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PROSPECTS FOR THE FIELD OF SCIENCE AND RELIGION: AN OCTOPUS VIEW

by Niels Henrik Gregersen

Abstract. The organic unity between the head and the vital arms of the octopus is proposed as a metaphor for science and religion as an academic field. While the specific object of the field is to pursue second-order reflections on existing and possible relations between sciences and religions, it is argued that several aspects of realism and normativity are constitutive to the field. The vital arms of the field are related to engagements with distinctive scientific theories, specialized philosophy of science, representative theological proposals, and the input from the study of world religions.

Keywords: contextualism; empirical naturalism; metaphysical realism; Charles Sanders Peirce; pragmatism; scientific naturalism; semantic realism; theoretical realism

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Octopuses have a reputation for being possessive, perhaps because they are so similar to human beings with their wide-open camera eyes, a substantial intelligence based on a central nervous system, and strong sensory organs attached to their highly efficient arms. We humans tend to be worried about competitors, and may be frightened by the constricting arms of octopuses.

Be this as it may, my octopus view of the field of science and religion will not have any such possessive or colonizing connotations. Rather my point is that the octopus may serve as an image of the field of science and religion with its many disciplinary arms, without which the field could not survive, while also having a central nervous system organically connected

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to its sensitive and acquisitive arms. Without something like a central head, science and religion will disperse as a focal discipline, and without its arms the field will not be able to move around and absorb insights from other disciplines. In contrast to a real-world octopus, however, the symbolic octopus of science and religion is capable of developing ever new arms in the adaption to the eco-space constituted by the new emerging academic fields surrounding the field of science and religion. However, the field needs to be self-reflective about its own core concerns, symbolized by the octopus's head.

Does Science and Religion Constitute a Disciplinary Field at All?

It is disputable, of course, whether "science and religion" constitutes an academic discipline of its own. Does the octopus have a head, after all? The answer depends upon how one defines what makes up an academic discipline in general.

As far as I'm aware, there is no existing consensus on this issue. One option is to view the relation between science and religion as a subfield of, for example, philosophy of religion, philosophy of science, history of science, systematic theology, or religious studies. There are obvious deficits to this view, however. First, the named disciplines are themselves hard-to-define and contested areas of scholarship, defined more by geographies, traditions, and institutional shelters than by coherent views of subject matter and methods. Science and religion, for example, is easier to define than the field of philosophy of religion, which builds on very different traditions (say, analytical, hermeneutical, continental postmodern, etc.). Second, it is easy to find prominent work done in the field of science and religion that is not locatable in any of these otherwise broad-ranging disciplines.

It therefore seems better to start out with a pragmatic approach when delineating the contours of science and religion as an independent field. In his very helpful analysis, *What Are Academic Disciplines?*, Armin Krishnan (2009, 9) points to the following list of general characteristics. First, "disciplines have a particular object of research." In the case of science and religion, I suggest, it is the study of *the relations between sciences and religion in historical and contemporary contexts.* Second, disciplines have "a body of accumulated specialist knowledge referring to their object of research, which is specific to them and not generally shared with another discipline." A discipline, in other words, has a scholarly tradition of accumulated specialist knowledge. Third, "disciplines have theories and concepts that can organize the accumulated specialist knowledge effectively." Fourth, "disciplines use specific terminologies or a specific

technical language adjusted to their research object," and fifth, "disciplines have developed specific research methods according to their specific research requirements."

The requirements of field-specific theories, terminologies, and research methods are perhaps the most difficult to fulfill in the case of science and religion, since our field is born to be interdisciplinary. The same, however, would apply to philosophy of religion, systematic theology, or religious studies. Also these fields adapt methods and terminologies from other disciplines, be it philosophy, history, or anthropology. And as argued by Krishnan, the crucial point is a sixth condition for disciplines: that they "must have some institutional manifestation in the form of subjects taught at universities or colleges, respective academic departments and professional associations connected to it" (2009, 9). Similarly, Terrell Bynum defines a field as follows: "The birth and development of a new academic field require cooperation among a 'critical mass' of scholars, plus the creation of university courses, research centers, conferences, and academic journals" (Bynum 2008, 16).

Regarding the requirement of institutionalization, science and religion seems to fare quite well, and will do so in a foreseeable future. We certainly have a *critical mass of scholars* (counted in the hundreds), and our field also has a large and interested public audience outside the scholarly world, as defined by books sold, lectures held, and public discussions stirred in various media. Many *university courses* are taught; there is a good stock of *text-books* in the field, beginning from the 1960s up to today, and spanning at least three generations of scholars; up to 10 *research centers* have specialized doctoral programs in the field. We have *conferences*, convened by international societies such as IRAS, ESSSAT, and ISSR, alongside countless other specialized conferences, especially in the United States, Europe, and Asia. We have academic journals published by strong international publishers such as *Zygon: Journal of Science and Religion* (since 1966), *Theology and Science* (since 2002), *Religion, Brain and Behavior* (since 2011), and the new journal *Philosophy, Theology, and the Sciences* (launched 2014). We also have authoritative encyclopedias in the field such as the Macmillan Reference *Encyclopedia of Science and Religion* vols. 1–2, with Wentzel van Huyssteen as editor-in-chief, followed in 2013 by Springer's *Encyclopedia of Sciences and Religions* vols. 1–4, edited by Anne Runehov and Lluís Oviedo. Add to this that Oxford University Press is launching a multi-decade digital project, called *Oxford Research Encyclopedias*, in which science and religion is listed as one of 27 core research areas, alongside the field of "philosophy of religion and theology" (fused into one area). All in all, academic and public recognition of the field is quite substantial—nicely accompanied by both applause and critique!

A Peircean View of Science and Religion

In order to make a workable distinction between the "head" of the octopus and its many "arms" (and reminding ourselves of the organic unity of the octopus as whole), let me take my point of departure in one of Charles Sanders Peirce's definitions of the meaning of signs:

> Now a sign has, as such, three references: 1st, it is a sign *to* some thought which interprets it; 2d, it is a sign *for* some object to which in that thought it is equivalent, 3d, it is a sign, *in* some respect or quality, which brings it into connection with its object. (Peirce 1992, 38)

Now replace the "sign" with "existing relations between science(s) and religion(s)." In fact, interpreted data concerning the relation between science and religion *already exist* out there. Understood as signs, these preexisting data never exist in isolation from their *interpreters*—be they the plethora of lived interpretations between sciences and religions "out there," or the interpretations "within" the field of science and religion. The task of science and religion is thus to offer a variety of second-order reflections, all of which operate in the understanding that the first-order interpretative object under study is always more wild, fussy, and comprehensive than any scholarly presentation can explicate—be it in the form of scientific explanations, hermeneutical interpretations, systematizations, or constructive proposals. There will always be gaps between scientific and academic models and the realities under study.

As Peirce points out, a sign stands "*for* some object [the first-order fields of existing relations between sciences and religion] *to* which in that thought [the scholarly second-order interpretation] it is equivalent." Without involving myself in a more subtle Peircean exegesis, the quotation shows the interplay between the semantic, the pragmatic, and the contextualized aspects of our field. First, science and religion is *about* something (existing relations between science and religion), which in itself is *about* something (some putative reality beyond the pursuit of science and religious practice); this constitutes the *semantic dimension* of the field. Second, both first- and second-order relations between sciences and religions are of importance to different groups of interpreters; this constitutes *the pragmatic dimension* of the field. Third, interpreters coming from different groups of stakeholders grasp the relations between sciences and religions "in some respect or quality," without ever being able to offer a total or impartial view of the possible relations as a whole; this constitutes the *contextual* nature of the field. Thus understood, the field of science and religion may be said to have minimally three ontological commitments:

(1) The field of science and religion is *about* past, present, or future relations between sciences and religions. As I will argue below, this

semantic dimension of the field will inevitably involve some core assumptions of realism in science as well as religion.

(2) The field is open to different groups of second-order interpreters of the relation between sciences and religions—be they historians or contemporary observers, scholars with descriptive, explanatory or constructive interests, believers or nonbelievers. A description of the field which is only for one or two interest groups will belong to subdisciplinary arms of the field, not to its head.

(3) The field is carried by the awareness that any particular view of the relations between sciences and religions can only do so from epistemic perspectives, to which there are attached particular cognitive and normative interests. This contextual dimension of the field constitutes a tolerance toward conceptual pluralism within the field.

The Head of the Octopus

On the basis of these commitments, let us now return to the head of the octopus. It seems to me that programs within science and religion need to be committed to some form of metaphysical realism, that is, the view that the world exists regardless of the observer, and consists of a variety of mind-independent entities or objective relations (including also the observer's interpretations).[1] However, other commitments to realism seem to feature in the head of our octopus. Central is the recognition that scientific as well as religious practices presuppose a semantic realism insofar as they purport to be discovering something real. But also a theoretical realism (meaning that some scientific theories and perhaps also some religious views are capable of discovering structures of reality) must somehow be acknowledged, at least as a possibility.[2] The success of a theoretical realism, however, will differ from discipline to discipline. It is difficult to do physics without believing that theoretical entities such as charged electrons exist. But what about the semantic claims of religion? There is here a certain asymmetry between science and religion. While the genus of scientific reasoning is rarely criticized, at least in a Western context, the family of religious practices, attitudes, and grasps of reality is sometimes questioned *in toto*. However, even an atheist will have to measure up to some aspects of a theoretical realism when articulating specific religious beliefs and patterns of experience. I would add that, in the academy, questions of adequacy of theories and ideas should always be raised with respect to particular interpretations; religious views cannot be dismissed by reference to their genus.

Also other aspects belong to what I called the head of our octopus. One is to take seriously the best and most articulate forms of science, as well as the best and most promising candidates for understanding religious life.

There are empirically well-established mature sciences which are likely to stand also in the future, either because their scope is universal and well-tested (as in physics), or because they have identified area-specific laws of nature (say, chemical bonding laws), or resilient structures that reappear in slightly varied forms from one organism to another (in biology). In other words, it belongs to the specificity of the discipline of science and religion that its second-order reflection gives priority to the best available theories within science.

Similarly, I also think that well-winnowed, representative, and self-reflective religions should be given emphasis in our field. Understanding contemporary religious perception in an age of science is not possible by analyzing only religious practices of the past, or fringy aspects of religious life (such as voodoo). As long as religion is seen mostly as an arbitrary mix of odd beliefs and strange practices, there can be no mutual interaction between science and religion. Also, despisers of religion must be able to understand what they don't like.

When it comes to creating a synthetic picture of the relations between science and religion, philosophy (which evaluates conditions for world-view formation) and theology and religious studies (fields evaluating the meaning of different religions in relation to other cultural forces, including science) may also have central roles to play. It is one thing, central to the field, to use scientific methods, say from theoretical and empirical psychology, to explain religious behavior, as in the case of cognitive science. It is another thing, likewise central to head of the discipline, to compare such scientific explanations with the religious self-understanding in a both comprehensive and self-reflective awareness. The kind of theology here entertained has the role of understanding general aspects of human religion (say, recurrent rituals and widespread beliefs) as well as understanding and rearticulating the semantic worlds of meaning in major representative religions (say, Hinduism, Buddhism, Christianity, and Islam). This general kind of religious reflection differs from the tradition-based theologies to be exercised in the specialized arms of the octopus.

Finally, part of the head of the octopus is not only ontological commitments and academic virtues, but also reflections on the ethical aspects of contemporary sciences and religious practices. Due to the pragmatic and contextual dimensions of the field, there is need for a continuous attentiveness to the ethics of physics (e.g., atomic bombs and plants), biology (e.g., genomics), physiology (medical research and distribution of medicine), psychology (psychoactive drugs), ecology (climate change), and technological sciences (for example, ethical issues relating to the world-transforming powers of information technology). Normative concepts of what is relatively better and potentially more dangerous when applying science to real-world problem should be central to the field of science and religion, and are also part of its central functions for the wider society.

The Arms of Theology and Religious Studies

We are now coming to the specialized arms of the field. For *whom* is the field of science and religion relevant, and in what *respect*? Since I happen to be a theologian, let me begin with some discipline-specific theological interests, not necessarily shared by all other stakeholders in the field. Theology offers second-order reflections of distinctive religious traditions which themselves are already self-reflective. Different traditions, however, have different interests and concerns in relation to the sciences.

In the future, we will have to be more aware of the difference between the major religious traditions. Religious communities cultivate diverse philosophical and theological commitments, also concerning worldview issues. For example, discussions on the anthropic principle have proven of central importance to the theistic traditions harboring a notion of a creation *ex nihilo*, from Judaism over Christianity to Islam. (I am not aware of corresponding interest from Hindu scholars or from Buddhologists.) Another example is evolutionary biology. Christian theologians have traditionally been concerned about questions of theodicy relating to Darwinian theories of selection. As shown by Nidhal Guessoum (2011), however, Muslim theologians have been less concerned with natural selection, and more interested in the creative role of mutations. The Dalai Lama, from his perspective, is committed to the Buddhist doctrine of a mind-first view, so that "it is from the mind that the world of sentience arises," and not the other way around (2005, 109). There is here no ascent of life or humanity from material conditions, as in the Western narratives. Rather, "the evolution of human life on earth is understood in terms of the 'descent' of some of these celestial beings, who have exhausted their positive karma, which provided them with the cause and conditions to remain in these higher realms" (Dalai Lama 2005, 107).

The examples show that any religious tradition will have a wider semantic range than that of scientific theories and worldviews and will speak about something beyond the material realm, at least as defined by the current sciences. Unless one favors the view that religious self-reflection should be reduced to scientific explanation, this can't be otherwise. The examples also show the danger of what Michael Stenmark (in current work) describes as "tailor-made science," in which scientific findings are massaged to fit into particular religious worldviews. One of the main questions of future science–religion discussion might be to delineate the conditions under which the representative religions can say more about reality than allowed by the natural sciences on their own. Which kind of guidelines for rationality can be established for fruitful connections between religions and sciences in the future? As said, it is natural and good that theologians representing different communities are working out their own ways of embracing aspects of contemporary science. This belongs to the specialized

theological arms of our octopus. Given this fact, a consideration of core commitments of current sciences, as reflected in the head of our discipline, is so much more important for counteracting uses of science, which are merely *ad hoc*.

The Scientific Arms of the Octopus

It goes without saying that scientists are central stakeholders of the field. Practicing scientists are methodological naturalists who would not look for religious explanations within their respective fields. Scientists, however, also live a life outside of their labs, and may have multiple belongings. This raises philosophical questions of the limits of science, and how to handle the boundaries between scientific and other forms of knowledge (Dupré 2005). A meta-scientific perspective is here required, also in order to counterbalance premature idealizations what "science" is about, and what particular scientific theories can or cannot achieve (Sober 2011).

Moreover, there are fundamental concepts used across scientific disciplines that raise questions about their distinctive meanings within different sciences. Think of the highly variegated concepts of explanation within the sciences ("explanatory pluralism"), or of the wide spectrum between scientific thought experiments, computer-based modeling, and real-world experiments at the other end of the spectrum. Or think of different uses of the idea of laws of nature—some deterministic, some probabilistic, some global laws, other very local causal capacities (Watts 2008). Even at fundamental ontological level, physicists and biologists begin to think of information as fundamental to physical reality on par with mass-and-energy (Davies and Gregersen 2010). Many questions relating to religion will resurface in new constellations, if the previous picture of a causal closure, based on physical micro-determination, gives way to an enlarged understanding of different forms of effective information, from quantum decoherence to biological and cultural information.

Finally, even though scientific progress is likely to come from the specialized sciences, there is an increasing need to reflect upon both the unities and disunities between the different sciences (Galison and Stump 1996). What counts as "scientific" differs wildly, a fact which should caution us against overly simplistic views of what constitutes "a scientific worldview." Gone are the days when "science" was equivalent to theoretical physics, or when science was defined by laws of nature. In fact, many sciences are involved in modeling systems without reference to laws of nature at all (Creager, Lunbeck, and Norton Wise 2007).

The Philosophical Arms of Science and Religion

Important guidelines for theological uses of science and for scientific self-awareness can be found in the field of philosophy of science, as already

amply evidenced in the work of Nancey Murphy, Wentzel van Huyssteen, Philip Clayton, and others. Still, however, much can be learned from the more specialized discussions within philosophy of science (philosophy of quantum mechanics, of biology, of psychology, etc.). Many pitfalls may hereby be avoided, especially the pitfall of adopting overly general metaphilosophies, which are grossly metaphysical more than concisely scientific in orientation. Scientists and other stakeholders in the field of science and theology may benefit from going deeper into the many forms of naturalism within current philosophy. One of the major discussions today is whether a science-based strict naturalism is still viable, or whether scientific forms of knowledge need to be complemented with humanistic, and potentially also religious, perspectives on reality. In philosophy we thus find concerted movements toward more liberal versions of naturalism, moving critically beyond the earlier orthodoxy of a strict scientific naturalism (De Caro and Macarthur 2004, 2010).

It is still an open question, however to what degree liberal naturalists are genuinely interested in scientific descriptions of reality. While some continue to use scientific naturalism as its metaphysical bedrock, including the principle of causal closure, other liberal naturalists self-define as metaphysical quietists, who do not care much for underlying natural processes. A third possibility (Gregersen 2014) is to follow the lead of an empirical naturalism. Here, the empiricist orientation in science is taken with utmost seriousness, giving priority to singular causes and system-specific capacities (Cartwright 1986, 91–140), while being reticent to speak of unified scientific world view. On this view, biological features and human culture are not seen as only accidental epiphenomena of an underlying reality. Quite a few contemporary philosophers tend to see metaphysical versions of scientific naturalism as lacking in argumentative detail and without sufficient scope with regard to explaining central features of consciousness, language, and organismic telos (e.g., Nagel 2012). The present author belongs to this group.

The Arms of Cultural Studies and Sociology of Religion

Several other arms of science and religion should be mentioned, not least cultural analyses of the interface of between scientific and spiritual mentalities. Usually social sciences are constructivist in orientation in tension with the realist assumptions undergirding science and religion dialogues. Nonetheless, they may influence the future of our field significantly. The methods vary from small-scale ethnographic methods, as Stefan Helmreich's keen analysis of the formation of worldviews and values at the Santa Fe Institute (Helmreich 2000) to the large-scale cultural analysis as we find in Mark C. Taylor's analysis of complexity theory and cultural awareness (2003). We also find examples of more classical methods of

sociology. Elaine Howard Ecklund (2010) has thus recently produced an impressively large study of scientists' views of religion and spirituality. How these cultural studies will affect future prospects of science and religion is still uncertain. But they show that scientific theorizing never emerges, and rarely flows, unsupported by cognitive aspirations and affective orientation far beyond those described in scientific text books.

Notes

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1. This has been disputed by some philosophers in the field. Eberhard Herrmann (1998), for example, follows Hilary Putnam (in his mid-career work from the 1980s) when arguing that an internal realism displaces an external realism, and that pragmatism means a farewell to the commitment of a metaphysical realism (Herrmann 1998). Recently, however, Putnam himself has retracted his earlier formulations, in which he argued that conceptual relativity (the idea that different epistemic models are possible as equivalent descriptions) stands in contrast to metaphysical realism, which Putnam (at that time) defined narrowly as the view that thought-independent objects "admit of only one description, independent of all choices" (Putnam 1981, 54, italics in original). I have earlier criticized this view as restrictive and confusing in relation to the general philosophical use of the term "metaphysical realism" (Gregersen 1998, 198–99). Today Putnam has cleared up the matter by admitting that "conceptual relativity is fully compatible with realism in metaphysics" (2012, 56). He now says that conceptual relativity indeed rules out one form that metaphysical realism can take (the restrictive view mentioned above), but that his earlier presentation was a "mistake" since it did not acknowledge that there is "a natural understanding of the phrase 'metaphysical realm' which refers to a broad family of positions, and not just to the one position I used to refer to" (2012, 62).

2. I'm here using the distinction between metaphysical realism, semantic realism, and theoretical realism in accordance with the helpful terminology of Stathis Psillos (1999). See also Gregersen (2004) for an application of these distinctions to science-and-religion.

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