

Contents

From the Editor

Science-and-theology dealing with neurology	3
---	---

Article-review

Ivan Colagè: Human Specificity: Recent Neuro-Scientific Advances and New Perspectives	8
--	---

Book reviews

José Sanguinetti et al.: <i>Moral Behavior and Free Will</i> (A. Visala)	20
Michael Welker (ed.): <i>The Spirit in Creation and New Creation</i> (R.W. Bowen)	24
Rebekka Klein: <i>Sociality as the Human Condition</i> (L. Oviedo)	27
Roger Scruton: <i>The Face of God</i> (V.M. Smiles)	31
Gilbert Meilander: <i>Should We Live For Ever?</i> (M. Marsh)	33
Diarmuid O’Murchu: <i>In the Beginning was the Spirit:</i> (A. Roothaan)	37
Frans de Waal: <i>The Bonobo and the Atheist:</i> (J. Feierman)	40

New books relevant for Science-and-Theology

General issues	44
Cosmological issues	47
Evolution studies	47
New scientific study of religion	48
Historical studies	49
Practical issues	49

Announcements

ECST XV: Call for Papers	50
New Treasurer needed	51
In memoriam: Sjoerd L. Bonting	52

ESSSAT News & Reviews is a quarterly publication of the **European Society for the Study of Science and Theology (ESSSAT)**.

ISSN: 1385-3473

Editor: Lluís Oviedo; *Assistant Editor:* Neil Spurway

Membership and subscriptions

ESSSAT News & Reviews is distributed freely to all members of ESSSAT. Membership is available to all students, independent and academic scholars. Contact ESSSAT web page: <http://www.esssat.org>.

Annual membership subscription: € 70.

Institutional, library and research center subscription to ESSSAT News & Reviews also €70 per annum.

Bank Account:

654 460 Postbank Dortmund, Germany.

Bankleitzahl (sort code) 440 100 46

IBAN DE58 4401 0046 0000 6544 60

BIC PBNKDEFF

Instructions to Authors

ESSSAT News and Reviews publishes academic style book-reviews and article-reviews, or articles describing the current developments in a sector of science-and-theology through the analysis of recent publications.

The fields covered are:

- general developments in science-and-theology;
- philosophical and epistemological issues;
- cosmological and physical (quantum) issues;
- evolutionary and biological questions;
- anthropological areas;
- the scientific study of religion;
- historical studies in the field of science-and-theology
- practical or ethical issues.

Book reviews should normally be of 700-1500 words. Review-articles should be kept between 3000 and 4000 words. In both cases contributors are asked to bear in mind that the majority of readers will not be specialists in the same field, and will not have English as their first language.

This publication will favour the Chicago Style Citation format.

Submissions and all correspondence should be sent to the Editor, Lluís Oviedo: loviedo@antonianum.eu

From the Editor

Science-and-theology dealing with neurology

Two years ago a survey was launched in order to assess the current development of science-and-theology. An open question at the end of the questionnaire asked: "What area(s) do you think hold the most potential for future development in the study of science and religion?". The first proposed area was 'Neuroscience', supported by 31 people; the second one was 'biology, evolution studies', by 23; cosmology issues gathered the same number of adherents.

Neuroscience is seen by many people as the hottest research field, and the one that promises most progress and future discoveries, despite many setbacks and an increasing wave of criticism. Either way, advances in neurology and related areas have become a motive of concern for theology and religious faith. There is talk about a 'strong program' aimed at providing a complete map of the brain and all neuronal networks. Such a map could help to reduce all mental activities to this elementary circuitry and thus unveiling the real structure or basis of many human activities, deemed 'special' from classical times. Religion would be not an exception; it rather becomes a favourite target or a 'big prize' for that endeavour.

In contrast to this 'strong program' we notice that most neurological research is more realistic and modest in its goals and programs. It aims at better understanding neuronal processes at different levels, aspiring not to reduce everything to the physical, but to integrate in a better way the different factors concurring in human experience and in its cultural expression. Personally I have met both kinds of neuroscientists. Probably something similar happens in other fields of scientific research: there are 'hawks' or 'hard-liners' and 'wolves' or 'moderates'. Nevertheless my feeling is that this division becomes more drastic and extreme in neurological studies. A possible clue points to the strong expectations that the study of the human brain might help to disclose the secrets of everything. Since this is the most complex organ in the known universe, and its role becomes paramount even at the cosmological level, then the key to the human brain should open all the doors in the universe.

I am pleased to introduce in this issue an article review by the young Italian scholar Ivan Colagè, who delivers a different, more constructive approach, to deal with neuroscience from a philosophical and theological point of view. His well researched paper shows clearly how the development in some areas of neuroscience does not go against the grain of the

Christian and humanistic traditions, but provides arguments and interesting clues to support a basic standpoint of these traditions: human specificity and uniqueness.

His treatment of the subject allows for a positive engagement in line with the scope of ESSSAT: there is always a possible dialogue between science and theology that renders their interaction fruitful for both sides. As I have told my students in all my years of teaching on this subject: when science closes a front door to traditional theology, it opens at the same time a rear one or some windows, allowing a new and refreshing panorama, unknown until that moment.

My intention as Editor is to deepen this line of bibliographical study, offering our readers up-to-date information on the advancement of neuroscience relevant for theological study. Since the field is moving quite quickly, we need to follow these developments closely. This is arguably the scientific research area most sensitive for theology, at least in its sub-disciplines of Christian anthropology, the treaty of faith and, obviously, Christian ethics. Since theology grows nowadays in contact with science, this becomes an important endeavour for a theology committed to its own expansion and relevance.

If as a Catholic I am allowed to quote the recently elected Pope Francis, one of his repeated concerns regards the problem of self-reference. His unease points explicitly to Church organizations. However self-reference is a problem for theology as well. Hopefully opening the doors to science can help overcome this stultifying attitude.

Lluís Oviedo

Article-Review

Human Specificity: Recent Neuro-Scientific Advances and New Perspectives

By Ivan Colagè, Pontifical University Antonianum

The impressive developments that cognitive neuroscience is currently experiencing may provide insightful contributions to the debate concerning traditional philosophical problems such as the nature of human free will, conceptual knowledge, language and society (Auletta *et al.* 2013; Auletta 2011a; Colagè 2013; Colagè, *forthcoming*). These issues also assume particular relevance for reflection addressed to clarifying the status of the human person from a theological standpoint.

One of the most recent and path-breaking findings has been the discovery of “mirror neurons” in monkeys and the subsequent ascertainment of the existence of a mirror neuron system in humans. Both empirical and theoretical advancements in mirror-neuron research have favoured fresh, although sometimes still speculative, insights into the neural bases of several cognitive processes: action understanding, empathy, intentions and emotions understanding, imitation, tool-use, language, and elaboration of conceptual thought. In general, mirror-neuron-related topics seem nowadays to set the stage for discussing several core anthropological questions.

At an even more fundamental level, the research in cognitive neuroscience is currently facing the challenge of re-thinking some of its underlying general assumptions. In my view, one of the most intriguing perspectives might be called the “neural re-use approach” (Anderson 2010 for review) and has to do with the structure-function relation or, more precisely, with the relations between the brain structural organization and the fulfilment of cognitive functions. The neural re-use approach is capturing the attention of an increasing number of scholars as a possible new general way of looking at the brain organization, at how such organization underpins the array of human cognitive capabilities, and at how certain cognitive capabilities may have emerged by re-using pre-existing neural substrates for fulfilling novel function.

In the following, I will first consider the key general features of the neural re-use approach and some of its particular declinations. Then, I will briefly focus on a seemingly clear-cut example of neural re-use. A succeeding section will address the theme of mirror neurons, with the aim of highlighting some recent perspectives on human language evolution and to show how these perspectives may be linked with the neural re-use approach. Finally, I will briefly outline some possible implications of the neu-

ral re-use approach for philosophical and theological anthropology, and thus for key aspects of so-called human specificity – a topic that still has crucial significance in the field of Science & Religion (Dean-Drummond and Wason 2012; Morris 2011; 2012; Oviedo 2006).

The “Neural Re-use Approach”

In a recent paper in *Behavioral and Brain Sciences*, Michael L. Anderson has emphasized the notion of “neural re-use” as a fundamental principle of brain organization and of how brain areas and processes may subserve different cognitive functions (Anderson 2010). The basic idea is that neural circuits or limited brain areas characterized by specific, low-level information-processing capabilities can be re-used for various, higher-level cognitive functions involving different *networks* of such circuits (see also Anderson 2007b).

The general tenet underlying what I am calling the “neural re-use approach” has been explicitly put to work in some theories proposed by different authors. Anderson has elaborated the “massive redeployment hypothesis”. Stanislas Dehaene has interpreted relevant findings about neural processes concerning written language and basic arithmetic in terms of the “neuronal recycling hypothesis” (see Dehaene and Cohen 2007 for review). Vittorio Gallese, in the context of social cognition, has developed the “neural exploitation hypothesis”, claiming that brain mechanisms, which evolved for sensorimotor integration, have later been exploited for the implementation of human language and conceptual thought (Gallese 2008).

As mentioned, the massive redeployment hypothesis may be seen as a view on the general organization of brain and cognition. In this respect, it states that (a) several neural circuits or brain areas participate in each single cognitive function and that (b) any neural circuit or brain area often partakes in different cognitive functions (Anderson 2007b; 2007c). Assertion (a) is not particularly problematic nowadays as it is widely acknowledged that high-level cognitive functions (such as, language or tool-use) are usually subserved by a number of different brain regions, often spread across the cortex. Assertion (b) is becoming more and more accepted as well. To give a substantial example, Broca’s area is acknowledged to be crucially involved in a striking number of cognitive functions, such as: action production and perception (Jeannerod 2006, pp. 154-164), tool-related behaviour (Stout and Chaminade 2012), speech repetition, imitation of actions and gestures (Roby-Brami *et al.* 2012; Heiser *et al.* 2003), as well as various aspect of language processing like phonology, syntax and syntax/semantics integration (Vigneau *et al.* 2006). Broca’s area has also been

proposed as a supramodal area for processing hierarchically structured information regardless of its use in language, action, tool-use, communicative gestures, or even music (Fadiga *et al.* 2006; Fadiga *et al.* 2009; Higuchi *et al.* 2009).

The massive redeployment hypothesis, and the neural re-use approach in general, also represents a middle course between the strict localization view of the brain and the holistic one (Anderson 2007b; 2007c). Assertion (a) above clearly undermines a strict localization view. Assertion (b) importantly implies, within the neural re-use approach, that the neural circuits involved in different cognitive functions do *not* change their basic information-processing activities from one function to another, whereas the holistic view would maintain that a brain area involved in more than one function would change its basic activity depending on the functional context in which it is involved from time to time. Note that the understanding of Broca's area as a supramodal processor of hierarchically structured information would run against the holistic view.

Besides proposing a brain organization principle, the massive redeployment hypothesis also has implications for the evolution of brain and cognition. In particular, according to this hypothesis, the evolutionary emergence of new cognitive functionalities would not necessarily have required the formation of new neural substrates specifically dedicated to such cognitive novelties since, as said, it proceeded by re-using pre-existing neural circuits to fulfil a novel function (Anderson 2007a; 2007c). From this viewpoint, a parallel is established between neural re-use and the notion of "exaptation" (Anderson 2007a; 2007c; 2008; also, for a slightly different perspective, Dehaene and Cohen 2007; for a discussion, see Colagè and D'Ambrosio, *forthcoming*).

The massive redeployment hypothesis puts forward three general empirical predictions: 1) any single brain region should support numerous cognitive task categories; 2) there should be a correlation between the phylogenetic age of a brain area and the number of cognitive functions in which it is implicated (with older areas implicated in more functions); 3) more recently emerged cognitive functions should exploit more widely scattered brain regions (Anderson 2010). There seems to be preliminary yet significant empirical evidence for such predictions (Anderson 2010; Anderson & Penner-Wilger 2012).

As already mentioned, other theories in line with the neural re-use approach has been recently proposed. Although sharing the general emphasis on utilization of neural resources for tasks differing from the ones originally

performed by means of those resources, these theories present interesting variations on the theme. Here, I will briefly highlight some of them.

The “neuronal recycling hypothesis” (Dehaene 2005; Dehaene and Cohen 2007), for example, is not a strict evolutionary thesis; rather, it focuses on the *ontogenetic* re-use of neural circuits for underpinning, in the human brain, cognitive abilities (such as arithmetic and *written* language) that are too recent for adaptive evolution to have provided suitable anatomical changes.

The “neural exploitation hypothesis” (Gallese 2008), developed after the discovery of the mirror neurons in monkey and the evidence in favour of the existence of a human mirror system, shares the evolutionary perspective but does not claim to be a general brain-organization principle; it is focussed on positing that sensorimotor neural resources not only characterize action execution and/or perception, but are also exploited for characterizing an action *concept* (Gallese and Lakoff 2005). More generally, this proposal holds that brain mechanisms for sensorimotor integration are exploited for language at the vehicle level (phonology, speech-production), at the content level, as just said (Gallese and Lakoff 2005; see also Glenberg and Kaschak 2002), and at the level of syntax (recursion and “phase-structure grammar” seem to be the outcomes of premotor networks primarily involved in the management of hierarchically structured goal-related actions).

Gallese’s neural exploitation was originally elaborated as a neural theory of social cognition, and the emphasis on language was motivated by the key social importance of linguistic interactions. Other crucial aspects for social cognition are the understanding of another’s intentions and the understanding of the other’s emotions. As to these key topics, proposals coherent with the neural re-use approach have been developed (Gallese and Goldman 1998; Gallese *et al.* 2004; Gallese and Sinigaglia 2011). The basic tenet is that we understand other’s intentions or emotions by re-using our own mental states for *simulating* the corresponding mental states of others (the matching between the observer and the observed subjects being grounded in the mirror mechanisms). What I would like to stress here is that whereas neural re-use approaches aimed at comprehending cognitive faculties such as spoken and written language or complex tool-related behaviour refer to re-use of neural resources rather at the *type* level (e.g., the Broca’s area intended as a supramodal area for processing hierarchically structured information to be put at the service of a variety of cognitive functions like language, action, tool-use, etc.), re-use in the context of intention or emotion understanding seems to consider mental representation or states more at the *token* level (e.g. the understanding of another’s intention to drink a

coffee thanks to the matching of my own motor program for drinking coffee with the movements and actions that I see the other is actually executing). Obviously, these two “nuances” are not necessarily mutually exclusive.

Finally, other recent theories and proposals addressing the evolutionary emergence of human language (Auletta 2011b, pp. 645-654, for a critical overview of various approaches) may be regarded as coherent or sympathetic with a general neural re-use approach, although they do not explicitly refer to it. One such proposal, the so called “mirror system hypothesis” (Rizzolatti and Arbib 1998) – further developed in a series of studies by Micheal A. Arbib – will provide relevant arguments and insights when we address, in the following, specific topics related to the mirror system in humans and the emergence of full-blown spoken language.

An Example of Re-use: The Brain and Written Language

In 2000, Laurent Cohen and colleagues (Cohen *et al.* 2000) isolated a specific brain area involved in the early stage of the reading process, which they termed the “visual word form area” (VWFA). A number of subsequent studies further characterized it (Dehaene *et al.* 2002; Cohen and Dehaene 2004; Vinkier *et al.* 2007; see also Dehaene 2005; Dehaene and Cohene 2007; Dehaene 2011). Without entering into too many technical details, the VWFA is located within the left ventral visual cortex, approximately at the lateral occipito-temporal sulcus (mean Talaraich coordinates: – 48, – 58, – 15, with 5 mm standard deviation). The VWFA responds selectively to orthographic stimuli, thus constituting a specialized interface between vision and language. It is strictly left-lateralized, strictly visual (i.e., processes unimodal visual information), and strictly pre-lexical (e.g. it responds to strings of graphemes irrespective of their being real words or pseudo-words). The VWFA forms in the human brain during the process of reading acquisition, and its anatomical and processing features are remarkably constant across individuals and across cultures or writing systems (see also Bolger *et al.* 2005).

Now, a first important fact is that written language was developed less than 6,000 years ago. This short time-span prevents us from assuming that the functional specification of such brain area is due to evolutionary processes and to species-specific hard-wired genetic or developmental programs (additionally, it should be noted that until recent times, only a tiny minority of humanity was literate). Moreover, its specification as a visual area for reading does not show critical periods and occurs regardless of the age of reading acquisition.

Before learning to read, or if an individual does not learn to read at all, this brain region subserves other processes: it is activated by faces, objects and checkerboard patterns. Only during reading acquisition does it begin to specialize for visual orthographic stimuli, progressively becoming insensitive to other kinds of visual inputs. Additionally, it displays a posterior-to-anterior gradient of increasing sensitivity for letter-strings closer to real and common words in the known language (Vinkier *et al.* 2007).

Therefore, the VWFA represents a case of neural re-use (or of neuronal recycling, according to the authors' phrasing) in which a brain area usually devoted to processing certain kinds of information, becomes adapted to process a distinct and highly specific class of stimuli. Clearly, there is no truly evolutionary process in this case. Equally clearly, there is no "magic" in this process, as (i) the basic information-processing capabilities of this brain area prior to reading acquisition (i.e. its sensitivity to high-resolution shapes and line configurations presented in the fovea) make it well suited to such a novel purpose, and (ii) its location in the brain is ideal for establishing connections with other temporal language areas.

However, there are two points that are particularly relevant for what concerns us here. First, the process of specification and specialization of the VWFA is (as we have seen) neither genetically nor epigenetically specified, nor does it seem to be a common learning process (Dehaene 2005). Of course, neuronal learning processes are at play in acquiring the capability of reading, but usual learning processes should bring to an individual variability across brains significantly higher than that observed for the VWFA (whose location, as mentioned, is extremely constant across individuals and cultures). Second, and perhaps more importantly, the formation of the VWFA brought about by learning to read is a somewhat direct consequence of a *cultural innovation* of our species. In other words, the invention of written language by humans of less than 6,000 years ago affects our brain configuration when we learn to read. (This latter consideration should be put beside a complementary one: the information-processing capabilities that this brain region already possessed prior to the invention of writing systems, constrains the general characters that written language may have.)

Mirror Neurons and the Emergence of Spoken Language

Reviewing all the findings and theories related to mirror neurons is completely outside the scope of this paper. What I shall do is just highlight possible interesting connections of some of this research with the neural re-use approach.

Mirror neurons were first discovered in the ventral premotor area F5 of the macaque monkey (Rizzolatti *et al.* 1996a; Gallese *et al.* 1996) and later found also in other brain regions (for reviews: Rizzolatti and Craighero 2004; Fogassi and Ferrari 2011). The fundamental property of this class of neurons is that of responding to both the *execution* of an action (e.g., grasping, tearing, etc.) and the *observation* of the same (or a similar) action executed by another individual (a monkey or an experimenter). More precisely, mirror neurons in monkeys respond to execution and observation of *object-related, goal-oriented* actions. Mirror neurons may respond to such actions even when the final part of it (hand-object interaction) is hidden, provided that the monkey knows about the presence of the object (Umiltà *et al.* 2001). Moreover, there exist mirror neurons that respond not only to appropriate visual stimuli, but also to auditory ones, e.g. the typical sound of an action such as nut-cracking (“audio-visual mirror neurons”; Kohler *et al.* 2002). Additionally, mirror neurons responding to actions made with tools have also been identified in monkeys (“tool-responding mirror neurons”; Ferrari *et al.* 2005; also Umiltà *et al.* 2008), although the findings show that such neurons may generalize the visual aspects of an action when the goal is similar to actions within the motor repertoire of the monkey (e.g. hand grasping for taking possession of an object) but are unable to translate the visual aspects in new motor abilities; this prevents the monkey from learning to use a tool by mere observation (Macellini *et al.* 2012). Therefore, mirror neurons in monkeys essentially serve the task of understanding the actions of others by means of matching them with those in the motor repertoire of the monkey itself. There is also some evidence that the monkey mirror system may underpin a preliminary form of intention understanding, as already at the very beginning of a complex action (an action composed by several elementary motor acts) it seems capable of coding the action’s final goal. The findings just mentioned concerning the involvement of mirror neurons in tool-related activities also show a certain plasticity of the monkey mirror system (Fogassi and Ferrari 2011).

In humans, the existence of a mirror neuron system has been progressively ascertained (e.g. Rizzolatti *et al.* 1996b; Kilner *et al.* 2009; Mukamel *et al.* 2010). With respect to monkeys, the human mirror system is considered to be involved not only in action understanding (for reviews: Rizzolatti 2005; Fogassi and Ferrari 2011), but also in an array of other (higher) cognitive functions: intention understanding (Iacoboni *et al.* 2005; Bonini *et al.* 2013; see also Gallese and Goldman 1998), tool use (Higuchi *et al.* 2009), imitation (Buccino *et al.* 2004; Ferrari *et al.* 2009; Iacoboni 2009), language (e.g. Gallese 2008; Fogassi and Ferrari 2007), conceptual knowledge

(Gallese and Lakoff 2005), emotion understanding and empathy (Iacoboni 2009), as well as social cognition (Gallese *et al.* 2004).

A number of reasons have prompted several theories or hypotheses that consider mirror neurons as having a key role in the evolutionary emergence of human spoken language. At the anatomical level, such proposals rely, among other things, on the involvement of Broca's area, an area long considered crucial for language, in the human mirror system. Functionally, data gathered from studies of monkeys show (a) that execution-observation matching may have some general communicative role, and (b) more specifically, that there are mirror neurons activated by monkeys' mouth-communicative gestures ("communicative mouth mirror neurons"; Ferrari *et al.* 2003). In humans, it is known that mirror neurons respond also to non-object-related actions, such as mimed actions or symbolic gestures (Lui *et al.* 2008), thus possibly subserving supposed early gestural stages in the evolution of language. In addition, the increasingly acknowledged plasticity of mirror neurons renders them quite suitable for being evolutionarily re-used for newer and newer cognitive contexts.

In the late nineties, G. Rizzolatti and M.A. Arbib, proposed the "mirror system hypothesis" (MSH) stating that the "parity requirement" for human language (i.e. that what counts for the speaker must count nearly the same for the hearer) is met because the Broca's area evolved on top of the mirror system for hand actions (Rizzolatti and Arbib 1998). Starting from this hypothesis, as already mentioned, Arbib developed an extended framework directly addressing the issue of the evolutionary stages that might have led to human language (e.g. Arbib 2005a; 2005b; 2006; 2010). This proposal is extensively articulated, includes many aspects "beyond" the MSH, and is currently intensively discussed by experts in the field. Here, I consider only a few key aspects particularly concerned with the theme of this paper. Arbib's theory proposes putative evolutionary stages for the emergence of human language. The first ones are related to pre-hominids and would have derived from the mirror system for grasping and a simple imitation system. The next stages are regarded as characteristic of the hominid lineage, and would be responsible for the comparison of (1) a complex imitation system for complex, structured sequences of goal-directed actions (2) pantomime, extending complex imitation to other kinds of gestures with communicative import, (3) protosign (i.e. a conventionalized manual-based communication system), and (4) protospeech "resulting from the extension of control mechanisms evolved for protosign to control a vocal apparatus" (Arbib 2010). The final stage, i.e. the emergence of human spoken language, is hypothesized to be the outcome of *cultural evolution* and to involve "little if any biological evolution" (Arbib 2005a). In this view, the previous evolu-

tionary stages would have led to the formation of the *language-ready brain* (i.e. a brain able to support human language if the subject grows in an environment where language is used to interact with him), whereas the development of language as such would result from a truly cultural and historical process.

I would like to suggest that such a hypothesis seems to be compatible with the neural re-use approach. In light of what we have seen so far, the evolutionary stages foreseen by the theory may be regarded as instances of re-use at the evolutionary level, in which neural circuits are progressively co-opted (or exapted) for ever newer and higher cognitive functions (becoming also part of novel neural networks). Even more intriguingly, the final hypothesized “cultural” stage could bear some analogies with the example of the VWFA considered above. If the transition from possessing a language-ready brain to the actual establishment of spoken languages is to be understood as a cultural process not *directly* due to biological evolution, then a neural re-use perspective at the ontogenetic level might provide a key for understanding such transition.

Conclusion: Being Human between Brain and Culture

The VWFA and Arbib’s hypothesis of a truly cultural stage in the emergence of human language could make a strong case for a careful consideration of the possible effects or consequences of genuine cultural dynamics on brain anatomy, which do not necessarily depend on changes at the genetic scale or at the level of the developmental program *per se* (of course, this does not mean that the array of conditions allowing for such “cultural effects” do not require those biological processes, or that they violate the latter). This perspective may have a number of implications, and raise intriguing questions potentially relevant for philosophical and theological anthropology. In concluding, I would like briefly to highlight some of them.

First of all, the possibility that genuine cultural inventions back-affect brain functional anatomy, in a way not entirely reducible to well-known learning mechanisms, could be regarded as a primary aspect of human specificity. In other words, this very possibility could underlie, and make possible, many acknowledged human peculiarities such as language, technology, artistic expression, or the symbolic capabilities in general.

Secondly, this perspective may provide fresh insights into the nature-nurture dichotomy, likely leading toward a unitary and equilibrated understanding of the human person that avoids two extremes: a complete separation between biology and culture, and the reduction of the one to the other.

Additionally, the doctrine of the human being as created in the image of God (*imago Dei*), which lies at the core of Christian theological anthropology, may be seen as a way of grasping the uniqueness of the human being. The attempt at understanding the human person in an integral and unitary way has often animated the efforts of Christian thinkers and, since the very beginning of Christianity, the doctrine of the *imago Dei* has also and specifically been related to the human body. May the notion that culture is capable of back-affecting the bodily constitution of man (or, conversely, that the human neuro-anatomical constitution is so “responsive” to cultural innovations) be of help in continuing to distil the implications of the *imago Dei* doctrine?

Finally, it should be considered that Christian anthropological reflections are not only concerned with the origin and nature of the human being, but also with the *destiny* of humanity. This also implies that the human person, and humanity as a whole, is considered in its prospectiveness and future-oriented attitude, as well as in its capacity for self-determination and self-transcendence. May the scientific perspectives, outlined in the previous pages, contribute to a deeper understanding of the dynamism and prospectiveness intrinsic to the human being?

I think that inquiring in such topics will surely promote further advancements in the “studies of science and theology”.

Acknowledgments

I warmly thank Paolo D’Ambrosio and Nicola Gobbi for useful comments and insightful suggestions. This work was in part supported by a grant from the John Templeton Foundation. The views expressed here are those of the author and do not necessarily reflect the views of the Foundation.

References

- Anderson M.L. (2007a), “Evolution of cognitive function via redeployment of brain areas”, *The Neuroscientist* 13: 13-21.
- Anderson M.L. (2007b), “The massive redeployment hypothesis and the functional topography of the brain” *Philosophical Psychology* 21: 143-74.
- Anderson M.L. (2007c), “Massive redeployment, exaptation, and the functional integration of cognitive operations”, *Syntese* 159(3): 329-345.

- Anderson, M. L. (2008), "Evolution, embodiment and the nature of the mind", In: Hardy-Vallee B., Payette N., ed., *Beyond the brain: Embodied, situated and distributed cognition*, Cambridge Scholar's Press, pp. 15-28
- Anderson M.L. (2010), "Neural re-use: a fundamental organizational principle of the brain" *Behav. Brain Sci.* 33: 245-313.
- Anderson M.L., Penner-Wilger M. (2012), "Neural re-use in the evolution and development of the brain: evidence for developmental homology?", *Developmental Psychology* (2012): 1-9.
- Arbib M.A. (2005a), "From monkey-like action recognition to human language: An evolutionary framework for neurolinguistics" *Behavioral and Brain Sciences* 28: 105-167.
- Arbib M.A. (2005b), "Interweaving protosign and protospeech: further developments beyond the mirror", *Interaction Studies* 6(2): 145-171.
- Arbib M. A. (2006), "A sentence is to speech as what is to action?" *Cortex* 42: 507-514.
- Arbib M. A. (2010), "Mirror system activity for action and language is embedded in the integration of dorsal and ventral pathways", *Brain Lang.* 112: 12-24.
- Auletta G. (2011a), *Cognitive biology: Dealing with information from bacteria to minds*, Oxford (UK), Oxford University press.
- Auletta G., in collaboration with Colagè I., D'Ambrosio P., Torcal L. (2011a), *Integrated Cognitive Strategies in a Changing World*, Rome, G&B press.
- Auletta G., Colagè I., Jeannerod M. (2013), *Brains Top Down. Is Top-Down Causation Challenging Neuroscience?*, World Scientific, Singapore 2013.
- Bolger D.J., Perfetti C.A., Scheider W. (2005), "Cross-cultural effect on the brain revisited: Universal structures plus writing system variation", *Human Brain Mapping* 25: 92-104.
- Bonini L., Ferrari P.F., Fogassi L. (2013), "Neurophysiological bases underlying the organization of intentional actions and the understanding of others' intention", *Consciousness and Cognition*, doi: 10.1016/j.concog.2013.03.001.
- Buccino G. Vogt S., Ritzl A., Fink G.R., Zilles K., Freund H.-J., Rizzolatti G. (2004), "Neural circuits underlying imitation learning of hand actions: an event-related fMRI study", *Neuron* 42: 323-334.
- Cohen L., Dehaene S., Naccache L., Lehéricy S., Dehaene-Lambertz G., Hénaff M.-A., Michel F. (2000), "The visual word form area. Spatial

- and temporal characterization of an initial stage of reading in normal subjects and posterior split-brain patients”, *Brain* 123: 291-307.
- Cohen L., and Dehaene S. (2004). Specialization within the ventral stream: the case for the visual word form area. *Neuroimage* 22, 466-476.
- Colagè I. (2013), “Le scienze naturali e la filosofia della natura: alcune riflessioni epistemologiche”, in Auletta G., Pons J.S., eds., *Si può parlare oggi di una finalità nell’evoluzione?*, G&B press, Roma 2013, pp. 59-79.
- Colagè I., *forthcoming*, “Philosophy of Language”, in Runehov A., Oviedo L., eds., *Encyclopedia of Sciences and Religions*, Springer, 2013 in press.
- Colagè I., D’Ambrosio P., *forthcoming*, “Exaptation and neural re-use: a research perspective”, in preparation.
- Deane-Drummond C., Wason P. (2012), “Becoming human in theistic perspective”, *Zygon* 47: 870-874.
- Dehaene S. (2005). “Evolution of human cortical circuits for reading and arithmetic: The ‘neuronal recycling’ hypothesis”, in Dehaene S., Duhamel J.R., Hauser M., Rizzolatti G., eds., *From Monkey Brain to Human Brain*, MIT Press, Cambridge (MA) 2005, pp. 133-157.
- Dehaene S. (2011), “The massive impact of literacy on the brain and its consequences for education”, in Battro A.M., Dehaene S., Singer W.J., eds., *Human Neuroplasticity and Education*, Pontificiae Academiae Scientiarum Scripta Varia 117, Vatican City 2011, pp. 19-31.
- Dehaene S., Cohen L. (2007), “Cultural recycling of cortical maps”, *Neuron* 56: 384-398.
- Dehaene S., Le Clec’h G., Poline J.B. Le Bihan D., Cohen L. (2002), “The visual word form area: a prelexical representation of visual words in the fusiform gyrus” *Neuroreport* 13: 321-325.
- Fadiga L., Craighero L., Fabbri Destro M., Finos L., Cotillon-Williams N., Smith A.T., Castiello U. (2006), “Language in shadow”, *Social Neuroscience* 1: 77-89.
- Fadiga L., Craighero L., D’Ausilio A. (2009), “Broca’s area in language, action, and music”, *Ann. NY Acad. Sci.* 1169: 448-458.
- Ferrari P.F., Gallese V., Rizzolatti G., Fogassi L. (2003), “Mirror neurons responding to the observation of ingestive and communicative mouth actions in the monkey ventral premotor cortex”, *European Journal of Neuroscience* 17: 1703-1714.

- Ferrari P.F., Rozzi S., Fogassi L. (2005), "Mirror neurons responding to observation of actions made with tools in monkey ventral premotor cortex", *Journal of Cognitive Neuroscience* 17(2): 212-226.
- Ferrari P.F., Bonini L., Fogassi L. (2009), "From monkey mirror neurons to primate behaviours: possible 'direct' and 'indirect' pathways", *Philos Trans R Soc Lond B Biol Sci* 364: 2311-2323.
- Fogassi L., Ferrari P.F. (2007), "Mirror neurons and the evolution of embodied language", *Current Directions in Psychological Sciences* 16: 136-141.
- Fogassi L., Ferrari P.F. (2011), "Mirror systems", *WIREs Cogn Sci* 2: 22-38.
- Gallese V. (2008), "Mirror neurons and the social nature of language: The neural exploitation hypothesis", *Social Neuroscience* 3(3-4): 317-333.
- Gallese V., Fadiga L., Fogassi L., Rizzolatti G. (1996), "Action recognition in the premotor cortex", *Brain* 119: 593-609.
- Gallese V., Goldman A. (1998), "Mirror neurons and the simulation theory of mind-reading", *Trends in Cognitive Sciences* 2: 493-501.
- Gallese V., Keysers C., Rizzolatti G. (2004), "A unifying view of the basis of social cognition", *TRENDS in Cognitive Sciences* 8: 396-403.
- Gallese V., Lakoff G. (2005), "The brain's concepts: The role of the sensory-motor system in conceptual knowledge", *Cognitive Neuropsychology* 22(3-4): 455-79.
- Gallese V., Sinigaglia C. (2011), "What is so special about embodied simulation?", *Trends in Cognitive Sciences* 15: 512-519.
- Glenber A.M., Kaschak M.P. (2002), "Grounding language in action", *Psychonomic Bulletin & Review* 9: 558-565.
- Heiser M., Iacoboni M., Maeda F., Marcus J., Mazziotta, J. C. (2003), "The essential role of Broca's area in imitation", *European Journal of Neuroscience* 17: 1123-28.
- Higuchi S., Chaminade T., Imamizu H., Kawato M. (2009), "Shared neural correlates for language and tool use in Broca's area", *Neuroreport* 20: 1376-1381.
- Iacoboni M. (2009), "Imitation, empathy and mirror neurons", *Annu. Rev. Psychol.* 60: 653-70.
- Iacoboni M., Molnar-Szakacs I., Gallese V., Buccino G., Mazziotta J.C., Rizzolatti G. (2005), "Grasping the intentions of others with one's own mirror neuron system", *PLoS Biol* 3: e79.

- Jeannerod M. (2006), *Motor Cognition: What Actions Tell the Self*, New York: Oxford University Press.
- Kilner J.M., Neal A., Weiskopf N., Friston K.J., Frith C.D. (2009), "Evidence of mirror neurons in human inferior frontal gyrus", *J Neurosci* 29: 10153-10159.
- Kohler E., Keysers C., Umiltà M.A., Fogassi L., Gallese V., Rizzolatti G. (2002), "Hearing sounds, understanding actions: action representation in mirror neurons", *Science* 297: 846-848.
- Lui F., Buccino G., Duzzi D., Benuzzi F., Crisi G., Baraldi P., Nichelli P., Porro C.A., Rizzolatti G. (2008), "Neural substrates for observing and imaging non-object-directed actions", *Soc Neurosci* 3: 261-275.
- Macellini S., Maranesi M., Bovini L., Simone L., Rozzi S., Ferrari P. F., Fogassi L. (2012), "Individual and social learning processes involved in the acquisition and generalization of tool use in macaques", *Phil. Trans. R. Soc. B* 367: 24-36.
- Moritz J.M. (2011), "Evolution, the end of human uniqueness, and the election of the imago Dei", *Theology and Science* 9: 308-339.
- Moritz, J.M. (2012), "Human uniqueness, the other hominids, and "anthropocentrism of the gaps" in the religion and science dialogue", *Zygon* 47: 65-96.
- Mukamel R., Ekstrom A.D., Kaplan J., Jacoboni M., Fried I. (2010), "Single-neuron responses in humans during execution and observation of actions", *Current Biology* 20: 750-756.
- Oviedo L. (2006), "Science, humanism, and christian theology: Dialogue with Lluís Oviedo. Is christian theology well suited to enter the discussion between science and humanism?" *Zygon* 41: 825-842.
- Rizzolatti G. (2005), "The mirror neuron system and its functions in humans", *Anat. Embryol.* 210: 419-421.
- Rizzolatti G., Arbib M.A. (1998), "Language within our grasp", *Trends Neurosci.* 21: 188-194.
- Rizzolatti G., Craighero L., (2004), "The mirror-neuron system", *Annu. Rev. Neurosci.* 27: 169-192.
- Rizzolatti G., Fadiga L., Gallese V., Fogassi L. (1996a), "Premotor cortex and the recognition of motor actions", *Brain Res Cogn Brain Res* 3: 131-141.
- Rizzolatti G., Fadiga L., Matelli M., Bettinardi V., Paulesu E., Perani D., Fazio F. (1996b), "Localization of grasp representations in humans by PET: 1. Observation versus execution", *Exp Brain Res* 111: 246-252.

- Roby-Brami A., Hermsdörfer J., Roy A.C., Jacobs S. (2012), "A neuropsychological perspective on the link between language and praxis in modern humans". *Phil. Trans. R. Soc. B* 367: 146-160.
- Stout D., Chaminade T. (2012), "Stone tools, language and the brain in human evolution", *Phil. Trans. R. Soc. B* 367: 75-87.
- Umiltà M.A., Kohler E., Gallese V., Fogassi L., Fadiga L., Keysers C. (2001), "I know what you are doing: A neurophysiological study", *Neuron* 31, 155-165.
- Umiltà M.A., Escola L., Intskirveli I., Grammont F., Rochat M., Caruana F., Jezzini A., Gallese V., Rizzolatti G. (2008), "When pliers become fingers in the monkey motor system" *PNAS* 105: 2209-2213.
- Vigneau M., Beaucousin V., Herve P.Y., Duffau H., Crivello F., Houde O., Mazoyer B., Tzourio-Mazoyer N. (2006), "Meta-analyzing left hemisphere language areas: phonology, semantics, and sentence processing", *Neuroimage* 30: 1414-1432.
- Vinckier F., Dehaene S., Jobert A., Dubus J.P., Sigman M., Cohen L. (2007), "Hierarchical coding of letter strings in the ventral stream: dissecting the inner organization of the visual word-form system", *Neuron* 55: 143-156.

Book Reviews

Juan Jose Sanguineti, Ariberto Acerbi, Jose Angel Lombo (eds.): *Moral Behavior and Free Will: A Neurobiological and Philosophical Approach*; Morolo, Italy: IF Press, 2011; pp. 430, ISBN: 978-8895565644 (pbk).

This edited volume is a product of several workshops organized by the Science, Theology and the Ontological Quest project (funded by the John Templeton Foundation) among various ecclesiastical universities in Rome, Italy. Papers in the volume are supposed to deal with morality, moral theology and neuroscience, but it turns out that some of them deal directly with the more general topic of free will. Most contributors are Italian philosophers, theologians or neuroscientists. As a whole, the book takes an interdisciplinary approach to its topics: considerations are brought forward from the sciences, philosophy and theology. The main issue with which most authors wrestle is how to bring these disciplines together into some kind of an overview as to how neural mechanisms, freedom and moral judgement and action are related.

The book consists of five parts. The papers in the first part address the relationship of philosophy and neuroscience and the larger methodological issues that have to do with philosophy and the sciences. It has to be pointed out that the papers in this section do not fit together very well. There is one very good paper dealing with the metaphysics of scientific theories (E. Agazzi: Some Epistemological Remarks: Unity of the Referent, Diversity of the Attributes, Specificity of the Scientific Approaches), but some do not seem to fit in with the theme at all (e.g., Jose Ignacio Murillo: Is There Room for the Will in Neuroscientific Research). Mario De Caro's article on moral emotivism and evolutionary psychology is a useful one but it does not really deal explicitly with the interaction of philosophy and neuroscience.

The second part takes up the topic of free will from various philosophical points of view. Ariberto Acerbi attempts to provide a phenomenological account as to how "I", "will" and freedom are related. He ends up arguing for a non-representational view of self-consciousness and maintaining the distinction between emotions, will and the self. Antonio Malo then compares three different views of free will and neuroscience, those of John Searle, Grant Gillett and the late John Paul II. Malo himself seeks to develop the latter theory further and argue that it avoids some of the problems that both Searle's and Gillett's theories have. Finally, Juan Jose Sanguineti wants to break down the dichotomy between disembodied voluntary act and non-voluntary bodily behavior by introducing a multi-level Aristotelian view of the relationship of the body, will and mind.

It is interesting to note that many authors in the volume want to adopt some kind of Aristotelian/Thomistic view of the will, emotions and the mind to make sense of neuroscience and free will. This is no surprise since such an approach would avoid what most authors of the book consider as bad alternatives, that is, mind/body dualism and reductive materialism. Further, the Aristotelian/Thomistic view of persons and morality does have a significant role in Catholic theology and philosophy, so if it could be successfully combined with the results of neuroscience and evolutionary psychology, the compatibility of Catholic theology and these new scientific disciplines would be guaranteed.

The third part contains articles that address the issue surrounding causality and free will further. Here the writers seek a third way between eliminating freedom (because it does not fit in very well with the naturalistic assumptions of many scientists) and positing some supernatural entity (e.g., the soul) as the seat of freedom. More specifically, articles of Carlos Moya and Nancey Murphy explore the notion of downward causation in complex systems. The aim is to provide an account of how higher-level states of a complex system, in this case the human being, could influence lower-level states, like brain states. Here we also see Juleon Schins developing an Aristotelian/Thomistic notion of causes of actions that would apply to both divine action and human action.

The fourth part of the volume consists of articles that explore the emergence and function of moral sense in neuroscience. Here we find matter-of-fact articles that consist of reviewing the current neuroscientific theorizing about, e.g., mirror neurons, the development of empathy, the neural basis of moral judgement and the relationship between emotions and will. The authors here seem to take a cautiously positive attitude towards neuroethics, but still maintain that giving neuroscientific explanations to moral behaviors does nothing to remove the responsibility of the subject.

In the fifth and final part of the book we find articles that (apparently) did not fit neatly into any previous parts. Writers discuss the different notions of altruism and the evolution of morality, the ethics of moral enhancement and the way in which moral judgements are connected to cultural practices.

Now, I want to look at one central issue of the book, that is, the worry that neuroscience will take over ethics and morality and leave no room for philosophy. Most articles in the book argue explicitly for, let us say, an anti-reductionist or pluralist view of science and philosophy by defending the need for both philosophical and theological work in addition to science. It is also clear that the authors do not want to go overboard from the other side

and claim that philosophy and theology need not engage with the neurosciences. Rather they maintain that when we approach the issues surrounding morality and freedom, the sciences are relevant but not the only source of knowledge. A dialogue between philosophy and neuroscience helps both.

Many writers are especially worried about the various programs in neuroscience that seek to “naturalize” the notions of morality and freedom. Against this tendency, several articles in the book maintain that these programs are not warranted. The reason is that the sciences only deal with one aspect of reality. Science, by its nature, only deals with what is measurable and testable. Philosophy, on the other hand, attempts to provide an overarching framework that draws from all sources of knowledge, not just science. Whereas naturalization programs seek to make all knowledge empirical and experimental knowledge, the opponents maintain that there are intentional, phenomenological and normative aspects of reality that do not fit in very well with the naturalistic framework. Such aspects of reality are clearly present in the domains of morality and lead to a more general question about freedom. Morality and freedom are, it seems, somewhere in between philosophy, theology and the sciences of the mind. The problem is that programs seeking to naturalize these domains make implicit philosophical assumptions that are not recognized as such. Of the many examples discussed in the book, I will briefly describe only two.

First, Benjamin Libet and others have famously suggested that human freedom is merely an illusion. This is because neuroscientific studies (conducted by Libet himself and later Paul Haggard) seem to show that before a conscious decision to act is made the motor areas in the brain are already active and preparing the action in question. The conclusion is that the conscious decision to act is not the real cause of the action. This, in turn, suggests that our conscious decisions are merely illusions as our actions are caused by brain events that have nothing to do with our conscious awareness.

The hidden philosophical assumption in Libet’s argument is that in order for an action to be free there needs to be conscious decision to act before the brain’s motor areas become active and this conscious decision must be somehow detectable by neuroscience. When he could not find one, he concluded that there must be no free will. But as several authors (e.g. Jose Amaya and Filippo Tempia) point out in their respective articles, Libet implicitly rules out the possibility of our freedom having an immaterial (or not clearly neural) ground. Our freedom might be grounded in social norms, intentionality or some other invisible factor in the neural level. Libet also fails to recognize that brain imaging only points to regularity between brain activation and action, not determination. Careful reading and philosophical analysis of Libet’s results does not warrant his conclusion.

Second, some evolutionary psychologists have argued that our moral judgements are grounded on our social emotions and emotions of disgust and repugnance. If this is the case, it seems plausible to think that our moral judgements are not actually directed towards objectively right and wrong actions, but instead are expressions of our emotions. In meta-ethics, this view is known as emotivism. Mario De Caro argues convincingly that although it might very well be the case that our moral judgements indeed have evolutionary roots, it is not the case that biology can explain morality as a whole or rule out the possibility of non-naturalistic moral facts. First of all, morality requires not only judgements driven by emotions but also taking a reflective distance from those emotions. We are capable of taking different attitudes towards our intuitive emotions and sometimes reflectively override them. This leads to the more general point that many articles in the book make: although some psychological mechanisms that enable human morality and moral judgement have their roots in our evolutionary history, it is culture, cultural content and personal reflection that explain our particular moral actions, not biology. Thus, human action is unintelligible if it is distinguished from its intentional context and viewed in terms of neural causes only.

Although an interdisciplinary approach to morality and freedom is certainly warranted, the various perspectives present in this edited volume might leave the reader more confused than before reading the book. How exactly are we to relate specific philosophical proposals of freedom, such as those invoking Thomism and Aristotelianism, with the scientific results and with those which take a more phenomenological approach? What about downward causation, that does not really make sense in the Aristotelian framework? Of course it is not the function of the volume to give definite answers, but still the plurality of approaches highlights the lack of an overarching framework that could unify scientific and philosophical accounts. I would not, because of its fragmented nature, recommend the book for a first introduction to the topics of free will, morality and neuroscience. There are much more coherent and concise books available for each topic. Nevertheless, some of the articles in the book contain genuine contributions to the contemporary debate and deserve a readership.

Aku Visala
Center of Theological Inquiry, Princeton

* * *

Michael Welker (ed.): *The Spirit in Creation and New Creation. Science and Theology in Western and Orthodox Realms.* Grand Rapids: Wil-

liam B. Eerdmans, 2012; 204pp., ISBN 978-0-8028-6692-9 (pbk.) £21.99.

This book gathers papers arising from a dialogue meeting about Spirit, divine and human, that took place in Germany in 2009. The authors of the papers have a remarkable diversity, in terms of discipline (biology, mathematics, physics, psychology, sociology and many forms of theology), religious tradition (Anglican, Catholic, Lutheran, Orthodox, Pentecostal, Reformed) and geography (Germany, Greece, Russia, Ukraine, UK and USA). The contributions are arranged in four sections.

The first section is entitled *The Spirit in Creation: Scientific Perspectives*. John Polkinghorne's paper *The Hidden Work of the Spirit in Creation* provides an update on some recent studies of the physics of complex systems. This leads to tentative suggestions of how a concept of 'active information' can offer a way of thinking about the providential action of the Spirit and how novel possibilities arise at 'the edge of chaos'. *The Spirit of God in Evolutionary History* (Denis Alexander) gives a wide ranging account of unity and separation, order and disorder, and personal and impersonal in evolution. Attention is drawn to the tendency toward increased complexity and also to findings suggesting that possible evolutionary paths may be more constrained than is commonly perceived. *Hovering Over Waters: Spirit and the Ordering of Creation* (Jeffrey Schloss) describes an ambitious approach to linking theological and scientific insights. It is noted how many aspects of evolutionary debate, such as inevitability versus contingency, can be used both to bolster and to critique postulations of direction or providence. A modest concordance of recent science and ancient teaching on the operation of the Spirit is suggested. The final paper of this section, *Mathematics of Infinity and the Orthodox Name Worshipping Spiritual Tradition* (Vladimir Katasonov) develops an intriguing account of the links between mysticism and mathematics. This is presented with reference to the hesychast tradition arising from Palamitism and Russian mathematicians and theologians such as Pavel Florensky.

The second section is entitled *The Spirit in Creation: Theological Perspectives*. Jürgen Moltmann's paper *The Spirit in Life* presents an intensely theological account of the creative energies of Spirit from an explicitly Christological perspective. This considers both creation and new creation, with an emphasis on the events of Pentecost. It also notes some limitations of science. For example, even though we may know Craig Venter's genome completely, do we hence know who Craig Venter is? *The Spirit or/and Spirits in Creation? Recalling the Seventh Assembly of the World Council of Churches in Canberra* (Vladimir Shmaliy) reflects on controversies at

that meeting concerning the discernment of spirits. For example, Orthodoxy has a guarded attitude to extra-ecclesial spirituality. This caution is challenged in some Christian traditions. To what extent is it a contingent cultural construct? *How Exactly Is Spirit Present in Creation? The Hesychast Reception of Natural Theology and Its Modern Implications* (Sergey Hovruj) argues that hesychast practice is the best approach to discernment. It is noted that while the West has cultivated unlimited horizons of knowledge the East has focussed on the permanent inner work of the Christian: ‘for “true knowledge” of God *man must change himself*’ (*metanoia*). Knowledge of God is thus converted from an intellectual cognitive paradigm to an integral paradigm of love and communion.

Although comparisons of theological and scientific approaches are made throughout the book, the third section is specifically entitled *Convergence between Theology and Science?* Cyril Hovorun’s paper *Convergence between Theology and Science: Patterns from the Early Christian Era* advocates learning from approaches of the early Christian thinkers such as Justin Martyr, Clement of Alexandria, Origen, and especially the Cappadocians. In particular, both scientists and theologians need to recognise that the language they use is not absolute but indicative. *Challenges of a Consistent Christian Language for the Creativity of God’s Spirit* (Friederike Nüssel) is concerned with the lack of attention to the Spirit’s activity in much theology and with the disconnection between Christian teaching on creation and new creation. An approach based on Wolfhart Pannenberg’s Trinitarian analysis is recommended and consequences for responses to New Atheism are noted. *The Human Spirit and the Spirit of God* (Michael Welker) addresses the ambiguity of general discussion of ‘spirit’, including ‘evil spirits’, and the requirement for discernment. An approach based on Paul’s theology is outlined, with attention drawn to the revolutionary aspects of the pouring out of the Spirit as ‘new creation’. The final paper of this section, *‘Keep Thy Mind in Hell and Despair Not’: Implications for Psychosocial Work with Survivors of Political Violence* (Renos K. Papadopoulos) is a challenging account of difficult matters of very practical importance. The paper begins with a discussion of Welker’s account of diaconical, prophetic and pastoral manifestations of the Spirit. It then considers a ‘Trauma Grid’ of negative, neutral and positive responses to adversity. ‘Keep thy mind in hell but despair not’ is a dictum of the Russian monk Silouan, where ‘hell’ refers to the absence of God and ‘despair not’ refers to the importance of keeping the heart, the centre of spiritual being, connected to God. That is, of remembering that renewal and new creation is always possible. The paper considers this as an example *par excellence* of Polking-

horne's observation of truly novel possibilities occurring at 'the edge of chaos'.

The final section of the book provides a focus on *The Spirit in New Creation*. Marcus Plestad's paper *Pneumatology and the New Creation in the Macarian Writings: An Ecumenical Legacy* proposes an approach based on the experiential theology of one of the great Christian mystics. The Syro-Mesopotamian author 'Macarius' is regarded as a bridge-figure between the Greek and Syriac thought-worlds, for whom God may be in all things, but all things are not God. The importance of experiential theology is further emphasised in *The Holy Spirit in Creation and Re-Creation: The Byzantine Fathers* (Andrew Louth). Here the realm of the Spirit is described as a *mysterion*, 'not a difficulty we can solve, but a realm in which we experience more than we know'. It is suggested that the way to understand the role of the Spirit is not through the implementation of some kind of programme but rather through 'an attitude of humility and watchfulness'. *Justified in the Spirit: Implications on the Border of Theology and Science* (Frank D. Macchia) proposes an imaginative interpretation and development of a key Lutheran doctrine. Such a pneumatological expansion allows for 'ecclesial, even social implications of justification' and an account of faith 'beyond confession or mental assent and in the direction of participation in the divine nature' (*theosis*). It is suggested that this offers rich resources for a theology/science conversation. Finally, *Human Religious Evolution and Unfinished Creation* (José Casanova) notes the irony of natural scientists increasingly adopting narrative accounts of existence at exactly the time when there is strong suspicion of such 'grand narratives' in the humanities. A consideration of human globalisation leads to identification of the need for humanity to draw on all available religious resources so as to avoid the dangers of rampant scientism.

Overall, this is a very welcome collection of papers on an important and somewhat neglected theme. Both the erudition of the authors and the quality of the writing are notably high. The great variety of the backgrounds of the authors makes for a very stimulating mix of papers. Especially welcome are the many contributions from the Orthodox tradition, greatly helping to strengthen a voice that has been rather muted in the science-theology dialogue. A slight disappointment is that, despite the great variety of views presented, relatively few of the authors relate their own viewpoint to those of the other authors in a substantial way. As the papers arose from a dialogue meeting, this seems to be a possible opportunity missed. A notable exception in this regard is Renos K. Papadopoulos's paper, which as a result of such engagement becomes a truly outstanding contribution. Creating

a synthesis from the other papers is mostly left to the reader, and the diversity and quality of the papers makes this a challenging and attractive task.

W. Richard Bowen
i-NewtonWales

* * *

Rebekka A. Klein: *Sociality as the Human Condition: Anthropology in Economic, Philosophical and Theological Perspective*, Leiden, Boston: Brill, 2011, pp. 324, € 125; ISBN: 978-90-04-19199-0 (hdbk.).

Anthropology has always been a disputed field of study. Now the situation is much more complex, since the natural sciences, together with economics, have gone into that disciplinary frame trying to settle old issues concerning human nature. These last arrivals have somewhat displaced the traditional monopoly that theology and philosophy have enjoyed for centuries. The situation has become so complex that no single discipline can pretend to best represent or model human behaviour. The addition of new entries to the list of 'scientific approaches to the human' has indubitably enriched the panorama and offered new insights. Nevertheless some order needs to be imposed, and some discernment added to better understand the many available contributions, theories and competing views.

A second issue at stake related to the book reviewed here is the emergence and exponential growth of the socially-driven paradigm of human nature. Since the so called 'alterity turn', mostly in philosophy, more attention has been paid to social aspects of the human condition, stressing dimensions like: altruism, empathy, extended or social mind, and social behaviour. New empirical and experimental researches are aiding the appreciation of this aspect of human beings. They try to account for the social dimensions that a too individualistic stance and method tended to obscure.

The book of Rebekka Klein, a young German theologian, contributes decisively to this endeavour and adds a more critical insight into the many available theories and corpus of data. This effort appears as more urgent after the many recent incorporations of empirical and experimental research into the field of altruism and empathy. More issues are at stake here, perhaps the most important of which being the qualification of human nature between the extremes of more selfish and more benevolent. This is an issue that Western thought has always struggled with, from classical times on, and has been the object of intensive inquiry during modernity and after the

scientific attempts to explain human behaviour. Ethical, political and educational questions are deeply involved in this discussion.

Klein's book is the result of several years of intense research in an interdisciplinary group based in the University of Zurich. It is part of a series, *Philosophical Studies in Science and Religion*. It is divided into an Introduction and four chapters. The main aim is to show the limits of the scientific approach to human sociality and to vindicate the necessity of more phenomenological and theological approaches in order to get a better insight on that dimension. Such a program has a practical side: to provide a basis to overcome forms of 'social inhumanity'. To this end, the author develops an in-depth analysis of modern philosophers concerned with the relational constitution of persons; dissects the current state of experimental research in economics, behavioural sciences, and neurology; and tries to correct the perceived flaws, resorting to leading authors in the study of intersubjectivity, and to theological insights.

The Introduction of the book lays the ground for this research. Economic science has recently attempted to provide a better foundation for its own development, after becoming aware of the limits of the 'rational choice' model. A more behavioural approach seeks to recognise how humans decide on practical issues. This most needed correction has shed new light upon the complexities of economic behaviour, trying to account for some to-date-ignored aspects, like the social dimensions therein implied. At the same time, philosophy and theology might feel displaced by these developments. However, the proposed revision could open the way for theology to have a new role, since human social constitution appears as an 'excess' that requires a more fitting treatment.

In the first chapter anthropology is introduced as an interdisciplinary endeavour. As such, the attempts to better understand human social dispositions, like the economic and biological descriptions, need to be completed by more ethical, philosophical and theological insights, otherwise we risk missing the 'extra' of the human phenomenon, beyond its objective appearance. Economic and biological models of altruism are shown in contrast to those in philosophy and theology. An extensive dossier of twentieth century thinkers, from Heidegger to Adorno; from Plessner to Arendt, helps to better state that difference. A radical difficulty emerges when trying to represent human nature only in scientific terms, inviting one to take into account alternative views to deal with the 'concreteness' of that phenomenon.

The second chapter examines closely "the conflict between egoism and altruism", resorting mainly to empirical studies. Such an approach raises both possibilities and limitations. The limitations are mainly: the 'double

description' – between more hermeneutical and more scientific ways; the problem of reduction; and the need for a critical complement by a more phenomenological approach. The bulk of this chapter consists in a rendition of the main lines of recent research in behavioural economics, including its neurological complement. It departs from a too rational, individualistic model, unable to take stock of emotional and social dimensions. The author engages in the methodological aspects of the new experimental approach, its heuristic basis in – among other things – game theory, and describes abundantly the most frequent experiments used to derive its results: the 'dictator game', the 'ultimatum game', the 'public goods' game... Between all these some gaps become apparent, since the experiments are unable to account for dimensions like the "intersubjective and expressive dimension of social reciprocity" (p.147), and the existence of social norms and their system of sanctions. Other proposals within a biological framework, like the theory of 'altruistic punishment', and the neurological access to empathy, do not help to fill the perceived gaps. As a result, what emerges is a clear sense of unease over the explanatory capacity of the experimental methods recounted, and the economic and neurological modelling of social interaction. Their attempts at naturalizing and reducing the reach of the experiences described do not deliver a satisfactory account of human social life. The problem is above all methodological: cooperation cannot be sufficiently rendered through these very reductive constructions, because that approach "ignores and obscures important aspects of human sociality" (p. 179). The conclusion is clear: "The approaches of experimental economics and neuroeconomics remain explanatory, with limited plausibility that provokes a multitude of critical enquiries, amendments and reassessments – and ultimately the incorporation of other aspects to ensure the continued growth and reorientation" (p. 184ff.)

Next step in the logical progression of this work is to review theories dealing with human sociality from political and social perspectives, in order to extend beyond the limits observed until now. This is the scope of the third chapter, introducing a series of authors and essays trying to make sense of the basic orientations of interpersonal relation and difference: antagonism, recognition and alterity. The classical model of antagonism (Hobbes) is seen as less plausible, even if it is at the basis of liberal thought. The recognition model knows several versions of this 'moderate' view. The third option is 'alterity', which assumes 'difference as a source of responsibility'; Levinas is its main representative. Klein characterizes, in her conclusion to this chapter, this immanent philosophical frame as insufficient, especially because of several conflicts that cannot be easily settled, between

more positive and negative anthropologies; because of the facts of social humanity and inhumanity; and deep ambiguities in the area of sociality.

At this point, the theological answer is badly needed. Theology provides its cautions, and contributes constructively resorting to the biblical tradition of 'neighbourly love'. "Social criticism instead of morality" is a first answer. Interestingly Kierkegaard becomes the main reference in this constructive section. The reference to God is the clue to truly understanding the idea of sociality, which extends to a normative concept of 'mercy' as an ethical disposition. Such reference provides an openness to universality beyond the boundaries of sheer social recognition.

Klein has developed an excellent work of interdisciplinary research, showing the fruitful possibilities hidden in the interface of experimental, philosophical and theological anthropology. Several insights in the humanistic tradition help to correct the perceived limits in the scientific research. Some issues arise in this rich panorama. A few are questions of preference, as in the choice of authors. Perhaps St. Augustine could be a more original quotation for a theology of neighbourly love than Kierkegaard.

A couple of points might help to broaden the described panorama. The first regards the convenience of extending the dialogue in both directions. I have had sometimes the feeling that the proposed exchange is somewhat one-sided: theology rather corrects the limits of sciences. However, as practitioners of this interdisciplinary exercise on altruism studies, theologians should be aware that the well documented fact of natural altruism prompts a correction of over-negative Christian anthropologies. This point is still more needed in the Protestant version: to recognize heroic altruism in unbaptized people means to move beyond a too corrupted view of human nature, and to assume neighbourly love as a 'natural virtue' as well.

The second point suggests an extension of the present study. Recent research has shown the complexities and ambiguities of the expected correlation between religious intensity and prosocial behaviour, at least to members of one's own "in-group." If empirical and experimental studies have to be incorporated into the theological frame, here we find a good instance of study that probably would help to correct some traditionally acquired assumptions in theology. This is only another possible direction of research to complement the outstanding exercise of dialogue that Klein has delivered.

Lluís Oviedo
Antonianum University, Rome

Roger Scruton: *The Face of God: The Gifford Lectures 2010*, London, New York: Continuum, 2012; 186 pp, ISBN: 978-1-8470-6524-7 (hdbk) £12.15, \$19.79.

This deeply thoughtful volume comprises Roger Scruton's edited 2010 Gifford Lectures. In six dense chapters, he deals systematically with "the question of God's presence" and of how God "can be related to us in this world" (p. 10). The argument involves both negative critiques of the ethos of modern society and, far more prominently, building a compelling case for the view that inherent to "the distinctiveness of the human condition" is "the concept of the sacred" (p. 160).

Scruton is well known for his work in aesthetics, and those perspectives, with regard to both architecture and music, play a prominent role in the book. For many, the book may be more (or less) compelling depending on their appreciation of Scruton's artistic views (the book features twenty illustrations). The bulk of the argument, however, depends primarily on a "Kantian metaphysic" (p. 162) – Kant is, by far, the most referenced philosopher. Even Kant recognized that reason leaps beyond empiricism into the realm of "questions that have no answer," and indeed that such leaps are "incurable and inevitable" (p. 14), being foundational to the human condition. Kant recognized that the world "must satisfy the *a priori* requirements of the understanding" (p. 6), but Scruton – quite rightly – takes this to be "not so much a fact about the world as a fact about us" (p. 7), and this leads him to his most basic and important insight: in order to respond to the essential "why?" questions, the starting-point cannot be "causal explanation" (p. 9) or "fields and forces, situated within the space-time continuum" (166). The starting-point has to be the human person in community, which is a "preparation for the experience of God" (p. 157).

The argument is developed logically. The first two chapters respond, among other things, to the assertions of "science" (he means: the philosophy of scientific naturalism) that religion and humanity can be fully accounted for in evolutionary terms. Scruton shows effectively why science is essential but insufficient for understanding the mystery of human existence (e.g. pp. 41-49, 160). To enter deeply into that mystery, Scruton proposes that we reflect on "three critical words: 'I', 'you' and 'why?'" He guides the reflections with the theme and a theory of the face – "the face of the person, the face of the world, and the face of God" (p. 21). In this endeavour, Scruton employs effectively the foundational image of God appearing to Moses from the burning bush and refusing to name himself, saying only, "I am that I am" (Exodus 3:14). The essential revelation is that God, like us, "is a person, who can utter the word 'I' and relate to his worshippers, I to

you” (pp. 51-52). This sets the stage for the entire argument, and for responding to the crucial question: “what kind of world contains a thing like me – a thing with freedom and self-knowledge?” (p. 40).

A constant theme throughout the book is the unavailability of personhood to the analytical eyes of science, and that “biology sees us as objects rather than subjects” (p. 70). Science, therefore, “has no real use for faces” as the “outward form and image of the soul” (p. 72). But if – following Moses, the Psalms and Paul – we wish to seek the face of God, we must contemplate the meaning of the human face, and the face of the world, and how it is that they lead us to the face of God. As a transcendental construct, building on Kant, the argument is compelling, even inspiring, for those who approach it with a reasonable measure of sympathy. The book does not qualify as light reading, but it is certainly to be recommended to those who think deeply about the relation between our science-dominated world and human spiritual longings, the loss of which must indeed be suspected as a culprit for the superficiality, iconoclasm and even violence of modern society, which Scruton laments.

All that being said, the fundamental relation between religion and science which the book presupposes leaves something to be desired. The book’s view of science is that it sees humans as “objects,” has “no use” for faces, and within its laws “subjects have no place” (p. 166). Scruton sees religion’s community-defining, membership-required beliefs as a cause of conflict with science. It is “absurd,” in his view, to think of “scientific beliefs” functioning in the same way (p. 16). But is that really true? To be sure, science is not religion, but it certainly involves adherence to doctrines, and indeed a passionate devotion to them that is a prerequisite of membership in the scientific community. Why else, in so much of academia, is it considered intellectual suicide to admit to religious belief, as though the latter were somehow incompatible with science? On the other hand, there are numerous scientists, as Elaine Howard Ecklund has shown (*Science vs. Religion: What Scientists Really Think*, Oxford University Press, 2010), who see no contradiction between their religious beliefs and their careers in science. And why indeed should they? It is not science, but scientism (a philosophy), which insists that science negates religion.

Most importantly what is needed is some exploration of *science itself as a witness of transcendence*. It would have strengthened Scruton’s case – very much a case for God – if he had incorporated into his argument thinkers who begin from the side of science, and who precisely *from that perspective* find their way to a transcendent view of the human condition. I have in mind thinkers like Teilhard de Chardin and Michael Polanyi, both

of whom took much of their inspiration from the insights and even the nature of the scientific enterprise. Sadly, neither of these thinkers plays any part in Scruton's book.

Polanyi's major work, *Personal Knowledge, Towards a Post-Critical Philosophy* (Chicago: University of Chicago Press, 1958), would be particularly valuable for the development of Scruton's thesis. Polanyi (1891—1976) was a scientist-turned-philosopher who spent the last half of his life developing an epistemology, based in science and logic, that demonstrates the multi-leveled, transcendent character of reality. "We can arrive," he said, "by continuous stages from the scientific study of evolution to its interpretation as a clue to God" (*Personal Knowledge*, pp. 285, 381-405), a view that powerfully reinforces Scruton's thesis.

The science-theology dialogue needs as much to *celebrate science* as to expose the shallowness of scientism. Science is not the problem. To be sure, science exposes weaknesses in any number of theological perspectives and doctrines (e.g. Original Sin), but when the enterprise involves – as is certainly the case in Scruton's book – the human capacity for the sacred transcendence of reality, then science and theology are allies. And then, it is a matter not merely of *relating* science with theology, but of showing that – though not by method, nevertheless by origin and purpose – they are essentially the same enterprise. Scruton's highly recommended book is on the very edge of making that discovery.

Vincent M. Smiles
College of St. Benedict & St. John's University

* * *

Gilbert Meilander: *Should We Live For Ever? The Ethical Ambiguities of Aging*, Grand Rapids, MI: Eerdmans, 2013; pp. ix-xiv, 1-121, ISBN 978-0-8028-6869-5. \$ 18.00 (pbk.)

Gilbert Meilander is Phyllis & Richard Duesenbery Professor of Christian Ethics at Valparaiso University (a small Lutheran-based private college in NW Indiana, USA). Meilander's quest is to elucidate the differences and ethical concerns regarding two ideas: (i) the (active) prolongation of life and (ii) research outcomes in respect of age-retardation: by which he means staying as young as possible for as long as possible. Are such aims possible, desirable – or, are there other alternatives worthy of consideration?

The prospect of aging and its entailments (Chapter 1) reveal the truism that we naturally age, accompanied by an inevitable loss of function, physically and mentally.

But we are unlike inanimate material, which also becomes older with the passage of time yet does not die. Why do humans die? – because that process is not necessarily linked to aging. There are many causes of dying before aging and degeneration begin to set in. For evolutionary biology, we exist merely to pass on our genes, to reproduce in order to secure the future of the species. Once we have done that, biology cares little for what remains thereafter – the “*disposable soma*” concept.

Yet Meilander’s problem with that kind of thinking is that it is our body which constitutes an important aspect of self and selfhood. Rather than genes, *per se*, it is we, as composite human beings, who develop a point of view, ideals and purposes, or care about the children we create, and our children’s children: grandchildren play an important role in our lives. Furthermore, we fall in love with others, affirming the other’s presence, an embodied humanity, and worthiness: together – in and through a loving relationship – is the next generation produced, nurtured, cared and provided for. We are not hunks of impersonalised meat pushed around by genes solely to deposit them for their own (selfish) survival. How should we explain, on that basis, those whose lives – secular and religious – are enacted in celibacy? The emerging field of epigenetics articulates a very powerful view that genes are, in fact, by no means in the ascendant, but controlled and markedly influenced by environmental contingencies. The Darwinian view upon which evolutionary biology is based has its inbuilt weaknesses, and these need to be recognised.

‘If you are under 30, you will be able to live as long as you like’; so Chapter 2 begins (p22), quoting from Bailey’s “*Methuselah Manifesto*”, and others, who boldly proclaim that we shall soon escape the relentlessness of time’s arrow – adding more than one year per year to our remaining life expectancy. Or ‘*How to become Posthuman*’ – ‘the brain instantiates informational patterns: consciousness is a neural epiphenomenon; the body is a manipulable prosthesis, and that there is no difference between bodies and computer simulations’. And the ‘Transhumanist Declaration’ (revised 2009) – a prophesy for overcoming age, cognitive shortcomings, involuntary suffering, and our confinement to planet Earth. Some of this will be secured through “enhancement” – cosmetic surgery, designer babies, brain-active drugs etc. Well, maybe we’ve heard that kind of thing before. What Meilander fails to do is to rebut these recent triumphalist predictions and firmly denounce them for their ignorance and sham value-predictions (they

sound more like the soothsayers and fortune-tellers who inhabit the back pages of some women's magazines).

As I read these early chapters, I recalled my life as a (somewhat less elevated) physician. In the 40 years of my professional academic career, I had noted that longevity (in the UK) has advanced by approximately one year/per year throughout my period of office. This casual view is virtually borne out by government statistics (London: Office National Statistics). In 1945, life expectancy for a British male was 62 years, but in 2013 had increased to 90 years – an expansion of ~30 years.

That was done by procedures largely unknown to, rather than forgotten by, our latter-day prophets, and not requiring high-tech, molecular techniques, or genetic manipulations, or other ethereal tamperings. How? The key decade is 1950-60. In 1956 the Clean Air Act was introduced, ending the era of “pea-soup fog and smog”, reducing broncho-pulmonary disease, increasing access to sunlight, and thereby improving health and alleviating rickets. Second, Sir Richard Doll (1950) in Oxford drew attention to smoking-related lung cancer: this observation through the remainder of the century reduced deaths from this malignancy, and also cardiovascular disease in general. Third, and at this juncture, the widespread use of penicillin was now dramatically reducing puerperal death rates, while the successful combination of triple chemotherapy for tuberculosis obviated need for long-term sanatoria, thereby restoring people to useful lives. Lastly, in more recent years, has come our recognition and adoption of principles of exercise, keeping a lean body in smoke-free environments (and maybe with a bit of aspirin, a statin and a mild anti-hypertensive), and having consuming interests which assist the elderly in securing fulfilled lives, as against the obese, diabetes-prone, TV-addicted couch-potato.

We should note that these political insights facilitated the public health measures which have, almost without exception or specific interventions to individuals, granted a staggering increase of nearly 30-40 years in life expectancy for all UK citizenry. These impressive achievements speak for themselves: we have no need for exotic predictions which fail to measure the true beat of our real, achieved experiences: and that's well worth remembering! And there is another important ethical concern missed here: a greatly increased elderly population now almost exceeds the working population and the taxes that can be raised to support free health care, prescriptions, bus passes, TV licences and winter fuel allowances.

And if you were beginning to think that tinkering around with a couple of genes could do the trick – forget it. Aging begins around the age of 30, and the rot sets in with the progressive involvement of multiple genes. Ra-

ther than try and extend life further from that (almost impossible) perspective – and beyond what we have so notably achieved so far – much better to manipulate individual (or small families of) genes to overcome vascular degenerations, malignant degenerations, neurological disorders and dementing cognitive incapacities which, in their own provinces, deprive the aged of the fuller life they otherwise deserve. On this front there are promising results, and existing new initiatives that offer promise of exciting returns.

But given that, would we want to have “immortality” on earth? – as Chapter 3 asks – and hence, would we have good reason to withdraw? As we have seen, life has already been considerably extended, but it not given us immortality. Unending life could well be unutterably tedious – and especially cheerless if only comprised of pure thought. And Meilander notes that there is no uniform, metaphysically detached view, or definition, of immortality. Moreover, he suggests, that if we are God-made, then we can only know ourselves in the love which constitutes being in the Godhead and within which we could be content to gaze on His beloved face. And in gazing on the Face of the Beloved, our contentment would be inexhaustible – as Psalm 17:15: *‘For in righteousness myself shall I gaze upon thy face: then, in my awakening, shall I be replete in Thine image’* (my translation).

So, through Chapter 4, we engage with “generativity”: not Evolutionary Biology’s impoverished idea of simply spilling genes, but a concern for all that is created, selflessly: to teach, transmit cultural ideals and techniques, thereby interlocking ourselves in a contextual web of love, family and caring, and giving time, energy and resources to this ongoing project. That also involves patience, and reflection towards the idea of continuity – the idea of not simply clinging to a death-encompassing perpetuation of ourselves, but to enjoy life by passing it on, thereby establishing a succession of generations. Here again, I wonder whether Meilander misses the point, since there is a far richer substance to “continuity” than merely establishing a vague ‘succession of generations’. Reproduction – the creation of a new individual – means becoming incorporated into, and thus, becoming part of a sequential, unbroken seam illustrative of the reproductive capacity, through the influence of gene and environment, of living matter evolved from its inorganic base. And the evolution of that inorganic base reflects, in turn, the sequence in cosmic evolution originating and continuing to grow, supposedly, from the Big Bang. Viewed as such, this imbues Creation with a far greater grandeur, if not “purpose”, which sees what appears to be the inexorable movement towards an evolved consciousness, and from which derives humanity’s ability to perceive its creator-God and afford to Him the honour and worship due.

And finally (Chapter 5) we need patience, not only in hopeful anticipation of life prolonged into fruitful old age, but also the patience to accept (for the present) the ills which attend the aging process. But in extending our years, we need to consider what we are doing – are we reaching out but spreading ourselves too thinly in accomplishing more than we can manage, or perhaps too deeply? Either could mean a uselessness (despite some intermittent joys), meandering and pointlessness, unless connected with a firm end in sight, an ecstatic *telos* towards and within the godhead. And should we already have embraced the godhead, we should not feel so destitute or purposeless and thus sense no real satisfaction achieved through our years extended.

In summary, some may find this book of help. From my biomedical perspective, I felt that some of the answers are already known, and that research on this frontier suggests targeted genetic manoeuvres which could alleviate the illnesses and deteriorations associated with prolongation of one's years. Those approaches provide some guidelines pertinent to securing these ends, rather than having to read inappropriate suggestions from quarters which seem ignorant of the true facts, as they stand. My own view is that I did not find this slim volume of particular value on the questions raised.

*Michael N. Marsh,
Wolfson College, Oxford*

* * *

Diarmuid O'Murchu: *In the Beginning was the Spirit: Science, Religion, and Indigenous Spirituality*. Maryknoll, New York: Orbis Books, 2012; pp. 260, ISBN 978-1-57075-995-6 £14.99.

'I am not an academic, and I have never worked in an academic institution' – with this negation Diarmuid O'Murchu starts characterizing himself as a writer on 'science and religion'. He continues however with a positive characterization: 'I am an intellectual [...] I belong to a vast sector of humanity that reads, studies, reflects critically, and shares wisdom, although they do not buy into the imperial and imposed knowledge of academic hegemony.' (O'Murchu, 2012, 8) And an intellectual he is: while his (meditative) experience clearly is the element linking his knowledge, he freely draws on readings from fields as divergent as physics, theology, religious studies, philosophy, biology and psychology. His aim: to show the possibility that indigenous wisdom, theology, and science all bear witness of the

energizing Spirit which works in creation as well as in human spiritual knowledge.

The criticism of academia in the above citation refers of course to the drive toward specialization which has characterized so much of twentieth century scientific research. Due to the ensuing narrowing of focus, no one seems to be able to see the big picture anymore. I second O'Murchu in his attempt to turn this tendency around, and am happy to see his motivation not to be restricted to non-academic intellectuals. Academia itself has to turn around, and a lot of academics are already doing so (of which attest the activities of many ESSSAT-members) – since they see that overspecialization means loss of content.

The fourteen chapters of O'Murchu's book can be roughly divided into three themes: a rendering of developments in the natural sciences which give evidence of Spirit-consciousness, an overview of indigenous wisdom relating to the Spirit, and finally a discussion of developments in Christian theology which show a 'return' of the Spirit. He connects the different discourses by playing with metaphors, like 'energizing', 'blowing', 'empowerment', seeking a language that might encompass traditional wisdom, psychology, and natural sciences. His attempt should first and foremost be judged as a piece of heuristics: a contribution to the determined search for new models of understanding. As such it is a thought-provoking and refreshing piece of work. And more, the book is pervaded by a positive, kindly, dialogue-oriented attitude, which makes one willing to follow the author along his winding road of investigation.

Critical remarks about the book can of course be easily made from the standpoint of the several disciplines which he combines, since it would have been nearly impossible for one author to reach a level of mastery in all these fields. This kind of criticism has to be made, however, if one takes his work seriously – so that his heuristic proposal might lead to more serious studies on the matter.

For me, the disciplinary shortcomings are most clear in a field in which I am to a certain extent knowledgeable – the field of African religion and philosophy. Not only is his choice of the African peoples he discusses arbitrary (as it is of the native American peoples), but he sadly repeats some worn-out views on the continent.

The first point I will discuss concerns O'Murchu's treatment of indigenous traditions in general, where he asserts them to be 'older', and closer to an original and pure understanding of Spirit, than the 'alienated' modern cultures. He writes, e.g., on Africa that 'the primordial Spirit power is

clouded by invasive patriarchal domination.’ (p 116) The patriarchal domination in the African context is of course thought to come from traditional, colonial, theology, and would have spoiled the original, non-male-chauvinist wisdom. This is a problematic assumption, which would make it harder to criticize e.g. any possibly ‘original’ domination of women by men in traditional cultures. When one blames everything on modern alienation (a concept which he borrows from the frequently-cited Herbert Marcuse), ‘premodern’ cultures tend to become romanticized, which I do not find to be helpful for understanding them.

A more serious point of criticism, however, concerns O’Murchu’s proclaimed goal to create a dialogue between indigenous traditions and ‘great world religions’. It is praiseworthy that he is explicit about his point of departure, which is the Christian tradition, and does not fall into the pit of a superficial universalism. There is no reason, however, when taking a Christian position, to neglect to such a great extent as he does the related traditions of Judaism and Islam. The Jewish tradition is solely discussed as a biblical source, and Islam is treated only in the most superficial manner.

The above might have led O’Murchu to his false claim that ‘Until the Europeans came along, Africa knew no written scriptures.’ (p 115) Even if one accepted the implication that ancient Egypt, e.g., was no part of Africa, it would still pass by the enormous influence of the colonization of Africa from the East by Arab invaders, who certainly brought writing to those parts of Africa which mainly knew an oral tradition – before the Europeans came. Last January one could have noticed a tiny item in the news, that the important library of Timbuktu was burnt down by fundamentalist rebels – who have a hard time with the ‘syncretistic’ West-African version of Islam. Among the lost treasures were many African scripts dating back to the thirteenth century.

I am convinced that readers from other academic fields might find more omissions and problematic viewpoints in O’Murchu’s text. But I would not want the book to be by-passed because of this. It embodies a brave endeavour to overcome the narrow-mindedness which has prevented his subject, the Great Spirit, from being studied in such an encompassing manner. I would rather have academics be inspired by this work and take it upon themselves to elaborate on the philosophical, theological, spiritual, anthropological, biological, physical and historical aspects of the subject. To follow up on the hypothesis which drives this book – all these ways of understanding are individual manifestations of the Spirit.

Angela Roothaan
Free University of Amsterdam

Frans de Waal: *The Bonobo and the Atheist: In Search of Humanism Among the Primates*. N.Y. & London: W. W. Norton & Co., 2013, 289 pp. ISBN 978-0-393-07377-5 (hdbk) \$27.95.

Starting with *Chimpanzee Politics* in 1982, and every few years thereafter, Frans de Waal, one of the world's preeminent primatologists, has produced a bestselling book on the primate origins of a seemingly human-only, higher cognitive/behavioral/emotional trait. In 1982 it was politics. With the publication of the present book it is humanism.

Although De Waal utilizes lots of science-generated information on primates, the body of the text has very little about religion and even less about theology, which raises the question of why the book is being reviewed in *ESSSAT News*. At least one answer might be somewhat unsettling. If many of the core values of humanism (a term in the sub-title of the book) and many of the core values of religions are thought of as the two arms of a "Y," this book can be thought of as providing insight into their common ancestor, which would be the bottom straight line of the "Y." And, as de Waal argues, many of the core values in the common ancestor of humanism and religion can be found in the behaviour of non-human primates, especially the chimpanzee and bonobo with whom we human beings shared a common ancestor about 6 million years ago.

You think that non-human primates can't have values? Do you, the reader, concede that non-human primates at least have emotions? If so, de Waal argues persuasively that morality need not be rationally constructed. He then asks, "What if it [morality] is grounded in emotional values, as Hume thought" (p. 164)? And hence the connection between apes, humanism and religion. To this de Waal adds, "Rather than reflecting an immutable human nature, morals are closely tied to the way we structure ourselves ... We can formulate all the moral laws we want; they will never apply everywhere to the same degree" (p. 180). He then concludes, "Morality arose first, and modern religion latched on to it. Instead of giving us the moral law, the large religions were invented to bolster it. We are only just beginning to explore how religion does so by binding people together and enforcing good behavior. It is not my intention to minimize this role, which was vital in the past and may remain so in the foreseeable future ... (p. 239)".

Over the past few centuries, humanism [occasionally with a capital "H"], or as it is sometimes called, "secular humanism," has emerged (evolved?) as an alternative to religion by providing an ethical life stance based on reason, social justice and philosophical naturalism and explicitly rejecting all forms of supernaturalism, revelation, specific theologies, religious doctrines, and dogmas. Leaving these group-splitting and divisive

matters aside, de Waal claims that at the level of core values humanism and religions, thought of as the two arms of the "Y," have much in common. At the same time as acknowledging this qualified similarity de Waal points out that many universal human values are not religious in origin and in fact did not even originate in human beings. Their origins can be found among the ancestor primates, represented by the bottom vertical line of the "Y." This is the main take-home message of the book. De Waal argues that many core human values that have representation in the higher primates have been appropriated by various religions, each supporting them with their own narratives and making them their own. If it matters to the reader, although raised as a Catholic in the southern part of the Netherlands, de Waal, now an American citizen living in the state of Georgia, states on page 83, "I'm not religious at all."

One can get a some idea of the book's content by the catchy names of the eight chapters: (1) Earthly Delights, (2) Goodness Explained, (3) Bonobos in the Family Tree, (4) Is God Dead or Just in a Coma?, (5) The Parable of the Good Simian, (6) Ten Commandments Too Many, (7) The God Gap, and (8) Bottom-up Morality.

For a few specifics, Chapter 4 contains the provocative statements that "young chimps are smarter than children" (p. 200). Chapter 6, which is about the Ten Commandments, is, shall we say, entertaining – especially the argument that most of them have nothing to do with morality and are not meant to be taken literally. In Chapter 7 de Waal is rather sympathetic to religion and writes, "The question is not so much whether religion is true or false, but how it shapes our lives, and what might possibly take its place if we were to get rid of it ... " (p. 216). He is also quite critical of the new atheists and writes, "Neo-atheists are like people standing outside a movie theater telling us that Leonardo DiCaprio didn't really go down with the *Titanic*. How shocking" (p. 204)! The title of Chapter 8 is significant in that it means the *important* features (excluding such trivia as "impure thoughts" and "self abuse") of human morality were not imposed from above, meaning by religion. Rather, they evolved with us from our primate heritage.

De Waal's style in the book is informal, almost conversational. He makes many of his points, or at least illustrates them, with literary and artistic analogies and narrative stories, most of which involve his and others' experiences with non-human primates, primarily chimpanzees and bonobos. In the late 1980s this reviewer had the opportunity to participate in one small experience with bonobos with Frans de Waal at the San Diego Zoo. Frans took my wife, daughter and me behind the outdoor bonobo exhibit where several other not-on-public display bonobos were kept. Interacting

face to face and hand to hand with a bonobo is a very memorable experience.

To better understand the book's message, here are some of the cognitive/behavioral/emotional features of human beings that chimpanzees and/or bonobos also exhibit. They are listed by the first time they appear in the book, followed by the page numbers: empathy (p.6), ability to take the perspective of others (p. 26), altruistic impulses (p. 33), caring about each other's welfare (p. 20), gratitude (p. 127), retaliation (p. 129), assisting others and taking others' specific needs into account (p. 146), deferred gratification (p. 153), having values (p. 164), attention to how one individual treats another (p. 174), imitation of prominent community members (p. 175), awareness of death (p. 196), planning (p. 205), knowledge of the future (p. 206), having ideals (p. 227), striving for harmonious relationships (p. 227), reconciliation (p. 228), ability to think ahead (p. 233), sense of fairness and justice (p. 234).

Finally, we get to the book's last chapter, "Bottom-up Mortality". Within this chapter is the subheading, "The Bonobo and the Atheist" that starts with the provocative sentence, "What would a bonobo tell an atheist" (p. 236)? The bonobo tells the atheist that there is no point in getting worked up about the absence of something! And moreover, "the bonobo laughs at the intellectual torture of trying to separate 'is' from 'ought,' which vexes any debate about moral evolution. De Waal adds what all members of ESSSAT already know, that we cannot proceed from the way humans and animals are to moral ideals. The first is descriptive ... the second is prescriptive" (p. 239).

De Waal warns that "If the thought is that animals are mere 'wantons,' lacking control over the impulses that nature has given them, we are on the wrong track ... his [the bonobo's] values are not altogether different from those underlying human morality. He, too strives to fit in, obeys social rules, empathizes with others, amends broken relationships, and objects to unfair arrangements. We may not wish to call it morality, but his behavior isn't free of prescriptions either" (pp. 239-240).

For many ESSSAT members this book could be light bedtime reading. It is also enjoyable to read and for persons not knowledgeable of the non-human primate literature, it is both entertaining and informative. The book contains lots of interesting facts that will give the reader grist for the casual conversation mill.

Where it has the potential to be more than light bedtime reading is in the application of its central thesis to the process of secularization. The

book caused this reviewer to consider whether or not secularization in general, and secular humanism in particular, are atavistic regressions. By shedding the culturally created veneer, the divisive and group-spitting particularities of individual (especially) Judeo-Christian religions could be eliminated. But this is no better than a unilateral disarmament. Much to think about from a book on apes!

Jay R. Feierman

New books relevant for Science-and-Theology

All the titles in this section are available for review; interested colleagues please contact the Editor to request one or more books.

General issues

Jonathan R. Wilson

God's Good World: Reclaiming the Doctrine of Creation

Baker Academic 2013

The author exposes what has been missing in current theological discourse and offers an original, constructive work on this doctrine. The book unites creation and redemption, showing the significance of God's work of creation for understanding the good news of redemption in Jesus Christ. Wilson develops a Trinitarian account of the life of the world and sets forth how to live wisely, hopefully, peaceably, joyfully, and generously in that world. He also shows how a mature doctrine of creation can help the church think practically about contemporary issues, including creation care, sexuality, technology, food and water, and more.

Ilia Delio

The Unbearable Wholeness of Being: God, Evolution, and the Power of Love

Orbis 2013

The award-winning author of *Christ in Evolution* and *The Emergent Christ* breaks new ground with this capstone in a trilogy that opens our eyes to the everywhere active, all powerful, all intelligent Love that guides and directs our new awareness of interrelatedness and interbeing. "We all have a part to play in this unfolding Love; we are wholes within wholes; persons within persons; religions within religions".

Philip Clayton and Steven Knapp

The Predicament of Belief: Science, Philosophy, and Faith

Oxford University Press 2012

Does it make sense for someone who appreciates the explanatory power of modern science to continue believing in a traditional religious account of the ultimate nature and purpose of our universe? This book is intended for those who care about that question and are dissatisfied with the rigid dichotomies that dominate the contemporary debate. The extremists won't be interested – those who assume that science answers all the questions that matter, and those so certain of their religious faith that dialogue with science, philosophy, or other faith traditions seems unnecessary. But far more

people today recognize that matters of faith are complex, that doubt is endemic to belief, and that dialogue is indispensable in our day.

Richard Swinburne

Mind, Brain, and Free Will

Oxford University Press 2013

The author argues that answers to questions about mind, body, and free will depend crucially on the answers to more general philosophical questions. He begins by analyzing the criteria for one event being the same as another, one substance being the same as another, and a state of affairs being metaphysically possible; and then goes on to analyze the criteria for a belief about these issues being justified. Pure mental events (including conscious events) are distinct from physical events and interact with them. No result from neuroscience or any other science could show that interaction does not take place: recent scientific work (such as Libet's experiments) has no tendency whatever to show that our intentions do not cause brain events.

Robert John Russell

Time in Eternity: Pannenberg, Physics, and Eschatology in Creative Mutual Interaction

University of Notre Dame Press, 2012

According to Robert John Russell, one of the foremost scholars on relating Christian theology and science, the topic of "time and eternity" is central to the relation between God and the world in two ways. First, it involves the notion of the divine eternity as the supratemporal source of creaturely time. Second, it involves the eternity of the eschatological New Creation beginning with the bodily Resurrection of Jesus in relation to creaturely time. The key to Russell's engagement with these issues, and the purpose of this book, is to explore Wolfhart Pannenberg's treatment of time and eternity in relation to mathematics, physics, and cosmology.

B. Alan Wallace

Meditations of a Buddhist Skeptic: A Manifesto for the Mind Sciences and Contemplative Practice

Columbia University Press 2011

Raising profound questions about human nature, free will, and experience versus dogma, Wallace challenges the claim that consciousness is nothing more than an emergent property of the brain with little relation to universal events. Rather, he maintains that the observer is essential to measuring quantum systems and that mental phenomena (however conceived) influence brain function and behavior. Wallace embarks on a two-part mission: to restore human nature and to transcend it. He begins by explaining the

value of skepticism in Buddhism and science and the difficulty of merging their experiential methods of inquiry.

Emmanuel Papadakis,

Beyond God: A scientist's search for the meaning of life in the 21st century

Iff Books 2013.

Beyond God is the product of a scientist's decade-long journey through Eastern and Western philosophy and religion inspired by the dramatic changes in modern science. Beginning from the perspective of secular Western atheism and believing the world is largely as we see it, the author considers the nature of reality more deeply: what science really tells us, what that means for religion and philosophy, and what that implies for how we choose to live. The result is an exploration of the key ideas in religion and philosophy that are compatible with recent scientific developments.

Mick Power

Adieu to God: Why Psychology Leads to Atheism

Willey-Blackwell 2012.

The book answers the psychological question of why, in the face of overwhelming scientific evidence to the contrary, do religions continue to prosper? To this end it looks at atheism and religion using a fair and balanced approach based on the latest work in psychology, sociology, anthropology, psychiatry and medicine. Furthermore it acknowledges the many psychological benefits of religion while still questioning the validity of its supernatural belief systems and providing atheist alternatives to a fulfilling life.

Dominique Chu

The Science Myth: God, Society, the Self and What We Will Never Know

Iff Books 2013

In the struggle between science and religion, science portrays itself as the white knight of enlightenment truth defending humanity against the dark forces of religious fundamentalism and ignorance, that threaten free thinking and progress. But is there really the fundamental difference between science and religion that the culture warriors like us to believe? This book takes the reader on an inside journey through science showing how scientific beliefs are made. It will show science as a human activity that is shaped by power struggles, personal interests, cultural prejudices, beliefs and values...and yes, experimental data as well.

Cosmological issues**Gary W. Driver*****What is Time****Tate Publishing 2012*

Time is the common denominator of the Bible and Science. Time is the key that reveals God in the most modern scientific discoveries in Quantum Mechanics, Physics, Cosmology, and Geology. Driver connects the dots of the bible and science to reveal the picture of time itself and creation. Time is no illusion; we cannot see the present, why we age, what is eternity. Enclosed proof the Big Bang cannot be the start of time and how this affects evolution.

Sharon Ann Miller***The New Paradigm - A Spiritual Scientific Cosmology, Utilizing Twelve Fundamental Archetypes at the Base of the Laws of Physics****Iff Books 2013*

People worldwide are questioning the materialistic, mechanistic scientific paradigm that has been the dominant cosmology for the past one hundred years or so. The purpose of *The New Paradigm* is to provide a philosophical foundation for a spiritual cosmology that can incorporate both modern science and ancient wisdom. This is a paradigm that many have hoped would arise to usher in the predicted New Age of elevated spiritual awareness and understanding.

Evolution studies**Peter J. Bowler*****Darwin Deleted: Imagining a World without Darwin****University of Chicago Press 2013*

Because non-Darwinian elements of evolutionism flourished for a time in the real world, it is possible to plausibly imagine how they might have developed, particularly if the theory of natural selection had not emerged until decades after the acceptance of the basic idea of evolution. Bowler's approach enables him to clearly explain the non-Darwinian tradition – and in doing so, he reveals how the reception of Darwinism was historically contingent. In this new vision of scientific history the sequence of discovery and development would have been very different and would have led to an alternative understanding of the relationship between evolution, heredity, and the environment—and, most significantly, a less contentious relationship between science and religion.

Martin A. Nowak and Sarah Coakley (Eds.)

Evolution, Games, and God: The Principle of Cooperation

Harvard University Press 2013

The book takes an interdisciplinary approach to the terms “cooperation” and “altruism.” Using game theory, the authors elucidate mechanisms by which cooperation arises through natural selection. They then examine altruism as a key concept in scientific attempts to explain the origins of morality. Discoveries in cooperation go beyond the spread of genes in a population to include the spread of cultural transformations such as languages, ethics, and religious systems of meaning. This essay resists the presumption that theology and evolutionary theory are inevitably at odds by rationally presenting a number of theological interpretations of the phenomena of cooperation and altruism and finding evolutionary explanation and theology to be strongly compatible.

New scientific study of religion

Greg Dawes, James Maclaurin (Eds.)

A New Science of Religion

Routledge 2013

This volume examines the diversity of new scientific theories of religion, by outlining the logical and causal relationships between these enterprises. Are they truly in competition, as their proponents sometimes suggest, or are they complementary and mutually illuminating accounts of religious belief and practice? Cognitive science has gained much from an interdisciplinary focus on mental function, and this volume explores the benefits that can be gained from a similar approach to the scientific study of religion.

Historical studies

Annibale Fantoli

The Case of Galileo: A Closed Question?

University of Notre Dame Press, 2012

The author presents a wide range of scientific, philosophical, and theological factors that played an important role in Galileo’s trial, all set within the historical progression of Galileo’s writing and personal interactions with his contemporaries. Fantoli traces the growth in Galileo Galilei’s thought and actions as he embraced the new worldview presented

in *On the Revolutions of the Heavenly Spheres*, the epoch-making work of the great Polish astronomer Nicolaus Copernicus.

Practical issues

Hilary Rose and Steven Rose

Genes, Cells, and Brains: The Promethean promises of the new biology *Verso 2013*

In *Genes, Cells and Brains*, feminist sociologist Hilary Rose and neuroscientist Steven Rose take on the bioscience industry and its claims. Examining the establishment of biobanks, the rivalries between public and private gene sequencers, and the rise of stem cell research, they ask why the promised cornucopia of health benefits has failed to emerge and reveal the questionable enterprise that has grown out of bioethics. The human body is becoming a commodity, and the unfulfilled promises of the science behind this revolution suggest profound failings in genomics itself.

David P. Gushee

The Sacredness of Human Life: Why an Ancient Biblical Vision Is Key to the World's Future *Eerdmans 2013*

Tracing the concept of the sacredness of human life from Scripture through church history to the present day, Gushee argues that viewing human life as sacred is one of the most precious legacies of biblical faith – albeit one that the church has too often failed to uphold. Besides providing a masterful historical survey, Gushee's discussion covers the many current ethical challenges and perspectives that will impact the survival and flourishing of human life, including biotechnology, the death penalty, abortion, human rights, nuclear weapons, just war theory, women's rights, and creation care.

Announcements

Call for Papers

15th European Conference on Science and Theology, Assisi, Italy

April 30th – May 4th, 2014

All those attending the conference are invited to offer a paper on the conference theme ***Do emotions shape the world?*** for presentation in a short paper session. This issue can be approached from a number of perspectives. In addition to the main question, we might ask: *What is emotion? What have we learnt about the biochemistry and psychophysiology of emotions? How has our understanding of emotions changed over time? What is the role of emotions in theology and religious experience? What is the role of emotions in scientific research? How should we describe emotions, rationality, subjectivity and objectivity in light of the best knowledge in science and theology? In the wake of “Descartes Error”, how do we re-conceptualize the understanding, pursuit and communication of science? How does theology feed cultural, spiritual and moral capital into the economy of global challenges?* These are some of the issues we aim to pursue.

Papers related to these issues are welcome. Papers on other aspects of the interaction between science and theology may also be offered.

Those intending to present a paper should submit a provisional title, 5 to 10 keywords, and an outline of not more than 500 words which makes clear the relevance of the paper to the theme of the conference or other aspects of the interaction between science and theology. These single-sided outlines should also include: full name, academic position (if any), full postal and e-mail addresses. They must be received as e-mail attachments only **before October 31st, 2013** by the Scientific Programme Officer at the address below and must be sent in either **.doc or .rtf file format**. The conference language is English. For more information about the conference, visit the ESSSAT-website: www.esssat.org.

Information about the acceptance of a paper will be given in December 2013, together with guidelines for the paper and its presentation at the conference. Complete papers must be received by March 15th, 2014. Papers and the short paper session schedule will be made available to registered participants and members of ESSSAT.

Each presenter will have 5-10 minutes to present the main ideas of the paper, followed by 20 minutes for discussion. PowerPoint facilities and overhead projectors will be available. Presenters are free to distribute their

own handouts, but must provide copies for the audience. Some of the papers presented at the conference will be printed in forthcoming ESSSAT publications. Information on submission and selection will be given later. Presentation of a paper at the conference does not guarantee publication.

Scientific Programme Officer: *Dr. Knut-Willy Sæther*, E-mail: programme@esssat.org

* * *

New Treasurer needed

The ESSSAT Treasurer, Chris Wiltsher, will leave office at the end of 2014. His successor will be elected by the Council in 2014, to take office from 1 January 2015.

The Treasurer is responsible for: managing the ESSSAT bank accounts; receiving membership fees; preparing accounts for audit and presentation to the General Assembly; preparing the ESSSAT budget and making recommendations to Council about membership fees; and preparing budgets and accounts for ESSSAT conferences. There are also some other smaller tasks.

Chris has also served as membership secretary, maintaining the database of members and handling applications for membership and resignations. This role has been combined with the role of treasurer for many years, but the two roles could be separated.

We seek a replacement treasurer and membership secretary. Any ESSSAT member interested in the combined role or either role separately is invited to contact Chris for more details about what these positions involve. He can be contacted at esssat@gsmentors.co.uk.

In memoriam

Sjoerd L. Bonting

Netherlands, 1924-2013

Born in 1924 in Amsterdam, Sjoerd Bonting studied chemistry at the University of Amsterdam, receiving a B.Sc. in 1944, an M.Sc. *cum laude* in biochemistry (1950), and a Ph.D. in biochemistry in 1952. Three weeks later he sailed with his young wife Susan to the USA on a postdoctoral fellowship of the National Institutes of Health. Between 1952 and 1960 he worked at the Universities of Iowa, Minnesota, and Illinois, and from 1960-1965 at the National Institutes of Health, Bethesda, MD. In 1965 he returned to the Netherlands to become chairman and professor of biochemistry at the Radboud University Nijmegen. From 1965-1985 he and his students worked in two research areas, the visual system and sodium active transport. In 1985 he returned to the USA as a scientific consultant for NASA at Ames Research Center, CA, for preparation of biological research on the International Space Station, and held this post till 1993.

He published 363 scientific papers, edited 9 books, was editor of *Advances in Space Biology and Medicine* (7vols, 1989-99), and sponsor of 52 Ph.D. dissertations.

From 1957-1963 Bonting also studied theology, and in 1964 he was ordained priest in Washington (Anglican) Cathedral. As such he ministered to English-speakers in the Netherlands, founding congregations in Nijmegen, Eindhoven, Arnhem and Twente between 1965 and 1985. From 1985-1993 he was assistant priest at St. Thomas' Church, Sunnyvale and St. Mark's Church, Palo Alto. After returning to the Netherlands in 1993 he remained active with the Anglican congregations there, but his main focus was on the science-theology dialogue, in which he published five books:

- *Creation and Evolution: Attempt at Synthesis* (1996; in Dutch),
- *Humanity, Chaos, Reconciliation* (1998; in Dutch),
- *Between Belief and Unbelief* (2000; in Dutch),
- *Chaos Theology, A Revised Creation Theology* (2002)
- *Creation and Double Chaos* (2005) and 99 articles.

He received 10 awards, and is listed in 'Who's Who in America', 'Who's Who in the World', and 'Who's Who in Theology and Science'.