

# 1

---

## The Question of Normativity

Definitions of health and disease, rather than being of academic use only, are critically important in our society. For instance, as there is currently no single standard of health care in the United States, the movement to define certain basic rights to health care is growing. Legislation such as the Patients' Bill of Rights is the result of this movement. Although few would argue against the desirability of childhood vaccinations or the right of a trauma victim to receive emergency medical care, it becomes less clear whether patients have "rights" to receive treatment for learning disabilities or for infertility. Indeed, it is a contentious issue whether such individuals have truly medical problems at all, or simply problems. Consider also our country's anti-discrimination laws, such as the Americans with Disabilities Act, which provides an individual with "a physical or mental impairment that substantially limits one or more of the major life activities of such individual" (1990, §12102) protection against discrimination on the basis of the disability. Legislators endeavored to state precisely what conditions should and should not be protected. Given that a number of exceptions had to be written in specifically, however, it is evident that they were unable to define "physical and mental impairments" and "major life activities" adequately. For example, a section of the Americans with Disabilities Act was included entirely to ensure that "disability" would not apply to an individual "solely because that individual is a transvestite" (1990, §12208).

Our understanding of what it means to be healthy is thus central to any number of issues, from doctor's notes presented to teachers and

employers to the most wide-reaching legal matters. For instance, many people consider the health of a pregnant woman relevant to the abortion issue, claiming that abortion is permissible in cases where her health would be endangered by continuing the pregnancy.

In *Roe v. Wade*, Justice Blackmun delivered the opinion of the court: . . . the State retains a definite interest in protecting the woman's own health and safety when an abortion is proposed at a late stage of pregnancy. (*Roe v. Wade* 1973, 174)

Blackmun held that changes in the state of medical knowledge and procedures can be relevant to whether abortion ought to be allowed insofar as they affect the expected impact on the woman's health (and safety). He took care to note that the woman's mental health is a factor, and not just her physical health, writing, "Mental and physical health may be taxed by child care" (*Roe v. Wade* 1973, 177).

It is remarkable that this opinion is presented in the complete absence of a theory of health. Blackmun stated that maintaining the health of women is in the interest of the state, but offered no guidance as to how we might go about determining when that health is endangered or compromised. Clearly, a richer understanding of the scope of terms such as "physical and mental impairments," "major life activities," "health," and "disease" can help us to create more consistent definitions and policies that in turn will help to understand and protect the rights of individuals and provide for a more just society.

This book is about the philosophy of medicine. Part I presents a theory of health, which makes it a study in metaphysics and the philosophy of science. Later parts are about the ethical implications of the theory defended in part I. This approach comes from the realization that knowing what it means for a person to be healthy is relevant to almost every medical encounter, and that clearer understanding of the goals of health care would allow professionals and patients to act more confidently and more responsibly. The conceit is that in order to improve the health of patients and populations, health care professionals and the patients themselves must be more thoughtful about *what health is*. The nature of health is a metaphysical issue central to the philosophy of medical science.

I take it as given that we have a concept of health, however rough, that we apply in our everyday interactions with the world and with one another. Although we may not have a definition that satisfies the standards of philosophy, we do have intuitions about what are healthy and unhealthy states. What we are looking for is an appropriate analysis of this concept, one that we will find enlightening and will, in general, be in accord with our intuitions. Of course, such an analysis may lead us to change our minds about things, and we may find ourselves with some new ideas. The goal is not, however, to replace our ordinary notion of health with something neat but foreign. It would do us no good to clarify what we mean when we talk about health in such a way that we end up with a completely different concept altogether. Our analysis must result in something that accords with the intuitions we hold most central or offer clear reasons for changing these intuitions. Furthermore, I will assume that if two people disagree on whether a given state is healthy, our analysis will either tell us that at least one of them is incorrect or give an account of how they can both be correct (in the way that ethical relativism gives an account of how people from different communities can disagree and both be correct about the moral value of some type of action).

A theory of health has crucial implications for the provision of medical care. Diagnosis, choosing among treatment options, outcomes assessment, and, of importance, how professionals talk to patients are all implicated. A theory of health can thus have an indirect effect on medical research as a result of changes in patterns of clinical diagnosis and treatment, and through changing patterns of requests from patients who begin to think of their own health differently. A theory can also have a direct impact on the course of research in medical science by shaping areas of investigation that are considered specifically health-related and hence medical.

### **Normativity and Medical Science**

A fundamental feature of a theory of health is whether values play a role. Some theories tell us how things are and imply nothing about whether it is desirable that things be that way. Others tell us how things should

be, are supposed to be, or ought to be; that is, how it is best for things to be. They identify certain states of affairs as having positive value, as being better than (at least some of) the alternatives. They are thus evaluative or, as I say, *normative*. For example, they tell us which states or conditions are healthy and that it is better to be in such a state or condition than not to be.

Another way of understanding this distinction is in terms of direction of fit. Descriptive theories are meant to conform to the facts. If the theories do not fit the facts, we blame the theories. Normative theories are such that the facts are supposed to fit them. If the facts do not fit the theories, we blame the facts. Thus, if an anthropologist offers a (descriptive) theory claiming that a culture with feature *x* must also have feature *y* when some cultures have *x* but not *y*, the anthropologist has a bad theory. But if the school dress code says that students are not to wear T-shirts, a student wearing a T-shirt shows not the code but himself to be bad. A key question for our project is whether health is a nonnormative or a normative concept.

Theorists such as Christopher Boorse, Arthur Caplan, and Thomas Szasz have suggested that normative theories are unscientific and without objective basis, and hence a normativist account of health will apply only within a particular culture and not universally.<sup>1</sup> To explain the nature of the debate over normativism in theories of health, Caplan (1993) wrote, “[t]he greater the role of values in the definition of health and disease, the worse the prognosis appears to be for both their objectivity and reality” (240–41). Issues that are a matter of value only, such as rules of etiquette, are said to be “merely” subjective, or conventional; they could be different without changes in the facts that science is interested in. Lack of consensus about issues concerning values, with etiquette and fashion perhaps the most compelling examples, looks like evidence that values lack the objectivity that would provide a basis for intersubjective agreement.

Szasz also acknowledged the important fact that people value health, while insisting that medical facts are just that—facts only, without normativity. These remarks came in the context of his famous position that mental illness is a dangerous myth of modern Western civilization. His primary reason for this position was captured as follows:

The norm from which deviation is measured whenever one speaks of a mental illness is a *psycho-social and ethical one*. Yet, the remedy is sought in terms of *medical* measures which—it is hoped and assumed—are free from wide differences of ethical value. (Szasz 1960, 114)

In short, Szasz believed that it is a mistake to address issues of value (such as, in his view, mental “health”) with nonnormative tools of medical science. The assumption again is that where values exist, intersubjective agreement is not to be hoped for, and a realm in which intersubjective agreement cannot be hoped for is outside the scope of science and hence outside the scope of medicine.

Why do people insist that science is nonnormative? One reason is the tradition, stemming from Francis Bacon and others, of treating science as based entirely on observation. One can observe the way things are but not the way things ought to be. This connects with the familiar empiricist views of Locke, Berkeley, and Hume. It also connects with the empiricist tradition of logical positivism. Logical positivists such as A. J. Ayer went so far as to claim that statements regarding value, such as ethical and aesthetic judgments, were without cognitive meaning because they could not be verified by experience. All of this leads to the conclusion that if science is a possible object of knowledge, it does not involve normativity.

David Hume is particularly famous for drawing what we call “the fact-value distinction.” In the famous “is–ought” passage of his *Treatise of Human Nature* (Hume 1978, 469), he objected to arguments with factual premises and normative conclusions. He claimed that it is “inconceivable” that a statement containing an “ought” or an “ought not” “can be a deduction from” statements containing only “is” or “is not.” Hume is invoked by those who reject normativity in science. (However, the role of deduction in Hume’s thinking is significant, and deduction is no longer a primary model for scientific reasoning.)

The view that science is strictly value neutral has serious implications. If we accept this view and we find that the correct understanding of health involves normativity, we may find ourselves stuck with the unwelcome conclusion that medical science (if it is to be understood as the scientific study of health) is not a science at all.<sup>2</sup>

### A Philosophical Tale I: Is There a Difference between Biological and Physical Sciences?

In this section I will tell a philosopher's story about the sciences. I call it a philosopher's story because although I am quite attached to it, as are many of my philosophical acquaintances, it has been known to irritate scientists. Scientists looking at the first part of this story (the part told in this section) do not always find themselves reflected in it. I am going to tell it anyway because it will help us to understand some important features of medicine. Afterward I will backtrack a bit, attempting to hold onto the moral of the story even in the face of admitting that it was only a story.

Once upon a time, science was thought to be the reporting of objective, nonnormative fact. The intuition that science properly so called must be completely free of normativity has its roots in at least three traditional ways of thinking. One is the empiricist tradition noted above. Another is the tradition according to which scientific knowledge (*episteme* for Aristotle; *scientia* for Descartes) consists of either self-evident first principles or the conclusions of deductive arguments from such principles. According to this tradition, mathematics is the primary example of a science. The third is the tendency to see physics, specifically Newtonian mechanics, as nearly on a par with mathematics. The legitimacy of Newton's *Principia* in the seventeenth century lay in its presentation of a mathematical theory of motion.

Newtonian mechanics is characterized by laws that serve as first principles. These laws allow us to deduce with certainty facts about the mechanical properties of objects. Newton's laws of motion are successful because they do a good job of describing the way things actually are. They fit the facts. (For the purpose of our tale we will ignore the complications of modern physics.) Furthermore, they are quite specific. They do not give an *approximation* of the velocity to be expected in an object or a *range* into which we can expect it to fall. They do not indicate that an object "should" or "will usually" accelerate in a given way.

Biological sciences, including medical subfields, do not work this way. Generalizations of anatomy and physiology are not expected to hold strictly across all organisms. Instead, they offer a sort of idealized account of a "normal" subject. It is difficult to sort out what this means,

as medical textbooks rarely address issues that concern philosophers of science. Instead, they tend to give average measurements and most common patterns and shapes (Basmajian and Slonecker 1989, xvii). Where they talk about extreme variations, they tend to use the terms “abnormality” and “anomaly”:

Owing to the variety of these [measures and patterns], the commonest may have less than a 50% incidence; therefore, it may not be truly representative . . . Some variations are so rare as to be abnormalities or *anomalies*. (Basmajian and Slonecker 1989, xvii)

Here the authors of *Grant’s Method of Anatomy* acknowledge that variations to be expected in anatomy are so great that there may not even be a representative structure.

Consider the following discussion of the skeletal system:

. . . it is often difficult to distinguish pathological from normal variation. Body height is an example: between the extremes of dwarfism and gigantism (both resulting from hormonal dysfunction), much variation in height occurs. (*Gray’s Anatomy: The Anatomical Basis of Medicine and Surgery* 1995, 433)

Kenneth Lyons Jones discussed and categorized many ways in which humans can develop abnormally. Malformations are distinguished from deformations. Whereas deformations are “due to mechanical factors . . .” (Jones 1997, 1) impinging on development, many malformations are simply cases of things going wrong. Of course, many others are the predictable results of causes such as a woman’s use of alcohol during pregnancy. However, even when the etiology of a malformation can be identified, we are told not to expect similar results in all similar cases. “Variance in extent of abnormality (expression) among individuals with the same etiologic syndrome is a usual phenomenon . . .”, and “it is unusual to find a given anomaly in 100 per cent of patients with the same etiologic syndrome” (Jones 1997, 2–3).

‘Anomalous’ is used more or less interchangeably with ‘abnormal.’ (They differ slightly, as anomaly in these contexts seems to ring with its literal sense, indicating that a phenomenon falls outside the laws.) Two concepts of normality (and hence of abnormality) are found in medical texts, however, and most statements about normality in discussions of anatomy are ambiguous between them. One is the concept of statistical normality, which physicians use when they speak

of a condition or state being normal *for a population*. This concept is not normative. It refers only to the range of states commonly found in a given population.

The other concept of normality is normative, and belongs to a family of related concepts, including health, disease, and proper functioning. This is the concept at work when physicians speak of what is normal *for an individual*. The structure or state that is normal for an individual allows that individual to function properly and thus maintain health. What is normal for an individual may be quite different from what is normal for the population of which that individual is a member.

According to my story, the fact that medical sciences allow for anomalies and abnormalities in the normative sense tells us a great deal about how these sciences differ from classical physics, and hence how the traditions identified at the beginning of this section can lead us to wonder whether medicine lives up to the standards of science properly so called. Because traditional science has at its core *laws*, part of these wonderings concern the status of the principles governing the medical sciences. Can principles allow for variations, even abnormalities and anomalies, and still be the principles or laws of a science?

Three sorts of scientific principles allow variation: probabilistic principles, *ceteris paribus* (“all things being equal”) principles, and normative principles. All stand in contrast to the strict laws of Newtonian mechanics. Could the principles of anatomy be probabilistic laws? No, because the variations described by probabilistic laws are part of what the laws tell us to expect even when things are going in accordance with the laws. Different possible outcomes are equally predicted by probabilistic laws and explained by them. Consider the gambler’s dice. Whereas some possible rolls are more desirable than others in the eyes of the gambler, they are equally good with respect to the laws of physics. In contrast, variations described by the anatomist are not predicted by principles. Medical abnormalities are evidence of something going wrong. Of course, because anatomical phenomena are also physical phenomena, there exists a level of description (biochemical, physical) at which laws cover and predict the anomaly. But at the level of description appropriate to their disciplines, an anatomist can find *malformations* and a physiologist *malfunctions*.



Could the principles of medical science be *ceteris paribus* laws, laws that hold not strictly or probabilistically but all things being equal? They are not *ceteris paribus* laws of the type that philosophers talk about today. A dominant view of *ceteris paribus* laws was proposed by Jerry Fodor in his discussion of the special sciences. Fodor spoke of laws in terms of subjunctive conditionals (counterfactuals), statements of the general form *if an event of type A occurs, then an event of type C occurs*. The types of events picked out by laws of a science are the types of events that are of interest to that science—the types of that science. The “if” clause of a conditional is called its *antecedent*; the “then” clause its *consequent*. In Fodor’s picture, *ceteris paribus* laws of special sciences (psychology and the other sciences whose laws do not apply to everything in the world, unlike the laws of physics are supposed to) can have two types of exceptions. What he called “mere exceptions” occur because certain background or corollary conditions (called “completers”) are not met.<sup>3</sup>

“Absolute exceptions” occur because the types that are picked out by laws of special sciences can be realized by states that fall into different types when described using the terms of a more basic science (generally, physics). This sort of “multiple realizability” is seen in the way that the same psychological events can be realized in different physical parts of the brain. For example, if parts of a young person’s brain are removed to help the person avoid seizures, the capacity for language processing develops elsewhere. Because neurological development does not depend on location (anatomy), each event type studied by psychologists and neurologists can be realized by a variety of physical event types.

Most realizations of the special science type specified in the antecedent of the conditional stating the law will lead to the consequent of the law, which is what makes it a law. However, some realizations will not lead to realizations of the consequent, which is what makes it a *ceteris paribus* law. Realizations that constitute exceptions to this law count as realizations of the relevant special science type only if, for most laws of the special science involving that type, they are not exceptions.<sup>4</sup> So there is nothing less good about those realizations of the special science types that are absolute exceptions to a particular law, because with regard to other laws, they are not absolute exceptions, and other realizations that

are not absolute exceptions to this law may be absolute exceptions to other laws.

Anatomy involves multiple realizability of normal states. For instance, a wide variety of different physical arrangements of blood vessels can count as normal. However, notions of malfunction and malformation carry evaluative vectors that are absent in exceptions to *ceteris paribus* laws.

Thus we are left with the conclusion that principles of medical science, allowing for variation in the specific way that they do, must be normative, with a direction of fit from facts to principles rather than vice versa. Of course, the variation is not just variation in how well an organism or part of an organism meets a normative standard. As noted in the anatomy texts cited, plenty of variation also exists among structures that do equally well at meeting a given standard. Eye color and precise placement of blood vessels are examples of this type of variation in the realm of multiple realizability.

### **A Philosophical Tale II: Normativity and Teleology**

Our story has brought us back to values. “Normative science” is seen by many as an oxymoron because values will be relative and subjective, whereas science must (at least pretend to) be universal, absolute, and objective. So does the conclusion of the last section entail that medicine is not a science? I am not worried that normative principles are unscientific. Medicine is a biological science, and biology has some notions that are normative to some degree, such as the notion of proper functioning. I am also not worried that normativism necessarily entails relativism. If we can find an objective basis for normativity in health, we can have normativity and objectivity both. Our job in this section is to see how normativity fits into the biological sciences.

The sort of normativity we find in the biological sciences has to do with functions and goals. Colloquially, someone with malformed heart valves might say, “I have a bad ticker,” and one with a permanent injury might explain a limp by referring to “my bum knee.” These evaluative statements certainly tell us something about the speaker’s relationship to these body parts; the body parts are not performing the function generally expected of them to the level hoped for by the person whose body

parts they are. These statements have much in common with other evaluations of instrumental value, value relative to some goal or function. Thus, someone who wants to satisfy a fickle sweet tooth might be offered several varieties of chocolate and say, “Those are no good.” The chocolate might be perfectly good—it just does not satisfy at the moment; it is of no good given present goals. Now, although “I have a bad ticker” and “those are no good” (uttered in the contexts cited) have much in common, they also seem different. Whether one has a bad heart does not seem to depend on the conscious goals of the individual, yet hearts do seem to be evaluated with respect to certain goals.

What determines the goals by which hearts are properly evaluated? This is a controversial matter. We want to say that hearts should be evaluated according to how well they perform their function. However, it is entirely unclear how to give a scientific explanation of a biological entity coming to have a function. We know how artifacts come to have functions: they are designed by entities that intend them to do things. Thus, a blender can have the functions of mixing, blending, whipping, and liquefying. And it is easy to determine that these are its functions—we look at the instructions or telephone the manufacturer. The functions of the blender are derived from, are dependent on, the intention of its designer. Of course, we may use the blender for some purpose of our own. We might use it as a paperweight or a vase. But this does not change its function.

Hearts are different. They do not come with instructions. We might suppose that they, like blenders, have a designer, but on most readings that supposition fails to ensure access to the designer’s intentions. Furthermore, we were hoping for a scientific answer, one making reference only to natural phenomena, not supernatural ones. Some suppose that a marvelous accident has resulted in the existence of hearts, but that does nothing to help us understand why we are comfortable thinking that things such as hearts have functions in a way analogous to the way that blenders have functions.

Another approach to functions is Aristotelian. Stated roughly, the thesis is that everything has a natural function by virtue of the type of thing it is, and that the types of things are a matter of brute fact about the world. For Aristotle, natural objects were like seeds, waiting for the opportunity to express the nature inside, just as the acorn

may wait through the winter to germinate and begin striving to grow into a mighty oak tree. In this picture, each natural object comes equipped with a *telos*, a goal or function, fulfilling which is the “good” for that thing.

The Aristotelian approach is very attractive, but has pained philosophers on several accounts. One is the metaphysical status of the “nature” that determines the *telos* of each object. In his *Physics*, Aristotle wrote, “. . . nature is a source or cause of being moved and of being at rest in that to which it belongs primarily . . .” (Aristotle 1941, 236). Later ancient and medieval philosophers developing this theme emphasized natures inhering in objects to such an extent that they were thought by some early modern philosophers to have been pantheistic, believing that little gods inhabited each thing.<sup>5</sup> Another difficulty is the Aristotelian tendency to see the fulfillment of the functions of natural objects as intrinsically good. This is particularly apparent in natural law theories in ethics, but plays an even broader role in Aristotle’s system. The increasing sense in modern times that values cannot be universal, combined with the related but independent sense that the natural world is made up of observable facts, leads philosophers and scientists alike to reject the Aristotelian view despite its obvious advantages for projects such as ours.<sup>6</sup>

Non-Aristotelian accounts of natural function fall into historical (etiological) and nonhistorical categories. Historical accounts tell us that the causal history of an entity can make it so that the entity has a natural function. Consider, for instance, Ruth Millikan’s account of proper function. This etiological theory portrays natural selection as responsible for determining proper function. The proper function of a biological organ or system is whatever ancestors of that organ or system did that contributed to the species surviving or proliferating (Millikan 1984, 316):

Underlining: that an organ or system has certain proper functions is determined by its *history*. It is *not* determined by its present properties, present structure, actual dispositions or actual functions.

Another approach relies on the current structure (“design” in a looser sense) of the object without reference to the history of the object. Robert Cummins (1993), for instance, maintained that we can come to conclu-

sions about the functions of biological entities such as organs or systems of organs by analyzing their current capacities and those of their parts. Morphologist M. J. S. Rudwick (1998) held that functions can be discovered through examination of current structures of biological systems, a sort of reverse reverse-engineering.

Larry Wright (1998) emphasized the explanatory role of function ascriptions: “. . . when we say the heart beats in order to pump blood, we are ordinarily taken to be offering an explanation of why the heart beats” (65). His analysis of function ascriptions is as follows:

The function of X is Z means . . .

- (a) X is there because it does Z,
- (b) Z is a consequence (or result) of X’s being there

The sense of “because” in (a) is explanatory; it is not there to cite the causal history that led to the presence of X, but to help us understand what X is doing there now.

Thus we have several different ways of accounting for our intuition that some biological entities such as hearts have functions. (I will not choose among them.) What they have in common is that they set up criteria for evaluation. Hearts are designed to pump blood; they exist to pump blood; it is their nature to pump blood; they are reproduced because of their blood-pumping capacity. All of these statements allow us to evaluate hearts. If a heart is designed to pump blood, then one that fails to do this well (assuming it is in the appropriate environment) is a bad specimen of its kind. (Of course, it could also be the case that the design is poor.) If a heart has been reproduced *because of* its blood-pumping capacity, one that fails to do this well is either a bad heart or the result of a poor mechanism of selection.

I want to emphasize here that the attribution of functions to objects underwrites evaluations, even for natural objects. Indeed, I suggest that what we mean when we use certain biological terms such as “heart” or “kidney” may be approximated as follows: a thing that is supposed to perform a function  $\phi$  and hence can be evaluated according to how well it succeeds in performing  $\phi$  under normal circumstances. The truth of this suggestion would not let the metaphysician off the hook of having to give some explanation of how there could be such a thing in the world as to fit this meaning. However, it can tell us a great deal both about

what biological scientists are up to and about what has motivated so many philosophers to search for an adequate theory of natural function. Even if philosophers cannot find an adequate theory of natural function, this does not change the fact that biological scientists (including medical researchers) apply function terms to organs and systems in ways that structure evaluations of these organs and systems.

The notion of goal-directedness is important to understanding what it is to have a function in the sense that interests us here. Not everything that is said to have a function is itself goal directed, however. The function of a clock's pendulum is to regulate the mechanism, although it is really *our* goal that the pendulum regulate the mechanism, not the goal of the pendulum itself. Biological entities with intrinsic natural functions are a different matter. Although they may not adopt conscious goals, they are still said to aim at achievements that are independent of outside interests.

Ernest Nagel (1998) suggested that many philosophers fail to recognize important differences between function and goal-directedness. Goal ascriptions "...state some outcome or goal toward which certain activities of an organism or its parts are directed." Goal ascriptions he contrasted with "function ascriptions." Function ascriptions, he says, identify the actual effects or activities of some entity. Nagel admitted that "[s]ome biologists use the words 'goal' and 'function' interchangeably ... possibly because the distinctions are not relevant to the tasks on which they are engaged" (199).

Nagel is right to point out, among other things, that goal ascriptions imply intentionality in the goal-directed entity much more strongly than do function ascriptions. However, in emphasizing the effects of functional entities, his theory is inadequate in accounting for entities that have a function that they are unable to perform.

Goal-directedness—aiming at something—is important to understanding biological function, because what fails to perform its function fails to reach a goal. Depending on what theory of biological function we adopt, we might think it impossible for biological entity E to have the function of  $\phi$ -ing unless some, or even many, Es have succeeded in  $\phi$ -ing in the past. However, it is certainly possible that a particular E has the function of  $\phi$ -ing even if it has never succeeded at  $\phi$ -ing. Obviously,

a heart does not aim at a goal in the same way that I do. However, we evaluate it as if it did.

### The Unity of Science and the New Biology

Biologists and medical scientists faced with the philosopher's tale tend to be indignant and bemused. They tend to be bemused by the fuss philosophers make over functions and goal-directedness. These they find obvious and relatively unproblematic. They are indignant in the face of the picture of the special sciences portrayed in A Philosophical Tale I.<sup>7</sup> Surely philosophers have noticed that biological sciences no longer have their own set of terms, terms wholly distinct from those of physics and chemistry! Modern genetics and pharmaceutical research, to name just two areas, make extensive use of chemical terms and types, just as orthopedics makes use of physics.

Biological scientists also take issue with the claim that their science is one of exception-prone principles. Once we allow them the use of physics and chemistry, explanations of failure of function come clearly into view. For instance, we can explain disruption of neural transmission, a biological function, by citing the presence of plaque, by noting a physical tangle in the neural structure, or by identifying a mutation or trauma.

All of this suggests that science is unified much more strongly than Fodor's picture of the special sciences would suggest. When scientists are entitled to whatever terms they need to solve problems that interest them, disciplinary distinctions become more an indication of the administrative structure of the university than of anything else. Indeed, with some prompting (a chemist of my acquaintance would admit that he accepts this view only after I promised not to tell his undergraduates), one can get some scientists to say that there are no really distinct scientific disciplines and that, instead, there is *just science*.

There is still something to say about the character of medical science even if medical science is simply part of a broader enterprise called science. The explanatory options regarding disrupted neural transmission are far simpler than our understanding of what causes most diseases. The epidemiologist's explanations commonly cite a number of factors, tendencies, and probabilities. Paul Thagard (2000) identified

these as instances of what he called “causal network instantiation.” “Causal network” refers to multiple interrelated factors. “Instantiation” occurs when we assign roles to some combination of these factors in an effort to explain the etiology of a particular patient’s condition (Thagard 2000, 254). In this picture, explanation of disease is not deductive or statistical; neither does it cite a single cause. Instead, it “produces a kind of narrative explanation of why a person gets sick” (Thagard 2000, 271), which makes reference to the patient’s relationship to some of the factors in the causal network (that commonly have only probabilistic causal connections to the disease explained). The causal network may cite factors using the language of physical, chemical, genetic, psychological, or environmental science.

However, even if there is just science and we are able to fill in *ceteris paribus* conditions of biological generalizations with physical and chemical explanations, normativity still plays a central role in biological (and perhaps some other) quadrants of science. Indeed, even Thomas Szasz (2000), a stalwart defender of the objective character of physical disease attributions, wrote, “Bodily diseases, conventionally defined, are undesirable [sic] deviations from objectively identifiable *biological norms*.”<sup>8</sup> If the philosopher’s tale helps bring philosophers to accept the legitimacy in science of the kind of normativity I have been describing, perhaps it was worth annoying the scientists a bit.

### Normativity and Concepts of Health

Our philosophical tale was intended to show that talk of functions and goal-directed activity is a legitimate part of legitimate science. The significance of this is that we need not be prejudiced against normative theories of health, even if we are looking for a theory that can be part of science proper.

Four positions are available with respect to the role that normativity plays in health. First, some theories suggest that certain states are healthy and hence intrinsically valuable. They identify certain states as healthy and hold that the status of these states as healthy makes them desirable (good, ideal, or valuable) in themselves, and not just because they are useful as a means to another valued end. For such theories, certain con-



ditions have intrinsic value, value that is not dependent on a particular community or individual.

According to these intrinsic normativity theories, the value that healthy states have is different from the value certain states may have due to contingent, even accidental, facts of agreement among individuals. For instance, we could imagine a world at which having long hair is universally valued because it is part of the socially constructed aesthetic of every society at that world. At such a world, having long hair would have value, not intrinsically, but because of societal agreement, which is extrinsic to hair length. This contrasts with the value attributed to healthy states by intrinsic normativity theories. One example of a state often believed to hold intrinsic value is the state of being alive. Many people believe that human life is valuable in itself, that being alive is always better than the alternative. They believe that human life has value even if no one recognizes that it does. Another familiar view that attributes intrinsic normativity to certain states is the Aristotelian view that such a thing as “the good” exists for human beings.<sup>9</sup>

A second type of theory posits that healthy states do not have intrinsic normativity, but are nonnormative. According to these nonnormativist theories, whether a system is healthy is neither good nor bad. In this view, people may value health for any number of reasons, but the value is independent of what states are healthy. That is, a value that health has is merely the result of people wanting to be in healthy states in order to get something else. In such a view, the value of health is like the value of gold. Gold is not intrinsically valuable; we want more gold only because of the things we can buy when we have it, and in many situations it would not be valued at all. However, whether it is valued does not affect whether it is in fact gold. Whether a given metal nugget is gold is a matter of chemical fact that by itself carries no evaluative force. Similarly, the nonnormativist wants to say that whether a given state is healthy is a matter of biomedical fact that by itself carries no evaluative force. Nonnormativist theories claim scientific objectivity.

Relativist theories, the third type, propose that whether a state is healthy depends entirely on whether it is considered healthy by the relevant individual or group, and not on anything intrinsic to the state itself. These theories involve what we might call *extrinsic normativity*. (It is

conceivable that the extrinsic determination of health would be value free. A theory that proposed this would be nonnormativist. We will not consider such theories here, and reserve the term “relativism” for normativist theories.) In relativist theories, an extrinsic determination is entirely responsible for whether the state is healthy.

Note how relativism about health differs from nonnormativist and intrinsic normativist theories. Our example of the world in which long hair is a universal but socially determined value is useful for exploring what a relativist might say. Suppose that having long hair is considered healthy in all communities at this world. The relativist might say that what makes having long hair healthy at this world are the contingent values of the communities, that any community might have had different values, and hence having long hair *would not be healthy* in communities (at other worlds or at ours) that did not value it in this way. Following the conventions of ethics, we may call those theories *relativist* that hold that relevant values are those of an entire community, and *subjectivist* that hold that relevant values are those of the individual.

However, even if what counts as health depends on what individuals or communities contingently value, that does not mean that the definition of health has to advocate some values over others or accept a view in which health is valuable only instrumentally or extrinsically, if at all. I want to propose a theory of a fourth kind, a theory of health that characterizes certain states as being valuable neither intrinsically nor merely because they are useful, but rather because of their being in an appropriate relationship to an individual’s actual values. By building variability into the theory in this way, such a view can accommodate variations in human goals that are recognized by the relativist and also take into account the important intuition that health is intrinsically good. Such a view might claim that certain states are healthy not in themselves but because they allow an individual to reach actual goals. We do not say that *a healthy state is valuable* because it allows us to reach or strive for goals, but rather that *a state is healthy* because it allows us to reach or strive for our goals. For want of a better term, I call this approach *embedded instrumentalism*.

Chapter 2 explores embedded instrumentalism in detail and defends a particular theory of health. In preparation, it is prudent to examine

other theories of health so that we may become familiar with the territory.

### Boorse on Disease and Illness

Christopher Boorse's (1977) biostatistical theory of health is the most widely discussed theory in the literature. In broad strokes, it states that health is statistically normal biological functioning. That is, a system is healthy if it is performing its biological functions well enough to count as typical for what Boorse calls its "reference class."

Boorse's full account goes as follows (1977, 555, 567):

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.

The reference class is a set of actual organisms. They must be of the same gender as the organism whose health is being evaluated because different genders have different sets of biological functions; they must be of the same age group because certain functions (e.g., growth) are different at different ages, and also because this allows us to avoid applying the term 'disease' to normal changes due to aging.

Having identified the (nonnormative) statistical normality concept of health as the one applied in medical theory, Boorse suggested that the concept of health applied in medical practice is related but different. It is set in contrast to illness rather than disease, where ". . . illnesses are merely a subclass of diseases, namely, those diseases that have certain normative features reflected in the institutions of medical practice" (1975, 56). Those diseases not treated in medical practice as bad are not illnesses.

Boorse is not the only one who embraced a distinction between disease and illness, with emphasis on the distinctively normative character of illness. Helman (1981) accepted the distinction as is. He and Mordacci and Sobel (1998) distinguished between disease and illness in a different but somewhat parallel way; Fulford (1989) maintained that diseases form a subset of illness rather than vice versa. Another approach, taken by Culver and Gert (1982), proposed that the concept of a malady is the most promising for explicating the normative aspect of health-related concepts.

Boorse's analysis of the theoretical concept of health (opposed to disease) is nonnormative. No values are involved in one's place in the distribution of biological measures. Like its theoretical counterpart, Boorse's clinical notion of health (opposed to illness) also does not attribute intrinsic value to healthy states. As it tells us that whether a state is unhealthy depends on (extrinsic) negative valuation in the practices of the medical community, it is a form of relativism. A remarkable feature of the theory is the claim that no condition can be an illness that is not also a disease.

Boorse's biostatistical theory is attractive. It seems to allow for an objective, scientific view of medicine and explains both the normativity and variability of diagnosis and treatment. Several compelling objections have been raised against it, however. Lennert Nordenfelt (1993a, 279) highlighted four. First, it is not adequately prepared to deal with the truly "great variation of normal values. . . ." Second, it does not consider how some organisms can maintain health by compensating for a lack of function in some area: "a subnormal value of a particular function can be compensated for by a supernormal value of a neighbouring function with the same net result." Third, the biostatistical theory does not allow for environmental factors affecting an entire population. (This objection was addressed in Boorse 1975.) Fourth, Boorse uses normative language in describing and developing his putatively nonnormative account of health.

Whereas others commenting on Boorse's theory have taken issue with the absence (or presence) of normativity (cf. Engelhardt 1996, chapter 5) and the emphasis on systems and mechanisms rather than on whole persons,<sup>10</sup> I want to draw attention to Boorse's concept of a

“reference class.” My concern is not with the general idea that health might be some relation to a comparison class. Rather, it is with the role of a comparison class of actually existing organisms. Consider the following passage:

... 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. (Boorse 1977, 557)

While admitting that there may be no disease-free crocodile, Boorse suggested that the distribution of levels of functioning among systems in the actual crocodile population is such that the composite idea of a croc with average levels of functioning for each of its systems will allow us to draw conclusions about what constitutes a normal crocodile.

This theory is meant to invoke species design. In fact, Boorse writes that “Our interest in species design is that we wish to analyze health as conformity to it” (Boorse 1977, 558). Boorse did not see that taking statistical normality to indicate species design is an illicit inference from a fact to a value. This is presumably because he did not see species design as determining a value. However, species design is not value neutral. It indicates how something is supposed to be; it involves normativity. We may not mind when certain things deviate from how they were supposed to be, but this does not take away from the fact that they were supposed to be a certain other way. But if we want to talk about species design, we are immediately introducing the possibility, even the likelihood, that members of the reference classes identified by Boorse may deviate from the ideal in such a way that their internal states are *all, for every member of the class*, impaired.

The nonnormative statistical variety of normality yields a specimen that is ideal in the sense of being a composite rather than an actual member of the reference class. But we should not confuse this sort of ideal with the normative sort. Even if Boorse did not confuse these two senses of ideal, he did seem to confuse the epistemological and the metaphysical. I say this because his theory makes more sense if we think of the reference class as *evidence for claims about normality*, than if we think of it as being *that on which normality supervenes*. Constructing a concept of an ideal crocodile based on an examination of statistically

typical states of a reference class of crocodiles may be the best way to generate justified beliefs about the species design of crocodiles. And this may be so even if, as I suggest, being the statistically typical croc and being a croc with systems that perform as designed are quite different concepts. We only hope (for the crocodiles' sake at least) that they coincide in the actual population.

Given that these two ideals may not come together in the actual case, we might imagine how we might respond if they in fact did not. For instance, perhaps 60 percent of the reference class has gastric ulcers, which impair digestive function. We can specify that these ulcers are not the kind enabled by infection, so they do not count as caused by an environmental agent. In this case we would reject the usual reference class as inappropriate for helping us to determine the ideal specimen and look to some other reference. So it seems that the ideal relevant to our judgments about health should not be the reference class of actual organisms (as Boorse would have it), but rather that our judgment about what constitutes the appropriate reference class is determined by the ideal. And yet it is unclear how we are to determine the ideal without some reference to actual organisms.

Boorse thought that he avoided objections such as mine, generally the problem of universal diseases (he did not claim to have solved the problem of universal genetic diseases), by distinguishing in part 3 of his definition between internal states and external agents (Boorse 1977, 566–67). However, there is no principled way to distinguish between internal and external. Are viruses internal or external? What about bacteria such as *Escherichia coli* that exist in normal symbiosis with humans in certain parts of our bodies but are unhealthy when present in other parts? Consider mitochondria, which are thought to have arisen from intracellular parasites that have become symbiotic with us. Problems with mitochondria are responsible for macular degeneration—is this an external or internal condition? In addition, internal states would include problems with expression of genes even when the genes themselves are normal. Such congenital defects are not genetic diseases. So it seems that universal genetic diseases are not the only conditions that cause difficulty for Boorse's definition.

### Fulford's "Reverse View"

In *Moral Theory and Medical Practice* (1989), Fulford defended what he called a reverse view of disease and illness. One of his main concerns was mental illness. He acknowledged the dominance of views, such as those of Boorse and Szasz, according to which the legitimacy of mental illness rests on the degree to which it is analogous to the presumably more objective and scientific notions of physical illness and disease. As we have seen, Szasz, Boorse, and others who wanted to eschew relativism by holding tight to science took dysfunction and (physical) disease to be the central and most logically basic concepts in medicine.

Against these views, Fulford contended that illness is in fact the more central concept:

... for patients, at least, the logical priority of 'illness' ... corresponds with the actual *experience* of illness; for the complaint normally precedes the diagnosis of the complaint; knowledge *that* something is wrong normally precedes the question *what* is wrong, let alone questions about possible *causes* of what is wrong. (70)

In ordinary usage, Fulford noted, disease terms "would be used typically ... to say *what* is wrong with someone who is ill" (63). This reverse view of the relationship between disease and illness does accord with a common sort of clinical experience: one feels ill and reports to the doctor to find out what is wrong. The frequent repetition of this course of events lends credence to the reverse view. Of course, the person may be wrong about whether he is ill. For example, he might mistake a benign mole for a cancerous one.

Another sort of clinical experience, raises questions for the reverse view. In some cases an individual goes to the doctor because of a condition that the physician agrees is statistically abnormal (and thus a disease in Boorse's account) but does not require treatment. Consider, for example, a young person in late adolescence who is experiencing a late growing episode, or a twelve-year-old who is growing at a rate that is slower than normal. Such a youngster could leave the clinic believing that he was somewhat unusual but not ill or diseased. Fulford's reverse view, although insightful, may not characterize all medical encounters quite accurately.

Another important aspect of Fulford's theory is his understanding of illness in terms of *failure of ordinary action*: "... failure of ... 'ordinary' doing in the apparent absence of obstruction and/or opposition" (109). This failure can include the simple inability to do something (such as move one's arm) or failure of one's beliefs and desires to work together into a coherent set of reasons for action that allow one to navigate the world (as in the case of schizophrenia and certain other psychological illnesses; see Fulford 1989, chapter 8). The emphasis on *ordinary* doing allows Fulford to distinguish between illness and disability, where disability is a state affecting what one can ordinarily do (see Fulford 1989, 125).

This theory has several features that should be highlighted. In identifying illness (the notion that something is *wrong*) as the most basic concept in medicine, his account is normative. Emphasis on the role of action accounts for three other important features. First, it draws attention to the patient as a conscious, whole person rather than just a body with systems that may or may not be functioning to species-typical levels. Second, the emphasis on action builds in a wide range of variability in states that will count as unhealthy due to the wide range of things that people "ordinarily" do. We see, also, that Fulford's theory links health to goal-directed activity. Ordinary action involves trying (and succeeding) to do something that one at least minimally wants to do.

## Conclusion

This chapter defended the legitimacy of teleological terms such as "function" and "goal-directed" in medical science and related them to the concept of normativity. Our four-fold taxonomy of the roles that normativity can play in a theory of health helped shape our exploration of Christopher Boorse's influential biostatistical theory and K. W. M. Fulford's reverse view. Normativity, goal-directedness, and biological variation arose as central to biological science and hence to theories of health. These concepts will play important roles in the theories discussed and defended in the next chapter and, indeed, the rest of this book.