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Four Basic Concepts of Medical Science

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It might be thought that the basic concept in medical science is that of health. However, as it turns out, medicine has little or nothing to say about health. (This is less true of some of the other health sciences and health professions, notably nursing and public health.) Instead it is diseases, injuries, impairments, and, to a lesser extent, symptoms which are the focus of concern in medicine. It is a generally recognized and frequently bemoaned fact that in this country, contemporary medicine and medical education largely ignore, not only the promotion of health, but even the prevention of disease and injury.² (Medical educators are among those most acutely aware of this situation.) Instead, medicine is principally concerned with the diagnosis and treatment of medical crisis.

It is small wonder that in explicating the concept of health as it is found in the theories which inform the practice of medicine, Boorse ([1],[2]) arrives at a negative notion, viz., *health as the absence of disease and injury*. While a negative notion does do justice to the concept of health in contemporary medical theory, that tells us more about contemporary medicine than about health. Furthermore, I shall argue that contrary to what Boorse says, the concepts of disease, injury, and impairment found in medical sciences *are* value-laden; I propose an original account of the nature of the normative component in each of these concepts, and one which I believe is more precise than that offered by Margolis and Engelhardt, although in much the same spirit as theirs.

1. Diseases

Diseases, unlike injuries and impairments, are *processes*. The assumption underlying medical theory and practice since Thomas Sydenham has been that these psycho-physiological processes fall into certain natural classes or species, called "disease entities." As I have argued elsewhere, the criteria used for the classification of disease

prominently includes information regarding prevention and treatment [16]. Now I do not wish to argue, as Engelhardt sometimes has, that to call the processes going on in someone "a case of disease" is to say that it is necessarily, or even *prima facie*, something which it is against the person's interest to have and/or which imposes a therapeutic imperative on others ([5], pp. 102-3).³ Rather, the centrality of information regarding prevention and treatment in disease classification shows that to call something a case of disease is to say that it is an instance of the *sort* of psycho-physiological process that people *wish to be able* to prevent or terminate. (By "people" I always mean the members of some human society because, like many others, I do not believe that a person can be defined in purely biological terms.) According to this account, *disease* is a value-laden concept, the decision to regard some process taking place in a particular person a case of a disease does not carry with it the presumption that it is against the bearer's interest to have that process. The full definition of human disease which I offer is the following:

A disease is any type of psycho-physiological process such that:

- 1.1. People *wish to be able* to prevent or terminate the process because it interferes with the bearer's psycho-physiological capacity to do those things that people commonly wish and expect to be able to do;
- 1.2. Either the process is statistically abnormal in those at risk or people have some other basis for a reasonable hope of finding means to prevent or effectively treat the process; and
- 1.3. The process is not also *necessary* for doing anything that people commonly want and expect to be able to do.

The first thing to notice about this definition is that it makes the extension of the term "disease" *relative to societal context* in being relative to what people are understood as wanting and expecting to be able to do. However, since the determination of what processes are statistically abnormal is independent of societal context, a process which qualifies as a disease by the first and third criteria, but which is ubiquitous in those at risk in a given locale and thus is not recognized as a disease by cultures within that locale, will still qualify as a disease. Thus the judgment as to what types of processes constitute disease depends on a value judgment of the societal group, *rather than* upon either the judgment of the person afflicted, or simply upon the judgment of the professional whom the society has charged with developing and applying preventive and therapeutic measures (although it is the latter who provide expert testimony about point 1.2 above).

Notice that this definition shows the concept *disease* to be value-laden in a very different way from another class of value-laden concepts, concepts such as that of a misfortune. Diseases, like forest fires and automobile accidents as well as injuries and

impairments, are the *types* of things which people wish *to be able* to control in certain ways. With all things of the foregoing types we are particularly interested in being able to prevent, combat, eliminate, terminate, lessen, etc. such things, and it is for this reason that we regard the valuation involved as negative. However, although people do wish *to be able* to prevent, terminate, etc., things of this type, they do not wish to exercise that ability in every case. Although every case of a misfortune is necessarily something which is counter to the interests of its bearer, it may be in the interests of a particular individual to have a case of some disease or to bear a particular injury or impairment. For example consider the good fortune of contracting cowpox when smallpox threatens and there is no safe smallpox vaccine. Other examples will be discussed in the section on impairments. The point I wish to emphasize is that the desirability of *being able* to do something does not imply even a *prima facie* case for desirability of doing. Thus a person's desire *to be able* to drive his or her car long distances does not lead to even a *prima facie* presumption the person wishes to actually make any long trips by car.

You may also notice that the above definition applies only to human disease. I have confined myself to human disease because I agree with Engelhardt that the criteria for human and non-human disease are different. In the case of non-humans (non-humans that we do not anthropomorphize), it is necessary that a psycho-physiologic process threaten the survival of the individual or species *and* be statistically abnormal in order for it to count as a disease [5].

In contrast, when we consider human diseases, we count as diseases some processes which are statistically *normal* in those at risk. Furthermore, medical science has come to classify as diseases, processes which were previously considered normal. Consider especially those universal or near universal changes which in former times were considered to be normal consequences of aging, and which now are regarded as diseases in spite of their universal presence in older people.⁴ In some instances the processes were seen to bear some resemblance to others which we already termed "diseases" when they occurred in younger people, in other instances, such as arteriosclerosis, increase in severity led epidemiologists to focus on the causes of this change and hence to raise the possibility of delaying or retarding the progress. In all cases *we came to think of the process as one which we might be able to prevent or treat*, and therefore no longer a necessary feature of the human life cycle. In terms of the foregoing definition of disease we came to regard the conditions outlined in criterion 1.2. as having been met.

Boorse tries to handle the distinction between disease and the consequences of aging with a distinction between processes which are internally caused and those which are externally caused, but this distinction does not help because, except in the case of a few genetic diseases, both internal and external factors are always involved. As I have argued elsewhere, those environmental

contributions which are *counted* as causes are the ones that serve our instrumental interest [16]. My point is illustrated by the fact that a number of the changes which *continue* to be regarded as due to age are due, at least in part, to living in earth's gravitational field over a long period of time, but since we believe that the strength of the gravitational field is not subject to our manipulations, we do not mention it as a cause.

Cases of changed status (from non-disease to disease) contrast with those cases in which medicine simply erred in its construal of the causal links between various signs, symptoms and other processes. Such errors occurred when it was thought normal for a woman to cough blood at the time of menstruation (so that many cases of TB in women went undiagnosed until the advanced stages), or that masturbation caused insanity [6].

I shall return to the subject of the descriptive and normative components in the concept of disease in a moment, but first I wish to define two notions which are similar to, but distinct from, that of disease. These are injury and impairment.

2. Injury

"Injury", "trauma", or "wound" are all synonyms. Any process which is triggered by the infliction of a wound is either a healing process or a disease process (e.g., a staphylococcal infection) or some combination of the two. In either case the process is *not* conceived as intrinsic to the wound or injury. However, although it differs in its descriptive component the concept of injury is value-laden in exactly the same way as the concept of disease.

I define an injury, trauma, or wound as any type of psycho-physiologic change⁵ such that:

- 2.1. People wish to be able to prevent or correct it because it interferes with the bearer's ability to do those things that people commonly want and expect to be able to do;
- 2.2. People have some reasonable hope of being able to prevent it or to make its reversal more rapid or complete; and
- 2.3. Is not necessary in order to be able to do what people commonly want and expect to be able to do.

3. Impairment

It is useful to employ certain frequently used distinctions among the concept related to those I am discussing. For example, Mervyn Susser offers the following distinctions with which I am in general agreement:

Disease is best thought of as a process that creates a state of physiological and psychological dysfunction...[in] the individual. *Illness* is best thought of as a subjective state, a psychological awareness of dysfunction, also... [in] the individual. *Sickness* is best thought of as a state of social dysfunction, a social role assumed by the individual that is defined by the expectations of society and that, thereby, affects the state of his relations with others. Impairment, disability, and handicap are analogous terms, but they are not synonyms either. They refer to established, stable and persisting states rather than to unstable evolving processes. *Impairment* refers to a persisting physical or psychological defect in the individual. *Disability* refers to persisting physical or psychological dysfunction, also confined to the individual. *Handicap*, like sickness, refers to persisting social dysfunction, a social role assumed by the impaired and disabled individual that is defined by the expectations of society. ([15], pp. 4-5).

One may have a few qualms about the fact that what frequently is impaired in an impairment is an ability, so that to keep the contrast with disability one might wish to substitute the term "defect" with its connotations of attendant structural abnormality. However, to do this would be to ignore the fact that it is in terms of impaired *ability* or *function* that many such impairments or defects are identified. The underlying anatomical or physiological conditions may or may not then be discovered. Sterility is a convenient example. Various anatomical anomalies (including some which are intentionally created) may underlie sterility. Moreover a number of diseases and disorders have sterility as a sign or symptom (e.g., starvation, Simmond's disease, anemic debility, and various uterine, ovarian, and testicular diseases). Given a person who complains of sterility, the problem is to decide if the sterility is a manifestation of a disease process or whether it is due to a stable (though perhaps correctable) anatomical defect (and hence an impairment), or whether it is due to a temporary anatomical change such as inflammation due to injury. (The case for underlying injury is more plausible if we take blindness, lameness, or amnesia, rather than sterility, as our example.) It is the failure to distinguish diseases from impairments and injuries which underlies Boorse's peculiar proposal to count sterility as a disease (along with such items as gunshot wounds and "general crushing") ([1], pp. 550-551). Sterility is first and foremost the name of a sign or symptom.⁶ By extension the term is applied to the stable anatomical anomaly, if any, which gives rise to it. Since many, though by no means all, impairments go by the same name as manifestations of disease, any attempt to blur the distinction between disease and impairment threatens to obscure the distinction between diseases and their manifestations (i.e., their clinical and pathological signs and symptoms) - a distinction which medicine has been careful to make at least since the time of Sydenham.⁷ Furthermore, a blurring of the distinctions between the

terms "disease", "injury" and "impairment" leads one to underestimate the *descriptive* component in the meanings of these terms. I shall return to the sources of Boorse's error presently, but first let us consider the question of values in connection with impairments. I do agree that the normative component is the same in the case of the concepts of disease, injury and impairment. However, unlike Boorse, I think it is not null.

The definition which I offer of impairment is (predictably) the following:

An impairment is a persisting psycho-physiological anomaly such that:

- 3.1. People wish to be able to prevent or correct the anomaly because it interferes with the ability of the bearer to do what people commonly want and expect to be able to do; and
- 3.2. Is not necessary for doing what people commonly want and expect to be able to do.⁸

According to this definition, conditions like sterility will count as impairments even though they are states which some people undergo surgery to achieve. I take it as a recommendation for the present explication of the normative component over those of Engelhardt [5] [4] and Margolis [11] that it accounts for and explains why particular cases of disease, impairment, and/or injury need not be undesirable for their bearers. So far I have discussed disease, injury and impairment. Unlike Boorse, I claim that these concepts have normative (as well as descriptive) components even though there are circumstances in which it is to a person's *advantage* to have a given disease, injury, or impairment. I have explicated the normative element in the concepts disease, injury or impairment, to be that these are psycho-physiological processes and states which people (in some societal group) wish to *be able* to prevent, treat, or correct. Therefore, the society develops the means to do this.⁹ These means are embodied in the institution of medicine or healing which Fabrega [8] tells us exist within every human culture.

4. Diseases, Injuries and Impairments in Relation to Symptoms

Some cases of disease (and *mutatis mutandis* injuries and impairments) develop without symptoms. This asymptomatic period may or may not be succeeded by a period in which symptoms are manifest. If such an asymptomatic period follows a symptomatic period it is called the "latent stage." If it precedes all symptomatic episodes (episodes of illness or acute episodes), then the disease at that stage is alternatively termed "sub-clinical". Now it is clear that during the sub-clinical phase of a disease there will be no ill (or symptomatic) person to seek treatment.¹⁰ In cases of diseases which are asymptomatic during only part of their course, there is no problem

in explaining the desire to *be able* to prevent and treat them, a desire which I have proposed as one essential feature of disease. Let us consider those cases which are subclinical throughout their *entire* course and furthermore leave no significant effects except, perhaps, specific immunity. In these cases it is the fact that the process bears a significant resemblance to other cases (that is, cases of the same disease entity) which *do* have symptomatic stages.

It is a consequence of the definition of disease which I have offered that if an asymptomatic process in a given person were not sufficiently similar to processes which manifest symptoms at *some* stage to be considered a process of the same primary type or species, then we would *not* consider it to be a case of a disease. This has an interesting consequence that, in conformity with medical usage, all responses to vaccination which are typically asymptomatic are classified as non-diseases *in spite of the fact the body's response to the killed or attenuated organism is indistinguishable from its initial response to the fully virulent organism* in cases of the corresponding disease.¹¹ The response to the *virulent* organism typically is part of a process which is, of course, not entirely asymptomatic and that is the reason why the whole process is classified as a disease. But the fact that the initial physiological response to the fully virulent organism is considered to be the first (and sub-clinical) stage of the disease in question, while the *physiologically indistinguishable* response to vaccination is *not*, shows how far medical usage is from using the term "disease" in a way which is purely descriptive of physiological and anatomical changes. It may be clear that the concept of a disease is intimately related to the concept of an illness, and not definable in purely physiological terms as Boorse ([1], [2]) has held.

5. Diagnostic Categories and Medical Records

Boorse has pointed out that the standard nomenclature manuals include in their listing conditions which do *not* interfere with the ability to do what people commonly want and expect to be able to do. One example is the absence of an appendix. (Since Boorse does not distinguish diseases from injuries and impairments, he calls the absence of an appendix a non-debilitating "disease".) Boorse's mistaken belief that there are non-debilitating impairments or diseases arises from a misunderstanding of the nature and function of nomenclature manuals. He takes the latter to provide an inventory of all and only those conditions which are considered to be diseases (injuries and impairments). However their actual function is to provide a uniform system for keeping records. It is important to keep records of many anomalies even if they are not (as far as we know) impairments. For example, it is important to record the fact that a person has no appendix, if, during an operation, it is observed that this is the case. This will not only explain why no appendectomy was performed, but also rule out the diagnosis of "appendicitis" for any abdominal pain that a person may have in the future. It is of course also possible that we will come to recognize

functions of now apparently useless structures in the human body, so one might on principle wish to keep a record of all anomalies to be on the safe side.

The nomenclature manuals, both the 1962 *AMA Standard Nomenclature* which Boorse employs extensively, and the work that has replaced it for the keeping of hospital records in this country, the *Hospital Adaptation of the ICDA (H-ICDA)*¹² do in fact show some appreciation of the distinctions between diseases, injuries, impairments, and simple anomalies. It is true that these manuals do use two crude general heading "operations" on the one hand, and either "diseases" (*AMA Standard Nomenclature*) or "diseases and injuries" (the *H-ICDA*) on the other, but, as the *subheadings* under these general headings clearly indicate, not all that falls under the first is an operation, and not all that falls under the second is a disease (or injury).¹³

6. The Patient

Earlier I said that medicine is not very concerned with health. I was using the term "health" in what I take to be the fundamental sense. However, I recognize that the term is also used to mean merely the absence of disease, injury, or impairment, although this use is common only in the context of a description of the application of medical art, which is a further indication that this use arose by fitting the concept of health to the Procrustian bed of medical concepts. Consider, for example, the expression "restoring the person to health". The preceding account may be regarded as an examination of this so-called negative notion of health. It is, I claim, the only one which is a concern of somatic medicine, and medically-oriented psychiatry. It is this notion of health which is related to that of patient, where "patient" means the host, or *bearer* of a disease, injury, or in certain cases, impairment.¹⁴

There is another sense of "patient" which contrasts with the one I am considering; namely that of a person who, voluntarily or otherwise, has come under treatment by the healing institutions of the society and thus, to a varying extent, has assumed the sick role. It may be noted that in our society it is common for pregnant women to be patients in the second sense, the sense of interest to the social scientist, without being patients in the first sense, the sense which concerns us at the moment.

In view of the foregoing distinction between the two senses of patient, I wish to conclude by reiterating the role of socially recognized values in determining the extension of the term "patient" where the latter means simply the bearer of a disease or injury. According to the definitions of disease, injury and impairment offered above, the extension of these terms, and hence that of "patient" depends on what people do commonly want and expect to be able to do, the existing basis for a reasonable hope for prevention and treatment. Determination of these factors presupposes a context

of assumed knowledge and shared interests (and hence values). Thus the societal context is an important factor in determining the extension of the term "patient",¹⁵ but this is *not* because the social role determines the application of the term in the sense in which I have been discussing it.

Notes

¹I am indebted to Joseph Margolis for some very useful criticisms of an earlier draft of this paper.

²Well-baby care within general pediatrics is something of an exception. However, much of the preventive concern tends to focus on the prevention of specific disease (e.g., via vaccination) rather than the promotion of health which guards against a variety of diseases and injuries. I deal with the distinction between prevention of disease and the promotion of health at length in [18]. In that paper I sketch a theory of health and argue that contrary to what Boorse, Engelhardt and Margolis say, disease (together with injury and impairment) does not form the complement of the concept of health, but that disease and health are not even concepts of the same order, i.e., health does not represent one end of a continuum and disease (together with injury and impairment) the other. The conceptual relationships turn out to be much more complex so that for example health (good health) is compatible with a fair degree of disease, injury and impairment. Therefore I hold that while greater orientation towards prevention, and towards management of chronic disease is possible and desirable in medicine (and in fact exists in some other societies, see Sidel and Sidel, [13]), the primary practice of health promotion is most appropriately conducted by individuals and lay communities with access to the resources to pursue the task.

³In discussing the therapeutic imperative, Engelhardt may have been led astray by Parson's classical formulation of the ideal doctor-patient relationship and its attendant view of the sick role. ([12], p. 465). However, the obligation of the practitioner to treat the sick, i.e., those who have taken on the sick *role* is a fact about the social roles. In a similar move, Boorse conflates sickness and illness ([2], p. 61). For the distinction between disease, sickness, and illness, see Section 3. below.

⁴These are among the universal diseases which pose such a problem for Boorse's account. Roughly his approach is to say that disease is a psychophysiologic process which lowers one's functional capacity below the ability of those in one's reference class. His problem is in defining the reference class. He must include age or all babies would be counted as diseased, but then he is at a loss to account for the fact that some processes are counted as diseases in spite of afflicting all older people ([1], pp. 566-568).

⁵Some may find the notion of a psychophysiologic change somewhat vague, and prefer some formulation such as "change in tissue or psychic state", however, such formulations misleadingly suggest that there is some clear dichotomy between the psychic and somatic. The literature on stress is instructive in revealing inseparability of psychic and somatic changes. Elsewhere I have argued that the distinction between somatic diseases and those conditions which are with any justification called "mental diseases" is not very interesting [16]. I maintain that most diseases have both psychic and somatic manifestations and predisposing factors (Tay-Sachs disease is one of the few purely somatic diseases that comes to mind.).

⁶A single phenomenon may be both a sign and a symptom if it is both observable by the practitioner and experienced by the bearer. Symptoms include not only abnormal *sensations* but abnormal functioning or appearance. Symptoms which are apparent *only* to the bearer are termed "subjective symptoms". *Stedman's Medical Dictionary*, ([14], p. 1231).

⁷Elsewhere I have discussed at length the relation between a disease process and its manifestations [16].

⁸The definitions which I have offered of disease, injury and impairment have an obvious application in clarifying what is meant by the charge that some issue or area has been "medicalized". It is that some state or process or persisting condition such as pregnancy, social deviance, or feature of sexual behavior is treated as though it met the defining criteria for being a disease, injury or impairment.

⁹In another paper [10] we have argued that among the kinds of actions one can learn to perform are actions upon the self, although western culture primarily recognizes and supports the mastery of skills in acting upon the non-self. We argue that in particular the state of so-called "selflessness" sought in certain eastern traditions is better understood as the ability to act on oneself in such a way that one learns how to psychically disengage from ones projects (including ones modes of interpretation) without abandoning them as false or useless. (This state of "selflessness" has been argued to be the same as that of Jungian individuation or of Plato's "birth in beauty" [7] or of the end state in psychotherapy [9].) Suppose that this is so, and this state became one which people in western society commonly sought to attain and furthermore that some people seemed congenitally unable to attain it. Given this expanded repertoire of what people would commonly want and expect to be able to do, we would then come to regard such people as impaired, although their impairment might conceivably be of benefit to themselves in specific instances.

¹⁰ Strictly speaking, very minor, *non-diagnostic* symptoms may occur in the course of sub-clinical disease. Thus cases of infantile paralysis which manifest themselves in ways that are indistinguishable from a slight cold are termed "sub-clinical".

¹¹ I omit from consideration vaccinations which are typically followed by significant symptoms. Depending on the specifics of the example chosen there may be reason to consider some of these to be very mild cases of the disease. Of course it is always possible that some (correctly prepared) vaccine which typically produces no symptoms, will trigger symptoms in a given case. The disease in question may be anything from an allergic reaction, to encephalomyelitis and other neurologic lesions. As their names indicate, all of these diseases are distinguished from the diseases which the vaccination was designed to prevent.

¹² This work is in turn the World Health Organization's 1965 *International Classification of Diseases* and the Public Health Service's Eighth Revision of the *International Classification of Diseases*, *Adapted for Use in the United States*.

¹³ Considering the currently employed H-ICDA (which, in this respect too, is an improvement over the AMA work) we find that of the seventeen sub-headings, twelve of these are headings for what are properly termed diseases, a fact reflected in the presence of the word "disease" in the case of all but one, that sub-heading being "Neoplasms" (i.e., tumors). Two of the sub-headings are mixed diseases and non-diseases presumably grouped together on the basis of the specializations that deal with them. These are "Mental Disorders," and "Delivery and Complications of Pregnancy, Childbirth, and the Puerperium" (which includes such familiar non-diseases as "normal delivery"). The remaining three are, significantly, "Congenital Anomalies" (which includes, of course, those which are debilitating, i.e., impairments, as well as *simple* anomalies like absence of an appendix), "Signs, Symptoms, and Ill-Defined Conditions," and finally, "*Injuries* and Adverse Effects."

¹⁴ In cases in which it is not customary to expect to be able to correct the impairment, its bearer is often spoken of as a "disabled person" rather than a "patient".

¹⁵ The room for actual disagreement between societies about whether a person is a patient is likely to be relatively small when both societies are in possession of the same biological, psychological and sociological information about that person; a society that did not have (or recognize its) interest in the survival, reproduction and cooperation of its members would not survive itself.

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