

## The Dialectic of Normality and Pathology: From Quantitative (An Epistemological Inquiry Positivism to Bionormativity)

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### Abstract:

For a long time, the biological sciences remained subject to the quantitative positivist approach based on experimentation and natural determinism, which reduced disease to merely a “quantitative change” or a statistical deviation from the normal average of the functions of organs, as was manifested in the theses of the pioneer of experimental medicine, Claude Bernard. This is what prompted Georges Canguilhem to reconsider the fundamental concepts of medical sciences and biology through criticizing the positivist approach and presenting new conceptions regarding how to approach vital and medical concepts, where medicine was no longer merely a therapeutic technique, but rather became a subject of philosophical and epistemological questioning. Hence, the problematic can be formulated as follows: how does biological normativity in Canguilhem become a tool for destabilizing the traditional concepts in the epistemology of medicine? And how did the idea of values contribute to the development of medicine in particular and the biological sciences in general? And what is the epistemological value of vital philosophy in light of the biotechnological revolution and digital transformations? We concluded by saying that Canguilhem founded a new epistemology in the field of biology based on the philosophy of biological normativity, which liberated biology from the dominance of experimental quantitative positivism, and which opened new horizons for investigating the problem of values or bioethics in light of scientific developments and digital transformations.

**Keywords:** biology, the normal, the pathological, vitality, positivism.

### Introduction:

The history of science in the twentieth century witnessed a radical transformation in the way vital and medical concepts were approached, as medicine was no longer merely a therapeutic technique but became a subject of philosophical and epistemological questioning. In this context, the French thinker Georges Canguilhem (1904–1995), a French philosopher, historian of science, and epistemologist who was concerned with epistemological issues in the field of medicine and biology among his most important works are *The Knowledge of Life*, *Studies in the History and Philosophy of Sciences*, and *The Normal and the Pathological*—occupies an exceptional position through his project based on the epistemology of life. He worked on reconsidering the fundamental concepts upon which medical discourse is based. At the

forefront of these concepts are the notions of health and disease, or more precisely the duality of “the normal and the pathological,” which for a long time remained subject to the quantitative positivist approach that reduced disease to merely a “quantitative change” or a statistical deviation from the normal average of organ functions, as was manifested in the theses of the pioneer of experimental medicine Claude Bernard, and in positivist philosophy in Auguste Comte.

Georges Canguilhem attempted to formulate a new conception of the duality of “health and disease” that carries a vital and epistemological philosophical meaning, taking into account the lived human experience, based on a vital philosophical vision that sees the living being as an active subject that produces its own norms and not merely a machine subject to rigid physical and chemical laws. “Human facts become disturbed if they lose the values to which they are linked, and life loses its nature if it loses the norms that constitute it” (Tawfiq Ben Waya, 2016). At this level, the normal and the pathological differ according to the vital and biological perspective. For him, disease is not the absence of a norm, but rather a “new biological normativity” experienced by the body in facing the challenges of the environment.

From here emerges the central problematic of this research in the following questions: How did Georges Canguilhem reconstruct the concepts of the normal and the pathological outside the quantitative and statistical standards of positivist medicine? To what extent can disease be considered a vital and normative experience in itself and not merely a deficiency or functional disorder? In other words: how does “biological normativity” in Canguilhem become a tool for destabilizing traditional concepts in the epistemology of medicine? How did the idea of values contribute to the development of medicine in particular and biological sciences in general? And what is the epistemological value of vital philosophy in light of the biotechnological revolution and digital transformations?

### **1- The concept of values in Canguilhem’s philosophy:**

The concept of values is considered one of the central notions in the philosophical and scientific project of Georges Canguilhem, as it is not possible to approach his vision of medicine, life, or science without understanding the nature of this concept. In the traditions of Western philosophy, values have long been associated with the ethical or aesthetic domain, and they have belonged to the sphere of “ought” in opposition to “is.” However, Canguilhem breaks with this dualistic conception by presenting a new approach that brings values back to the very heart of life itself, making them an essential feature of the living being, rather than an external “addition” imposed upon it.

This conception is based on a direct link between life and the creation of meaning, and it considers the living organism as the primary evaluative agent, which does not merely live, but evaluates life. Here, the vital act itself—such as resistance, adaptation, rejection becomes a value-laden act. Thus, epistemology is transformed from being merely an analysis of methods of knowledge into a philosophy of life that embodies a new normative perspective on science, medicine, and technology. (Canguilhem Georges, 1966)

## **2- Life as a source of values: towards a biological relativism:**

In his seminal work *Le Normal et le Pathologique*, Canguilhem argues that a true understanding of concepts such as “health” and “disease” can only be achieved if we understand that these concepts are not external objects, but arise from the experience of the living being. Health is not an “objective state” but a capacity for adaptation. This is what makes the living being not merely a biological organism, but a valuating being. Canguilhem says: “The living is not only that which lives, but that which judges the conditions of its life, accepts them or rejects them” (Canguilhem Georges, 1966).

This means that vital values are not merely cognitive reflections or conscious moral choices, but are part of the internal structure of the living being. This is what Canguilhem calls the “normative function of life” (*la fonction normative de la vie*), meaning that the living being does not merely exist, but produces its own norms within its own conditions. Disease, in this context, is not a deviation from an external natural model, but the capacity of the living being to create new equilibria.

## **3- Biological normativity in Georges Canguilhem’s epistemology:**

The analysis by Georges Canguilhem of the concepts of health and disease represents one of the most important philosophical contributions to the epistemology of medicine and biology in the twentieth century. It is based on the idea that “the epistemology of life sciences requires living categories that accompany it, whether in expressing its discoveries or in recording its history.” Many scholars believe that Canguilhem was inspired by the concept of biological normativity in understanding life from the German neurologist Goldstein, from whom Canguilhem borrowed this idea (Tawfiq Ben Waya, 2016). This idea is defended by one of the researchers of Canguilhem’s philosophy, J. Gayan, in *The Concept of Individuality in G. Canguilhem’s Biological Philosophy (Le Concept d’individualité dans la philosophie biologique de G. Canguilhem)*, who states that “part of the theses of Canguilhem’s book are inspired by Goldstein’s book—*The Structure of the Organism (La Structure de l’organisme)*.” Biological normativity (Vital Normativity) in the philosophy of the French thinker Canguilhem is a central concept which affirms that the living being is not merely a biological machine subject to determinisms, but a “normative” being that produces its own values and norms in order to preserve its life and adapt to its environment. Life, for Canguilhem, is the capacity of the organism to establish new (healthy) norms in order to confront pathological changes, and living is “radiation and organization of the environment from a center.” In short, biological normativity is the capacity of life to transcend, adapt, and create a new normal system, and this confirms the interdisciplinary relation between philosophy, medicine, and biology.

He considered that health and disease cannot be understood merely as objective biological states based on quantity and statistics, but rather as expressions of biological values determined by the living being itself in its relation with its environment. Canguilhem says: “To be healthy does not mean simply to be normal in a given situation, but to be capable of normativity in the situation one is in and in a different situation” (Canguilhem Georges, 1966), because the concept of health is linked to adaptation to the environmental and social milieu. Thus, Canguilhem did not treat health and disease only as biological phenomena, but as cultural and

intellectual phenomena influenced by social and ideological norms, subjecting them to epistemological questioning. In doing so, this view departs from the positivist approach that dominated modern medicine, which tended to standardize health and disease as quantitative and normative concepts measured by comparison with the “normal.”

Through his central work *Le Normal et le Pathologique* (“The Normal and the Pathological”), Canguilhem reconfigured the relationship between medicine and philosophy, and expanded medical epistemology from a mere rational analysis of biological data to a profound understanding of vital function, norm, and the meaning created by the living being through its subjective experience. The epistemological conception of life in Canguilhem is like a stimulus that awakens the categories and concepts that operate on life.

#### **4-- The concept of health and disease from the biological to the vital:**

Canguilhem argues that health does not simply mean the absence of disease, but rather the capacity of the living organism to invent new norms (normativity) and to respond flexibly to environmental changes. Disease, in his view, is not an absolute defect or a breakdown of vital functions, but rather another mode of life that expresses a reduction in the organism’s capacity to adapt and to invent norms (Canguilhem Georges, 1966).

Health, therefore, is not a static or ideal “state,” but a continuous dynamic activity. It is the capacity to confront changing situations and to reorganize vital functions in accordance with new contexts. In this sense, the concepts of the Normal and the Pathological are transformed from objective descriptions into expressions of the organism’s capacity to establish a “subjective relationship with the world.”

In this context, Canguilhem goes beyond the classical conception of the normal as a statistical average or anatomical rule, as is the case in positivist medicine, and insists that the normal is what the living being is capable of creating as a law for itself (Canguilhem Georges, 1966).

For example, a diabetic patient does not merely live with the disease of “insulin deficiency,” but lives a new relationship with food, daily activities, and the environment; and this relationship is qualitatively different from that of a “healthy” person. Therefore, disease is a complete life experience that must be understood and respected, not merely a condition to be eliminated.

In Canguilhem’s analysis of health and disease, this philosopher offers a perspective that differs radically from the traditional understanding in medical science. For him, health is not merely the absence of disease, but a state of dynamic equilibrium through which the organism is able to adapt to surrounding conditions. This means that health does not represent a fixed state, but rather a vital condition that changes according to biological, social, and cultural contexts.

As for “disease,” it is seen not merely as a biological dysfunction of the body, but as a response of the living being to its environmental and social conditions. It is not simply a material phenomenon, but a phenomenon that carries social values reflecting society’s view of what is considered normal or abnormal.

#### **4/1- Health as dynamic flexibility:**

Canguilhem argues that health is not only related to the balance of biological functions, but rather to the capacity of the living organism to adapt to changes in the surrounding environment. Health is a state of continuous interaction between the organism and its environment, and the organism's ability to adjust to environmental changes.

#### **4/2- Disease as a social and cultural response:**

On the other hand, Canguilhem sees disease not merely as a violation of biological norms, but also as a social and cultural interpretation. The social classification of disease is influenced by prevailing cultural standards, showing how society defines what is normal and abnormal based on its cultural contexts.

#### **5- Critique of quantitative positivism in medicine:**

The main features of Canguilhem's critique of the dominant positivist epistemology in nineteenth-century biology and medicine appear in his caution regarding the dominance of material explanations in biological interpretations, and the danger of metaphysical distortions. "The historically late emergence of biology as a distinct and specific science, compared to other sciences, requires great caution: caution against the dominance of physics and chemistry, and thus the risk of reducing life to purely material mechanisms. This also implies caution against the metaphysical past of biology" (Tawfiq Ben Waya, 2016).

Positivism was one of the dominant philosophical frameworks in medicine, where scientific knowledge and medicine were considered more abstract and technical. Claude Bernard defended physiology as a foundational science for an authentic practical medicine, a precise, closed, and systemic physiology that reduces all facts to a single idea (Bernard, 1959). To emphasize his experimental approach and deterministic explanation in biology, he states that experimental medicine must be based on experimental physiology, and that no progress (Broussais) occurred except through linking pathological anatomy with physiology. Canguilhem considered what Claude Bernard called a continuation of Enlightenment philosophy to be an ideological construction in medicine, a form of constructed discourse. Thus, what Broussais dreamed of achieving was, according to his own words, already being realized by others: "medicine is nothing but the physiology of the sick human being" (Broussais, 1836).

Canguilhem concludes that positivism, which sought to make medicine a science based purely on natural laws, ignores the complex differences between living beings and the diversity of experiences of illness. It reduces medicine to experimental determinism. Therefore, he offers a strong critique, arguing that medicine cannot be examined only through mechanical scientific tools, but must be understood within the context of social and cultural interactions.

Canguilhem criticizes the positivist orientation in medicine, which reduces health and disease to objective measurable data and neglects the subjective experience (subjective expérience) of the living being. This approach, heavily influenced by experimental physiology (Claude Bernard), established a medical model focused on correcting physiological indicators without considering the value and existential dimension of disease.

Canguilhem emphasizes that medicine cannot be a purely experimental science like the physical sciences, because its object—the living being—produces values and meanings (Canguilhem, 1952). While physics studies phenomena that do not involve a subjective standpoint, disease involves suffering, a subjective judgment of one's condition, and a desire for healing. Excluding these dimensions from medical discourse means losing an essential aspect of medical knowledge.

This critique is clearly expressed in Canguilhem's rejection of the "strict biomedical model" (Le Modèle Biomédical Strict), which considers disease merely a mechanical malfunction that can be repaired without understanding the patient's subjective experience.

### **5/1- Beyond mechanical medicine:**

Canguilhem indicates that the traditional understanding of medicine as merely a direct application of scientific knowledge must be changed. Medicine does not deal with abstract bodies, but with individuals living in social contexts, where disease experiences differ between individuals due to their cultural and social norms.

If Claude Bernard believes that disease is merely an increase or decrease in sugar, for example, Canguilhem insists that disease is a new and limited mode of life. For Claude Bernard, if we measure the level of sugar in a person's blood and find it higher than the statistical average, the person is considered ill; thus disease here is merely a number above the normal, and treatment is the restoration of that number to its normal level.

However, for Canguilhem, the rise of blood sugar is not the disease itself, but rather the body's attempt to adapt to a dysfunction and to create a "new equilibrium," a new normativity. The patient feels ill not because of the number,

but because his life has become restricted and his possibilities of adapting to the world have narrowed.

### **5/2- Medicine and the return to the human being:**

Medicine, in Canguilhem's view, cannot be understood through purely experimental standards. The human dimension must be taken into account in interpreting disease, and medical theories must be developed in a way that integrates both the biological and social understanding of the individual. "The organism's function is to produce new biological norms, and if it ceases to live, it is its absolute striving for change that maintains the stability of its healthy state" (Tawfiq Ben Waya, 2016). This means that the concepts of health and disease in life are not parallel concepts in which one can simply indicate the other, for a clear reason: disease is itself a form of normality, and likewise health is also a form of normality (Tawfiq Ben Waya, 2016).

Thus, Canguilhem moves medicine from a quantitative pathology isolated in the laboratory, as in Claude Bernard, to a philosophy of the living being and its subjective experience of life and environment.

### **6- Health and disease in light of the biotechnological revolution:**

With the emergence of biotechnology, the problematic of health and disease has deepened in light of increasing human intervention in biological formation itself through technologies such

as CRISPR-Cas9 (gene editing), artificial intelligence in medicine (AI in Medicine), and personalized medicine. Here arises the urgent need for a new epistemology that considers not only technical efficiency but also the values embedded in these practices (Habermas, Jürgen, 2003).

Canguilhem, through his analysis of vital values, warns against reducing health to genetic modifiability or to achieving ideal bodily specifications. If the “healthy” becomes what is “programmable and optimizable,” then we face the risk of losing the organism’s normativity in favor of technological normativity.

For example, if genes are modified to prevent hereditary diseases such as cystic fibrosis, the question is not only technical (can we?), but also ethical (should we?), which requires a critical epistemology grounded in Canguilhem’s conception of health as a value rather than merely an optimal function.

Similarly, integrating artificial intelligence into diagnosis and treatment, despite its benefits, raises an existential question: can a machine evaluate? Can it decide what is best? For Canguilhem, the notion of value is tied to consciousness, suffering, and lived experience dimensions that technology is still unable to fully simulate.

In this context, Canguilhem raises several questions about how technological development affects the concepts of health and disease. Social and cultural values will play a fundamental role in defining what is “normal” and “abnormal” in the future, and thus in guiding these technologies toward paths beneficial to humanity.

### **1.6- Values in gene technology:**

In the context of gene editing, it is important to consider that the values determining what is socially acceptable or unacceptable will be at the heart of this debate.

### **2.6- Future challenges in biomedical medicine:**

Future challenges arising for the concept of health and disease due to biotechnology will be related to how humans are classified and understood within the context of the human genome. How will hereditary diseases be dealt with, and will we have the capacity to reshape the human genome?

### **7- The epistemological value of Canguilhem’s philosophy:**

Canguilhem’s philosophy carries a distinctive epistemological value that makes him one of the central figures of the epistemology of science in France, especially in the field of the history and philosophy of biological and medical sciences. He was not merely a historian of science; he reshaped the way we understand the development of scientific concepts. His philosophy is characterized by an epistemology of concepts: for him, the scientific concept is not fixed but a dynamic structure that constantly changes and corrects itself throughout the history of science. He also brought a revolution in the scientific and philosophical understanding of medicine and life by defining the role of conceptual value in life, through his analysis of knowledge of life; namely, identifying the position and function of the concept as one of the highest forms through

which the human living being understands the environment in which he lives, and through which he continuously shapes and reshapes that environment.

Canguilhem's analysis had a major impact on reshaping contemporary medical concepts, especially regarding the understanding of disease as a normative position rather than merely an abnormal state. Disease is a biological normativity produced by the body's adaptation to its situation, and health is not merely the absence of disease, but the capacity to transcend old norms and establish new ones that is, the body's ability to fall ill and recover. This opened the way for the development of fields such as narrative medicine, person-centered medicine, and medical sociology.

His vision also paved the way for philosophers such as Michel Foucault, one of his students, to explore the relationship between power, knowledge, and the body through more radical analyses of medical institutions and clinical practices.

In other words, Canguilhem provided a new vision for understanding medicine as a social and cultural science rather than merely a biological science. He played a significant role in the development of medical epistemology through the following points:

**First: Medicine as a social science**

Through his analysis, Canguilhem presents a different conception of medicine, where it is not limited to examining biological phenomena but must also take into account the prevailing social values in society. He asks: "Why do doctors talk about disease and not about health?" The answer, according to Canguilhem, is that there is no science of health; therefore, health is a value acquired by the individual and lived in consciousness, which can be gained or lost. Healing, on the other hand, is an event in the relationship between doctor and patient; it expresses what is regained, restored, and rebuilt (Khan Jamal, 2022). Medicine is thus a social practice influenced by values, norms, and ideologies prevailing in each society.

**Second: Emphasizing the importance of history in understanding medicine**

Canguilhem indicates that medicine is not only understood as a treatment of diseases, but as a tool for understanding the historical and cultural developments of society. Medicine reflects the cultural and social changes occurring within societies. The value of life becomes a criterion for evaluating the values of science, especially in fields aimed at producing scientific knowledge about the living. The history of life sciences is understood as a history of principles, where the subject of this history is not given in advance. This is evident in the concept of health, which—according to a Nietzschean analysis does not appear as a state, but as "a force that tests all values and all desires." "One does not feel health except when one feels more than normal that is, adapted to the environment and its demands but also normative, capable of following new norms of life" (Georges Canguilhem, 1943/1966).

Accordingly, health is defined in the Nietzschean sense as the capacity to establish norms different from those that are dominant, while disease is the inability to achieve normativity.

Canguilhem moves philosophy from metaphysical abstraction to the heart of scientific practice, and affirms that understanding medicine and biology as vital human practices that constantly attempt to adapt, err, and correct themselves. From this perspective, some philosophers,

including Michel Foucault, drew their tools for deconstructing concepts such as madness, disease, and medical power.

### **Conclusion:**

Georges Canguilhem (1943/1966) represents one of the central philosophical figures of the twentieth century, not only because of the depth of his analysis of the concepts of health and disease, but also because he established the foundations of a new epistemology for biological and medical sciences, based on lived experience and vital evaluation rather than purely formal and objective models that have dominated scientific thought since Cartesian modernity.

Canguilhem demonstrated, starting from his project in *Le Normal et le Pathologique*, that medical science cannot be reduced to a neutral technical practice, but is embedded within a network of values and norms that are not derived from outside, but emerge from life itself. The patient is not measured only by his deviation from a “standard,” but is understood as a being capable of producing a new norm of life within his own pathological condition. Hence, health, as Canguilhem understands it, is not a static state, but a capacity for adaptation and vital innovation.

This conceptual shift is grounded in a deep epistemological background that shows Canguilhem’s influence by his teacher Gaston Bachelard, although he went beyond him by linking science to life, not only to rational construction or “epistemological ruptures.” Biology, for Canguilhem, is not merely a science whose object is the “living being,” but a science founded on the specificity of life itself as a normative force.

In the context of contemporary transformations, where biology intersects with biotechnology and artificial intelligence, Canguilhem’s thought becomes more relevant than ever. Technological choices offered by tools such as CRISPR or cloning raise decisive value-based questions: what do we consider improvement? Who decides the “norm”? And how can we ensure that science does not become an exclusionary power in the name of “health” or “biological quality”?

Canguilhem warns against a scientific ideology that attempts to impose a single normative model, while life itself is plural, capable of producing its own norms, even in illness and dysfunction.

In light of this, epistemology cannot be separated from anthropology, nor science from values. Canguilhem opens a new critical horizon that restores to medicine and science their human depth, and elevates life not as an object of analysis, but as a valuing subject (*sujet évaluateur / valuing subject*), with the right to define health and disease from within its own experience.

Canguilhem invites us to think of health, intelligence, and beauty not as fixed standards, but as values produced by life itself through its diverse experiences, fragilities, and adaptations. This restores to human beings their position as meaning-creating living beings, not merely consumers of norms.

The philosophy of values in Georges Canguilhem appears as a vital call for a new understanding of science and medicine, one that does not separate knowledge from meaning, nor life from norm. With the rise of the challenges of the biotechnological revolution, his ideas become a moral, epistemological, and critical compass warning against the risk of science

becoming a normative authority that judges life before understanding it. Recognizing that every living being possesses an intrinsic capacity to produce meaning and norms is what makes Canguilhem's critique a fundamental step in confronting reductionist and objectifying tendencies in medicine and technology.

Canguilhem's legacy remains a sharp critique of scientific ideology: science, when it detaches itself from its vital roots, becomes an instrument of symbolic and normative domination. This is reflected in contemporary medicine's tendency to "standardize norms" and to conceive health as a single "natural" state that everyone must conform to. Canguilhem's contribution does not lie only in developing a critical theory of medicine or science, but in establishing a conceptual framework that makes the relationship between science and life, between knowledge and value, central to understanding modernity and its aftermath. For this reason, his thought remains an indispensable reference for understanding contemporary challenges in medicine, ethics, and biotechnology.

### **References:**

- 1- 1- Tawfiq Ben Waya, "Towards a Regional Epistemology in Biology in Georges Canguilhem," *Journal of Social Sciences*, Issue 22, June 2016.
- 2- 2- Georges Canguilhem, *Studies in the History and Philosophy of Sciences*, trans. Muhammad Ben Sassi, 1st ed., Beirut, 2017.
- 3- 3- Georges Canguilhem, *Ideology and Rationality in the History of the Life Sciences*, trans. Iyas Hassan, 1st ed., Damascus, Dar Al-Farqad, 2016.
- 4- 4- Dominique Lecourt, *Georges Canguilhem*, trans. Hammad Ben Raja Allah, 1st ed., Beirut, New United Book House, 2017.
- 5- Barnard. Cloud, *La cholera de 1832 en France et la pensée médicale inhalée*, PUF, 1959
- 6- Broussais. *Essai sur La Philosophie Médicale et sur les généralistes de la clinique medicale 1836*
- 7- Canguilhem, *La Connaissance de la vie*, Vrin, 1952, p. 21
- 8- Dominique Lecourt, *Georges Canguilhem et le rationalisme appliqué*, PUF, 1990, p. 97
- 9- Habermas, Jürgen, *The Future of Human Nature*, Polity Press, 2003
- 10- Georges Canguilhem, *Le Normal et le Pathologique*, PUF, 1943/1966, p. 61
- 11- Michel Foucault, *Naissance de la clinique*, PUF, 1963, p. 15
- 12- <https://hekmah.org/%D9%83%D8%A7%D9%86%D8%BA%D9%8A%D9%84%D8%A7%D9>
- 13- <https://mana.net/le-nietzscheisme-social>.