

## DOCUMENT SUMMARY

This paper by Mary Tiles explores Georges Canguilhem's historical and philosophical examination of the distinction between the **normal** and the **pathological**. It critiques the modern tendency in **scientific medicine** to equate health with statistical normality, arguing that this overlooks the individual's capacity to adapt and establish new vital norms. The article presents Canguilhem's alternative definition of health as a margin of tolerance and the ability to overcome illness, challenging the purely quantitative and objective basis of modern physiology and medical practice.

## FILENAME

Tiles\_1993\_article\_normal\_pathological\_scientific\_medicine

## METADATA

Category: RESEARCH Type: report Relevance: Supporting Update Frequency: Static  
Tags: #philosophy-of-medicine #canguilhem #normal-pathological #scientific-medicine  
#health-concepts #nosology #foucault Related Docs: N/A Supersedes: N/A

## FORMATTED CONTENT

# The Normal and Pathological: The Concept of a Scientific Medicine

*Brit. J. Phil. Sci.* 44 (1993), 729-742

## MARY TILES

## ABSTRACT

In this paper it is suggested that Canguilhem's examination of the history of the distinction between the **normal** and the **pathological** contains material of relevance to current debates about the nature of medicine, in particular concerning the status of quantitative indicators as indicators of the need for medical intervention. His arguments against the equation of health with normality are presented, together with his own suggested definition of health and the implications of this definition for physiology and medicine.

The concept of norm is an original concept which, in physiology more than elsewhere, cannot be reduced to an objective concept determinable by scientific methods. Strictly speaking then, there is no biological science of the normal. There is a science of biological situations called normal. That science is physiology.

Canguilhem ([1978], p. 138)

This is the provocative conclusion which **Canguilhem** reached at the end of his doctoral thesis (published in 1943). When he returned to the same topic twenty years later (1963-6) this conclusion was not substantially altered, although it was nuanced by the introduction of consideration of the importance of the social environment of human beings, of the social conditions for the emergence of modern medicine, and the introduction of the concept of 'error' into pathology. These additions can be understood as a reaction to Foucault's work *The Birth of the Clinic*, which appeared in 1963 in a series edited by **Canguilhem**. Indeed there are many respects in which Foucault's work complements Canguilhem's. **Foucault** examined the historical period (late eighteenth and early nineteenth centuries) immediately prior to Canguilhem's starting point. Whereas **Foucault** was concerned with the period in which the epistemological field of medicine is reformed and restructured in such a way that the distinction between the **normal** and the **pathological** comes to be central in the constitution of the object of **scientific medicine**, **Canguilhem** was concerned with the nature of the discipline whose object is constituted in this way. The move toward a self-consciously **scientific medicine** goes hand in hand with a shift in the concept of **health** in which **health** is primarily identified with **normality**. As **Foucault** explains:

Generally speaking it might be said that up to the end of the eighteenth century medicine related much more to **health** than to **normality**; it did not begin by analyzing a 'regular' functioning of the organism and go on to seek where it had deviated, what it was disturbed by, and how it could be brought back into normal working order; it referred, rather, to qualities of vigour, suppleness and fluidity. which were lost in illness and which it was the task of medicine to restore. To this extent medical practice could accord an important place to regimen and diet, in short, to a whole rule of life and nutrition that the subject imposed on himself. This privileged relation between medicine and **health** involved the possibility of being one's own physician. Nineteenth century medicine, on the other hand, was regulated more in accordance with **normality** than with **health**; it formed its concepts and prescribed its interventions in relation to a standard of functioning and organic structure, and physiological knowledge once marginal and purely theoretical knowledge for the doctor-was to become established at the very center of all medical reflection when one spoke of the life of groups and societies, of the life of the race, or even of the psychological life, one did not think first of the internal structure of the organized being, but of the medical polarity of the **normal** and the **pathological**. (Foucault [1963], p. 35)

But why should these historical discussions, neither of them very new, be of any general concern or interest? Because in the present climate of debate about medicine in particular, and science and technology more generally, it is necessary to raise the question of the nature of claims to scientific status, not in order to discredit them, but in order to make the issues explicit. There can neither be a sensible response to the claims of alternative medicines, nor a sensible debate about the merits and disadvantages of high technology medicine if the scientificity of current, institutionalized medical practice is simply taken for granted in a dogmatic assertion, where the

technological and the quantitative are aligned automatically with the scientifically progressive. A reasoned, and indeed a scientifically rational, response requires a more critical and more concretely based understanding of what is, or could be, required of a **scientific medicine**. There has been, in recent years a return to placing more emphasis on 'healthy living' but we need to enquire about the concept of **health** involved here. With what authority can one be told by one's doctor that one ought to take medication to reduce one's blood pressure, ought to go on a fat-free, salt-free diet, eat oat bran, or whatever? There is, moreover, a prima-facie ground for thinking that there are here relationships and formations which are not well understood. The conception of a **scientific medicine** immediately brings with it the conception of a body of practice founded in theory, theory which is itself the product of basic scientific research. Yet it is this relationship which, like that between science and technology has, until recently, received little attention from philosophers of science, because it was presumed to be straightforward. To have realized that it is not straightforward is itself progress, but that does not mean that there is as yet any achieved understanding.

The straightforward picture of the relationship between basic scientific knowledge and the practice based on it is that the basic science gives objective, purely factual knowledge of the general laws governing a specific kind of phenomena. Practice involves dealing with particular situations in which these kinds of phenomena occur. The basic general laws can then be applied to the particular situations (universal quantifier elimination) to provide predictions of what will happen when given combinations of conditions are realized. This gives rise to purely factual hypothetical imperatives of the form 'If you want to do X, then it can be done by doing Y or Z'. Here it is assumed that the practical goals are set independently; science has nothing to say about which goals should or should not be selected. In other words it is the function of science to establish the facts, independently of all consideration of values. Since courses of action are directed toward ends dictated by values, these values must be supplied by individuals or societies, and it follows that no practice can be wholly scientific--there can be no science of what ought to be done in relation to a given range of phenomena. How then could the conception of a **scientific medicine**, a practice whose imperatives themselves have scientific status, ever arise?

However, a moment's historical reflection will show that this is the wrong question. The better question would be why haven't more questions been raised about the claims of medicine to scientific status, given the general climate of divorce between fact and value, theory and practice? For Plato and Aristotle it is quite natural to include medicine as a science alongside ethics, biology, and physics. In studying the good for man this must include his physical as well as his moral well-being. But when teleology is banished from science, the good for man, whether physical or moral, ceases to be a legitimate object of scientific enquiry. Science cannot, or is not supposed to, consider things as having ends, purposes or goals. It would seem that **health**, physical well-being, should go the way of virtue. That is has not is due to the assumption that it is possible to define physical **health** in purely physicalist, physiological terms via the distinction between the **normal** and the **pathological** (**normal** is healthy) without a whiff of teleology, hence the centrality of the **normal** and the **pathological** in an examination of the scientific status of medicine. **Canguilhem** says:

The ambition to make pathology, and consequently therapeutics, completely scientific by making them derive from a previously established physiology would make sense only if, first, the **normal** could be defined in a purely objective way, as a fact, and second, all the differences between the **normal** state and the **pathological** state could be expressed in quantitative terms, for only quantity can take into account both homogeneity and variation. (Canguilhem [1978]. p. 23)

The strategy required is clearly illustrated in Durkheim's discussion of the rules for distinguishing the **normal** from the **pathological**. He takes it that medicine is already established as a practice which is scientific in a way that few other practices are and seeks to regain the connection between theory and practice at the level of social and political action.

For societies, as for individuals, **health** is good and desirable; sickness, on the other hand, is bad and must be avoided. If therefore we find an objective criterion, inherent in the fact themselves, to allow us to distinguish scientifically **health** from sickness in the various orders of social phenomena, science will be in a position to throw light on practical matters while remaining true to its own method. (Durkheim [1895], p. 86)

Much of the credit for developing a methodology for experimental **physiology** and for the vision of a medicine which is scientific in the modern sense goes to **Claude Bernard**. The basis for Bernard's claim that **physiology** should be genuinely experimental was his vision of a universal determinism. There are laws governing living systems which are identical in kind with those governing non-living systems. These can only be discovered experimentally for, citing Bacon, it is only through experiment that we can come to a knowledge of those laws that increase our mastery over nature.

The intellectual conquest of man consists in diminishing indeterminism to the extent that with the aid of experimental method it wins ground for determinism. This alone can satisfy his ambition, for it is by this means that he extends and will extend more and more his power over nature. (Bernard [1865]. p. 196)

**Physiology** must then be experimental if it is to be the ground of technological intervention in and mastery over the phenomena of living organisms in general and of human beings in particular. Moreover, this vision of an experimentally based medicine is regarded as a final displacement of all values and all subjectivity from medicine.

experimental medicine is not a new system of medicine, but, on the contrary, the negation of all systems. In effect, the advance of experimental medicine will result in the disappearance from that science of all individual views, replacing them by impersonal general theories which will, as in other

sciences, only be a reasoned and regular co-ordination of facts furnished by experience. (Bernard [1865], p. 301)

It is this idea that both **Foucault** and **Canguilhem** seek to undermine, the idea that medicine is scientific in the sense that its object (both in the sense of goal and of object of knowledge) is subject to completely factual, objective, determination. Both utilize the history of medicine to demonstrate that its objective is not a natural 'given'. Here I am focussing on Canguilhem's argument's since these are designed to reflect directly on to medicine as currently constituted rather than on the conditions for its emergence. The interest of the strategies employed both by **Foucault** and **Canguilhem** lies in the fact that they do not seek to reinstate a rigid fact-value distinction. They do not argue that medical practice, centered on **health**, cannot be scientifically grounded because of the value-ladenness of the concept of **health**; i.e. they do not argue that the goal of medical practice is set independently of the medical sciences such as **physiology**, and could thus be altered without affecting the content or the methodology of those medical sciences. Rather, they are concerned to reveal the ways in which there are values intrinsic to and built into the very framework of the conception of medical sciences as linked to the possibility of a **scientific medicine**. Thus Canguilhem's arguments turn on an insistence on the specificity of the object (in the sense of object of knowledge) of the life sciences, which renders these sciences distinctive in character and makes it impossible wholly to assimilate them, either methodologically or epistemologically, to sciences such as physics and chemistry. This is part of a more general strategy to force a reconceptualization of the scientific and to move away from the positivist conception of science as wholly objective, factual, purely descriptive, etc. That medicine is not scientific in the positivist sense does not mean that it is discredited; it does mean that in so far as its practices have been shaped by an image of itself as scientific in this sense it is open to criticism, and it also means that its imperatives cannot claim the authority of absolute, factual backing; its claims to authority must themselves be re-evaluated.

Canguilhem's stated aim was to show the inadequacy of the principle of pathology which asserts that the morbid state of a living being is a simple quantitative variation on the physiological phenomena which define the **normal** state of the corresponding function. An outline of the issue he wants to address and the direction from which he approaches is roughly as follows. Throughout the history of the various specifications of the concept of **disease** there runs a common thread-**disease** is negatively valued; to be sick is to be harmful or undesirable or socially devalued in some way. Positive values attach to things like life, long life, the capacity for reproduction and for physical work, strength, resistance to fatigue, absence of pain, etc. From the physiological point of view what is desired in **health** is thus fairly obvious and this gives the everyday concept of physical **disease** a relatively stable basis. But medical science is not advanced by analysing this everyday concept of **disease**. Its task is to determine what are the underlying vital phenomena which lead men to call themselves sick, to determine their origins, laws of evolution and the actions which modify them. In specifying these phenomena the everyday value-laden concepts disappear, but the vocabulary of **disease** is still used because medical activity is essentially linked to patients and their value judgement via clinical questioning and therapeutics. A doctor is interested in



diagnosis and cure, where curing is taken to mean restoring a function or an organism to the norm from which it has deviated. He derives his conception of the norm from three sources—from **physiology**, as the science of **normal** man, from clinical experience, and from the representation of the norm which is dominant in the society within which he is working. Of these three, **physiology** is presumed to provide the ultimate court of scientific appeal. Modern **physiology** is presented as a canonical collection of functional constants and these are termed **normal** both in so far as they designate average characteristics and because they enter into the normative activity of therapeutics. Physiological constants are thus **normal** in both a descriptive and a normative sense. The question, as **Canguilhem** sees it, is whether it is medicine which converts a purely descriptive sense of norm derived from **physiology** into a biological ideal and thus (as the straightforward positivist picture requires) grafts on this normative element by making restoration of normal function its goal. In this case medical values would be superimposed on **physiology** to yield medical practice. Or is it that the normative element is already present in the physiological concept of the **normal** so that medicine derives from **physiology** a conception of what should be its aim, as envisaged by Bernard and the conception of a wholly **scientific medicine** (medical practice)? In this case **physiology** is already delivering scientifically determined medical goals in accordance with the positivist idea that technology should be the application of a science; **physiology** must throw light on pathology in order to establish and scientifically ground therapeutics; logically we can, on this view, only progress from experimental **physiology** to medical technology and practice. Canguilhem's argument will be to the effect that one cannot have it both ways. To the extent that **physiology** conforms to the positivist ideal of a science, it cannot determine medical goals and the debate about what are appropriate medical goals and appropriate procedures would have the status of ethical disputes. To the extent that **physiology** does deliver guidelines for medical practice it does not conform to the positivist image of science but is able to supply norms to medical practice only because medical practice has itself informed and directed the development of physiological conceptions, so leading to the incorporation of a normative component in the physiological conception of the **normal**.

Slippage is possible here because of an ambiguity in the concept of the **normal** between that which is usual and that which is as it ought to be. This ambiguity extends to physiologically based medicine, where the **normal** state designates both the habitual state of the organs and their ideal-ideal because establishment of the habitual state is the ordinary therapeutic aim. To make his case **Canguilhem** needs to argue that there can be no purely scientific (in the positivist sense) definition of the **normal** which would bridge the gap between theory and practice without relying on this ambiguity, i.e. a definition of **health** as **normality** is impossible. This requires argument both against definition of the **normal** in terms of an ideal of physiological function (attempted by Bernard) and against definition of the **normal** in statistical terms.

The case against defining the **normal** in terms of ideal physiological function, as suggested by Bernard, can be illustrated by reference to Bernard's work on diabetes. In describing this work **Canguilhem** shows how physiological understanding is gained, but from a perspective which eliminates the distinction between the **normal** and the **pathological** conceived as the distinction between **health** and **disease**. Bernard

showed that the sugar found in an animal organism is produced by that organism, which implies that blood sugar levels (glycemia) do not depend directly on sugar intake. The presence of sugar in the urine (glycosuria) is then shown to be a consequence of the rise of the blood sugar level above a certain quantity which serves as a threshold. Urine is considered as a product of renal secretion, and glycosuria as an excess of blood sugar (glycemia) pouring over a threshold. The difference responsible for glycosuria is purely quantitative; glucose production and renal secretion are qualitatively the same. In making this variation understandable at the physiological level it is explained in terms of the **normal** (law-governed) operation of physiological mechanisms. But when glycosuria is regarded as a major symptom of diabetes, the presence of sugar in the urine makes it qualitatively different from **normal** urine.

The problem with the descent to pure physiological mechanisms is that it leaves the qualitative difference between **normal** and **pathological** at the level of illusory appearance. What **Canguilhem** points out is that Bernard's conception of a **scientific medicine** grounded in **physiology** can seem possible because there are always two ways of looking at a physiological state. (i) It can be viewed as a simple summary of quantities, without considering questions of biological value; the body can be considered simply as a complex physical and chemical mechanism. From this point of view there is a natural continuity between **physiology** and physics and chemistry. But the physical and chemical state of a mechanism cannot be called healthy, **normal**, diseased, or **pathological**. '**Normal** and **pathological** have no meaning on a scale where the biological object is reduced to colloidal equilibria and ionized solutions' (Canguilhem [1978], p. 59). (ii) The physiological state can be viewed as one which has a qualitative value for the living organism, in which case there will not be a continuity between **normal** and **pathological** states.

Because **physiology** stands at the cross-roads of the laboratory and the clinic, two points of view about biological phenomena are adopted there, but this does not mean that they can be interchanged. The substitution of quantitative progression for qualitative contrast in no way annuls this opposition. It always remains at the back of the mind of those who have chosen to adopt the theoretical and metrical point of view. (Canguilhem [1978], p. 58)

To reduce the difference between a healthy man and a diabetic to a quantitative difference of the amount of glucose within the body; to delegate the task of distinguishing one who is diabetic from one who is not to a renal threshold conceived simply as a quantitative difference of level, means obeying the spirit of the physical sciences which, in buttressing phenomena with laws can explain them only in terms of their reduction of a common measure. (ibid., p. 58)

If **physiology** were to living bodies what astronomy, dynamics, hydraulics, hydrostatics, etc. are to inert ones then there would be no space left for pathology. There is no pathology of inert bodies.

Is a person to be treated as sick simply because his blood pressure deviates from a given norm, because his blood sugar levels are abnormal, because his cholesterol level is too high, etc.? Is failure to conform to the norm ground for medical intervention? These become pressing questions when such tests are used by insurance companies for the setting of rates for life and medical insurance. How are physiological norms to be determined? Bernard's view was that the physiologically **normal** is to be defined in terms of an ideal type realized in precise experimental conditions and was thoroughly opposed to use of statistical notions. But the notion of an ideal type as the type not merely from which explanations start but at which medical practice should aim already imports values. What guarantees that a mode of functioning, deviations from which can be explained by reference to interfering factors (the ideal function from an explanatory point of view), will coincide with the ideal at which medical practice should aim?

The more promising route for one concerned to obtain a scientifically respectable definition of the **normal** is to incorporate a use of statistics into the understanding of mechanisms and functions supplied by **physiology**. **Canguilhem** does not set his face against all use of statistical methods. He acknowledges that in biology it is necessary, in order to represent a species, to give norms which are empirically determined averages. But this determination of the **normal** (typical) members of a species by no means entails that every member of the species which deviates from those norms is abnormal. All real individuals will diverge in some degree or other from these norms; it is in this that their individuality consists and on which the possibility of evolution by natural selection depends.

This, however, does not rule out the possibility of a reverse connection— that averages may be viewed as the expression of norms. The human type- the average man-might be determined as being such that those who most closely resemble him are most common whereas those who diverge most are rare. The problem with this supposition is that the norms expressed in human averages may not be purely biological norms, but may be a reflection of ways of life, themselves an expression of human values.

If it is true that the human body is in one sense a product of social activity, it is not absurd to assume that the constancy of certain traits, revealed by an average, depends on the conscious or unconscious fidelity to certain norms of life. Consequently, in the human species, statistical frequency expresses not only vital, but also social **normativity**. A human trait would not be **normal** because frequent, but frequent because **normal**, that is, normative in one given kind of life, taking these words 'kind of life' in the sense given to them by human geographers. (Canguilhem [1978], p. 92)

For example, average life span, or post-natal mortality for infants up to five years depends on, amongst other things, the techniques of collective hygiene. provision of



medical facilities, etc. which in turn reflect the value attached to life by a given society. In this case the average life span is not a biologically determined norm. The average expresses social norms. This opens up the space of comparative anatomy and **physiology** alongside consideration of regional variations in relation to environmental, social, and life-style differences. For example, a study of Brazzaville natives revealed 66 per cent of them as hypoglycemic, with 39 per cent ranging from 0.9 g to 0.75 g and 27 per cent below 0.75 g. These are levels which would be considered grave, if not fatal, in Europeans, yet are withstood by African blacks without apparent disturbance and without convulsions or coma. The causes for the hypoglycemia could be found in their conditions of life, chronic undernourishment, chronic and polymorphous intestinal parasitism and malaria. The tolerance of it could then be seen as an adaption to these living conditions.

It follows from the views just outlined that a statistically obtained average cannot provide the doctor with a criterion of whether the individual before him is or is not in a **normal** or healthy state. 'We cannot start from it in order to discharge our medical duty toward the individual.' If tradition is to be believed, Napoleon had a resting pulse rate of 40 when in good **health**, yet the average for the healthy member of this species is around 70. The view which **Canguilhem** has been urging is that the **normal** is neither an average nor the reflection of a law of normal functioning, but is a norm which is capable of being transformed in the specific context of an individual member of the species and of his relation to the particular environment in which he lives. This means that at the level of quantitative generalizations the boundary between the **normal** and the **pathological** will necessarily be imprecise, even though it will be quite precise for each individual.

Thus **Canguilhem** concludes that the concepts of **normal** and average are to be regarded as distinct concepts. This is the negative claim. The positive theses concerning **health**, **physiology**, and medicine are founded in Canguilhem's view that values enter into the very constitution of the domain of the life sciences, not as elements which are arbitrarily or subjectively imposed on them, but as inherent in the object of study.

It is life itself and not medical judgement which makes the biological **normal** a concept of value and not a concept of statistical reality. For the physician, life is not an object, but rather a polarized activity, whose spontaneous effort of defense and struggle against all that is of negative value is extended by medicine by bringing to bear the relative but indispensable light of human science. (Canguilhem [1978], p. 73)

The basic fact on which **Canguilhem** insists is that there is no biological indifference. It is the framework of a biology of natural selection itself which introduces this valuation along with notions of adaptive value, selective advantage, and so on. The whole basis of the theory of natural selection is that the differences resulting from random variation are not all of equal survival value. Here it is the polarity of life and death which is the source of the value. This dynamic polarity of living beings finds expression in normative activity. There are healthy biological norms and **pathological** ones and they are not the

same. The definition of **health** must thus be one which (a) makes sense at the level of the individual and (b) is in full accord with the biological conception of man as a living being. **Health** is that which confers survival value, i.e. adaptability. It is also the feeling of being able to establish vital norms, of being able to cope with challenges presented. It is the ideal from which the image of the athlete derives its seductive power-she is one who can transcend the physiological limitation incorporated into the characterization of women. establishing and living by a new set of physiological norms. She is thus seen as an embodiment of biological **normativity**. (In this image the reality, the price paid for athletic specialization, is absent.)

Health is a margin of tolerance of the inconstancies of the environment...  
What characterizes health is the possibility of transcending the norm, which defines the momentary normal, the possibility of tolerating infractions of the habitual norm and instituting new norms in new situations.

To be in good health means being able to fall sick and recover, it is a biological luxury. (Canguilhem [1978], pp. 115-16)

**Disease** is then characterized as a reduction in the margin of tolerance for the inconstancies of the environment. Here it should be emphasized that the environment includes the totality of conditions which may affect an organism's functions and in the case of human beings this includes the social environment. The danger of diseases such as measles lies not in the threat which they immediately pose to the healthy person, but in their potential for reducing the person's ability to face other diseases the concern over measles is with the possibility of pneumonia and other complications. Similarly diabetes is not so serious if it is just glycosuria-but coma and gangrene are another matter. Hemophilia is not in itself life threatening, so long as traumatism does not occur-but in what range of conditions can that be assured?

What, now, are the implications of this definition of **health** for **physiology**?

**Canguilhem** has clearly rejected Bernard's definition of **physiology** as the science of normal functioning (i) because he has rejected the equation of **health** with **normality**, (ii) because he has rejected the idea that there can be any ontological grounding for the notion of normal functioning at the level of the biological type the level at which **physiology**, as a science dealing in generalization, would have to work, (iii) because he rejects the equation of the **pathological** with the abnormal. On his account of **disease** it involves the institution of new functional norms which are precarious in relation to change in environmental conditions. Once again the fundamental point is that **physiology** must be seen as a biological science, a science which has living beings as its object of study.

The laws of physics and chemistry do not vary according to **health** or **disease**. But to fail to admit that from a biological point of view, life differentiates between its states means condemning oneself to be even unable to distinguish food from excrement. Certainly a living being's

excrement can be food for another living being but not for him. What distinguishes food from excrement is no physico-chemical reality but a biological value. Likewise, what distinguishes the physiological from the **pathological** is not a physico-chemical reality but a biological value. (Canguilhem [1978]. p. 130)

Of what, then, is physiology the science? The answer suggested is that physiology is the science of stabilized modes of life, where modes of life are divided into two fundamental kinds:

- (1) those whose stability will not prevent them from being altered and re-established-the normal (normative) mode of life (normally functioning immune system-immunity);
- (2) those whose stability is tenuously clung to because disruption is threatening-the pathological (non-normative) mode of life, even though the stability expresses a kind of normality so long as the being is alive (pathologically functioning immune system-allergy).

It is not the job of **physiology** to look for an objective definition of the **normal**, but rather to recognize the normative character of life. The role of **physiology** would then be to determine exactly the content of the norms to which life has succeeded in fixing itself without prejudicing the possibility or impossibility of eventually correcting these norms. In so far as **physiology** works to determine the constants and invariants which define the phenomena of life and does so by scientific methods, it is a science in every sense. In so far as it looks for the vital significance of these constants, it goes beyond what is undertaken in sciences such as physics and chemistry. For to take this step involves considering life not as timeless and unchanging but as constituted by a polarized movement. The bio-chemist and the bio-physicist study matter from a different point of view than the chemist and the physicist. Moreover the biological point of view adopted by the physiologist is the point of view of a living being. The categories of **health** and **disease** are introduced into human consciousness because they are living beings; this consciousness is an expression of their experience of their own biological polarity.

The fact is that the physiologist's scientific activity, however separate and autonomous he may conceive it to be in his laboratory, maintains a more or less close, but unquestionable relationship with medical activity... The categories of **health** and **disease** are biologically technical and subjective, not biologically scientific and objective. Living beings prefer **health** to **disease**... The physiologist is often a physician, always a living man, and this is why the physiologist includes in his basic concepts the fact that if the living being's functions assume modes all equally explicable by the scientist, they are not for this reason the same for the living being himself. (Canguilhem [1978]. p. 132)

This brings us to the relation between **physiology** and medicine. The fact that human beings are conscious of and seek to understand and cure their own diseases is seen as

introducing an epistemological and conceptual structure for medicine which renders it distinct from sciences such as physics and chemistry, and even other branches of biology, for here the patient, or man as potential patient, is both subject and object of study. In this case to allow that the notion of **disease** must ultimately be tied back to the value judgments of the sick man is not to introduce a wholly illegitimate subjectivity, for it is the sick person who is also the object of knowledge so that his values are internal to the object of study and so form part of the object domain.

We think that medicine exists as the art of life because the living human being himself calls certain dreaded states or behaviors **pathological** (hence requiring avoidance or correction) We think that in doing this the living human being, in a more or less lucid way, extends a spontaneous effort, peculiar to life, to struggle against that which obstructs its preservation and development taken as norms. the fact that a living man reacts to a lesion, infection, functional anarchy by means of **disease**, expresses the fundamental fact that life is not indifferent to the conditions in which it is possible, that life is a polarity and thereby even an unconscious position of value; in short, life is in fact a normative activity. (Canguilhem [1978]. p. 70)

In other words, the expression of **disease** by a patient and its negative valuation have simultaneously a subjective and an objective status; the negative valuation is not introduced only in the patient's verbalization or in his or the doctor's conceptualization of his state but is present in the state viewed as the state of a living being which is being expressed through his behavior. This does not mean that the patient has an objectively correct or privileged view of the nature of his **disease** or even that human conceptualization determines what are vital norms. It is simply viewing verbalizations and conceptualizations as part of behavior expressive of and prompted by the disruption of vital norms. It does mean, however, that the business of the definition of **disease** should not be handed over to anatomy and **physiology**, rather, clinical practice, medical and surgical practice should have a continuing input into **physiology** and pathology. Medical practice cannot be grounded in an independently derived body of basic science. The conflict between physiologically and anatomically based definitions of **disease** and those derived from the experience of the patient is itself to be explained by reference to clinical practice. The doctor may be able to see a patient in someone who does not feel himself to be one on the basis of accumulated experience derived from those who have in the past presented themselves as patients and the results of diagnostic techniques performed on them. (An illustration of the way in which clinical and basic research interact in the production of physiological knowledge is provided in Star [1986].)

To summarize: the healthy state cannot be equated with the **normal** state. A person is healthy in so far as she is normative relative to fluctuations in her environment. Cure is the regaining of stabilized physical norms and is more or less effective depending on the robustness or fragility of the stabilization. But no cure returns the system to biological innocence; cures always involve the institution of new norms of life, sometimes superior to the old ones.

This emphasis on **health** as opposed to **normality** is of interest in the context of more recent debates concerning the character of medicine, where a positive concept of **health** has once again come to be pushed into the foreground. The problem is that it has re-emerged in two very disparate forms: as an ill-articulated and highly subjective concept, ill adapted for dialogue with, let alone for incorporation into the framework of, a medicine which sees itself as scientific; the other presenting itself as scientific, coming with quantitative tests and physiological explanations derived from statistical definitions of **normality**. Where medical care is financed by private insurance, preventive medicine is aimed at getting the majority of the population to conform to the norms of those who have in the past been statistically good risks for medical insurance companies.

**Canguilhem**, on the other hand, presents a rigorously articulated concept of **health**, one which is grounded back into the general framework of biological science and which incorporates the gains which have been derived from advances in our understanding of the internal structures, mechanisms and functions of living organisms. There is doubtless much here that can be criticized but, it seems to me, it does at least provide a starting point for serious discussion as well as a model for what is required of a critique of **scientific medicine** mounted with the aim of reconnecting the psychological, subjective awareness of **disease** with its medical understanding, and of resisting the downgrading of clinical judgment of individuals in favor of quantitative, technically sophisticated tests processed in large batches.