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ROBERT BOYLE, A CHRISTIAN VIRTUOSO

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Robert Boyle has been hailed as one of the greatest scientists of the 17th century, and deservedly so. To a much lesser extent he is recognized as a theologian, although relatively recently the situation improved in that respect. He was a fervent Christian believer wishing to live as a Christian in all facets of life, and that included his great interest in science. Boyle espoused the traditional belief that there is the book of nature and the book of Scripture, both having the same Author, whereby there is "the excellent Harmony betwixt the 2 Great Bookes of Nature and of Grace" (W2 13.171)[1], and that the world is "a great master-piece of power and wisdom" of God (W1 4.37)[2]. He believed that a naturalist through his research discovers "the boundless power and goodness of the great architect," he saw how "admirably every animal is furnished with parts requisite to his respective nature," he becomes convinced that "God, who has with such admirable artifice framed silk-worms, butterflies, and other meaner insects, … must needs be fully able to furnish those he delights to honour, with objects suitable to their improved faculties, and with all, that is requisite to the happiness he intends them in

[1] References are made to the following works of Boyle:

A – *Boyle on atheism*, Toronto: University of Toronto Press 2005.

W1 – *The works* of the Honourable Robert Boyle, London 1772, vols. 1–6; the following works are quoted: New experiments physico-mechanical 1.1-117; Some motives and incentives to the love of God (Seraphic love) 1.243-293; Considerations touching the usefulness of experimental natural philosophy 2.1-63; Of the usefulness of natural philosophy 2.64-246; The origin of forms and qualities according to the corpuscular philosophy, 3.5-137; The excellency of theology compared with natural philosophy 4.1-78; Some considerations about the reconcileableness of reason and religion 4.151-202; A discourse of things above reason 4.406-468; Of the high veneration man's intellect owes to God 5.130-157; A free inquiry into the vulgarly received notion of nature 5.158-254; A disquisition about the final causes of natural things 5.392-452; The Christian virtuoso 5.508-562, 6.673-796.

W2 – *The works* of Robert Boyle, London: Pickering & Chatto 1999–2000, vols. 1–14; the following works are quoted: Of the study of the booke of nature, vol. 13.147-172; Essay of the holy Scriptures, 13.175-223; Of the atomicall philosophy 13.227-235; De diversitate religionum 14. 237-265.

[2] Actually, in passing, Boyle also mentioned the third book, the book of conscience (W2 13.147).

their glorified state" (38). Therefore, the scholarly pursuits have also a theological and religious side, namely not only showing the constitution of nature, but also convincing people that this constitution is the result of the supernatural Agent. This, in turn, is not to be done out of sheer curiosity, but the recognition of the existence of God should lead to the investigation of God's attributes and thereby to the recognition of God's will in respect to His creation, humans in particular. At that point, human salvation is at stake, and this has eternal consequences.

THE INVESTIGATION OF NATURE

There are three kinds of demonstration, metaphysical demonstrations where the conclusion is derived from metaphysical axioms that are always true: the law of non-contradiction, *non entis nullae sunt proprietates reales* (W1 4.182), the law of excluded middle, the division of lines into straight and crooked, of numbers into odd and even, if a = c and b = c, then a = b, definitions of a triangle, circle, etc. (6.709), *non entis nulla sunt accidentia*, the whole is greater than its part, if a = b, then a+c = b+c, only a truth can be derived from a truth (711). These are things we know without medium, connate or innate notions (4.414).

Physical demonstrations are derived from physical principles: nothing comes from nothing, *nulla substantia in nihilum redigitur*, which are not absolutely certain since God can create and annihilate substances; and there are also moral demonstrations which are probable as based on principles of practical philosophy. Human actions on the individual and social level are usually based on moral truths (W1 4.182).

Of particular interest for Boyle were physical demonstrations, the demonstrations limited to hard sciences and yet having religious and moral consequences. In fact, "a man addicted to experience, may by being so, have some peculiar advantages to be convinced of the truth of the Christian religion" (W1 6.717). How can that be? Even a superficial investigation of nature shows its harmony, complexity, grandeur, and beauty thereby indicating that there is some intelligent design behind it all. However, the scientific investigation of nature only shows that this superficial assessment is not by any means mistaken, and it should be deepened and widened by natural philosophy. There are many things "that require such a number and concourse of conspiring causes, and such a continued series of motions or operations, that it is utterly improbable they should be produced without the superintendency of a rational Agent" (5.404). That is, even a superficial knowledge of nature suffices to see that it was designed by God and the appreciation of God's wisdom deepens with the level of the study of nature (515). The works of God are worthy of Him since besides "the impresses of his wisdom and goodness … upon their surfaces, there are many more curious and excellent tokens and effect of divine artifice in the hidden and innermost recesses of them," and it takes a skillful investigator to discover them since the knowledge of anatomy, physiology, chemistry, etc. is needed to appreciate these hidden tokens, which otherwise would escape "a vulgar eye" (516). Although even the most unlearned can even by a superficial investigation of the world see that it was not created by chance, minute

contrivances can be appreciated only by attentive investigators (A 61)[3]. Consider the makeup of the eye, Boyle's favorite example (2.52, 5.425, 6.735, A 61). Different eyes for different species fitting the rest of their bodies and the environment and this "delightful variety" shows the skill of the divine Author (5.406, 408). "The eye of a fly is … a more curious piece of workmanship than the body of the sun" (403). Just from the structure of the eye it can be concluded that there must be an intelligent Being that designed it, who is invisible, self-existing, eternal, simple (A 57).

The task of a naturalist as a scientific researcher is to provide explanations of phenomena in nature by natural causes. And thus, when speaking about his own explanations concerning the rarefaction of air, Boyle rather proudly stated: "our controversy is not what God can do, but about what can be done by natural agents, not elevated above the sphere of nature. For though God can both create and annihilate, yet nature can do neither: and in the judgment of true philosophers, I suppose our hypothesis would need no other advantage, to make it be preferred before our adversaries, than that in ours things are explicated by the ordinary course of nature, whereas in the other recourse must be had to miracles" (W1 1.149)[4]. Generally, the naturalist refers to the first cause – which is God – only to account for the preservation of matter and motion, but uses in his explanations of phenomena only the size, shape, motion, texture, and resulting qualities of particles (3.48). However, secondary efficient causes (and material and formal causes) are not the only ones that the naturalist should utilize.

Naturalists investigate natural phenomena and try to establish their interconnections and interdependencies. For Boyle, the determination of connections between phenomena would clearly indicate the existence of purpose in nature; the more complicated interdependencies are, the more clearly they point to the existence of a design and, thus, a designer. In physics, all things should be grounded on a solid reason, but not all reasons have to be precisely physical, particularly when treating about the first and general causes of the world itself, which can include final causes (5.399). That is, a naturalist as a naturalist should look for final causes, for purposefulness of natural events and phenomena. The eye is one prominent example, but Boyle pointed to other instances.

The existence of humans clearly depends on the existence of food which is extracted, among others, from plants. Thus, plants exist for the human use; that is, plants have to exist, which is made possible by the sunlight, so, one purpose for which the sun was created is to provide the light to the earth, for plants, in particular (W1 5.411). Some things are useful for humans indirectly (417); e.g., clouds provide rain needed to water plants (418). Naturalists can make statements about the purposes of the parts of animal bodies (424). Diseases, when some of these parts fail to function properly, show how well parts of bodies are created with the benefit of the entire organism. It is rational to infer from the "manifest fitness of some things to cosmical or animal ends" that they have been designed by an intelligent agent (428). Consider the instincts of

3 In fact, superficial knowledge may be a double-edge sword since "a slighter Knowledge of Nature is apt to seduce man to Atheisme, but a profounder Insight brings them backe to Religion" (W2 13.157).

4 See also Jan W. Wojcik, *Robert Boyle and the limits of reason*, Cambridge: Cambridge University Press 1997, ch. 7.

animals and their workings (429). Boyle himself observed such instincts at work in bees since he had in his closet a transparent beehive with an outlet to the garden. He also spoke about ants, spiders, and beavers. Propagation of species is another example of the purposefulness abundantly manifested and Boyle discussed briefly wasp nests, and the amazing variety of bird nests (430–432). Another very specific example he scrutinized were teeth, some of the least elaborate parts of the body (433): different animals have different kinds of teeth, some animals have some other "excellent contrivances … in the fabric of the mouth" instead of teeth, all of it pointing to the "designing wisdom of God" (435–436). And these are just teeth, a seemingly simple part of the body. A similar conclusion concerning purpose and design can be made from observations of other parts of the animal and human body: the brain (6.740), bones (744), the tongue (747), etc., and in the harmonious cooperation of these parts (745). However, the naturalist should not be dogmatic about determining the purposes of things since one part can be fit for several uses, and the same end can be reached by several means (5.440, 442)[5]. Moreover, anthropocentric arrogance should be put aside as expressed in a frequently voiced opinion that the universe was created for humans. The celestial bodies abundantly declare God's greatness by their sizes and motions (410), but it is difficult to say that they were created only to be in the service of humans. At best, such a service was one of purposes (411) and these bodies were not crated only for the human use (420). It is hard to see of what use for the Earth are all these distant stars of the Milky Way (421). However, "the terraqueous globe and its productions" are according to the Scripture designed for the use and benefit of humans, although a caution should be exercised when making such a statement even if it is limited only to the Earth, since it is doubtful that what is in underground was created for humans who never reach the underground beyond certain depth. But possibly some parts of the Earth are not serviceable for humans but are there since otherwise the earth could not be "well suited to the general destination of the universe" (422–423). At best, an ignorance should be expressed concerning the reasons for which distant stars or the inside of the earth were created (424).

In any event, the purpose and harmony, regularity, and deliberately made arrangements can be detected by the investigation of nature on each scale. In fact, the smaller the scale, the more impressive becomes the existence of design. "I have seen elephants, and admired them less than the structure of a dissected mole" (W1 2.22), said Boyle, and how much more wonderful than a full-grown body is a seed in which all future parts and functions must be "durably delineated" (5.138). The wisdom of God is manifested in His creation, in the makeup of the bodies of creatures; "the meanest living creatures of God's making are far more wisely contrived, than the most excellent pieces of workmanship, that human heads and hands can boast of; and no watch nor clock in the world is any way comparable, for exquisiteness of mechanism, to the body of even an ass or a frog" (5.136). The investigation of insects

[5] On the other hand, "where an organ is obviously and uniquely used for a given function, and when the necessity of that function to the animal's welfare has been established, it is unreasonable to question the claim that it was chosen for that function," James G. Lennox, *Robert Boyle's defense of teleological inference in experimental science*, Isis 74 (1983), p. 50.

makes it clear that "the finallest and most despicable productions of nature … are capable both to invite our speculations, and to recompense them" (2.12). In particular, spiders and silkworms can spin better without any instruction than the best weaver, birds can build better nests than an architect can build the best building (2.40). and so, "there is noe Creature of God so little, that it deserves not a greate deale of our Wonder, did we but fully know it" (W2 159–160).

In all this, explanations in terms of efficient causality become inextricably linked with final causation. This is necessary for a religiously minded naturalist in order to combat other the possibility of chance as an explanation. For Boyle, it is more unlikely that this world with all creatures in it was made by randomly moving atoms "jostling or knocking one another in the immense vacuity" than the description of the creation of the world given in the *Genesis* would be spelled out by letters thrown into air and falling to the ground (W1 2.43). There are in the body hundreds of parts and hardly any can be left out or made otherwise without undermining the integrity of the body. This is not the work of chance (2.44). It is incredible that "an innumerable multitude of insensible particles … [could] fortuitously justle themselves into so admirable and harmonious a fabric as the universe or as the body of man" (2.49). And again, such an immense and well-crafted machine as the world could not be the result of "mere chance, or the tumultuous jostling and fortuitous concourse of atoms" (5.519). For such reasons, it is sheer "stupidity and perverseness" to consider "the visible works of God" to be a product of blind chance (A 233).

Boyle simply rejected the view that atoms by chance created the world in an infinite space or that God put in matter an invariable quantity of motion so that afterwards material parts unguided, by themselves, would create the world; it is God who guided the motions of the parts of matter to form the world by His design and established the rules of motion and the laws of nature (W1 4.68). In Boyle's view, after God created an undistinguished matter, He put its parts into various motions whereby various bodies were created, and He guided these particular motions to form "beautiful and orderly frame we call the world." He also created rules of these local motions so that the parts of the universe could maintain the system of bodies and propagate species of living beings. Each body needs other bodies to continue its existence as part of "the same great automaton." The world is a "pregnant automaton," a "compounded machine" along with laws of motions established and maintained by God gives the order of corporeal entities (5.179; 2.39; 3.15, 48).

A naturalist should not limit himself to the investigation of nature alone. He should use naturalistic explanations as much as possible, but he may look for inspiration outside of nature to grapple with nature. As Boyle wrote, "though I take the scripture to be mainly designed to teach us nobler and better truths, than those of philosophy; yet I am not forward to comdemn [!] those, who think the beginning of Genesis, contains divers particulars, in reference to the origin of things, which though not unwarily, or alone to be urged in physicks, may yet afford very considerable hints to an attentive and inquisitive peruses"[6]. These hints include the idea that the

[6] Stronger yet, the *Genesis* account contains "more true solid & praegnant Principles of Naturall Filosophy then Aristotle & all his commentators put together can afford" (W2 13.154). In his own inter-

world will be transfigured after the present world will be destroyed by fire; that the human body was first formed by God and is not a product of randomly moving atoms and will be resurrected; that humankind is an offspring of the first couple. Theology teaches that the immortal soul exists, although reason gives some dim information about it; rationality can only show that the rational soul, being incorporeal, does not have to vanish after death and retains the ability of thinking being a thinking substance, but reason cannot say what will happen to the soul after death (W1 4.11-14).

THE LIMITATIONS OF REASON

Human knowledge of the world is very limited. We know nothing about the inside of the earth, nothing certain about fixed stars and their distances (W1 4.50-51), but this kind of limitation can be due to the lack of means and thus, for instance, distant stars can be seen only through a telescope (6.695). Also, with the extension of knowledge, the realization of how much we don't know also grows (6.760), and thereby the human ignorance also increases.

We know very little about the way senses provide information (W1 4.43). Also, the union of the incorporeal soul with the corporeal body is unique in nature and it is more difficult to comprehend than the mystery of the Incarnation (44). And thus, we simply do not know how the soul, an immaterial substance, moves the body or its parts (A 253). This is because something as simple as raising a hand, although not supernatural, is a supra-natural event, not purely corporeal; however, "it is conformable to the regular powers, the Author of nature has vouchsafed to man" (W1 6.756).

One problem that troubled Boyle a great deal was the problem of infinity, in the small and in the large. In the small: the problem of infinite divisibility of matter (4.408). More colorfully, "the difficultys that attend *Compositio Continui* &c. afford an Argument of the Imbecillity of Humane Reason" (A 113). The atomists set a limit on such a divisibility through the atomic structure of matter. For Boyle, atomism was unacceptable, although he rejected it more because of theological rather than physical reasons: he identified atomism with atheism and hence along with atheism he also rejected atomism[7]. This set him in England in the opposition to Walter Charleton, a follower of Pierre Gassendi, in his promotion of atomism as reconcilable with Christianity[8]. Boyle opted for corpuscularism (W1 3.5), although it is not quite certain what is the nature of corpuscles. Are they infinitely divisible?[9]

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pretation of the *Genesis*, Boyle "was moving toward the conception of the world as the vast mechanical contrivance of a divine artisan," Margaret G. Cook, *The chymist and the craftsman: divine artifice and Robert Boyle's mechanical and experimental natural philosophy*, MA thesis, Calgary: The University of Calgary 1997, p. 59.

[7] Cf. John J. MacIntosh, Robert Boyle on Epicurean Atomism and Atheism, in: M.J. Osler (ed.), *Atoms*, *pneuma*, *and tranquillity: Epicurean and Stoic themes in European thought*, New York: Cambridge University Press 2005, pp. 197–219.

[8] Walter Charleton, *Physiologia Epicuro-Gassendo-Charltonina: or a fabrick of science natural*, *upon the hypothesis of atoms*, London: Tho. Newcomb 1654; cf. Robert Kargon, Walter Charleton, *Robert Boyle*, *and the Acceptance of Epicurean Atomism in England*, Isis 55 (1964), pp. 184–192.

[9] Apparently, they can, but not indefinitely: they were envisioned as composed of smaller, atomic-

There is also an infinity in the large. For instance, God existed an infinite number of years before the year 1680, and also an infinite number of years before the year 1685, but the latter infinity is apparently larger by 5 years than the former, but such a notion "is generally held to be repugnant to the very notion of Infinite Quantity"; however, if the problem of infinity is properly treated, there is nothing "self-repugnant or Unconceivable" in it (A 221). Also, infinity in the small is directly to the infinity in the large; a short interval is infinitely divisible, then a longer interval's divisibility appears to exceed infinity; thus, we have to reject legitimate conclusions or accept things which appear to be absurd (W1 4.409).

Apparently, for Boyle, there was only one infinity and something larger than infinity was inconceivable for him. He may be excused that he did not resolve before Cantor the problem of different cardinalities in the realm of infinite sets. Also, he ascribed to the principle that a part is smaller than the whole (W1 4.414) and he saw as absurd the fact that a subset of an infinite set can be of the same cardinality as the set itself, although this should have been within his grasp considering such examples known to him as the cardinality of the set of odd integers vs. the set of all integers. In any event, Boyle was aware of the fact that human intellect is finite and, thus, it should be careful when contemplating infinite subjects since it can be overpowered by them (A 220).

And there are supernatural truths. It is above the capacity of the human reason to show that God is the Trinity; to provide any information about the redemption of mankind (W1 4.15), or about angels (9). All attributes of God are infinite and human reason, being finite, cannot know them fully, but it "may make an endless progress in that knowledge" (22), an endless progress in the eternal afterlife. Reason is not supposed to teach us about supernatural things, but to lead us to the supernatural teacher, God, and to defend what it teaches from an accusation of a contradiction or an impossibility (W1 6.714). However, as far as God's existence is concerned, the mind is not totally unprepared. "We are indeed born with, or at least have a power and divers occasions to frame an idea of a being infinitely perfect, and by this idea we may sufficiently discriminate the original of it, God, from all other objects whatsoever," but we cannot fully grasp the essence of God's infinite perfection (4.424). There is an innate concept of perfection, and not just any perfection, but the one which is infinite, so, the human mind does have some notion of infinity, unclear as it may be: an imperfect idea of perfection, imperfect because it involves infinity and thus goes beyond the full grasp of the human mind (cf. 4.451). Apparently, the investigation of nature and the discovery of God's perfections in it will help to make this concept of infinite perfection a little bit clearer.

Another troublesome problem was the problem of the free will, or rather the reconciliation of free will with God's omniscience as expressed in prophecies

like particles (4.293-294), thereby forming an equivalent of today's molecule, cf. Marie Boas, *Robert Boyle and seventeenth-century chemistry*, Cambridge: At the University Press 1958 pp. 93–101. It is thus possible to speak in this context about atomic corpuscles and molecular corpuscles as proposed by Peter Anstey, *The philosophy of Robert Boyle*, London: Routledge 2000, p. 44. His early sentiment was that atomism "seems very probable" (W2 228) considering that atoms "may be further divided by Imagination yet they cannot by Nature" (227).

(W1 4.408), since the overemphasis on the latter may lead to the denial of the former or to viewing free will as an illusion, self-deception. If so, all actions are predetermined and this did lead directly to the problem of predestination. Reason is helpless to solve this problem and one has to rely on the belief that free will does not contradict God's omniscience (4.466).

The realization of the limitations of reason should help in addressing the problem of apparent imperfections of the world and thus dealing with theodicy. For example, could the world be made better? (W1 5.195). Many creatures, when considered in isolation, could be improved: an oyster cannot hear, see, walk, swim, fly, it is not so perfect as an eagle or an elephant. But a plain watch that shows time only and a watch that shows also day and month equally show the skill of the watchmaker (196). As to God, "his wisdom may be better set off to men, and perhaps to angels or intelligencies, by the great variety of his contrivancies in his works than by making them all of the excellentest kind" (197). Some irregularities in the world may have been allowed to punish sinners. When creating the world, God had several goals, not all of them known to us; some of His principles are the manifestation of His glory, the usefulness for humans, the maintenance of the cosmic system including the propagation of species (198). Consider a very specific case: a person choked with hair; why was it not avoided? (200). This does not happen very often and "it was fit, that the providence of God should, in making provision for the welfare of animals, have more regard to that, which usually and regularly befals them, than to extraordinary cases or unfrequent accidents" (201).

Limitations of reason are a hard reality in this life[10]. However, in the blissful afterlife, most of them will be lifted, when people will be like angels; ignorance will be dispelled. God will incite new ideas in human minds and will provide occasions for true speculations. All faculties will be enlarged and so will knowledge which will contribute to happiness in that new state (W1 6.789). People will understand the mysteries of religion (1.289), all historical events will make sense, "all that unwelcome darkness, that here surrounded our purblind understandings, will vanish" (290). "In heaven (in a word) our inexhausted joys [including cognitive joys] will be so numberless, and so immense, that we shall need (as well as have) eternity itself to taste them fully" (291).

CHRISTIANITY

Boyle's theological doctrine was that God is the freest agent, created the world freely; His understanding is infinitely superior to human in extent and clarity and His purposes humans can discover to some extent. His creations bear an impression of His attributes and humans are able to learn about these attributes. The makeup of the universe and natural laws suits best God's purposes (5.251). All happens according to His will, although His purposes may be hidden from humans and pheno-

[10] And thus, "man's desire to know could be only partially satisfied in this life," as stated in the concluding sentence in his book by Jan W. Wojcik, *op.cit*., p. 219.

mena "which seem to us anomalous, may be very congruous or conducive to those secret ends, and therefore are unfit to be censured by us dim-sighted mortals" (252). That would be, however, somewhat generic religious belief. It was necessary for Boyle to set Christianity in the center of such a belief.

Natural philosophers can establish through their investigative efforts that there is a powerful, wise, and good God the Creator of the universe and of humans. That establishes the foundation for all religions (A 126). For Boyle, contrasting Christianity with other religions clearly indicated that "the Christian religion is the one to be embraced, and that any one of the Christian religions is to be preferred to all the rest" (W2 14.238). To argue for the superiority of Christianity, Boyle referred to traditionally used argument of miracles which included "the miracles wrought by Christ and his disciples" (W1 5.531; W213.188). Some arguments that can be used state, 1st: the Christian doctrine is more complete than other doctrines; 2nd: it is based on the Christian religion (A 227); 3rd: it gives higher goals to virtue than other doctrines; 4th: it gives better encouragement and help to practice virtue, namely by the assistance of the Holy Spirit; 5th: it promises higher reward for virtue (228); in sum, its "Precepts being better in themselves, in many Points, and in divers things more perfect and more perfective of Humane Nature; the Promises being more illustrious" than in other religions (W2 14.253-254). However, Boyle preferred the proof of Christianity drawn from miracles, which included prophecies, since miracles are proper testimonies of the divine origin of Christianity; Christ and the apostles used that argument and people easier comprehend it than other arguments (A 272). Belief should be based on the power of God, not on the reason of man, hence miracles (276). However, reason is necessary to check if miracles are divine miracles, not tricks or "demoniacall works" performed with the help of "evill Spirits" (281) and that Biblical prophecies are genuine by comparing them to the nature of God, to one another to see that Christian doctrines are worthy to be revealed by God, that they are so good and holy and beneficial to humans that they deserve to be treated as given by God (282). "Miracles are vouch'd, that we may not perniciously mistake Diabolical workes for Divine Miracles" (293). The veracity of miracles should not be assessed by the doctrine of a particular religion – since the miracle is supposed to conform this religion – but by general principles of natural reason and religion: that God exists, He is one, just, good, gracious, caring, etc. (294). Moreover, although human reason cannot directly prove the veracity of miracles, such as the resurrection, the "Irrefragable Reason," i.e., "a full & exquisite Demonstration," should show that they cannot be disproven and do not lead to contradictions (W2 202). In this, human reason and human grasp of the wonders of the universe, can, in Boyle's view, set Christianity on a firm footing, whereby rationality recognizes also its limitations and points to the higher realm of what surpasses human investigative powers.

PHYSICO-THEOLOGY

Boyle promoted natural philosophy as a means of discovering God and of deepening one's belief in the Creator. However, natural philosophy was also viewed

by some as a possible danger to religious beliefs. Boyle stated that the universal experience was that the contemplation of the world usually made people believers in God rather than the contrary (W1 2.55), but, still, a fear existed that the natural philosophy could explain everything by natural causes without referring to God (15, 58). Boyle did not see why the student of physiology could not be an enemy of atheism since "the contemplation of the creatures is but one of the ways of coming to be convinced that there is a God" (58), but the fear of detaching scholarly pursuits from religious aspects was not unjustified and the history shows that from 17th century onwards the forces trying to separate science from religion became only stronger.

Out of all possible proofs of the existence of God, Boyle favored the physico-theological proof since it perfectly meshed his enthusiasm for scientific research and his zeal for Christian religion. The proof of the existence of God from "the Fabrick of the World is not so much a single Argument as a Topick" particular arguments being the makeup of animals or the harmonious composition of the system of the universe (A 234). This is the line he promoted, among others, by the establishment of Boyle Lectures, and the promotion of this approach was one of the main, if not the main, factor contributing to the flourishing of physico-theology in the last third of the 17th century and in the 18th century, to its outburst in England and very soon in Germany and to some extent in France and Holland, but also in some other parts of Europe, including its popularity in Russia. When Boyle wrote, "So numberless a multitude, and so great a variety of birds, beasts, fishes, reptiles, herbs, shrubs, trees, stones, metals, minerals, stars, &c. and every one of them plentifully furnished and endowed with all the qualifications requisite to the attainment of the respective ends of its creation, are productions of a wisdom too limitless not to be peculiar to God" (W1 2.21), he implicitly pointed to these various areas of nature that should be investigated in detail to bring up to the fore the divine wisdom permeating each aspect of nature. In a way, he pointed to possible subdivisions of physico-theology and, in fact, this is what soon happened with the multitude of names for them, coined particularly by Germans: testaceo-theology, insecto-theology, litho-theology, and many others. In fact, Boyle was one of the first authors who used the very name "physico-theology" or rather "physico-theological" in the title of *Some physico-theological considerations about the possibility of the resurrection*", an appendix to *Some considerations about the reconcileableness of reason and religion by T.E. a lay-man* (1675), although the name was used at least two decades before him[11].

Boyle made a case for Christian virtuosi, "those that understand and cultivate experimental philosophy" committed to make pious application of the discovered truths (W1 5.513) since by being addicted to experimental philosophy, a man is rather assisted than indisposed to be a good Christian, as stated in the subtitle of *The Christian virtuoso* (508). Not only hard sciences should be enlisted into theological service, but the theological significance of scientific work should be given by naturalists themselves rather than by theologians since the latter could be considered incompetent

[11] Joachim Lütkemann, *De vero homine*, *dissertatio physicotheologica* (1650), Walter Charleton, *The darknes of atheism dispelled by the light of nature: a physico-theologicall treatise* (1652); it is also worth to mention Samuel Parker's book, *Tentamina physico-theologica de Deo* (1665).

(4.3), whereby their writings would be ineffective at least among naturalists. Theology pertains to higher subjects than natural philosophy, whereby theologians may not even see any reason to include in their deliberations the results of scientific observations and experiments. Boyle agreed that theology does treat about a higher level of reality than science and that science, even if it is not a "handmaid to divinity," is but "a lady of a lower rank," although the theological effectiveness of natural philosophy will be enhanced by the fact that they are offered by an accomplished scholar and a Christian believer, a Christian virtuoso, and Boyle saw himself as one of such virtuosi and his name was frequently invoked in writings of physico-theologians.

On a large scale, this is a plan that Boyle effectively proposed. The first step is to show by the investigation of nature that God exists and that He is a powerful, wise being who cares for His creation. This is the job of physico-theology. The second step is the ascendance to Christianity: revealed religion should be founded on natural religion which shows that God exists, shows His attributes (W1 6.719). Christianity should be based on miracles and prophecies, which, in turn, should be based on the nature of God, but, in this life, humans discover the nature of God, to some extent, at least, through their reason, through natural religion, through investigation of nature, through physico-theology. The nature of God – His power and veracity – indicate that the Bible is His revealed word by showing that it is in agreement with natural reason and by the use of hermeneutical investigations and Biblical criticism[12]. When this is established, then supernatural elements of the Bible that surpass human reason can be accepted as truths and thereby the salvific work of Christ and the prospects of the afterlife can also be accepted, which should affect the life of each person. In this way, the human mind, as it were, bootstraps itself through reason to the belief in supernatural facets of Christianity – the doctrine of the Trinity, the Incarnation, the afterlife – and all of it by beginning with the investigation of nature by scholarly work used as a guide to supernatural truths. And Boyle considered himself and his fellow naturalists as principal actors in fulfilling this task and as viable participants in this "amazing opera … upon the face of the earth" carried on by the great Author (W1 5.143). The world is also a temple[13] and thus, people in it are priests "ordained to celebrate divine service" (2.32, W2 13.151, 170), a kind of "philosophical worship" (W1 2.63)[14], and there is no doubt that Boyle viewed himself as a priest, a priest of nature (6.764), and he wanted all other naturalists to take their priestly duty very seriously, so that they not only live in the world, by they "must study and spiritualize it" (2.62)[15].

[12] *Some considerations touching the style of the Holy Scriptures* (1661) based on his early unpublished work, *Essay on the Holy Scriptures* (1651–1652), is Boyle's contribution in this area.

[13] It is even stated that, for Boyle, seeing the world as a temple was "a basis for his whole physico-theological position," Harold Fisch, *The scientist as priest: A note on Robert Boyle's natural theology*, Isis 44 (1953), pp. 254–255.

[14] "The philosophical worship of God through the study of his works was a primary act of religious devotion for Boyle," Rose-Mary Sargent, *The diffident naturalist: Robert Boyle and the philosophy of experience*, Chicago: The University of Chicago Press 1995, p. 91.

[15] That is, Boyle "attempted to spiritualize the natural world," Richard M. Hunt, *The place of religion in the science of Robert Boyle*, Pittsburgh: University of Pittsburgh Press 1955, p. 75.

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ROBERT BOYLE, A CHRISTIAN VIRTUOSO

Summary

Robert Boyle was one of the greatest scientists of the 17th century, a scientist and a theologian who used his scholarly competence in the service of Christian religion. He particularly cherished the physico-theological proof of the existence and majesty of God by deriving God's attributes from the orderliness, complexity, and the beauty of the universe in general and all of its elements.

ROBERT BOYLE, CHRZEŚCIJAŃSKI WIRTUOZ

Streszczenie

Robert Boyle był jednym z największych uczonych XVII w., naukowiec i teolog, który swoje kompetencje naukowe wykorzystywał w służbie religii chrześcijańskiej. Szczególnie cenił on fizyczno-teologiczny dowód na istnienie Boga i Boskiego majestatu, czerpiąc atrybuty Boga z porządku, złożoności i piękna wszechświata w ogóle i wszystkich jego elementów w szczególności.

Słowa kluczowe: Robert Boyle, fizyko-teologia

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