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Angels and blue brains: aesthetics of knowledge in science and religion

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Abstract

This paper deals with the sensory and culturally situated dimension of knowing, which I refer to as "aesthetics of knowledge", and focuses on knowing and knowledge in two fields of the modern and contemporary cultural sphere: science and religion. Since its emergence during the 19th century, science has been sharing many elements of the aesthetics of knowledge with modern Western religion. These are shaped by common heritage from the Romantic period and, while often dismissed as superficial borrowings, they contribute to construct scientific meaning. Based on existing literature, this paper endeavours to show how a focus on shared aesthetics of knowledge in science and religion can provide new insights in science, media and art studies by complementing other approaches.

Keywords

aesthetics of knowledge; science and religion; visual communication; brain simulations; inscriptions

Ángeles y cerebros azules: estética del conocimiento en la ciencia y la religión

Resumen

Este documento trata sobre la dimensión sensorial y cultural del conocimiento, a la que me refiero como «estética del conocimiento», y se centra en el hecho de conocer y en el conocimiento en dos campos de la esfera cultural moderna y contemporánea: la ciencia y la religión. Desde su aparición en el siglo XIX, la ciencia ha estado compartiendo muchos elementos de la estética del conocimiento con la religión occidental moderna. Estos están conformados por la herencia común del período romántico y, aunque a menudo se desestiman como préstamos superficiales, contribuyen a construir un significado científico. Basándose en la literatura existente, este artículo se esfuerza por mostrar cómo un enfoque en la estética compartida del conocimiento en la ciencia y la religión puede proporcionar nuevos conocimientos en estudios científicos, de medios de comunicación y de arte complementando otros enfoques.

Palabras clave

estética del conocimiento; ciencia y religión; comunicación visual; simulaciones cerebrales; inscripciones

Introduction: comparing science and religion

This paper is situated at the intersection of two subjects that in the last decades have been often discussed but rarely connected. The first one is the relationship between science and religion, and the second one is the sensual, performative, historically and culturally situated dimension of knowing, which I will refer to as "aesthetic". References to God in science and to quantum physics in religion are often dismissed as superficial borrowings made for the sake of popularizing scientific knowledge or promoting religious beliefs while leaving the contents being expressed untouched. In the following pages, I will argue that the connection between both fields is deeper than usually assumed and that it can be productively brought to light by approaching them through the verbal and visual modes of expression that they share and which constitutively shape the knowledge being expressed in one or the other field.

Is it possible to compare science and religion, though? Indeed, the relationship between them has usually been framed in terms of opposition or cooperation, implicitly assuming that both fields are different in some essential way and, therefore, hardly comparable. This dichotomy goes back to the beginnings of modern science in the 19th century, when scientific "objectivity" emerged in opposition to religious "subjectivity", and scientific "knowledge" was pitted against religious "belief" (Daston & Galison 1992, 2007; Borrelli & Grieser 2020). This view is still today part of the image of science as an epistemically privileged activity with respect to religion and all other fields of human culture. However, philosophers of science are still debating how to plausibly characterize this privilege, for example in terms of a normative definition of the "scientific method" (Hepburn & Andersen 2021). Historians and scholars from media and cultural studies, on the other hand, have often challenged the allegedly unique value of scientific knowledge by showing how what counts or not as science can vary in time, communities and cultures. This long-standing debate cannot be summarized here, but among the various positions on the subject that have been proposed, the one taken in this paper is that of historical epistemology in which, following Hans-Jörg Rheinberger, science is viewed rather as a process than as a system and scientific knowing is regarded as always historically situated, with permeable, often shifting borders between scientific and non-scientific knowledge (Rheinberger 2013).

From this perspective, science and religion can be seen as two fields of activity within the same, historically and culturally situated contexts and, as such, comparable in their differences and similarities. In this paper, I focus on the modes of expression and communication that both draw from the same pool of sensory, performative, medial forms, and which they often share. Following the researchers whose work I discuss, I refer to these aspects as "aesthetic", indicating all forms of perception, which I assume are shaped by an irreducible combination of natural and cultural factors (Johnston 2020). More specifically, I will discuss how an aesthetics of knowledge, which has both religious tradition and epistemic implications, is employed in science. In the next section, I briefly introduce some research results which serve as the basis for the following discussion. After that, I demonstrate the fruitfulness of the approach by comparing two papers discussing images in science and religion, the first one inspired by art and media studies, and the second one focusing on the aesthetics of knowledge. The methods and results I am discussing have already been presented elsewhere for the most part, and my primary aim here is to showcase them to a broader community, highlighting how they can methodologically enrich science, media and cultural studies and contribute to the vision of variantology and materiology.

1. Aesthetics of knowledge in science and religion

In this section, I build upon existing literature to expound the premise of my claims, namely that science and religion not only share some aesthetic modes of expression but also that it is possible to speak of a shared aesthetics of knowledge between both fields. This claim may

appear a bold one, since, as noted above, according to some disciplinary traditions scientific knowledge has a unique character. The standpoint taken in this paper is that there are no sharp qualitative distinctions among types of knowledge, although, of course, a broad range of situated classifications are possible, for example distinguishing scientific and religious knowledge, depending on the contexts where they are expressed or who is expressing them.

In the study of religion, the role of aesthetics has been neglected for a long time, due to a focus on abstract doctrines and on a singular experience of the sacred as described by Rudolf Otto and others (Grieser & Johnston 2017a, Koch & Wilkens 2020, Johnston 2020). Material, sensory and performative dimensions could, at most, symbolize doctrines or experiences of the sacred. In the last decades, though, scholars have turned their attention to the role of the senses as well as the interplay between religious practices and developing media technologies. From these perspectives, all sensory dimensions can play a role: images, sounds (Wilke 2017), smells and fragrances (Guggemos 2020), body postures in dance or meditation (Koch 2017), each with its own specific mode of communication. The aesthetics approach to religious practices can also lead to insights into how religious forms permeate contemporary Western society by adapting to consumer culture and how a tradition of aesthetics of spirits is realized in New Materialism (Gautier 2017, Johnson 2017). Here, I can, of course, only mention the extensive research that provides the basis for my argument, but what is important for the aims of the present paper is that these studies demonstrate how religious practices can both require and foster embodied skills, mental and emotional stances and heightened perception. These, in turn, can be seen as forms of knowledge that are in principle analogous to those employed to manipulate scientific instruments, perform mathematical computations or interpret neuronal scans. Scientists, too, consistently employ in their work skills that are not and cannot be acquired only by reading handbooks or listening to lectures but must be developed through practice. This kind of knowledge in science, religion or other fields has been the subject of much research, and its various definitions and characterizations are reflected in a variety of terms, like *tacit*, *personal*, *practical,* or *embodied* knowledge or *knowing how* (Pavese 2022, Polanyi 1958, Valleriani 2017, Varela *et al.* 1996). Despite its tacit or embodied character, this knowledge is an essential component of scientific practice, and in fact, all knowledge in science (or elsewhere) has an embodied, practical, aesthetic component, even when it concerns the most complex physical-mathematical theories. As I will argue further below, from this perspective any distinction between "embodied" and "disembodied" knowledge is hardly tenable.

In science studies, this aesthetic dimension was long neglected but has attracted increasing attention since the last decades of the 20th century (Galison & Jones 1998, Klein 2001, Latour 1987, Lenoir 1998, Rheinberger 1997, Wise 1988). Although these works rarely discuss connections to religion, they are of great relevance, as they show how scientific knowledge cannot be split into constant, disembodied content and variable sensually perceivable forms: scientific knowing comes with its aesthetic dimension which cannot be exchanged without also transforming the knowing process and the knowledge acquired. This also applies to theoretical practices: mathematics was one of the case studies chosen by Michael Polanyi to demonstrate the role of personal knowledge in science (Polanyi 1958), and, since then, other authors have continued along that path (Barany & McKenzie 2014, Rotman 1993). I, too, have argued with several case studies that physical-mathematical concepts are constitutively shaped by their expression in words, images or instruments (Borrelli 2005, 2010, 2011, 2017).

Moreover, looking back at the emergence of modern science during the 19th century, one can see that the aesthetics of knowledge in the emerging field were also often shaped by that of knowledge cultures that would later be labelled as unscientific, particularly those linked to the Romantic tradition. Some examples are the fields of energy conservation, electromagnetism and crystallography, in the development of which the verbal, visual and haptic strategies of Naturphilosophie played an essential role while being, in turn, shaped by experimental practices in those areas (Brain 2007, Caneva 1997, Zielinski 2019, 169-186). The ideals of scientific knowledge production also emerged in the 19th century and they could be expressed in the same forms as those of religious practice. In their analysis of the history of scientific objectivity, Lorrain Daston and Peter Galison noted how 19th-century scientists were expected to achieve a detachment from their objects of research which was analogous to that of asceticism. Referring to Ernest Renan, Daston and Galison noted how he "chose the language of Christian asceticism and self-sacrifice" to describe how scientists should not succumb to the temptation of prematurely attaching too much value to their theories: "A profound scientific virtue is needed to brake [sic] that fatal inclination and to deny oneself that headlong haste, when the whole of human nature clamors for the definitive solution" (from Ernest Renan, *L'Avenir de la science* (Paris: 1890), 235, quoted after Daston and Galison 1992, 121). Self-sacrifice and self-denial, at the time also ideals in literature and art, paid out in science as in religion, letting scientists appear to politicians and the broader public as "fit vessels for natural truth and worldly power", as was the case for priests earlier on (Daston & Galison 1992, 122). The same aesthetics of knowledge could, thus, perform the same function for science and for religion.

The ideal of "pure" science (Lucier 2016) also emerged in this period. Science achieved purity by refusing to engage in the newly developed, paid activities of patenting and consulting, since "pure" research had to be free from commercial interests. The notion of "pure mathematics" also appeared around this time, and mathematics is, since then, often seen as the most objective mode of knowing nature, so the formulas expressing physical-mathematical theories like general relativity or quantum mechanics are still often regarded as in some way reflecting the inner structure of nature and are, accordingly, used by philosophers as privileged starting points to reflect on, or even make hypotheses about those structures (Chakravartty 2017). In this context, it is often forgotten that the notations in which formulas are expressed are historically and culturally situated and have specific visual and haptic aesthetics which essentially shapes both scientific knowledge and the process of its construction (Borrelli 2005, 2011, 2017, Garber 1999). Finally, it is worth

mentioning that discussions on aesthetics in theoretical practices have often focussed on the use of terms like *beauty*, *elegance*, or *naturalness* by theorists when referring to physical-mathematical theories and, most recently, also on the question of how far discourses of beauty should be regarded as relevant for – or even harmful to – the advancement of research (De Regt 2002, Hossenfelder 2018). This is, of course, a different notion of aesthetics than the one discussed in this paper, but, interestingly, as I have shown elsewhere, theorists who speak of the beauty of some theories and their formal features (especially symmetries) make use of verbal and visual expression with a long tradition in the religious field to suggest the connection between beauty and truth and, so, argue for the potential of specific theories in understanding natural phenomena (Borrelli 2017).

The remarks above have sketched some research trends on science and religion that, of course, cannot be presented here in any detail. They constitute the background for the more focused reflection presented in the rest of the paper. This reflection exemplifies an approach to scientific practices with a methodological focus on the aesthetics of knowledge that science shares with religion. This approach has rarely been employed in the study of science, even in projects like the *Iconoclash* exhibition and catalogue, that explicitly aimed to discuss aesthetic practices (in this case visualization) in both science and religion (Latour *et al.* 2002). Of course, I do not intend to criticize the outstanding results of that research, but only wish to point out that it can be complemented productively by the approach outlined above. To support my claim, I will analyse two papers based on different methodologies proposing comparisons between scientific and religious images. The first one is by Bruno Latour, one of the few scholars from science studies who has endeavoured to perform such a comparison and the second one is by Alexandra Grieser, a scholar from religious studies who has significantly contributed to the development of the aesthetics of religion and its application to reflection on modern science.

2. Maps and angels

The best-known author who discussed the relationship between science and religion by analysing images is Bruno Latour, and I will use one of his texts as a foil to highlight the specificities of the aesthetics of knowledge approach. The paper appeared in a volume on the relationship between science and art and it aims to show how methods from art history and media studies can deliver insights into the practices and ideals of science and religion (Latour 1998). Latour chooses two images, one from the scientific field and one from the religious field, which share some common visual element, and then combines art historical methods with socio-cultural contextualization to show how, despite their similarities, both images fulfil different, indeed opposite functions.

The common feature is a depiction of acts of pointing with the finger. The scientific image is a photograph taken by Latour himself when accompanying a geological field expedition in Brazil, and it shows three geologists looking at and pointing to details in two large paper sheets spread out in front of them (Latour 1998, 419). We cannot see what is on them, but Latour explains that they are an aerial photograph and a satellite map of a given portion of the Amazonas, and the scientists are comparing them trying to identify a site of interest. The other image is a fresco by Fra Angelico (ca. 1440), now in the Museum of the San Marco Church in Florence, representing the discovery of Jesus' resurrection (Figure 1). We see four women staring at the empty tomb, while an angel leans on it, one hand pointing downwards to the empty tomb, the other upwards to the apparition of the resurrected Jesus floating behind the women. In the bottom left corner, a monk is kneeling down in prayer. Both images share a rather abstract feature, i.e. actors pointing, and have little in common from an aesthetic point of view. The structure of the scenes, the position of the actors, the colours: there is hardly any similarity in this respect. Moreover, one is a snapshot of scientists at work taken without any apparent artistic goals, while the other one is a carefully planned painting reflecting the stylistic conventions of its period and destined to be consumed by a broad public. This choice fits well the goals of Latour's analysis yet precludes the possibility of an aesthetic comparison. Nonetheless, as I will show, Latour's results lend themselves to be profitably combined with those of an analysis focusing on the aesthetics of knowledge if one overcomes traditional biases on how to conceive religious practice.

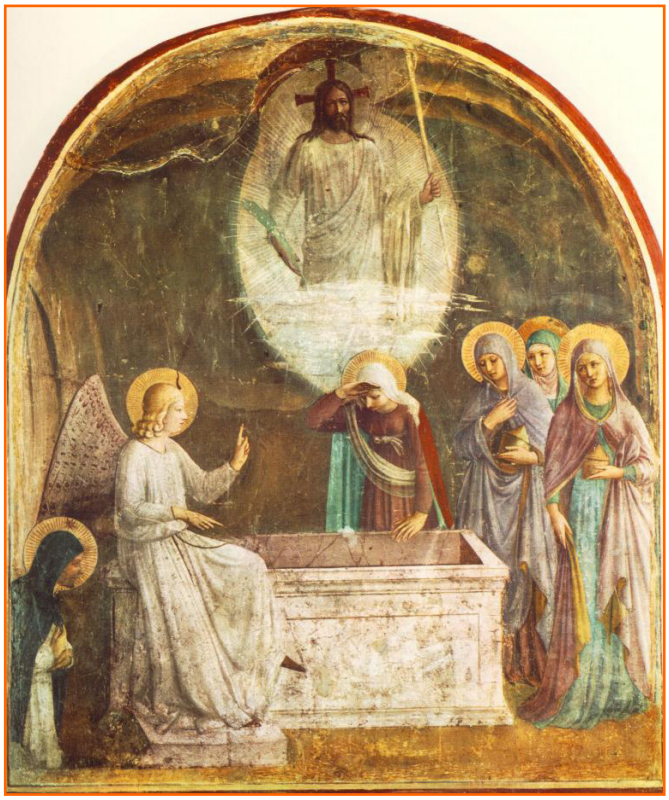

Figure 1. The three Marys at the tomb, resurrection of Jesus, fresco by Fra Angelico in the Museum of San Marco in Florence

Source: www.wga.hu, Public Domain, and https://commons.wikimedia.org/w/index.php?curid=7363033

Latour interprets the image of the scientists in terms of his theory of inscriptions and immutable mobiles, according to which scientific knowledge is constructed by means of its passage from one medium to the other. More precisely, Latour speaks of the construction of "scientific in-formation" by "disembodiment and re-embodiment", i.e. by inscribing in a series of forms, one of which is visualization (Latour 1998, 425). Information (here the geological site) is what is assumed to remain preserved through all transformations, yet "[i]nformation is never simply transferred, it is always radically transformed from one medium to the next" (Latour 1998, 425). Latour then goes on to explain that science studies (by which he probably means his own work) have shown how science is all about mediation: "The active locus of science, portrayed in the past by stressing its two extremities, the Mind and the World, has shifted to the middle, to the humble instruments, tools, visualization skills, writing practices, focusing techniques, and what has been called 're-presentation'. Through all these efforts, the mediation has eaten up the two extremities: the representing Mind and the represented World" (Latour 1998, 422). For scientists and the general public, though, in-formation becomes substance, and the work of mediation is forgotten, generating "a powerful scenography [...]: a calculating Mind and a calculable World" (Latour 1998, 427). This final step, the erasure of mediation is an essential component of scientific practice for Latour. It is only when looking at scientific practice through art history and the history of science that the "scenography" of the Mind and the World is deconstructed and mediation again comes to the fore.

Let us now turn to Latour's discussion of the religious image: his thesis is that the function of the painting is not to carry any information about the doctrine of resurrection, but rather what he calls "person making" (Latour 1998, 428). To explain this notion Latour refers to the sentence "I love you", which he states cannot be interpreted as carrying a piece of information to be transmitted once and for all, and instead functions as a way to mediate in the here and now the presence of the speaker as a gift to the listener "again and anew" (Latour 1998, 428). The opposition between the functions of scientific and religious images should, however, not be interpreted in terms of objectivity and subjectivity: "[Person making] is a full-blown mediation, a form of life, with its own form of judgement, its canon, its empirical world, its own taste and skills. Truth and falsity, faithfulness and infidelity are carefully detected, measured, proved, demonstrated, elicited" (Latour 1998, 429). This description shows that for Latour what is mediated in "person making" is also a form of knowledge. But how does this mediation work? It works by renouncing any reference in the picture, and this is what the pointing fingers of the angel do: they indicate both the empty tomb and the image of the resurrected Jesus, which is not visible to the women, as it floats behind their backs. Indeed, Latour explains, art history considerations tell us that the apparition can only be seen from a point of view that is not within the picture. And that is precisely the angel's function: redirecting the attention to what is not there, Jesus who has risen (Latour 1998, 430). The apparition can only be seen when kneeling in prayer in front of the picture, and this is what the image of the monk suggests to do: "the index [of the angel] here is not about others but about you, not about absent belief but about present persons" (Latour 1998, 431).

Although, in the end, Latour essentially interprets the picture in terms of the doctrine of resurrection, he strongly opposes an interpretation of "person making" as a belief in some transcendent, non-present entity and insists on the immediacy of the process, which is about presence. However, as we saw above, he had also characterized "person making" as being about life, judgement, skills, and even truth and falsity, so it is not clear why it could not be interpreted in terms of knowledge, as opposed to the rightly criticized notion of belief. On that notion, he also makes a very interesting side-remark: "Religion has been turned, *because* of the contamination of the model offered by information transfer, into something exactly *opposite*: a belief in the existence of a distant substance beyond the realm of experience to which we have access only through the intermediary of special vehicles – a definition that, funnily enough, is a good description of science production, but not of "person making" as defined above" (Latour 1998, 431). While Latour apparently dismisses this similarity between science and religion as no more than a "funny" coincidence, I regard it as highly significant in view of understanding processes of knowledge construction and justification in both fields. Instead of dismissing religious and scientific belief, one could understand it as a constitutive aspect of knowing in both fields, pointing to the strategies through which knowledge is justified, letting individual observers and the broader community emotionally relate to "the existence of a distant substance beyond the realm of experience", in one case the resurrected Jesus, in the other the view of nature as a calculable World and the calculating Mind. Instead, Latour chooses to uphold the strict dichotomy between science and religion: "The two deictic gestures in the two images point at remote phenomena and absent features; both of them designate a reality; both of them force us to transcend the setting in which we are immersed (the Amazonian restaurant or the San Marco cell); both gestures help us see things that are invisible, and yet they are completely different in their definition of absence, presence, reality, phenomena, transcendence, visibility, invisibility, opacity, and transparency" (Latour 1998, 421). According to Latour, the pointing fingers in both images can be interpreted as aesthetic expressions of an absent reality (the resurrected Jesus, the calculating Mind and the calculable World). In the case of science, this seems to be the final step: the Mind and the World are what science is about for scientists, though not to science study scholars deconstructing it. In the case of religion, though, Latour assumes that a further step, "person making", takes place: the religious image is not about the belief in a godhead (the resurrected Jesus), but ultimately "about you". This interpretation seems to me a slightly modified version of the traditional idea of an (allegedly universal) experience of the sacred which is aesthetically mediated by places, words or rituals, but is also a fundamentally introspective phenomenon to be experienced individually (Hinnells 2017, 437-438). In view of overcoming the dichotomy of science and religion, one might wonder, on the one hand, whether such

a singular experience as "person making" really obtains in all religious practice, and on the other hand, whether an analogous experience might be found also in the scientific sphere. With this idea in mind, we now turn to the blue brain.

3. The blue brain

The second paper to be discussed is by Alexandra Grieser, a researcher in the academic study of religion who greatly contributed to the development of the aesthetics approach, with particular attention to the shared aesthetics of knowledge in science and religion (Grieser 2017). Grieser's paper focuses on a type of image of the (human) brain which has become increasingly popular with the rise of neuroscience, especially projects of computer simulation of the brain like the Blue Brain Project and the Humans Brain Project (Blue Brain 2024, Human Brain 2024). Figure 2 shows an example of such images, and any internet search for images of "blue brain" or "brain simulation" will deliver many more. These images show what is recognizable as a (human) brain, although it does not display realistic features in colour or consistency, but rather appears as a rigid, bright blue structure outlined against a dark background. Sometimes the brain is enclosed in a transparent human head, underscoring that it is alive and active, as also indicated by sparks and rays surrounding it. These types of images are often shown on websites, where the brightness of the computer screen adds to the shiny effect of the whole but are also featured on the pages of science magazines.

Figure 2. *3d brain with lightning*
Source: Image by kjpargeter on Freepik

Grieser's analysis begins with a broad contextualization of the images. The first factor shaping their aesthetics is brain imaging techniques which in the last decades have witnessed a rapid development and now dominate the practices and arguably also the concepts of neuroscience (Dumit 2004). Electromagnetic activities in the brain are stimulated, detected and eventually visualized at the appropriate location in a computer-generated 3D image of the brain. In biomedical practice, the visualization follows strict principles, is readable to experts and has been used as the basis for a computer simulation of brain activity. The images discussed here, although generated with similar methods, do not encode any specific scan results, but rather generally present the active brain as a subject of scientific study (Grieser 2017, 247-248). Beyond the strictly technical aspects, the aesthetic analysis also must recover the broader cultural context, which in this case includes traditions of conceiving and representing the brain that are still influential, though not anymore part of scientific fields. One of them is the topos of the "brain in a vat" as an organ fully detached from the body but, thanks to technological supports, still able to sustain life, cognition and identity (Grieser 2017, 248-249). Despite the wealth of indications that cognition needs the whole body, the notion of the brain as an exclusive site of knowing and self-awareness persists, also thanks to the equally problematic view of the brain as a computer controlling the body. The latter idea, in turn, points to the conviction that computers may simulate human cognition. While this imaginary might be regarded as pertaining only to modern science or science fiction, it is, in fact, linked to religious and Romantic heritage (Grieser 2017, 249-253). There is a long tradition of picturing idealized body parts as detached from the body in the religious field, yet alive and representing human features and activities. The most prominent example is the heart, with a long religious tradition and omnipresent in today's popular and commercial imagery, but also the hands and the eyes are frequently featured. In religious images, specific body parts mediate the connection to the godhead, and do so by means of rays and sparks like those appearing in the brain images. Grieser shows as an example an illumination from a mediaeval manuscript, in which rays emanate from the hands of Jesus and Mary, reaching St. Bridget in her holy vision (Grieser 2017, 250).

Not only light but also electric sparks can perform a similar function. The *ante litteram* connection of electricity with the divine existed in antiquity through lightning but became more diverse with the production and exploration of electric and magnetic phenomena from the late European Renaissance onwards. In this period, electricity was simultaneously a public spectacle, an object of natural philosophical study and a means to explore and reflect on the divine, of which it could be regarded as a privileged manifestation. The Romantic period was a high time for both experimental research and theological speculation on electricity and magnetism (Brain 2007, Caneva 1997). A prominent actor in both fields was Johann Wilhelm Ritter, who in the early 19th century used his own body to make electricity manifest to the senses, in line with Romantic religiosity, which regarded sensation, rather than meditation, as a means to approach God (Zielinski 2019, 169-186). The

reflections of Ritter and other "electric theologians" are often dismissed as an extreme expression of Romantic stances that can be separated from the scientific content of the authors' work but, in fact, the religious aesthetics of electricity lived on in the late 19th century and beyond, and indeed became even stronger with the diffusion of electric light and current delivering illumination and energy to an increasing portion of the general public. A religiously-shaped aesthetics of electricity dominated the world exhibition in Paris in 1900, which featured a statue of the personification (or possibly the deity) of electricity, represented standing on two electromagnets (Staley 2008, 137-141, image on p.139). The monumental portal of the exhibition was illuminated at night by unprecedented electric light displays in green and blue and was surmounted by the statue of "La Parisienne", modelled on Sarah Bernhardt and wearing a long, sapphire-blue dress in contemporary style. At that time, electric sparks and discharge arcs also featured prominently in Nikola Tesla's promotion of his electric technology and his ideas on "human energy", which also reflected Romantic notions of universal force (Figure 3, Tesla 1900). Thus, the blue brain can be placed within a "religious history of electricity" and, referring to Hans Belting's work, Grieser notes how refined, technically-produced images can shape perception, in this case leading people to identify their selves with the brain (Grieser 2017, 253). It is not possible to further follow the trail of the religious history of electricity in this pages, but Siegfried Zielinski draws a line between Ritter's work and "the early veneration of the internet as an all-powerful medial apparatus – a new religiosity that viewed electronic telematics as the new salvation" (Zielinski 2019, 169).

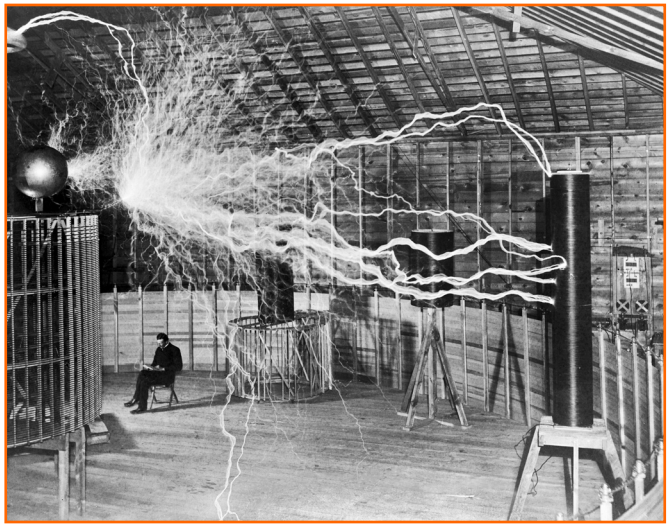

Figure 3. Nikola Tesla, with his equipment for producing high-frequency alternating currents (ca. 1899). The image was realized by superposing two photographs. Attribution 4.0 International (CC BY 4.0)
Source. Wellcome Collection

The next aesthetic feature discussed is the colour blue, which is most often used in the images (Grieser 2017, 253-257). As Grieser explains, blue is rarely found in animals or plants but is present in the natural environment as the colour of sky and water, which are most often associated with divinity. In the Middle Ages and the Early Modern Era, blue was a particularly expensive colour to paint with and was accordingly used for the holiest details, notably Mary's mantle. However, blue has also been associated with trustworthiness and is the preferred colour of uniforms and business suits. Blue light also plays an important part in contemporary spiritual movements, where the aesthetics of religion combine with that of staged group events, which are often accompanied by flooding lights. The colour blue, together with the sharp contours, underscores the distance of the brain's image from that of the actual brain, which in the reality of the lab appears as a dead, grey and flabby mass. In the image, it is instead presented as an aesthetically fitting seat of spirituality.

The final question of the analysis is: how does the viewer relate to the blue brain? (Grieser 2017, 257-261). Other than in medieval paintings, here, sparks and rays do not purport to connect the brain to some specific otherworldly entity but have a more diffuse character. In Figure 2, the rays seem to emanate from – or possibly converge towards – the brain but at the other end they do not point to any specific direction or object, but rather at the whole world. Since one may assume that observers tend to identify with the brain, then, Grieser convincingly argues, the image can be interpreted as visualizing the self of the observer and its possibly unlimited cognitive potential. In the early 19th century, Ritter sought the divine in the sensory impressions of electricity, but, since then, the rise of modern science has gone hand in hand with a devaluation of the senses as means of attaining knowledge about nature in favour of complex, standardized and usually quantifying instruments and of mathematical equations (Daston & Galison 1992, 2007, Garber 1999). This development lets the brain appear as an organ, in principle, capable of direct appraisal of cosmic order. This is Latour's short circuit between Mind and World which follows from the erasure of mediation in scientific practice. The blue brain is at the same time "a product and a producer of scientific knowledge" (Grieser 2017, 259). Yet one may ask once again: is it plausible to speak here of knowledge as an overarching category comprising both religious and scientific practices? Speaking as a scholar from religious studies, Grieser states: "These images do not impart neuroscientific knowledge; they target the level of affective attitudes rather than content and arguments. If we accept, however, that knowing includes affects, attitudes and aesthetic forms; and that engaging with images establishes multi-sensory ways of knowing through the body – body knowledge – then it is reasonable to state that the brains we are confronted with impact on how we relate to our brains, and to ourselves" (Grieser 2017, 259). As a science historian and philosopher, I add that neuroscientific knowledge, too, does not comprise only content and arguments but also affects, attitudes, aesthetic forms and more in general body knowledge, a fact that, as discussed in the opening of this paper, can be claimed for any knowledge labelled as scientific in today's everyday parlance. In this sense, I believe that the images of the blue brain can be seen as imparting neuroscientific knowledge both to the broader public and to scientists. The image of

the brain conveyed is that which is common in today's science, and at the same time, as Grieser argues, it "covers the symbolic and perceptual configurations once occupied by notions of the spirit and the soul" (Grieser 2017, 260). Thus, images of the blue brain convey a double message, standing both for scientific knowledge about the brain and for the "essence of humans" acquiring that knowledge (Grieser 2017, 260). I would, therefore, like to suggest that in Latour's words, the blue brain stands both for the calculating Mind and for the calculable World. Going one step further, one might argue that the images of the blue brain fulfil a function of "person making" in Latour's sense, as they are in the end both about neuroscience and "about you", in that they involve the viewer as a knowing subject expressed as a blue brain. In this sense, as I have argued elsewhere, images and verbal expression in contemporary science often combine the representation of scientific knowledge and of the process of attaining it, a process in which scientists can identify not only epistemically but also in terms of careers and of socio-political standing (Borrelli 2020).

Concluding remarks

The aim of this paper was to sketch and briefly exemplify an approach to studying science that helps bring to light the irreducible variety of modes of world-making that transcend the just recently imposed borders between science, religion and art. Building upon a large body of research results in the studies of science and religion, I have argued that in reflecting on scientific practices of knowledge production in the modern past and present, too little attention has been devoted to the features that those practices share with religious ones so far. This lack of attention may be due partly to a disciplinary distance between science studies and religious studies but is also linked on the one hand to implicit or explicit assumptions that scientific knowledge is or should be regarded as having a somehow privileged status with respect to other forms of knowledge, while on the other hand to the fact that religion is often seen as having at its centre unfounded beliefs which may not even deserve to be described as knowledge. The previous sentence is, of course, wilfully provocative, as today it is generally regarded as acceptable to doubt science's epistemic privilege and grant epistemic relevance to religion. However, as I have tried to show in my analysis and interpretation of Latour's work, traditional templates can turn up again in apparently new forms. Moreover, since the beginning of the new millennium, it has become increasingly common for scholars from science studies – Latour included – to plead for a more careful approach to the deconstruction of science's authority, as this might have potentially dangerous political consequences (Latour 2004). This stance can constitute a further obstacle to comparisons between science and religion, as they might be seen as raising the possibility that scientists are not pursuing knowledge of nature with rational, objective methods but simply following subjective, unfounded beliefs.

Leaving aside the question of whether self-censorship in science studies would really support, and not possibly further undermine scientific authority, I hope to have demonstrated that becoming aware of the shared aesthetics of science and religion, far from letting science appear irrational or subjective, can help to better understand the way in which scientific knowledge is constructed, justified and communicated both among scientists and towards the broader public. The aesthetics analysis presented should be regarded as a small example of methodology: each representation of scientific knowledge can and should be questioned about its situated aesthetic elements and functions by keeping into account that no dichotomy exists between scientific and religious knowing. In particular, the comparison I proposed should have demonstrated how much aesthetics and semiotics of knowledge production can complement each other, mutually helping to keep a balance between the general and the particular and hopefully contribute to "generate surprises".

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