

Draft - Not For Distribution

**Aristotelian in Spite of Himself?**

**Christopher Boorse and the Philosophy of Nature**

**Michel Accad, MD**

Over the last four decades, Christopher Boorse has made an important contribution to the philosophy of medicine, a contribution generally known as the “bio-statistical theory” (BST) of health and disease. In presenting and defending his theory, Boorse has claimed to rid the definition of health from any remaining “Hellenic sepsis,”<sup>1</sup> a phrase referring to any residual Aristotelian concept that might still underlie—if only subconsciously—our medical paradigms. But did Boorse in fact succeed in this detoxification of medical philosophy? Is he able, as he claims, to rest his theory solidly on a foundation of biological reductionism?

On the one hand, the modern medical profession, whose stated aim is to restore or maintain health, rests on a foundation of scientific reductionism which has seemingly rejected formal causality (“that by which the thing is the kind of thing that it is”) and the closely related concept of final causality (“that for the sake of which the thing acts”). It is therefore conceivable that the notion of health need not invoke these Aristotelian notions.

On the other hand, the universal desire for health would seem to suggest at least an implicit acknowledgement of Aristotelian concepts of form, nature, or final ends. The etymology of health, for example, refers to wholeness, and if wholeness is thus recognized as a good to be maintained or achieved, then the entity who is to enjoy health would unlikely be an incidental assemblage of parts, but would seem to merit an ontological status distinct from those parts, as provided by the principle of formal causality. Furthermore, health is commonly thought to be an *objective* good, therefore attributable to all or most members of the species, that is, to “the kind of thing” and not just to the individual thing itself. Health, that is, is not purely or

---

<sup>1</sup> Boorse, C. “Rebuttal on Health,” in *What is Disease?* Humber J.M. and R.F. Almeder, eds., Totowa, NJ:Humana.1997. 32

primarily subjective, as some reductionists (though not Boorse) would hold. Finally, as we shall see, health commonly appeals to a notion of normal activity or stability, which also recalls the Aristotelian idea of nature (“principle of motion and rest”), an idea that might be congenial with Boorse’s concept of normality.

In this paper we will begin by exploring the idea of health under an Aristotelian framework. We will then sketch of the influence of reductionist thought on concepts of health in the modern era. Finally, we will examine the naturalistic bio-statistical theory of disease proposed by Boorse, and show that, instead of purging Aristotle from modern medical philosophy, it actually invites us to reconsider Aristotelian concepts more closely. Finally, we will briefly discuss the extent to which Aristotelian thought can help formulate solutions to current problems in the philosophy of medicine.

### **Aristotle on health**

Aristotle does not appear to have specifically elaborated on a theoretical concept of health, but instead accepted the humoral theory advanced by the Hippocratic school. According to Hippocratic principles, an illness comes about when an external agent acting on the living organism creates an imbalance in the proportion of the constitutive elements and humors of the body. The agent is usually believed to be an improper nutrient, and the resulting imbalance leads to dysfunction in the body and to symptoms. The restoration of health, then, aims at re-establishing the balance of humors through the judicious use of medicines and diet, but the role of the physician is primarily to gently aid nature’s own tendency to heal, the so-called “*vis*

*medicatrix naturae.*"<sup>2</sup> This medical approach was further developed and promoted by the second century Roman physician Galen,<sup>3</sup> and remained a firm foundation for medical practice in the Western world until the Renaissance.

Stated in terms of Aristotle's philosophy of nature, one might say that an illness comes about when an external agent acting as an efficient cause provokes an alteration (accidental change) in the subject and changes the disposition of the matter resulting in an imperfection in the body, causing symptoms. Restoring health, then, amounts to improving the disposition of the matter, thus facilitating the perfection of the form (viewed here as a principle of operation). The work of restoration may be aided by the physician, but the patient's nature itself will tend toward the healing process. Since the source of the form, its inclinations, and spontaneous activities, is the first mover, who directs the being to its proper end, perfect health can also be viewed as the perfect operation of the form, directing the body to its final end.

We should note that the concept of health just sketched does not directly convey an idea of ontological "wholeness" but more specifically an idea of perfection of the form. In hylomorphic terms, a sick man remains a composite of prime matter and substantial form, and is therefore whole in that sense. However, to the extent that a disease changes the disposition of the matter and makes it less apt for its present form, then a serious disease can be thought of as a *threat* to the present hylomorphic unity or wholeness of the substance.

### **Reductionism and the concept of health**

---

<sup>2</sup> Yapijakis, C. "Hippocrates of Kos, the father of clinical medicine, and Asclepiades of Bithynia, the father of molecular medicine." *In Vivo*. 2009 23(4):507-14; Bynum, W.F. "Nature's Helping Hand." *Nature* 2001 414(6859):21.

<sup>3</sup> Galen. Brock A.J. transl. "On the Natural Faculties, II, VIII." In *Health Disease and Illness*. Concepts in Medicine. Caplan A.L, J.J. McCartney, and D.A. Sisti, eds. Washington:Georgetown University 2004. 5-6.

For the sake of our discussion, we will take reductionism simply to mean the notion that nature can be explained entirely on the basis of its fundamental material element(s): from the material parts we get to the whole.<sup>4</sup> Empirical science, while not necessarily bound to that notion, has tended to assume reductionism as a framework that justifies examining and explaining nature solely in terms of its quantifiable aspects. Conversely, modern general philosophy, impressed by the predictions and achievements made possible through empirical science, and unwilling to question scientific assumptions, has adopted reductionism as a tacit metaphysical truth.<sup>5</sup> However, if there is any common background to the diverse philosophical and scientific schools of thought in the modern era, it seems to be found primarily in the desire to reject Aristotelian notions of form and end,<sup>6</sup> a rejection whose explicit articulation we will encounter later in this essay in our discussion of Boorse's theory.

Reductionism is perhaps simplistically but conveniently traced back to Descartes whose proposal for a mechanical universe, however short-lived as a viable philosophy, provided an appealing alternative to medieval worldview, challenged as it was by the startling overthrow of Ptolemaic cosmology. Commencing with an explicit desire to abandon any speculative concepts and hold on solely to "clear and distinct ideas," and seeking a universal mechanism as natural law, Descartes imagined a material world of moving "corpuscles" which have extension and shape, but no other quality. All phenomena in the sensible world would be explained on the basis of the size, shape, and speed of these particles. He rejected Aristotelian notions of formal

---

<sup>4</sup> A more detailed elaboration on the different concepts of reduction (i.e. ontological, methodological, and epistemic) can be found in Brigandt, I and A. Love, "Reductionism in Biology", *The Stanford Encyclopedia of Philosophy* (Summer 2012), Edward N. Zalta, ed., <http://plato.stanford.edu/archives/sum2012/entries/reduction-biology/>.

<sup>5</sup> Burt, E.A. *The Metaphysical Foundations of Modern Physical Science*. Garden City, NY:Doubleday 1954. See esp. chap. 1.

<sup>6</sup> *Ibid.*, chap. 8.

and final causality and placed spiritual entities on a plane completely separate from the material world.<sup>7</sup>

Descartes had a keen interest in health and in medicine which he considered to be firmly rooted in his general philosophy. The physiology developed by Descartes for all non-human animals consequently only invoked purely material and mechanistic explanations to account for the functions previously imparted by the vegetative and sensitive souls. Even complex behaviors of animals, such as chasing a prey or running from danger, were explained using the model of the automaton—in defiance of the animal apparent sensitive faculties and decision-making abilities.

While Descartes saw man as the only creature to possess a soul, he still extended the automatic nature of his physiology to all non-conscious or non-intellectual processes, and proposed a highly dualistic anthropology: a body solely composed of matter and a separate rational soul “interacting” with the body at the level of the pineal gland. The nature of the interaction, however, was left undefined. With this mechanical account of nature, Descartes advanced a notion of healthy body akin to a “well-made clock.”<sup>8</sup> The aim of medicine, then, was to fine-tune the mechanical body by the diligent application of scientific progress on the nature and properties of matter.

Of course, the mere invocation of a “well-made clock” would seem to implicate final cause, for isn’t a clock made for the sake of telling time? But here, Descartes’ rejection of final causality was more specifically a rejection of instrumental causality as elaborated by the

---

<sup>7</sup> Hatfield, G. "René Descartes," in *The Stanford Encyclopedia of Philosophy* (Summer 2011), Zalta E.N., ed., <http://plato.stanford.edu/archives/sum2011/entries/descartes/>.

<sup>8</sup> Descartes, R. *Meditations*, quoted in Lindeboom, n A.G. *Descartes and Medicine* Amsterdam:Rodopi 1978. 58-9

medieval scholastics, and Aquinas in particular. In his mechanical scheme, God remained the creator and designer of the universe, and ultimately responsible for all beings. Descartes saw no need to invoke formal causality as an independent principle, and therefore also rejected “nature” in the sense of an intrinsic principle of motion and rest.

While Descartes did not contribute in any lasting way to physiology or anatomic discovery, his mechanical model could at least theoretically account for the problem of inappropriate compensatory mechanisms, such as the sensation of thirst common in patients who suffer from dropsy and for whom drinking would be detrimental. Medieval medicine may not have had ready answers for such difficulties which cannot be easily addressed with the principle of *vis medicatrix naturae*. A “badly made clock,” on the other hand, is one that will precisely fail to operate as intended and therefore explain a body’s tendency to promote its own demise.<sup>9</sup>

The mechanical reductionism introduced by Descartes found a propitious terrain among the medical followers of Paracelsus, the iconoclastic physician and alchemist from the Renaissance. Paracelsus had rejected the Ancient Greek system of four elements—Earth, Air, Water, and Fire—in favor of another one rooted in Neoplatonic mysticism, which emphasized the role of metallic elements.<sup>10</sup> Though still committed to the notion of internal harmony as a principle of health, Paracelsus disagreed with Galen in that he postulated that humoral imbalance was due to *persistence* of chemical poison in the body. With this slight change in understanding, he elevated the role of efficient causality as a principle of operation in illness. Paracelsus also gave chemistry a prominent place in the treatment of disease, and thus provided fertile ground for introducing mechanical philosophy into biology and physiology.

---

<sup>9</sup> Ibid., p. 59

<sup>10</sup> Borzelleca JF. “Paracelsus: Herald of Modern Toxicology.” *Toxicology Science*. 2000. 53(1):2-4

The marriage of Descartes' corpuscular theory to Paracelsianism gave rise to "iatromechanism," a doctrine of medicine and health based on the Cartesian theory of matter. But this unambiguous espousal of mechanical theory would be short-lived, failing as it did to provide soon enough tangible solutions to the problems of health, disease, and suffering. And besides, Descartes body-mind dualism was quickly found to be wanting, a shortcoming that would temper any broad endorsement of strict materialism in medicine. On the other hand, there seemed to be no interest to return to the concepts of final and formal causality, and mechanism in one form or another would continue to influence biomedical understanding.

Many factors have likely contributed to the tenacity of mechanism in medicine, not least of which is the fruitful application of empirical science to the realm of biology. Claude Bernard's success in quantitating biological phenomena, in applying experimental techniques to the study of animals, and in articulating the "principle" of the *milieu intérieur* for living organisms, seemed to provide a formidable argument in favor of the mechanical and deterministic theory he espoused. The discovery of microbial pathogens and the enunciation of the cell theory by Virchow also seemed to converge towards finding causative explanations in the realm of the microscopic: if the cell is the "fundamental level of organization," perhaps the concept of substantial form is indeed unnecessary. And Darwin's theory of evolution seemed to provide a momentous argument against the importance of final causality (inasmuch as final causality is misunderstood as a quasi-efficient causality). All these discoveries also occurred in the context of development in physics and chemistry of the atomic theory of matter, which undoubtedly would have bolstered the position of philosophical reductionism.

With these and other milestones in biomedical science, the emerging Western practice of medicine became heavily influenced by the mechanical account of nature, but this trend was



probably facilitated as well by social and political factors.<sup>11</sup> For example, Brown has shown that in mid-to-late century London, the College of Physicians felt compelled to embrace iatromechanism to ward off the influence of a competing school of apothecaries. Later on, if we are to believe Foucault, biological reductionism would give rise to an entire new medical discourse that could put the body under the influence of post-revolutionary political interests. Still later, in the United States, reforms in medical education and licensing would demand mastery of chemistry and physics as an entry requirement in medical school, and the medical curriculum would become organized on a “foundation” of biochemistry, with the basic sciences considered prerequisite “building blocks” for clinical training.

The ensuing medical successes in the 20<sup>th</sup> century have certainly continued to promote the reductionist undercurrent in biomedical science. But in the postmodern era, despite continuing advances in medicine and, so far, a continued elongation of life expectancy, tenacious socioeconomic and bioethical crises have called for a re-examination of the philosophical basis of medicine. From these scholarly discussions, several different proposals have been articulated to attempt to better apprehend the notions of health and disease and of the proper role of the physician. Among contemporary philosophers of health, Christopher Boorse stands at one extreme in articulating a concept of health which he claims appeals strictly to biological science and avoids any normative or evaluative notions. His concept of health aims to be, by his own account, “as value-laden as inorganic chemistry or astrophysics.”

---

<sup>11</sup> Michel Foucault in his *Birth of the Clinic* provides a radical thesis about the politicization of biological reductionism by way of medicine, but at a more mundane and specific level, Brown has examined the sociopolitical factors which compelled the London College of Physicians to embrace iatromechanism in the mid-to-late 17<sup>th</sup> century, namely, the desire to ward off the influence of the competing school of apothecaries (Brown, T. “The College of Physicians and the Acceptance of Iatromechanism in England, 1665-1695.” *Bulletin of the History of Medicine*. 1970 44:12-30).

Controversial from the get-go, Boorse's theory has been extensively debated for more than three decades.<sup>12</sup> The remainder of this essay will introduce this theory and examine if it can remain grounded in a reductionist worldview or, given that it deals directly with the subject of health, if it must pre-suppose ideas that relate to Aristotelian concepts of formal and final causality.<sup>13</sup>

### **Christopher Boorse on health**

In papers published in the mid 1970's Christopher Boorse offered a definition of health which aimed to be "naturalistic", i.e., value-free and purely descriptive.<sup>14</sup> His point of departure is that diseases do exist as objective realities in nature, and a definition of health is therefore a work of natural science, at least if the definition is restricted to a "theoretical" understanding and not meant to offer a working paradigm for clinicians who must deal with significant social and evaluative aspects in the practice of medicine.<sup>15</sup> Boorse's understanding of biological nature is firmly rooted in the paradigm of evolution by natural selection, and as such, would seem to appeal to a reductionist viewpoint. And in keeping with this perspective, Boorse claims that his concept of health can be easily applied to plant and animals and offers it, therefore to all living species. We will return to this particular point at the end of the paper.

---

<sup>12</sup> In 2012, three international symposia were dedicated to Boorse's theory and its application to the practice of medicine. See Univ. of Delaware website, <http://www.udel.edu/udaily/2013/dec/boorse-medicine-120512.html> , accessed Dec 11, 2013.

<sup>13</sup> We will not discuss whether Boorse's theory succeeds as a model of health and disease. The aim is simply to tease out what concepts from the philosophy of nature underlie his theory.

<sup>14</sup> See Boorse, C. "Health as a Theoretical Concept." *Philosophy of Science* 1977 44:542-73 for the most detailed exposition of his theory.

<sup>15</sup> Boorse has separately addressed what constitutes a valid claim for the sick role, but the bulk of his work focuses on identifying objective naturalistic criteria for health and disease irrespective of the social aims of medicine.

The most succinct summary definition of Boorse's position is that health is "normal functioning, where normality is statistical and the functions biological."<sup>16</sup> Statistical normality applies to a referent class, specifically an age group of the same sex. Biological function is hierarchically characterized according to its contribution to reproduction and survival. The expanded definition is given here:

1. The reference class is a natural class of organisms of uniform functional design; specifically, an age group of a sex of a species.
2. A normal function of a part or process within members of the reference class is a statistically typical contribution by it to their individual survival and reproduction.
3. A *disease* is a type of internal state which is either an impairment of normal functional ability, i.e. a reduction of one or more functional abilities below typical efficiency, or a limitation on functional ability caused by environmental agents.
4. *Health* is the absence of disease.<sup>17</sup>

According to Boorse, this definition can objectively capture conditions commonly considered diseases without the need to appeal to social or personal normative judgments. Although Boorse initially developed his definition strictly for physical diseases, he later proposed its application to mental health as well, save for some important caveats to which we will return later.<sup>18</sup>

How does this definition fit within the philosophy of nature? Can Boorse claim to remain within the reductionist paradigm or must he implicitly or explicitly appeal to non-reductionist notions such as form or end? The next two sections will demonstrate that Boorse's theory straddles both philosophies.

### **Boorse's health concept as reductionist:**

---

<sup>16</sup> Ibid., 542.

<sup>17</sup> Ibid.

<sup>18</sup> Boorse, C. "What a Theory of Mental Health Should Be." *Journal for the Theory of Social Behaviour*. 1976 6:61-84.

Two major aspects of Boorse's theory seem to fit well within a reductionist worldview. First is the appeal to statistics to describe health and to identify the reference class. This quantifiable formulation is in keeping with Boorse's aim to place his theory in the framework of empirical science. In some sense, this is an innovation, since we commonly conceive of a healthy function in binary terms: healthy or not. The problem with a dichotomous view of health is that it requires pre-specifying what is understood to be healthy, which would be evaluative (a position Boorse is precisely trying to reject). Boorse appeals to the notion of functional efficiency to define normal function as diagrammed here:<sup>19</sup>

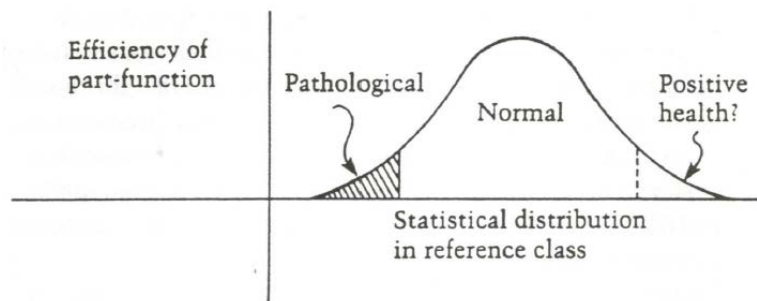


Fig. 1. Normal vs pathological.

We also commonly conceive of species in distinct descriptive terms and categories—as *forms* precisely. But Boorse attempts to get around these categorical notions by appealing to the idea that species are *statistical abstractions*:

As a result, the subject matter of comparative physiology is a series of ideal types of organisms: the frog, the hydra, the earthworm, the starfish, the crocodile, the shark, the rhesus monkey, and so on. The idealization is of course statistical, not moral or esthetic or normative in any other way. For each type a textbook provides a composite portrait of what I will call the *species design*, i.e. the typical

<sup>19</sup> Boorse, "A Rebuttal on Health," 8

hierarchy of interlocking functional systems that supports the life of organisms of that type. Each detail of this composite portrait is statistically normal within the species, though the portrait may not exactly resemble any species member. Possibly no individual frog is a perfect specimen of *rana pipiens*, since any frog is bound to be atypical in some respect and to have suffered the ravages of injury or disease. But the field naturalist abstracts from individual differences and from disease by averaging over a sufficiently large sample of the population. The species design that emerges is an empirical ideal which, I suggest, serves as the basis for health judgments in any species where we make such judgments.<sup>20</sup>

With this concept of statistical abstraction based on observation of functional activity, Boorse seems to be departing from typical contemporary treatments of species, which focus either on shared genetic material or, alternatively, on patterns of interbreeding. However, this departure should not be considered scientific heresy since the “species problem” is still an unresolved one for which a number of different solutions have been proposed.<sup>21</sup>

The other aspect of the theory that fits within a reductionist framework is his conception of the organism:

Contemporary biology employs a version of the idea of natural design that seems ideal for the analysis of health. The crucial element in the idea of a biological design is the notion of a natural function. I have argued elsewhere that a function in the biologist’s sense is nothing but a standard contribution to a goal actually pursued by the organism. Organisms are vast assemblages of systems and subsystems which, in most members of a species, work together harmoniously in such a way as to achieve a hierarchy of goals. Cells are directed toward metabolism, elimination, and mitosis; the heart is goal-directed toward supplying

---

<sup>20</sup> Boorse, “Health as a Theoretical Concept,” 557

<sup>21</sup> Boorse gives particularly credit for his ideas to Sommerhoff, G. *Analytical Biology* London:Oxford University 1950 and King, C.D. “The Meaning of Normal.” *Yale Journal of Biology and Medicine* 1945 17:493–501.

the rest of the body with blood; and the whole organism is goal-directed both to particular activities like eating and moving around and to higher level goals such as survival and reproduction.

In other words, the organisms is a hierarchy of nested “systems and subsystems,” and the health of the organism can be reduced to the healthy functioning of its parts understood in quantifiable terms of statistical efficiency at achieving goals.

Boorse therefore proposes a concept of health and disease that lends itself to empiric verification and seems to appeal only to material concepts elaborated in the basic science of biology.

### **Boorse as an unwitting Aristotelian?**

Remarkably, but perhaps unsurprisingly given that it relies on the concept of function, Boorse admits from the get-go that his definition indeed appeals to teleology. Furthermore, he acknowledges its Aristotelian heritage, at least to some extent:

From our standpoint, then, health and disease belong to a family of typological and teleological notions which are usually associated with Aristotelian biology and viewed with suspicion. Often this suspicion is excessive. Informal thinking in the life sciences constantly uses typological and teleological ideas with profit, and much recent philosophical work has been done on concepts of function and goal-directedness in modern biology. This work suggests that aseptic substitutes can be found for ancient notions that continue to have a scientific use.<sup>22</sup>

---

<sup>22</sup> Boorse, “Health as a Theoretical Concept,” 554

Note, however, that Boorse claims a different sort of teleology based on “aseptic substitutes” for the ancient notions. When it comes to identifying the source of this teleology (or the nature of the “aseptic substitutes”), however, Boorse is less forthcoming. It seems clear, though, that he is not considering a divine origin or an unmoved mover. In a prior paper, Boorse commented that “...it is no part of biological theory to assume that what is natural is desirable, much less of divine artifice.”<sup>23</sup>

But the theory of evolution by itself cannot explain, in natural terms, why survival and reproduction are at the top of the hierarchy of goals. Not everything in nature is directed to survival and reproduction, only life is. Furthermore, the teleology Boorse refers to begins with life *forms* as a given, but contemporary biology does not know how to define life.<sup>24</sup> And it is not by means of “statistical abstraction” that we distinguish living from inanimate matter. On the contrary, Boorse claims that “goal-directedness [is] the key feature dividing living organisms from dead or inorganic matter.”<sup>25</sup> Teleology, then, is an immediately recognizable feature of life. But how to account for it?

If Boorse acknowledges teleology, is a notion of formal causality lurking implicitly underneath his theory? After all, Aristotle demonstrated that final and formal causes are inextricably connected, with the final one being the first and source of all other causes.<sup>26</sup>

To begin with, the idea that species are statistical abstractions implies that certain boundary “cut-offs” in the statistical distribution must be selected to decide which individual life

---

<sup>23</sup> Boorse, “On the Distinction Between Health and Disease.” *Philosophy and Public Affairs* 1975 5:49-68

<sup>24</sup> See, e.g., DeKoninck, C. “The Lifeless World of Biology,” in *The Hollow Universe* London:Oxford University Press 1960.

<sup>25</sup> Boorse “A Rebuttal on Health,” 9, again citing Sommerhoff, *Analytical Biology*, 6.

<sup>26</sup> Aristotle. *On the Parts of Animals I,1*

form belong or does not belong to the species. Boorse does not specify how this cut-offs are to be chosen. Is a rabbit an entity that eats carrots with 99 percent efficiency but beef with only 0.5? If the beef-eating efficiency rises to 0.6% is it no longer Bugs Bunny? This seems an implausible mechanism by which to abstract species design.

And besides, however he arrives at the concept of species or reference class, almost by definition, he has a form, and his need to analyze health according to “reference class” presupposes its existence.<sup>27</sup> In fact, Boorse’s vocabulary cannot but betray the existence of forms: “our interest in species design [which as we have seen, is understood in terms of a class of *uniform* functional design] is that we wish to analyze health in *conformity* to it.”<sup>28</sup> Even Boorse’s appeal to function which, after all, is synonymous with *performance* contains at least traces of formal concepts.

I suspect that Boorse would argue that evolutionary theory establishes the species or form as proceeding from more primitive parts, but how does teleology come into the picture of physiology when it is apparently not there in inorganic chemistry and astrophysics? The existence of form as a life principle seems difficult to avoid if one wishes to identify life according to function, so perhaps Boorse is not as successful as he would wish in ridding health of its Hellenic infestation.

### **Can Aristotle and Boorse be reconciled?**

---

<sup>27</sup> See Sokolowsky, R. “Formal and Material Causality in Science.” *American Catholic Philosophical Quarterly*. 1995 69:57-67

<sup>28</sup> Boorse, “Health as a Theoretical Concept,” 558, emphases mine



If Boorse's theory appeals to teleology and implies formal causality, to what extent can it be understood in terms of Aristotelian concepts?

For one thing, Boorse and Aristotle seem at least to agree that reality can be abstracted by the mind from the sensible observation of nature into intelligible ideas. For Aristotle, the direct observation of the particulars in nature can lead the mind to abstract intelligible concepts and categories such as "species." Boorse also appeals to abstraction, although he gives it a specific statistical character. In neither case are there filtering paradigms nor "categories of understanding" that reside in the mind and prevent us from grasping the world as it is. And if Aristotle would unlikely identify species design and functional normality in terms of statistical averages,<sup>29</sup> he would certainly agree that regularity does occur in nature, and this regularity and predictability underlies our ability to comprehend it.

Furthermore, the disease concept proposed in Boorse's definition as a "reduction of one or more functional abilities below typical efficiency" can relate to notion of changes in the disposition of the matter that decreases the perfection of the form, so that its inclinations and spontaneous activities are impaired. The cause of the reduction in functional ability may be an external agent acting as an efficient cause or, if we are dealing with an inborn genetic illness, explained on the basis of the improper disposition of the matter in the previous form (the sperm or the egg).

What about the question of mental health? In a lengthy paper devoted to applying his theory of disease to mental illness, Boorse states:

---

<sup>29</sup> See Lennox, J. "Aristotle's Biology," in *The Stanford Encyclopedia of Philosophy* (Fall 2011), Zalta, E.N. ed., <<http://plato.stanford.edu/archives/fall2011/entries/aristotle-biology/>>. See esp, sect. 5.1 for a discussion on how the Aristotle conceived of animal categories.

Mental health, then, would be the special case obtained by focusing on the functions of mental processes; and so there is such a thing as mental health if there are mental functions. For this, two conditions must be satisfied. First, some mental processes must play a causal role in action. Since philosophers are divided over whether mental events can be causes, the issue cannot readily be treated here. I agree with Davidson (1963) that the arguments against mental causation are weak and will conduct the discussion on that assumption. The second condition required for mental health is that mental processes contribute to action in a sufficiently species-uniform way to have natural functions.<sup>30</sup>

Of course, “philosophers are divided over whether mental events can be causes” because reductionism cannot easily account for this kind of “top-down” causality without appealing to mind-body dualism or to more arcane modern theories of mind.<sup>31</sup> But if we merely limit ourselves to Boorse’s two pre-requisites (that mental causation exists and that normal mental function can be characterized), his definition of mental health becomes potentially compatible with an Aristotelian framework, where the rational soul is certainly causative and its healthy operation gauged in the doctrine of virtues.

The nearness of Boorse’s definition of health and disease to Aristotle’s hylomorphic philosophy is readily illustrated by William Wallace who conveys an Aristotelian concept of health in the following terms:

What is health, and how does it relate to a nature that is said to be healthy? The traditional reply is that health is a habit or disposition that characterizes the organism as a whole, but is especially manifest in the way a natural power

---

<sup>30</sup> Boorse, “What a Theory of Mental Health Should Be,” 63-4

<sup>31</sup> Boorse devotes a portion of “What a Theory of Mental Health Should Be” to reject mind-body dualism in favor of some form of “functionalism” or “identity theory” of mind.

energizes or activates its respective organ system. In this sense one can have a healthy liver, healthy circulation, and healthy limbs; the aggregate of all these healthy systems constitutes the health of the organism.<sup>32</sup>

And further:

The sense of entitative perfection just described may now be extended somewhat to include more than bodily health (that associated with organs and organ systems), to include the type of health that is peculiarly human, the health of the mind. The mind is healthy when it thinks properly...<sup>33</sup>

In other words, notions of physical and mental health appeal to habits and virtues, which, if we were to use Boorse's terminology, could probably be expressed as kinds of "goal-directed functions." Uncannily, Wallace's Aristotelian analysis leads him also to "include under health practitioners horticulturists and veterinarians as well as physicians and surgeons,"<sup>34</sup> echoing precisely Boorse's sentiment. In other words, Boorse's attempt to comprehend health in purely naturalistic terms makes him converge toward a Hellenistic position he precisely wished to avoid. But the paradox is not altogether surprising given our earlier remarks that health is inherently "holistic" and ill-suited for a reductionist or physicalist worldview.

### **Concluding remarks**

We began this paper with the observation that the concept of health is ill-suited for treatment under a strict reductionist paradigm and we showed that the most thorough contemporary attempt to define health in "naturalistic" terms fails to avoid Aristotelian concepts of formal and final causality. Can a Scholastic analysis of health hope to influence modern

---

<sup>32</sup> Wallace, W. "Nature as Animating: The Soul in the Human Sciences." *Thomist* 1985 49:635

<sup>33</sup> *Ibid.*, 636

<sup>34</sup> *Ibid.*, 638

philosophy of medicine? The preceding observations offer reasons to be cautiously optimistic, but important challenges for an Aristotelian-Thomistic “paradigm shift” remain.

For one thing, if we are to believe Thomas Kuhn, those who hold to Aristotelian views and those who do not live in “different worlds.”<sup>35</sup> Boorse, for example, is assuming a scientific account of man based on reductionist assumptions that the successes of modern medicine appear to have made evident. He may be hard pressed to understand (let alone embrace) the existence of certain “intelligible principles” of nature when the scientific world seem to be getting along perfectly without them.

Secondly, an Aristotelian account of health and disease must explain, or at least cohere with, a range of observable facts about health and illness. Before it can be proposed as an alternative to any current philosophy of health, such an elaboration must be able to deal with conceptual difficulties like those which caught Descartes attention: how to explain “natural” behaviors that seem self-harming? How to deal with the problem of aging? And more generally, if we are to further adopt a Catholic-Thomistic position, how do we thoroughly define health in a fallen universe?

Thirdly, medicine belongs properly to the practical philosophies rather than to the speculative ones, a distinction which impacts the acceptance of a new medical theory. A new scientific theory, such as quantum mechanics, need only convince a tiny number of specialists to claim success as a worthy model for nature. A new paradigm on health and disease, however, must appeal to a much broader community of patients for validation, or else it can at most hope to be a stimulating academic exercise.

---

<sup>35</sup> Kuhn, T. *The Structure of Scientific Revolutions*. Chicago:University of Chicago Press 1962. See esp. chap. 10

But the time is ripe with health care “crises” of momentous importance across the world, and if these become manifest in a Kuhnian sense, then perhaps there can be some optimism that a model of health based on Aristotelian-Thomistic philosophy will emerge to not only *shift* the current paradigm but, as Wallace suggests, *add* substantially to it and to our understanding of nature and man.

Draft - Not For Distribution