably the recipient rather than the donor of insight. Thus, whether acknowledged or not, epistemological sovereignty (cf. Healy 2003) continues to belong firmly to science. Thus, there is a question mark as to whether science/religion engagement has generated (or, as currently practiced, is *capable* of generating) any widely accepted expansion of knowledge of the kind required here. For those who believe not only in the inherent rationality of the theological enterprise but also in its ability to produce genuine knowledge about the world, this represents a frustrating state of affairs.

The current burgeoning of the neurosciences and the resulting generation of large volumes of data relating to human cognitive functioning has exacerbated this tension: given the many insights developed within different theological systems on the nature of the human condition, this ought to be an area of rich potential for dialogical exchange. However, the appearance of neurotheology as a new "discipline," far from capitalizing on such possibilities, has so far failed to produce a coherent and distinctively different type of science/religion discourse despite recent claims to the contrary (Newberg 2010, 1, 21, 54) and instead has only added to the disquiet about science/religion work which continues to be expressed from both scientific and theological camps (e.g., Atkins 2006,124; Coles 2008, 1956; Geertz 2009, 319–24; Goldberg 2009, 325–30; Helminiak 2010, 47–74).

A critical question is therefore whether it is possible to develop different forms of dialogue between theology and science (in particular here with the neurosciences), which could facilitate a genuine exchange and corresponding expansion of knowledge. Such a venture however requires attention to the epistemological and ontological knots that underlie science/religion engagement, since these have a bearing on the development and potential shape of any neurotheological endeavor. First, though an important caveat must be noted, namely that there is, as John Brooke's nuanced and meticulous commentary observes, "no such thing as the relationship between religion and science" (Brooke 1991, 321); the intersections between

them, are highly contextualized (Brooke 1991; Brooke and Cantor 1998; Livingstone 2003; Numbers 2006). Moreover, since both are located in living, developing, evolving traditions, the boundaries between them are constantly shifting (van Huyssteen 1998a, 23). Hence, the contours of engagement between science and religion are not a given of the world but, like Gerard Manley Hopkins's landscape, a patchwork of things plotted and pieced—something given shape by the activities of those who work the territory through their own particular combinations of "fold, fallow, and plough."

But while blanket theses about the contours of interaction are thus difficult to sustain, it is nevertheless necessary to make some general observations about the current state of the field and its programs, and about certain underlying tensions between the two discourses, particularly as these have a bearing on the development of neurotheology. Such tensions are complex in nature and resist simplistic reduction, but for the purposes of this discussion I want to consider them under three broad categories—purpose, epistemological strategies, and ontological understandings. It is against this background that the more specific issues of neurotheological engagement will need to be set.

Science/Religion Dialogue—An Ambiguous Academic Venture?

Alongside the central tensions already noted, and organically related to their lack of decisive resolution, are legitimate questions as to the wider impact of the science/theology exchange, both generally and on its contributing disciplines. Willem Drees's (2010, 2) comment on the field's lack of consensus on important matters, limited impact on religious communities, and marginal credibility in wider academic circles makes uncomfortable reading for practitioners but is by no means unsupported. Many theologians take little or no interest in such dialogue (Knight 2001,1–3; Polkinghorne 2008, xi–xiii) and its outputs are conspicuous by their absence in recent systematic theologies (Smedes 2007, 596–97). There is a similar lack of academic engagement and discussion from the science side and no critiques of assorted attempts at articulating the fruits of science/religion in journals outside the specialist ones—for example, most references to *Zygon* papers are found within other *Zygon* articles (Drees 2014, 781). An implicit recognition of these issues, and also possibly of the accuracy of Drees's stark assessment, is attested to by ongoing and multiple attempts to rearticulate, reframe, or reimagine different aspects of the field (e.g., Drees 2010; Gregersen 2014, 419–29; Gregersen and van Huyssteen 1998a; Hefner et al. 2010, 419–522; Messer 2018, 821–35). It is also apparent in the stringent criticisms already noted, which have attended the emergence of new subdisciplinary fields such as neurotheology.

But while much has been written on the *nature* of the relationship between science and religion, attention to and discussion of the actual *purposes* of dialogue is far less overt and explicitly laid out in either compendia of the field or individual texts; moreover such attention as there is tends to be fleeting and subsumed under consideration of models. In effect, consideration of "why?" is swallowed up by discussions of "how?" A notable exception here is Drees's exploration of the variety of purposes which engagement between religion and science appears to serve from insider/outsider perspectives. Drees argues that the development of different types of apologetics for various different communities is a significant object of science/religion engagement—particularly perhaps for those with prior religious commitments (Drees 2010, 12–37). While supporting evidence for the claim can be drawn from a variety of other sources (e.g., Harrison 2008, 255–71; Numbers 2009), it also seems clear that it does not exhaust the "why?" aspect of engagement, with the vision statements of both *Zygon* and *Theology and Science* both indicating something more than simply apologetic intent. Either implicitly or explicitly, a larger claim appears attached to many efforts to construct a dialogue that not only enriches and expands the understanding of both disciplines equally (e.g., Murray 2011, 23), but also has the potential to produce a fuller picture of "reality" than either discipline generates alone. However, while positive claims about the impact of theology in and on debates are fairly commonplace in the literature, they remain unsubstantiated: even Wentzel van Huyssteen (2006, 322–23), whose Gifford project was built on a strongly reenvisioned account of mutual contribution, remains virtually silent on what its theological input contributed to the thinking of scientists on the subject of human uniqueness.

Seemingly, then, the issue of dialogical purpose is not particularly prominent in the consciousness of science/religion engagement at present. However, for the emergence of new ventures such as neurotheology, the question is vitally important because it not only defines the identity but also profoundly influences the shape, structure, and situatedness of the embryo discipline. In the case of neurotheology, these questions as to purpose and identity carry additional freight for theology, particularly in light of the fine dividing line from the scientific study of religion: depending on how such questions are answered, the theological contribution could potentially vary from merely providing subject matter for study through to actively contributing to the expansion of understanding. However, such questions have not thus far been successfully addressed with respect to neurotheology: on one hand, the declaration and discussion have been either vague or even absent, for example, with the field's original pioneer James Ashbrook who never explicitly defines neurotheology or its remit. On the other hand, as with its current champion Andrew Newberg, the proposed remit and reach is so vast that the potential territory of neurotheology becomes almost unmanageable and at times the concept struggles to retain

any coherence. My contention throughout these three articles will be that a combination of clear purpose and robust methodology can generate a model of neurotheology in which both neuroscience and theology are enabled to make a direct contribution to expanding knowledge. Fashioning such a venture, however, also requires attention to the epistemological and ontological tensions that underlie science/religion engagement, because these too will have a bearing on its development and potential shape.

Science/Religion Dialogue—An Unbridgeable Epistemic Divide?

Both science and religion claim to give a description to the same world and the human experience thereof, and thus the primary locus for tension between them is usually perceived as being epistemological. Each discourse has its own sources, resources, and distinct and rich vocabulary embedded in a dedicated semantic field. As such they are understood as having radically different preoccupations, questions, and purposes—the oft-repeated (albeit inaccurate) maxim being that religion asks "why?" whereas science asks "how?" It is in response to this apparently unbridgeable divide that the various typologies of engagement which have been a hallmark of the science/religion field have been formulated and revised. However, there are also, given the highly contextualized nature of science/religion dialogue, legitimate questions as to whether developing such typologies is a coherent strategy for understanding and pursuing engagement strategies (e.g., Brooke 1991, 5; Brooke and Cantor 1998, 275; van Huyssteen 1998b, 3; Olson 2011, 70).

Nevertheless, Ian Barbour's (1990, 3–30) fourfold model, regarded as the gold standard, continues to be widely employed, and his delineation and defense of the possibility of dialogue and integration, with its underpinning stance of critical realism, have become an enduring legacy. The mainstay of the modern dialogue has thus been to claim methodological parity through shared use of a critical realist approach to investigation, with both disciplines thus seen as moving from interpreted experience, via metaphors, models, and theories, toward increasing verisimilitude with reality. This kinship has then been taken as a substantive way to bridge the gap between the two disciplines (e.g., Polkinghorne 2007) and thus to facilitate engagement and dialogue, working toward a "viable unifying account of human knowledge" (Gregersen and Van Huyssteen 1998b, 2). However, this approach is not without its difficulties for theology because the very nature of theological reflection and its attendant commitments mean that, with respect to both the criticality of its thinking and the extent to which it can lay claim to producing realist accounts, it is vulnerable to charges of having less entitlement to the label than it claims (Bennett 2012, 179–88). Even when epistemological parity is accepted there is still, *de facto*, a

marked asymmetry to the dialogical and constraining relationship between the two disciplines, which is openly acknowledged (Polkinghorne 2006, 171). Once again this returns us to the question of "why?" and the related question of whether dialogue can be a genuine opportunity for mutual enhancement or enlightenment or whether it always entails a degree of assimilation of theology to science.

In the case of neurotheological endeavor, the way in which this question has been answered—both implicitly and explicitly—illustrates the potential pitfalls of pursuing the assimilative route and the profound difficulties of attempting to give equal weight to both scientific and theological inputs without an adequate methodological framework. In a rapidly developing field, such as neuroscience, the first of these runs the risk of building inescapable and possibly rapid obsolescence into the output—as has happened to some extent with Ashbrook. In the case of the second, any attempt to construct an exchange in which the *a priori* assumptions of neither discipline are privileged has to negotiate a variety of challenges. The absence of a robust strategy for managing this leads, as is sometimes the case with Newberg, to scenarios in which nothing useful can actually be said (e.g., Newberg 2010, 55).

Enfolded within this general question of purpose is the further one as to who are the beneficiaries of any science/theology engagement. Does such engagement genuinely contribute to a more widely accepted expansion of human understanding or simply generate more sophisticated forms of apologetics for those with concomitant religious and scientific commitments, as per Drees's observation? In what senses can or do theologies contribute to either scientific understandings of the world or to scientific approaches to understanding the world? These are legitimate questions, particularly in view of the critiques of the field from both without and within which were highlighted earlier.

Closely allied to these questions is the issue of which voices (particularly from the theological side) are admitted to dialogue. As I will discuss further in the next article, simplistic understandings and assumptions about the nature of scientific progress and the uniformity of scientific knowledge are no longer tenable in the light of even the less extreme of postmodern interlocutions. Nevertheless, there is still an important sense in which scientific accounts of the world are much less fragmented and mutually contradictory than theological ones. If the primary purpose of dialogue is to refine religious understandings of the world, then there is essentially no inherent difficulty in engaging scientific perspectives with different and possibly mutually exclusive religious ones—for example, on creation or godly action. However, if the aim is to offer a theological contribution, either to illuminating scientific understanding of certain matters (whether of perspective or process) *per se*, or to the development of an expanded understanding of the world and its workings, then this raises issues about

proposed contributions that must be addressed: which of possibly conflicting theological positions can "science" be reasonably expected to engage with, and how are these choices to be legitimated? What, if any, place can there be for "nonnegotiable commitments" (both theological and scientific) in such a dialogue? Does separating theological insights about humanness from the faith propositions of the systems that give rise to them reduce theology to the "anemic myth" or debased coinage feared by Vitor Westhelle (2000,171–72)?

The ramifications of such questions are particularly acute for any effort to develop a coherent account of what form neurotheology might take. However, as I will subsequently argue and then demonstrate in the second and third articles of this set (Bennett 2019b, 2019c), conceiving this in terms of a transversal venture and allying the construct to a suitable methodology, provides one way of negotiating these various difficulties. It also, as I will discuss in the second article, opens up the possibility of a new way of integrating theological and scientific insights to generate a discourse that is both coherently and distinctively neurotheological. However, any attempt to integrate the very different knowledge of the disciplines also requires attention to the ontological knot underlying the science/religion dynamic, since this too has important implications for various aspects of the neurotheological enterprise—particularly as regards the potential loci for fruitful exchange.

Science/Religion Dialogue—An Irreconcilable Ontological Disjunction?

The disjunction here is essentially that between a discourse "in the key of knowledge" and one "in the key of mystery." For the sciences the world is, in principle, completely knowable and understandable given time and appropriate application. Well-honed empirical methods with an emphasis on testability, repeatability, and shared third-person description and consensus have progressively expanded the boundaries of knowledge about the material world, providing an increasingly integrated and successful applied understanding of reality (Drees 2006, 109). Moreover, the sciences are seen by many as being not only unrestricted in their scope but also sufficient for a total understanding of the world, with all "why?" questions being essentially reducible to "how?" ones (Atkins 2006, 124, 127). In contrast, religions have generally been far more cautious about what can be known and said of reality—both as to the completeness of the account that can be rendered of any phenomenon, and to the ultimate limits of human knowledge. For example, Christian thought has historically comprehended both cataphatic and apophatic elements in its accounts of both the divine and the human.

However, the difference extends beyond the issue of *what* can be known and expressed to also encompass an aspect of *how* things are

to be known (here taken in terms of ontological encounter rather than epistemological strategy). In understanding certain aspects of the world and human experience to be essentially mysterious rather than empirically understandable, religion approaches them in a different way. This is particularly well captured in Gabriel Marcel's concept of the mystery of Presence with its two distinct levels of engagement with an "Other": in the first of these, the reality encountered is subject to a process of abstraction and categorization, being objectified and problematized in an attempt to discover its true nature (Marcel 1949, 116–17)—in effect the approach taken in science. However, Marcel argues that these very maneuvers preclude the possibility of a real encounter and thus of gaining true ontological knowledge of the Other, leading to what might be termed a "hypostasis of absence" (Pamplume and Brombert 1953, 92). To fully know the Other necessitates a further level of engagement in which such maneuvers are set aside and they are instead encountered as Presence. This is not simply a variation of the apophatic theme above; rather the issue is whether, in the case of certain types of encounter with reality, the approach of interrogating and interpreting experiential data might actually cause elements of the knowledge that we seek to understand and articulate to slip through our fingers—again well captured by Marcel in a line from his play *L'Iconoclaste* that "Knowledge exiles to infinity whatever it claims to clasp." As I shall discuss in article three, this is a particular issue when engaging with some types of neuroscientific data on relational experience.

The contrast with the purpose of scientific endeavor could not be plainer and George Steiner's observation (about playwrights and novelists) that "[He] who tells all communicates knowingness, not knowledge. He ruins in his creation the mystery of independent vitality" (Steiner 2001, 36) seems to encapsulate not only the dilemma but also its deep paradox: contrary to what might seem to be the case, attempts to precisely specify the world may not fully deliver, and indeed may even destroy, a certain aspect of knowledge which humans instinctively recognize and value. With respect to the development of neurotheology, this is an issue that has particular ramifications for any proposed remit for the venture, the more so given the direction in which this is now increasingly tending with the development of dynamic brain scanning, *viz.* attempts to determine the specific neural correlates of religious experience (Newberg and Lee 2005, 469–89). In light of the critique above, the perennial question of what theology contributes to the project is not only heightened, but must also be joined by ones as to whether and how a greater appreciation of precise brain activity contributes to understanding such experiences or activities from a religious (or even simply an affective human) perspective: does knowledge of the neural correlates of an experience (to the coarse extent that we can currently investigate these) tell us decisively what the experience is or what it means? Furthermore, some scholars are keen to extend this type of exploration

into other areas such as the roots of religious thought. Indeed, Newberg sees gaining a more precise understanding of what is going on in the brain during the formulation of theological thoughts and ideas as a key area for neurotheological exploration (Newberg 2010, 87–114).

Once again then the question of "why?" is critical: what is the presumed purpose of neurotheological engagement? The contention of these articles is that construing this chiefly in terms of investigating neural correlates of religious practice and spiritual experience, or as a way to "understanding" specific theological formulations, seriously diminishes its potential. Theological reflection within many different religious traditions has generated profound insights on the nature of the human condition which, with the employment of a suitably critical approach, could be combined with those currently being generated in different branches of experimental neuroscience to produce a richer understanding of humanness, and it is this vision of neurotheology that informs my project.

These then are the basic and ongoing tensions that attend any attempts at an engagement between science and religion. I have suggested that both dialogical "why?" and certain related outworkings of the epistemological and ontological tensions present particular problems to any attempt to construct a neurotheological perspective, and to decisions on where it should be located, how it should be conducted, and what type of discourse it can produce. It is to further exploration of these points through the work of neurotheology's principal expositors that the article now turns. In considering the routes taken by Ashbrook and Newberg, and the problems associated with these, I will use a threefold metric that implicitly governs any creative engagement, namely that of encounter, exchange, and expression: where, and around what nexus, is interaction to be situated? In what manner is it to be facilitated and regulated? And finally, in what form are any resulting outcomes to be expressed, and for what purpose? These are all questions that are critical to the development of a robust and useful conception of neurotheology.

Mapping the Neurotheological Landscape

The precise classification of neurotheology—whether disciplinary subspecialization, interdisciplinary endeavor, or new hybrid discipline—is unclear. Although obviously involving conjunction of some kind between cognitive and theological perspectives, how this is to be achieved and for what purpose, is neither self-evident nor always spelled out clearly by practitioners. Indeed, it is a striking feature of a substantial number of the papers which have carried "neurotheology" in the title or as a listed keyword, including Ashbrook's original paper (1984a), that the term is never defined and often does not even appear in the actual text itself. The formal definition given in *The Encyclopedia of Religion* of "an emerging field of study

that seeks to integrate *in some manner* cognitive neuroscience with religion and theology" (Newberg 2005, 6492, emphasis mine) is similarly vague.

Nevertheless, it is possible to identify two distinct strands in neurotheology—an earlier one associated with the work of James Ashbrook, the original pioneer of the discipline, and the current one that is strongly associated with Andrew Newberg. While there are some obvious similarities and overlaps between them, they are also distinctively different and each illustrates some of the specific issues attending any attempt to interface theology with neuroscience, and the difficulties which ensue if these are not adequately addressed.

Ashbrook's project is essentially one of integration giving the human brain privileged status as an analogical expression of God (Ashbrook 1989, 65–81), and fashioning a holistic understanding of the spiritual, psychological, and neurological dimensions of personal and spiritual life (Albright 2010, 480). Some elements of the way he approaches this task would actually sit very comfortably within the postfoundational dynamics that I will be setting out in the next article (Bennett 2019b), for example, his engagement with an eclectic mix of sources, and the imaginative leaps he makes in connecting these up and drawing out inferences. However, these are also a source of some of the difficulties into which his project runs—partly because of the nature of the neuroscientific data he draws on and partly because of the way in which he then builds on these.

In terms of "encounter" Ashbrook situates himself at the coalface of the experimental neuroscientific research of his day, in particular, the exploration of brain structure and function. Thus, in *The Human Mind and the Mind of God* (Ashbrook 1984b) he takes brain lateralization as the basis of his neurotheological explorations and extrapolations, constructing a whole system of religious analysis and interpretation on the back of the functional asymmetry of the brain. Similarly, *The Humanizing Brain* (Ashbrook and Albright 1997), builds on Paul Maclean's (1990) model of the triune brain with its division of the brain into reptilian, paleomammalian, and neomammalian parts, responsible, respectively, for survival, emotions, and executive functions. In both instances, Ashbrook takes these specific understandings of the brain's functional anatomy and interprets them within a theological framework. However, this heavy reliance on specific models is problematic—a point I will discuss further below.

Ashbrook's methodology for "exchange" is somewhat more difficult to pinpoint involving as it does the cross-disciplinary leaps already noted. Thus, for example, from the starting point of brain lateralization, he proceeds via a fourfold heuristic for dividing mind input and output to discerning a similar asymmetry in Christian history and theology. From here, via a suggestion that—just as with the brain—when the two halves do not work properly together, the response generated is flawed and inadequate, he uses the model to analyze differences between the theologies of Eastern

and Western strands of Christianity (Ashbrook 1984b, 151–78, 231–58). Similarly, Maclean's model becomes, via an eclectic range of material including the object relations theory of Donald Winnicott and interpretative readings of Michelangelo's creation scenes in the Sistine Chapel, and, under the influence of theological thinkers such as Augustine, Tillich, Kaufman, Hefner, and Whitehead, an analogue for understanding common perceptions about God. Ashbrook's thesis is that the orderly structure of the brain reflects the universe from which it emerged and points to the nature of its ultimate reality—God (Ashbrook and Albright 1997, 20). Supporting dialogical maneuvers are described as involving "convergence and overlap amongst technical disciplines" and "combin[ing] the languages of religion with neuroscience talk to make sense of religion" (Ashbrook and Albright 1999, 9), but there is little offered in the way of an explicit methodology for regulating this. For Ashbrook, neurotheology essentially comes down to juxtaposing the disciplines "as if they belong together. They may not correspond except through an act of faith or an exercise in imagination" (Ashbrook 1984b, 18). However, while acknowledging the important role that imaginative leaps play, relying solely on such is methodologically inadequate. Arguably, it leaves anything that Ashbrook builds on the back of such acts of faith and imagination (essentially the greater part of his neurotheological output) in a vulnerable position.

There are a number of other important issues to note here: first the way in which the neuroscientific data are approached and appropriated. While in-depth discussion of complex experimental technicalities is not necessarily needed, it is still important to take note of the possible limitations of these and thus the inferences that can be drawn from any resulting data. There has sometimes been a slight theological overeagerness to appropriate and build on scientific theories and data without sufficient understanding of either the meanings of the former or the limitations of the latter, which has occasionally contributed to the lack of credibility of some science/theology discourse. While Ashbrook does not necessarily fall into this trap, his work does raise the issue of how, and to what extent, the nonspecialist can critically engage with and appropriate scientific data.

Similarly, certain caveats need to be noted with respect to the theological inputs. Ashbrook draws on a variety of theological motifs such as *analogia entis* and *imago Dei*. However, the assumption that these enable us to make larger and, ultimately, theological sense of neuroscientific data is simply assumed, never examined. An unquestioning normativity is also sometimes assumed for hermeneutic and theological elements used, such as the opposition of creation with redemption, or process theology. Once again this raises the wider questions touched on earlier relating to the multiplicity of voices and perspectives within theology: how does one select a suitable dialogical partner from among the different possible theological voices—especially, if these stand in contradiction to each other? Is it possible to use

motifs from the theological canon, which themselves, either historically or currently, comprehend a variety of different interpretations? In the following article, I will argue that using van Huyssteen's methodology, with its identification of specific intersecting trajectories and in its requirements of a critical stance toward material offered to dialogue, provides a way of addressing these dilemmas.

With regard to the results of Ashbrook's projects, his occasional ambiguities and sometimes rather opaque elaborations mean it is not always easy to discern precisely what some of his theses actually entail. However, as already indicated there are much bigger problems with respect to the durability and wider applicability of any resulting understandings that are rooted in the way he selects and uses his material. The first issue is his use of extremely particular models of brain function on which to build complete neurotheological theses. There are a number of dangers with this type of approach. First, it may generate models or analyses that are simply inadequate: concentrating solely on one aspect of a complex system such as the brain, particularly as a basis for developing a unified account or exploring other complex psychological, sociological, or historical phenomena, runs the risk of producing etiolated models or simplistic analyses—as is arguably the case with some of Ashbrook's theses in *The Human Mind and the Mind of God*. Second, in a field that is advancing rapidly, tying a thesis and the analytic development based on it to a particular model of brain function runs the risk of building obsolescence into the whole system if models become disputed, or are superseded and discarded, and with it the potential undermining or loss of those wider understandings developed from it. Thus, for example, while Maclean's tripartite model has retained support with some psychological and educational therapists, it has never been widely accepted and has had no enduring impact on neurobiology (in marked contrast to his work on the limbic system). This absence of scientific currency calls into question the lasting significance of Ashbrook's neurotheological formulations predicated on the model. It also highlights the dangers in trying to focus theological analyses through this kind of neuroscientific lens, particularly against a background of exponential growth in raw experimental data and understanding.

Closely related to this is the issue, already hinted at earlier and becoming even more acute with Newberg's approach, as to whether conceiving neurotheology chiefly in terms of investigating and articulating spiritual experience and understandings in terms of brain structure and function is the most fruitful, or indeed the only, way in which the two disciplines can be brought together. It is the contention of this set of articles that there are other possibilities for engagement, which not only avoid some of these potential pitfalls, but also allow the theological side of the equation to extend beyond merely supplying the material for analysis, or contributing to the devising of better scientific studies by providing more precise

delineations of "spirituality" or the different nuances of various religious practices.

This leads us to the second neurotheological approach being examined—that of Andrew Newberg, whose recent *Principles of Neurotheology* (2010) represents the first attempt to more formally describe and define neurotheology and suggest possibilities for its future development. Newberg is also responsible for the formal delineation and subsequent description of the potential field given in the *Encyclopedia of Religion*, but his work has been strongly criticized for its methodology (Geertz 2009, 319–24), data interpretation (Goldberg 2009, 325–30), and complete "deafferentation from both important neuroscience and mainstream theology" (Coles 2008, 1956).

While the aim of comprehensively mapping out a substantive territory for neurotheology is laudable, the project actually fails to address fundamental issues as to where and how theology and neuroscience might intersect. In the case of "where?" the proposed territory is simply too vast to be either manageable or, at times, remain coherent as a distinctive enterprise. These difficulties are then amplified by those attending the "how?" question; Newberg offers no clear strategies for managing the actual mechanics and tensions associated with science/religion dialogue. At root is a failure to answer the more fundamental "why?" question, and the combined result is a lack of clarity as to what form any resulting neurotheological discourse is to take, and what weight its insights might legitimately claim in any given interaction. This leads to a scenario in which, despite a claim that neurotheology represents "a fundamentally different form of scholarship in the science-religion arena" (Newberg 2010, 54), it is often difficult to see how it differs from the scientific study of religion, or can generate the distinctive new insights promised (Newberg 2010, 21). Once again, I will use the encounter/exchange/expression framework to examine these issues in more detail.

Newberg's designated potential arena for neurotheology is vast: a basic initial definition of "a field of study linking the neurosciences with religion and theology" is immediately widened to include both "the totality of religion and religious experiences" along with "psychiatry, psychology, cognitive neuroscience, genetics, endocrinology as well as other macro- and micro-perspectives of the neurosciences" (Newberg 2010, 45). Later principles that neurotheology "should be applied to a wide range of cognitive processes" and "address any and all theological questions" (Newberg 2010, 185, 221), along with the associated discussions of these points, confirm the feeling of a more or less unrestricted ground in which discussion could be situated. While Newberg's own preferences for areas of research such as spiritual experience are clear, exactly how to identify suitable loci in all this potential territory is never clearly specified—though the implicit heuristic seems to be something akin to Mary Midgley's (2006, 112–14) multiple

maps metaphor. In the light of the opening comments about the imbalances between excessive knowledge production and our ability to assimilate or utilize it, what seems to be urgently required is some mechanism for identifying those areas that offer the combination of potential usefulness and possible dialogical fruitfulness, at which to coordinate and concentrate engagement—something that I will address in the second article of this set (Bennett 2019b).

This lack of delimitation is rooted in what Newberg sees as a central topographical feature of the neurotheological landscape, *viz.* that all human perceiving, experiencing, knowing, and construction is shaped by the fundamental constraints of brain function (Newberg 2010, 84–85, 214). When combined with a lack of clarity as to the precise purpose of neurotheology, the net result is something of an "Everest" rationale where topics are addressed simply because they are there, rather than because of any potential to produce a useful expansion of understanding through a combined science/religion approach. However, Newberg's vision for the loci of neurotheological encounter is, paradoxically, also somewhat too *narrow*: much of the reach envisaged actually exists within a single conceptual framework controlled by the perspective indicated above and formalized in his "crucial" neurotheological principle of brain constraint (Newberg 2010, 84). The stance toward theological and religious ideas which ensues focuses primarily on understanding *the ideas themselve*s in terms of their cognitive underpinnings, and locates their primary value as a contributor to neurotheology in being thus understood. But while there may well be potential value in improving our understanding of the underlying cognitive processes in assorted aspects of religious thinking, this value represents only one way of interfacing cognitive neuroscience and theology, and ignores the existence of other fields of an encounter, which may be equally if not more productive.

The "exchange" element of Newberg's approach also presents significant problems: he makes strong claims that disciplinary equality, nonprivilege, and reciprocity are central to any neurotheological endeavor, but fails to provide an adequate methodology for enabling this. Early in the *Principles*, a vision of neurotheology is offered centered on constructive and complementary exploration in which all those involved must remain open "at least somewhat" to all the different perspectives involved, whether religious, cultural, theological, or scientific (Newberg 2010, 16–17). But while the attitude is commendable, no clear guidelines as to how such a dialogue is to be instigated and maintained are ever offered. This is not to say that discussion of methodological matters is absent; indeed Newberg himself explicitly links the establishment and flourishing of the discipline to the development of sound methodology (Newberg 2010, 113). But the focus of this is on practical experimental issues of study design and data interpretation (2010, 113–46) and he

does not address the actual dialogical mechanics of any neurotheological projects.

Thus, for example, a statement that the assumptions of neither discipline can be privileged as normative in advance of any analysis (Newberg 2010, 55) has no accompanying methodological suggestions for how an *a posteriori* decision about the direction of any causal arrow is actually to be made. A hypothetical study of brain activity in nuns experiencing the presence of God offered as illustrative of the principle underlines the point perfectly: Newberg observes that nonreligious and religious perspectives will point the causal arrow in diametrically opposite directions, but gives no indication of how in these circumstances a neurotheological approach would determine causality other than the suggestion that it "might be possible" to set up a study that allows a more specific determination of causality (Newberg 2010, 55). It is thus difficult to see how any distinct neurotheological interpretation can be arrived at, offered, or defended. Given the important place that studies of brain activity hold in Newberg's overall project, this lack of any methodology for guiding interpretation of data is all the more striking.

Newberg glosses over the obvious difficulty here by maintaining that such an approach demonstrates the "substantial questioning and healthy skepticism" which neurotheology demands and which allows it to "explore the intersection between the two [disciplines] far more thoroughly" (Newberg 2010, 56). Subsequent comments that skepticism must then be allowed to give way to new ideas and paradigms, and that neurotheology should be open to and evaluate all such possibilities, simply shift the problem of "how?" to another location. The claim that utilizing such skepticism will help in either exploration or in determining which approaches and lines of questioning will be most fruitful (Newberg 2010, 56) seems meaningless in the absence of either a methodology or a specified larger framework against which to do this.

As already indicated, the perennial and vital question of "why?" lies at the heart of these problems and leads inexorably to further problems with the expression phase of the project, in particular the determination of the precise aims and beneficiaries of any project. The lack of resolution of the question is partly due to the extreme expansiveness of remit already discussed, but also seems to have a locus in an unresolved tension between Newberg's wish to espouse a nonreductive stance with respect to the religion/theology components and his essentially physicalist stance with respect to the limiting role of brain function. Newberg's general claims for neurotheology as a discipline implicitly suggest that the generation of new insights (rather than, e.g., a harmonization of accounts, or a sharpening of theological/scientific understanding of a particular issue) is his preferred aim, but by what criterion a suitable outcome might be decided for any specific project is unclear. This lack of clarity over what form

neurotheological outputs might take is also evident in the huge range of the designated "foundational goals" of neurotheology, which he sets out, *viz.* improving our understanding of the human mind and brain; improving our understanding of religion and theology; improving the human condition, particularly in the context of health and well-being; and improving the human condition, particularly in the context of religion and spirituality (Newberg 2010, 18). The net result is that ultimately the project fails to generate the distinctively novel neurotheological insights or discourse, which are part of its avowed aims (Newberg 2010, 21). Newberg's comment on the exemplar hypothetical study alluded to earlier that "the *most that can be said is*: there are certain brain activity levels associated with the experience" (Newberg 2010, 55, emphasis mine) illustrates the point perfectly.

In summary then, both the form of neurotheology practiced by Ashbrook and that envisioned by Newberg encounter problems in each phase of the dynamic of engagement. For "encounter" these have to do with the identification of either appropriate loci or suitable contributory material; with "exchange" they relate to the coherence and defensibility of the methodologies employed or proposed; and with "expression" they concern not only the generation of stable or coherent outputs, but also the development of a distinctively neurotheological discourse. Many of the identified issues can potentially be remedied with the employment of a suitable methodology and they do not therefore fatally undermine the attempt to conjoin religion and neuroscience in the ways envisaged by Ashbrook and Newberg. However, such approaches do not exhaust the possibilities of neurotheology and I want thus to propose a distinctively different way of bringing together the two discourses and combining their insights. My interest here is not just in finding a way of negotiating the difficulties in interfacing either science/religion generally or neuroscience and theology specifically but also, as part of a larger project, in whether and how we can address the issues raised at the beginning of this article regarding the increasing and increasingly disconnected quanta of knowledge now being generated. I will therefore conclude this first article by briefly sketching an alternative vision for how neurotheological exploration might be conceived and executed, which I will then explore in the next article (Bennett 2019b). By clearly identifying both purpose and locus of engagement, and through adopting a robust methodological approach and generating a distinctive discourse, this approach seeks to address some of the issues highlighted above as problems in Ashbrook and Newberg's projects. At the same time, it is also an attempt to respond to some of the questions raised earlier regarding the purpose of dialogue between science and religion, and to explore the possibility of bringing together scientific data and theological insights in a very different way to develop what Edgar Morin describes as "complex knowledge" (Morin 2008:2-6). Once again I will structure this brief outline according to the threefold heuristic of encounter, exchange, and expression.

Plotting and Piecing a Different Neurotheological Approach

The proposed locus for this neurotheological exploration is in the area of health—more specifically the link between the experience of human relationality and health outcomes. As suggested in my critique above, one way of improving the chances of a fruitful encounter between neuroscience and theology is to look for areas of intersecting interest between them. In this instance, there is a wealth of evidence from both epidemiological and PNI studies to suggest a strong connection between the number and nature of social relationships and health outcomes. There is also a strong thematic strand in both Old and New Testament canons linking the experience of relationality with well-being, suggesting a potential intersection of interest around which an encounter between the two disciplines could be established. The aim here is not the development of a Christian apologetic on health and healing, but to bring together various neurobiological and theological perspectives on human relationality and health as a way of expanding understanding of the connection between them.

Another major criticism raised in the mapping of neurotheology above is the absence of a robust methodology for engaging theology and neuroscience. I have also suggested that such methodologies are available, and in the following article I will draw on one of these—the transversal space dialogue developed and utilized by van Huyssteen (2006) in his Gifford Lectures. From a basic philosophical stance of postfoundational rationality, this takes the notion of shared tools of rationality as the basis for the mutual acceptance of epistemic and intellectual parity, and as such offers a very different way of addressing the issue of disciplinary equality. It also opens a way to dealing with some of the other issues that have been raised, for example, the delimitation of territory. Rather than looking for possible consonances of meaning, van Huyssteen's approach is centered on identifying intersecting lines of interest at which dialogue can be situated. The associated idea of opening up a "transversal space" (which belongs to none of the contributing disciplines) for dialogue, taken in conjunction with the acceptance of epistemic parity already indicated, raises the real possibility of achieving the bidirectional "free exchange of ideas, data and information" which Newberg sees as the hallmark of neurotheology (Newberg 2010, 54). This methodology, through its selection and accountability aspects, also provides a way of addressing the "many voices" issue noted earlier, as well as the possibility of using such material in a way that preserves its theological identity without tying this to systematic particularities.

I have also suggested that for neurotheology to claim legitimacy as a coherent enterprise, it must be able to produce and articulate insights that are distinctively neurotheological in form and expression. To this end, I further develop van Huyssteen's basic methodology in a way that takes

it beyond the interdisciplinary confines within which he himself has employed it, expanding his concept of transversal space engagement to support the production of what I term transversal arguments and models—that is, ones which also inhabit a space at intersections between the disciplines and which are therefore not constrained by any one of them but which belong to all. The third article (Bennett 2019c) will then discuss how this expanded methodology was used in my doctoral thesis (Bennett 2013) to support a neurotheological exploration of relationality and health, drawing on diverse voices from theology and experimental data from cognitive neuroscience and PNI; and from these conversations to develop a model for a possible pathway connecting relational experience and health via immune signaling mechanisms.

The project thus addresses the issues of uneven flow and constraint which have been identified as a feature of science/religion exchange and generates a perspective on the connection between relationality and health which can be coherently designated as neurotheologically informed. It is also, as an essay into exploring different ways in which knowledge can be constructed and validated across disciplinary boundaries, an attempt to show that science/religion dialogue is indeed a suitable and robust vehicle for bringing together the complexities of the natural world and of human lived reality, in ways that deepen and enrich our understandings of this dappled world that we inhabit.

Notes

1. I use the term science/religion rather than science/theology as this is the most commonly used designator of the field.
2. The neologism is used throughout these papers to refer to the human capacity to form and sustain relational connections with others.

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