Prolegomena 13 (2) 2014: 351–372

Neurotheologia, *Quo Vadis*: Some Philosophical Problems of Neurotheology

SEBASTJAN VÖRÖS

University of Ljubljana, Faculty of Arts, Aškerčeva 2, 1000 Ljubljana, Slovenia
sebastjan.voros@gmail.com

ORIGINAL SCIENTIFIC ARTICLE / RECEIVED: 08–05–14 ACCEPTED: 10–07–14

ABSTRACT: The article provides a critical analysis of some of the most pertinent philosophical problems of neurotheology. Neurotheology is one of the most recent and arguably the most controversial neuro(sub)discipline that purports to account for, or at least shed light on, the phenomenon of religion in neuroscientific terms. Following a very brief overview of this newly emerging (neuro)scientific discipline, two major philosophical issues are presented: the explanatory vacuity of neurotheological accounts and the inability to reflect upon, and therefore draw appropriate implications from, their epistemological and metaphysical commitments. It will be argued that both issues are at least partially dependant on the so-called modular hypothesis which has been uncritically accepted by most authors in the field and still plays a major role in neuroscience as such. At the closing of the article, some very general suggestions for an alternative approach to the study of religious experience are put forward, drawing on two complementary and interrelated approaches to consciousness and cognition, namely neurophenomenology and the "4EA models".

KEYWORDS: Enactivism, epistemology, neurophenomenology, neurotheology, philosophy of mind, philosophy of (neuro)science, religious experience.

0. Setting the Scene: The Spectre of Neuroscientific Revolution

In the 1990s, an unexpected, and what soon seemed like an almost unlimited, research potential was unleashed in the field of consciousness studies. The so-called "neuroscientific revolution"[1] (Lynch 2009), instigated prima-

[1] Recently, some authors (e.g. Choudhury and Slaby 2012b) have questioned the talk of a "neurorevolution", suggesting that "the breathless convictions that within a few years … the brain sciences will … begin to supersede social, cultural, philosophical, political, literary, or other 'folk' explanations of behavioral phenomena" are exaggerated and speculative. Instead of focusing solely on specific prophecies and promises made by neuroscientists, scholars should

rily by the emergence of new imaging techniques (fMRI, PET, SPECT, etc.), opened up a rich and colourful world of the *living* human brain. Technological innovations enabled real-time study of neurobiological correlates of a wide array of mental processes, making phenomena that had been traditionally relegated to the realm of humanities amenable to methods of natural sciences. The prospect of being able to determine the neurobiological underpinnings of mental phenomena (e.g. decision-making, volition, belief-formation, emotions, etc.) attracted experts from different scientific backgrounds who were hoping that the newly acquired knowledge might perhaps shed light on some of the intractable difficulties in their own area of research. Thus, over the past twenty years we have borne witness to a proliferation of different neuro(sub)disciplines: from the already traditional neuropsychology and neuropsychiatry to such curiosities as neuroeconomics, neuroethics, neurohistory, neurophilosophy and even neurotheology. "Neurotalk" (Illes et al. 2010) has been – slowly, but surely – seeping not only into humanities and social sciences[2], but also into the crooks and crevices of our everyday lives.

But it was not long before several authors started voicing their concerns about methodological and explanatory strategies promulgated by the burgeoning field of neuroscience. Some of its far-reaching claims and interpretations, along with its methods of collecting, organizing and interpreting data, were subjected to fierce criticism from philosophical, ethical, sociological and historical perspectives (Bennett and Hacker 2003; Choudry and Slaby 2012a; Satel and Lilienfeld 2013; Tallis 2011; Uttal 2001). The problem seems especially pertinent in the case of newly emerging neuro(sub)disciplines that have set out to provide neuroscientific accounts of very complex human phenomena, e.g. ethics, politics, religion, etc. It has become increasingly obvious that it is far from clear what the bright and colourful brain images actually *do* and *can* tell us about moral belief, political decision-making and religious experience, and that therefore a better understanding of conceptual, methodological, epistemological and metaphysical presuppositions of neuroscience is needed.

This article provides a critical analysis of one of the most recent and arguably the most controversial neuro(sub)discipline, namely *neurotheology*

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also critically engage with "the assumptions and visions of neuroscience on which such [future] scenarios are built", as these are equally, if not more important in elucidating the reasons why neuroscience has gained such widespread recognition in the academic circles and the mechanisms that have enabled it to exert such influence on media and popular culture (*ibid.*: 5–7).

[2] The unrelenting trend towards the "neurologization of humanities" prompted Raymond Tallis' sarcastic, yet a not wholly unfounded remark: "If you want to understand people, look at their brains. The writing is on the wall and the script is pixels on a brain scan. Roll over, social sciences and humanities, allow yourselves to be incorporated into a vastly extended neuroscience and discover your true nature as animalities" (Tallis 2011: 59).

(Joseph 2003; Newberg 2010b; Vörös 2013b: chapter 2). But what might seem like an eccentric exercise in (neuro)philosophy is not a goal in itself, as the overall aim of the article is much broader in scope: namely, by delineating some of the *particular* philosophical pitfalls that so many advocates of neurotheology have fallen prey to, it purports to show how *not* to do (neuro)science *in general*. In other words, the blunders of neurotheology can be instructive for both neuroscience as such, as well as for prospective new neuro(sub)disciplines.

The article consists of five parts. After a very brief overview of the newly emerging field of neurotheology in the first section, I present two major philosophical issues that loom large in most neurotheological accounts: the explanatory vacuity of neurotheological accounts (second section) and the blatant inability to reflect upon, and therefore draw appropriate implications from, their epistemological and metaphysical commitments (third and fourth section). It will be argued that both issues are at least partially dependant on the so-called modular hypothesis which has been uncritically accepted by most neurotheological authors and still plays a major role in neuroscience as such. In the fifth section, I will therefore provide a very brief outline of an alternative approach to the study of religious experience, drawing on two complementary and interrelated approaches to consciousness and cognition, namely neurophenomenology and the 4EA models. It is my contention that, as long as neurotheology remains oblivious of its underlying philosophical presuppositions, it is bound to remain a *pre-* or even *pseudo*scientific endeavour, a (to paraphrase Dennett 1987[3]) "neuroscientific bit of physicalist gymnastics" with "no methods, no data, no results, no future, no promise" (*ibid.*, 2001).

1. Neurotheology: God in the Brain or the Brain on God?

So what is this strange scientific discipline called neurotheology?[4] Its beginnings go back to the 1970's and 1980's, but it was only at the end of the

[3] The original phrase "introspectionist bit of mental gymnastics" was, as the reader may very well know, aimed against the 1st-person approaches in cognitive science.

[4] Not all authors associated with the field accept the proposed neologism. James H. Austin, for instance, notes: "'Neurotheology' has become a buzzword. Fashionable in some quarters, it has not entered my lexicon" (Austin 2006: 229). And Newberg exclaims exasperatedly, and somewhat surprisingly, given that he was one of the major popularisers of the notion (see e.g. d'Aquili and Newberg 1999; Newberg and d'Aquili 2002): "I have never been comfortable with the term 'neurotheology'. This is, of course, a great problem for someone who is frequently engaged in the field of neurotheology. There are a variety of reasons for my trepidation. However, my greatest concern has always been the lack of clarity about what neurotheology is and what it should try to do as a field. Try as I might to avoid using neurotheology in

1990's that it started gaining more attention – *and* notoriety – partly due to the greater availability of imaging techniques and partly due to fashionable catchphrases, such as the "God Machine" (Horgan 2003: 91–105) and the "God Part of the Brain" (Alper 2008), that have become associated with it. The main goal of neurotheology is to account for, or at least shed light on, the phenomenon of religion in neuroscientific terms. If it is namely true that all human experience is modulated and processed by the brain, then it seems reasonable to suppose that neuroscience is, and must be, the most fundamental explanatory level for *all* experiential phenomena, religious phenomena included (d'Aquili and Newberg 1999; Newberg and d'Aquili 2002). The Archimedean point of neurotheology – the point where the link between empirical and theoretical work ought to be forged – is thus the field of religious *experience*: Since the experiential aspects of religion fall under the purview of experimental neuroscience, the field of religious experience seems to be a perfect starting point for the account of how religious phenomenology arises from neuropsychology (d'Aquili and Newberg 1999). This doesn't mean that neurotheology isn't interested in other aspects of religion (e.g. rituals, beliefs, mythology, etc.), but merely that the research on religious experience seems to be backed up by concrete empirical data, which gives it greater authority.

The field of neurotheology is extremely diverse, and there is very little, if any, consensus among individual authors on which brain regions are implicated in religious experience or how the experimental findings ought to be interpreted, to the point that it is doubtful whether there actually exists a unified discipline that we might label as "neurotheology". In the past few decades, numerous neurobiological models of religious experience have been put forward: from (a) *unimodular* – right-hemisphere hypothesis (Ornstein 1972) and temporal-lobe hypothesis (Ramachandran and Blakeslee 1998; Persinger 1983; Persinger and Healey 2002) – through (b) *bimodular* – temporal-parietal-lobe hypothesis (d'Aquili and Newberg 1999; Newberg and d'Aquili 2002) and temporal-frontal-lobe hypothesis (McNamara 2009) – to (c) *multimodular* or *systemic* models (Austin 1999, 2006; Beauregard and O'Leary 2008). This diversity of neurobiological accounts is matched only by an almost equally wide scope of metaphysical commitments embraced by their authors: some consider their findings to be compatible with materialism, be it in a reductionist (Ramachandran and Blakeslee 1998; Persinger 1987) or an emergentist flavour (Austin 1999; McNamara 2009), some take an explicitly anti-physicalist/materialist stance (Beauregard and O'Leary

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my articles and books, it seems to be something that simply will not go away–at least any more than God. While my concerns have continued unabated, I have watched the rest of the world continue to use 'neurotheology' to describe the field studying the intersection between the brain and religion" (Newberg 2010b: ix).

2008), while others try to sail the noncommittal waters of methodological agnosticism (d'Aquili and Newberg 1999; Newberg and d'Aquili 2002).

Neurobiological models of religious experience have been criticised from numerous perspectives. In this paper I will focus primarily on their interpretative/explanatory and epistemological/metaphysical shortcomings and will leave out theconceptual/phenomenological and methodological/operative problems, which I have analysed extensively elsewhere (see Vörös 2010; Vörös 2012; Vörös 2013b: chapter 2). Suffice it to say that most models are severely lacking in phenomenological and conceptual characterization of the experience under study (i.e. little or no effort has been made to distinguish between different types of religious experience, e.g. visions, locutions, trances, mystical experiences, etc., and/or they are uncritically lumped together under the vague heading of "religious experience"), and that it is also questionable as to what extent the current imaging techniques are actually amenable to, and appropriate for, this type of study. Namely, not only are religious experiences rare and unpredictable (i.e. impossible to initiate at will), but there are also currently no reliable methods of correlating a given experience with a given brain activity: on the one hand, the experimenters can't ask questions during the experiments, so it is difficult to determine *in retrospect* which brain scan corresponds to which experience; on the other hand, numerous processes are taking place in the brain simultaneously, so it is difficult to establish which of the myriads of changes are truly relevant (statistical procedures that are normally used in such analyses are not really helpful, as they tend to overlook subtle, yet potentially important changes).

2. *Circulus vitiosus*, or On Explanatory Vacuity

The problem of correlating *neurophysiological* changes with the relevant *experiential* changes brings us to our first major issue in this article, namely the issue of explanation. For even if it were possible to obtain a relatively well-defined set of neurobiological correlates of a given experiential state we would still have to face the question as to *what* do these results *actually* tell us about the religious experience in question. The (minimal) finding that the latter is – as are, indeed, all other experiences – (at least partially) instantiated in the brain seems to be neither particularly interesting nor particularly revealing, for this is something that, putting aside a few rare exceptions at the radical dualist end of the metaphysical spectrum, would be expected and accepted by virtually everyone. But what can neurobiological correlates really tell usabout the experience? Why not turn to, say, the level of (neuro)chemistry? The intricate interplay between different neurotransmitters seems to play (some) role in the experiential alternations, so why not seek the solution there? Antonio Damasio brings out the issue poignantly:

> By now everyone knows that the so-called mood-altering drugs turn feelings of sadness or inadequacy into those of contentment and confidence. Long before the days of Prozac, however, alcohol, narcotics, analgesics, and hormones such as estrogens and testosterone, along with a host of psychothropic drugs, have shown that feelings can be altered by chemical substances. It is obvious that the action of all these chemical compounds is due to the design of their molecules. How do these compounds produce their noteworthy effects? The explanation usually is that chemical molecules act on certain neurons in certain brain regions to produce a desired result. From the standpoint of neurobiological mechanisms, however, these explanations sound a lot like magic. Tristan and Isolde drink the love potion; bang, and by the next scene they have fallen in love. It is not clear at all why having chemical *X* attach itself to neurons of brain area *Y* can suspend your anguish and make you feel loving. (Damasio 2003: 120)

But why is it then commonly assumed that the most appropriate explanation of the religious experience is to be found at the neurophysiological level? After all, it seems that trying to account for experience in terms of an activation of a certain brain area is equally, if not even more, akin to (neuro)magic. For what is it about neural activation at the level of *neural structures* that can supposedly help us account for a specific type of experience?

It was mentioned in the previous section that neurotheological models differ in their claims about what brain regions are supposed to be implicated in the explanation of religious experience. It is possible to depict these differences in terms of a progressive descent on the *modular-systemic scale*: on the *modular* top, we find theories claiming that the key role in religious experience is played by a singular discrete unit (e.g. hemisphere or lobe), whereas on the *systemic* bottom, we find theories that interpret religious experience as an intricate interplay between different cortical and subcortical regions. What is particularly interesting, is the fact that the *explanatory strength* of a given model seems to be inversely proportional to its complexity. In other words, it seems that the anatomically/functionally simplest theories, i.e. theories with *higher* modularity (Ornstein, Ramachandran, Persinger), have greater explanatory strength than theories that are anatomically more complex, i.e. theories with *lesser* modularity (Austin, Beauregard). This line of reasoning seems to be implicitly presupposed by *all* neurotheological authors, but is probably most evident in Beauregard, who believes that the fact that religious experience is accompanied by activity in multiple brain regions implies that the former cannot be reduced on, and explained by, the latter. In his view, then, if it turns out that the modular theories are false (as purportedly demonstrated by his experimental findings), there are good reasons to conclude that religious experience cannot be accounted for in neurobiological (physicalist) terms.

But why should this be so? Clearly, the idea that models of lesser complexity have greater explanatory value has no *logical* support, so why does

it seem to enjoy widespread recognition among neurotheological authors? I contend that one of the main reasons for its seeming plausibility is the hypothesis of the *modular structure* of the brain, i.e. the idea that individual brain regions are highly specialized for the performance of specific cognitive functions (Tallis 2011: 22–37). And although the modular hypothesis is often shunned *in theory*, it is still heartily embraced by many neuroscientists *in practice*. So, what is the appeal of the modular conception of the brain, and why does it seem to hold such great promise for the explanation of experience? If we assume that specific brain regions are specialized for specific mental functions, then it seems that mental properties of a given experience could be analytically explained (away?) by the (say, causal) properties of specific brain regions. If, for instance, it turns out that the parietal lobe is responsible for the maintenance of the sense of self and the self-positioning in space (e.g. d'Aquili and Newberg 1999; Newberg and d'Aquili 2002), then it would seem plausible that the experience of ego-death that commonly accompanies certain types of religious experiences might be accounted for in terms of the deactivation of the parietal lobe. In other words, the modular conception of the brain rests on the idea that properties of a given experience are nothing but the sum total of properties of brain regions that have been shown to accompany this particular experience. And if it turns out that while studying a certain religious experience, we stumble across a neural activation pattern that is restricted to one or several discrete brain regions (e.g. some sort of "brain module" as envisioned by Ramachandran, Persinger or Alper), it would seem that this finding, clearly in accordance with the modular hypothesis, is more likely to provide a coherent explanation than, say, "a pattern of brain activity that is so complex, dispersed and context-dependent as to seem almost inconsistent with the neurotheological project" (Norman and Jeeves 2010: 245).

Yet the modularity hypothesis is extremely problematic. The brain is namely "a dynamic, functionally integrated, and highly interdependent system of complex synaptic-neural networks that interact in non-linear ways"; in such a system there are no isolated neural activities, as each individual activity, even if it might *seem to be* distinct from other happenings in the brain, is actually a part of an integrated mesh of broader networks of activity (Cunningham 2011: 228). Cunningham[5]provides a comprehensive list of recent neuroscientificfindings that substantiate this claim. First, the seemingly discrete brain regions (e.g. the sensory-motor cortex) actually merge with other regions. Second, there is a considerable overlap between areas that seem to be functionally demarcated (e.g. speech areas). Third, certain brain re-

[5] It should be noted that as much as I agree with Cunningham's criticism of some of the unfounded presuppositions of neuroscience, I find his alternative dualist proposal ("the mediatory brain" hypothesis) unconvincing and metaphysically moot.

gions (e.g. cerebellum) that were once considered to be involved in only one function (e.g. motor coordination) are now known to perform several functions (e.g. substantial cognitive function). Fourth, an organizational principle called *multiplexing* offers an account as to how the same neural network can perform different functions and different networks can perform similar functions. Fifth, the phenomenon of recovery of a function (after a stroke, etc.) indicates that dynamical alterations in the localization are possible and that the brain can plastically reorganize itself. Sixth, the apparent anatomical boundaries are actually functional boundaries, and the individual boundaries are capable of changing location (*ibid.*).

These points, in themselves, pose grave difficulties for the plausibility of the modularity hypothesis, but in the background, there looms an even greater threat. To get a better grasp of this elusive danger, let us try to reconstruct how a neuroscientist might come to a conclusion that a certain brain region is (allegedly) associated with such-and-such cognitive function. It is important to note that her realization *wasn't* derived from a careful investigation of individual brain regions *per se*, because no region contains *intrinsic* properties that would, in themselves, explain why it is *precisely this* region that plays a key role in *precisely this* function/state. On the contrary, a neuroscientist has come to her conclusion *correlatively*, i.e. by drawing parallels between changes occurring in mental functions/states and the corresponding brain damages, changes in neuron activity, etc. Upon collecting a sufficient amount of such correspondences, she is then able to draw a conclusion that this region is *somehow* (without knowing how and why; see below) associated with such-and-such mental state/function. It is true that, once the correspondence has been established, a scientist might *retrospectively* attempt to find (tentative) reasons about how, and why, a given area might contribute to a given conscious phenomenon, but such attempts are only possible *post festum*, as the brain tissue itself *is silent*: it is futile to try and guess the function of a certain brain region might be if there are no psychophysical indications of what that region is supposed to be doing:

> Our only knowledge of the functional architecture of the brain stems from the collection of reports and behavioral observations with which the measured brain activities are correlated. Looking at just the brain reveals nothing interesting to cognitive scientist. … The brain areas that have come to be known as "sensory areas" have only been recognised as such based on a collection of reports about sensations. (Overgaard 2004: 370)

Now, let us ask ourselves what it is we would learn from a finding that a given mystical experience M[6] is always accompanied by an activation of a certain

[6] Mystical experiences form a unique experiential category that can be roughly characterized as follows: "The most prominent characteristic of 'mystical experience proper' seems to

neural network *N* and a deactivation of a certain neural network *O*. Given that the function of these two networks has *previously* been determined on the basis of (behavioural or verbal) accounts of mental states accompanying *N* and *O*, it is unclear what – except for the "stamp of scientific authenticity" – the mentioning of the neurobiological level would actually contribute to the understanding of *M*. Let us assume that *previous* research has shown that the experience of *ego-loss* is accompanied by the deactivation in the circuitry *O*. Since this very same neural pattern – deactivation of *O* – is then also found to be present in *M*, we might draw the conclusion that *M* is accompanied by the experience of ego-loss, and that the reason for the latter is the deactivation in the circuitry *O*. But this is absurd: first of all, the fact that mystical experience is accompanied by the loss of self was known *in advance*, as this is one of the phenomenological characteristics that distinguish mystical experiences from other types of religious experiences (e.g. visions or trances) and therefore it had to feature in its (operational) definition; and second, how can deactivation of *O* feature as an explanation for the experience of the loss of self, if the function of *O* was determined from previous (verbal, behavioural, etc.) accounts of the experience of the loss of self and not from some *inherent* property of *O*? The only thing that this "explanation" tells us is that mystical experiences are accompanied by the deactivation of *O* whose deactivation is accompanied by an experience of the loss of self. In short, instead of an explanation, we're stuck with a tautological snake that is voraciously feasting on its own tail.

Many modular neurobiological accounts are therefore not real explanations at all, but mere *postulations*. To recapitulate: The explanation of mystical experience is to be found in, say, the right hemisphere or the parietal lobe. But what is it about *this particular* hemisphere or *this particular* lobe that instantiates mystical experience? Why is precisely *this* lobe associated with its experiential features and not some other region, say, the temporal lobe? Because it is the *parietal* and not the temporal lobe that partakes in the establishment of the sense of self, and it is well-known that the sense of self

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be *the breakdown of the subject-object dichotomy*, i.e. of the sense of *my* being separated from *the world*. This breakdown, where both 'the self' (interiority) and "the world" (exteriority) are extinguished or transcended, is normally associated with the experience of *oneness* and/or *nothingness*, and entails a *radical transformation* of one's state and manner of being. [The term 'mystical experience' thus covers] a *whole spectrum of experiences* distinguished by *how* this subject-object breakdown is realized. On the one end of the spectrum, there are experiences of absolute nothingness/oneness, i.e. experiences emptied of all phenomenological content (sensations, thoughts, volitions, emotions etc.) in which nothing but pure oneness/nothingness is present; and on the other end of the spectrum we find experiences where this nothingness/oneness is present *in* and *through* phenomenological content. Between these two extremes lie experiences in which nothingness/oneness is experientially/existentially realized to a lesser or greater degree" (Vörös 2013a: 392–393).

disappears in mystical experience. But how do we know that it is the parietal and not the temporal lobe that plays a role in the establishment of the sense of self? Because previous clinical and imaging studies have shown that experiential changes in the sense of self are accompanied by changes in activation of the parietal lobe. And in what sense can it then be claimed that this actually makes up for a *neurobiological* explanation of mystical experience?

3. From Skull Bumps to Vibrant Images

It thus turns out that the issues of explanation that bedevil neurotheology are actually anchored in a set of deeper philosophical problems. As an entry point into this next stage of our discussion I propose that we ask ourselves the following question: How *scientific* is neurotheology? Recently, some authors (e.g. Dobbs 2005; Kuran 2011; Norman and Jeeves 2010; Tallis 2012; Uttal 2001) have put forward a seemingly radical claim, namely that all modular approaches in neuroscience (neurotheology included) seem to be drifting-dangerously towards *phrenology*, a controversial (pseudo)scientific discipline from the 19th century. But what exactly is phrenology, and why would someone draw parallels between what looks like an obscure (pseudo)scientific endeavour and recent neuro(theo)logical models of religious experience, which seem to be grounded on solid principles of modern science?

Phrenology was based on three fundamental postulates: (a) the brain is *the organ of the mind*; (b) the functions of the brain are *modular*, i.e. different brain regions are responsible for different mental functions; and (c) precise *measurements of the skull* can reveal the extent to which a given brain module, and consequently a corresponding mental faculty, is developed (Tallis 2012: 33). The main goal of phrenology was thus to relate the so-called "psychology of faculties", which seems to have been the psychological theory of the day, with the "current knowledge of the structure of the brain" (Norman and Jeeves 2010: 236). For instance, Franz Joseph Gall (1758–1828), one of the founders of phrenology, believed that mental functions are localized in discrete parts of the brain, which he referred to as "organs", and that each of these organs (modules) was a substrate of a particular mental faculty. He was also convinced that the functional strength of a given cerebral organ was determined by its volume, and that the latter, in turn, determined the correlative size of the bulges and bumps in the region of the skull adjacent to a given cerebral organ. Gall thus maintained that, by observing, palpitating and measuring the skull, it would be possible to construct a map of brain organs that instantiate different psychophysical characteristics (Kuran 2011; Simpson 2005).

Why was phrenology discounted as *pseudo*-science? Contrary to first appearances, the reason was not so much its methodology, as the fact that it

had uncritically transcended its basic theoretical framework and attempted to provide answers (explanations) to questions that were out of its bounds. Even more importantly, however, all this was done *in the name of science*: "Because phrenology was seen as based on scientific 'facts', advocates used this authority to make claims about issues far removed from phrenology" (Norman and Jeeves 2010: 236). The modern reader might chuckle upon learning what kind of "empirical data" (bumps in the skull, etc.) Gall's *Schädellehre* (skull reading) used to substantiate its claims with, but we should pause to wonder whether the situation will be that different when people living 100 or 150 years from now are confronted with the findings and methods of contemporary neurotheology. Moreover, the nature of empirical data was *not* the primary reason for the downfall of phrenology; far more important were the *theoretical criteria* determining what is to be construed as an empirical datum (i.e. the theory of modularity).

At its inception, phrenology was a *perfectly legitimate* and even *very original* research programme. Its main problem weren't its theoretical assumptions *as such* – these were formulated as (interesting) *hypotheses*, which the later empirical research might have corroborated or (as it actually happened) invalidated – but the fact that phrenology, operating under the pretext of "doing strict science", used these (untested!) assumptions to account for highly complex psychological, sociological, cultural and religious aspects of human life (from temperament and personality to morality and religion). What made phrenology *non*-scientific and eventually contributed to its progressive decline, was therefore not so much the result of the non-"empirical" data that it used to substantiate its claims with – in its early stages there was no way of telling whether these might prove reliable or not – as the fact that it tried to deduce *scientific (empirically corroborated) answers* to the above-mentioned questions from *uncorroborated (theoretical) hypotheses*. Norman and Jeeves draw a similar conclusion:

> Phrenologists were happy to point out Gall's 'scientific basis' for phrenology; but no one was prepared to explore the discipline in the scientific manner. … It is not the case that phrenology was not scientific because it was not experimental. That misses the point. On the one hand, not all experiments are scientific and on the other hand, some descriptive investigations can follow the scientific method. (*ibid.*: 243)

Thus, unlike some authors (e.g. Kuran), who believe that the sole problem of phrenology was its reliance on its preferred ways of collecting data (measurements of the skull, etc.), while the idea of modularity itself was "scientifically sound" and provided solid foundations for the future development of cognitive (neuro)science (Kuran 2011: 46), our analysis asserts that phrenology's main weakness – that, which eventually contributed to its deterioration

from a promising scientific discipline to a naïve philosopheme – was precisely the fact that it made use of uncorroborated scientific assumptions to answer questions that were obviously beyond its explanatory scope. Phrenology became ideology at the very moment it tried to create an impression that its assumptions weren't *speculative*, but *scientific*. And what connects phrenology with modern neurotheology, is precisely the (uncorroborated!) *assumption of modularity*:

> [A]lthough the 'bumps on the skull' idea is no longer with us, the idea that mental components exist and that they can be assigned to specific locations of the brain very much is. Indeed, the central problem facing cognitive neuroscience is how to deal with the unproven assumption that mental processes are accessible, separable, and localizable as are the material aspects of the brain. (Uttal 2001: 108–109)

The *data collecting techniques* might have changed – skull measurements have been replaced by brain scans – but the *basic background assumption* remains the same, and we have seen this assumption to be empirically and explanatorily moot. It can therefore perhaps serve as a (dubious) *scientific hypothesis*, but *not* as a "corroborated fact", which is why explanations it entails are, despite all the flashing imagery produced by brain scanning devices, merely *presuppositions* that are (empirically) suspect and (explanatory) insufficient. And this is particularly true of phenomena of such complexity and elusiveness as religious experiences:

> Modern-day neurotheology runs the risk of following in phrenology's footsteps. No one doubts the mass of empirical data that has been collected relating brain activity and various measures of religiosity. The question is whether investigations of the relationship between brain activity and religious/spiritual activity have been scientific. (Norman and Jeeves 2010: 243)

Here, one can but agree with Bradford who, in his critical assessments of neurotheology, sees neuroimaging techniques as "a boon" for neuroscience, as they confer its claims with "a halo of certainty" (Bradford 2012: 111). Just as observations of the skull, measurements of bulges, etc. were used in the past to provide phrenology with an aura of "scientific credibility", so too are the modern imaging techniques, such as fMRI, PET or SPECT, all too often (mis)used and (mis)portrayed by certain members of the neuroscientific community to embellish their findings with a "stamp of scientific authenticity". To caricature: the flashing and flickering of imaging devices is supposed to *illuminate* the observed object (subject's brain) and thereby *enlighten* the observing subject (experimenter). Yet even if the flashing *does*, in fact, illuminate *something*, it is *not* always particularly enlightening; it is namely the contention of this paper that, contrary to popular belief, what the flashing illuminates is often *not* the research object itself, but the observer's *unreflected*

(philosophical) *presuppositions* that have been unconsciously incorporated into the experimental study. In other words, the end result of the imaging procedure is not "facts", but "data" in need of further interpretation. Empirical findings *in themselves* are *silent*; and whoever disdains "metaphysics" and demands of empirical findings to speak *for themselves*, does little more than obscure the metaphysical presuppositions on which one's claims are based. There is *no* neutral position, *no* Archimedean disembodied point of view that would enable us to observe the world from an "impartial" and "objective" perspective: every *view*point presupposes a certain *stand*point. The very least one can do is to reflect on one's background presuppositions, "bring them to light", and then either strengthen or abandon them in subsequent academic discussions.

It is possible to catch a glimpse of this broad and colourful spectrum of background metaphysical presuppositions (from materialist through agnostic to dualist) once we consider how phrenologists and "neurotheologians" deal with questions about the nature and reliability of religious experience. As pointed out by Norman and Jeeves, the theoretical framework of phrenology was compatible with a whole spectrum of different metaphysical positions. Some phrenologists were convinced that phrenology will "replace" religion, some that it will "purify" religion, and others that it will "harmonize" religion with science. Some maintained that the "soul" was "using the brain", others that it was merely "its manifestation"; some believed "revelation" to be "superior" to scientific truths, and some to be its "inferior" (Norman and Jeeves 2010: 239). As we have seen above, a similar situation – "the same diversity of opinions" – is present in modern neurotheology: some authors maintain a "materialist position", some are "non-materialists", and others are "noncommittal" (*ibid.*: 243). What all these examples have in common, however, is the fact that the position taken by an individual author isn't based on empirical findings, but on his or her implicit/background (metaphysical) presuppositions, which normally remain *unreflected*. That is why what might have ended up as a potentially interesting scientific discipline turned not only into *bad science*, but also into *bad philosophy*: instead of promoting a direct confrontation between different metaphysical and epistemological positions, these disputes continue to wave the flag of naïve "empiricism" and clutch uncritically to mutually incommensurable intuitions.

Correlations between mental and neurobiological states are *metaphysically and epistemologically* neutral. It is true that, in light of the enormous success of modern science, the modular-reductionist physicalist position might *seem* more persuasive, but the question remains *metaphysically* open. This means that alternative (e.g. non-reductionist and emergentist physicalist, but also dualist and even idealist) positions are equally compatible with experimental data, and that the arena of confrontation between different po-

sitions is, or should be, the arena of philosophical reflection – as well as the arena of lived (embodied) praxis! –*regardless* of whether this is something that the participants in the debate are willing to (explicitly) subscribe to or not. In other words, just as turning a blind eye to philosophical presuppositions won't change them into scientific presuppositions, so too will *philosophical* debates *between scientists* remain just that – *philosophical* debates. Newberg is therefore right in claiming that researchers should opt for methodological agnosticism because a "brain scan that demonstrates changes in certain structures when a nun experiences being in God's presence could indicate that the brain changes created the experience or that the brain was responding to the actual experience" (Newberg 2010a: 541). Kuran, on the other hand, maintains that such methodological openness is scientifically inacceptable (Kuran 2011: 40–41), but fails to realize that what is inacceptable is the fact that theories are being spread *in the name of science* that have actually *nothing or little to do with science*.

4. The Elusive Shrieks of a Bat

These questions have brought us to the greatest problem pestering the idea of modularity, whether it be clad in the outdated phrenological or the flashy neurotheological attire. It is namely far from clear whether such a theory can, *in principle*, be anything more than speculation, i.e. whether it can ever obtain the status of a (scientific?) theory that would truly explain the phenomenon under study. Let us return to the problem mentioned in the previous section, and assume, for the sake of the argument, that we were able to juxtapose a certain religious experience with an activity in a certain brain network.

> What exactly would that tell us about how our brain-mind actually accomplished their function? … Even if we could find precise modular locations in the brain associated with well-defined psychological constructs, we still would not have solved the problem of how brain activity becomes mental activity. (Uttal 2001: 70, 126)

This brings us to the well-known philosophical problem of *conscious experience* (Chalmers) or *qualia* (Jackson), the problem of the notorious *explanatory gap* (Levine) between "conscious" and "physical" phenomena or between the "first-person" and "third-person knowledge". Wherein lies the rub?

One of the more elegant ways of approaching the problem is through Thomas Nagel's famous paper "What it is like to be a bat?" (Nagel 1974). Nagel opens his paper with the question of what it means to have *conscious experience*: "[N]o matter how the form may wary, the fact that an organism has conscious experience *at all* means, basically, that there is something it is like to *be* that organism" (*ibid*.: 436). This *subjective* what-it-is-like character

is something that cannot be expressed in *objectivist* terms, regardless of how precise or accurate the latter might be, and is the distinguishing feature of all mental phenomena. Nagel underlines his point by inviting the reader to consider the experiential world of a bat.

Given that bats are mammals (as are, for instance, cats or dogs), most people would probably readily agree that they have conscious experience. But having conscious experience entails that there is something it is like to *be* a particular organism (in this case, *a bat*). Most bats perceive the external world by means of a sonar: they emit high-frequency shrieks, detect their reflections from objects in range, and then correlate the outgoing signals with their echoes, which enables them to (re)construct the distance, height, form, movement, and texture of objects (*ibid.*: 438). The bat sonar provides for a special type of perception that is very different from the perception associated with our (human) senses. Therefore, there seems to be no reason to assume that the experience of a bat is in any way similar to that of a human being. For even if I tried to imagine what it would be like to have wings, to have a very poor eyesight, and to catch insects at dusk, this would convey only what it was like to be *me pretending to be a bat* (*ibid.*: 439). The subjective character of experience thus consists in nothing else than being the organism experiencing this particular subjective character. As conscious beings we are bound by our own unique subjectivity: just as nobody else can understand what it is it like to be me, so it is impossible for me to experience the subjectivity of someone (or something?) else (I can experience only what it would be *for me* to act as this other organism).

Frank Jackson's thought experiment about Mary the colour scientist revolves around a similar point. Mary is a top-notch neuroscientist who knows everything there is to know about neurophysiology of colour perception. Yet, for whatever reason, she was brought up in a black-and-white environment, so she has never actually been exposed to, and has therefore never *actually seen*, real colours. What would happen if Mary decided to leave her black-and-white room and enter the world of colour? Would Mary learn something new about the world or would the knowledge gained during her studies suffice? Jackson is convinced that Mary most definitely would learn something new: she would learn what it is like to actually experience certain colour, i.e. what is the subjective or qualitative feel of this particular colour. Factual knowledge cannot exhaust the subjective experience that Mary is bound to experience, as it fails to capture qualia (the what-is-it-like feeling) that accompany the perception of a colour (Jackson 2002). Joseph Levine has put the point eloquently by saying that there is an explanatory gap between conscious and brain states: every attempt to account for the former in terms of the latter is bound to fail, as there remains a surplus of qualitative charac-

ter (what-is-it-like, how-does-it-feel) that cannot be explained in physicalist terms (Levine 2002).

Chalmers named the problem of (qualitative) experience "the hard problem of consciousness":

> The really hard problem of consciousness is the problem of *experience*. When we think and perceive, there is a whir of information-processing, but there is also a subjective aspect. As Nagel (1974) has put it, there is *something it is like* to be a conscious organism. This subjective aspect is experience. When we see, for example, we *experience* visual sensations: the felt quality of redness, the experience of dark and light, the quality of depth in a visual field. Other experiences go along with perception in different modalities: the sound of a clarinet, the smell of mothballs. Then there are bodily sensations, from pains to orgasms; mental images that are conjured up internally; the felt quality of emotion, and the experience of a stream of conscious thought. What unites all of these states is that there is something it is like to be in them. All of them are states of experience. (Chalmers 1995: 201)

The question why some organisms have conscious experience – i.e. why the information processing in their cognitive systems is accompanied by experience – remains a mystery:

> How can we explain why there is something it is like to entertain a mental image, or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does. (*ibid.*)

No matter how exact or thorough our knowledge of a brain state *B* that accompanies an experiential state *E*, it will fail to provide a satisfactory explanation as to why *E* is the way it is or why *B* is even accompanied by *E*. In other words, the correlates between neurobiological and experiential states, in themselves, tell us nothing about how these states are mutually interrelated, so the nature of this relationship is not a scientific, but a metaphysical question. What is more, it is one of the most important questions that all monist theories of mind have to face.

5. A Way Forward?

So, where does this leave us? Are all neurobiological approaches to religion and religious experience destined to fail? Not necessarily. Note that the *main* reason why current neurotheological models are unsuccessful is not the complexity of their research *object*, but the inadequacy of their *research methods*, i.e. it is not so much about *what* they try to explain, as it is about *how* they go about doing it. The domain of religious experience is undoubtedly extremely

complex and beset with numerous perils, but this doesn't mean it is intractable *in principle*: *should* appropriate phenomenological and hermeneutical analyses be carried out and *should* carefully constructed maps of a somewhat obscure terrain of religious experience be provided, there seem to be no *a priori* reasons why these phenomena couldn't be investigated scientifically. What is crucial, then, is how this type of research is carried out, and this is something that future neuroscientific studies *can*, and *should*, address systematically.

First, the modular hypothesis has to be critically reappraised and preferably abandoned in favour of a more dynamic and systemic conception of the brain. Second, it is essential that neuroscientists become better acquainted with their philosophical commitments, especially with the latter's epistemological and metaphysical implications. What strikes me as particularly vexing is the fact that most authors working in the field of neurotheology seem to be completely oblivious of, or only superficially familiar with, the major developments and dilemmas in the field of philosophy of mind and cognitive science. For this reason they operate mostly within a theoretical framework of crude (not to say naïve) Cartesian physicalism (Dennett 1991), and if they occasionally *do* happen to stumble across epistemological and/or metaphysical difficulties, they normally tackle them in an extremely superficial *either-or* fashion (e.g. either God is in the brain or the brain is high on God), with no or very little consideration of the proffered philosophical solutions/alternatives to such dilemmas. The same holds true for the fundamental theoretical presuppositions about the functioning of the brain: most authors simply presuppose some version of modularism, without any critical assessment of what such a supposition entails and why it might *seem* plausible.

Consequently, little or no thought has been given to alternative approaches that try to tackle these difficulties head-on. One such proposal, which might be of special interest to neurotheology, is *neurophenomenology* (Lutz and Thompson 2003; Rudrauf et al. 2003; Thompson 2007; Varela 1996). Neurophenomenology was initially put forward by Varela as a direct response to Chalmers' "hard problem", and provides a tentative methodological solution to some philosophical puzzles that the "classical" neurotheology fails to address properly. There are at least three reasons why neurophenomenology might be of interest to neurotheology.

First, one of the central tenets of neurophenomenology is that experiential and neurobiological data need to be set on equal footing, i.e. that systematic and disciplined 1st-person (phenomenological) analyses and 3rd-person (neurobiological) analyses *mutually constrain* each other: "Phenomenological accounts of the structure of experience and their counterparts in cognitive science relate to each other through reciprocal constraints" (Varela 1996: 343). Thus, from the neurophenomenological perspective, detailed

phenomenological accounts are not only a *sine qua non* of any scientific study of religious experience, but they perform the role of structural constraints on possible neurobiological accounts. Second, the level of appropriate neurobiological description is not the level of single neural processes or structures, but the level of dynamic and transient interconnections between different brain regions (Lutz and Thompson 2003: 40–42). Not only is this view much more in line with the dynamic and multi-layered picture of the brain that has been put forward by recent neuroscientific theories, but it also provides a tentative account ("the mutual restraint thesis") as to why consciousness research should be carried out primarily on global (systemic) and not on local (modular) level of description.

Third, neurophenomenology is actively engaged with epistemological and metaphysical dilemmas that loom large in current philosophy of mind and is firmly rooted in an alternative theoretical and pragmatic framework called the "4EA approach"[7]. A detailed account of the 4EA model would take us too far afield (see e.g. Kiverstein 2012; Ward and Stapleton 2012), but suffice it to say that it actively seeks alternative ways of conceptualizing and approaching consciousness that would avoid and/or solve epistemological and metaphysical conundrums associated with the mind-body problem. Thus, according to the 4EA model, consciousness is not something relegated to the "inside" of a human being, i.e. a cognitive mechanism that would represent the independent "outside" world, but something that emerges in a dynamic interplay between the brain, body, and the world. A living being, in constituting itself as a living being, *enacts* its own world, i.e. its own field of significance and meaning, and it is against the background of this circular (two-way) interaction that consciousness emerges (for further details see: Varela et al. 1991; Thompson and Stapleton 2008; Thompson 2007; Thompson 2011). This alternative theoretical framework might not only provide improved means for conceptualizing experience (especially against the background of embodied practices, e.g. meditation, prayer, ritual, etc.), but would enable neurotheologians to take seriously and conceptually approach certain unique features associated with religious experience (e.g. the capacity of realizing modes of being and knowing beyond the subject-object dichotomy, etc.), as I have argued for elsewhere (Vörös 2013a).

6. Wrapping it All Up

The main aim of this article was to underline some of the gravest shortcomings of current neurotheological models, especially the uncritical acceptance

[7] The name reflects how the model conceives of cognition, namely as *extended, embedded, embodied, enactive* and *affective*.

of the modular hypothesis and the blatant disregard of their underlying epistemological and metaphysical presuppositions. This myopia regarding one's own philosophical commitments is the main reason why neurotheology suffers from the same shortcomings and is bound to repeat the same mistakes that had brought about the spectacular, yet informative downfall of phrenology in the 19th century. And since some of the shortcomings that are *explicit* in neurotheology also pervade, albeit often in a much more *subtle* manner, the neuroscience at large, it is my hope that bringing them out in the open might – vibrant fMRI pictures notwithstanding – forestall the unwanted and *avoidable* historic recurrences, and spark a productive discussion on the prevalent and alternative frameworks underlying current neuroscientific approaches.

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