

# Canguilhem: a philosophy of life and a philosophical history of the life sciences

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**Abstract:** At first, Georges Canguilhem's philosophy is a philosophy of medicine recognizing the main contribution of biological knowledge to medicine. However, this philosophy also questions the nature of life. Life involves biological processes, but life is also normativity. In this paper, we question the normativity and the epistemological history in Canguilhem's works to understand their relevance for current scientific questions. According to Canguilhem, the epistemological history of the life sciences concerns an activity of constitution of (biological) scientific disciplines. The relevance of Canguilhem is the fact that a historian of science has not only to restore a history of the scientific theories or a history of the development of the sciences in context, but he also has to explore the relationship and the limits between life science and its context in the process of genesis and scientific elaboration. Scientific work is a vital activity of the human being, the history of science is the history of this axiological activity, and this implies a philosophical approach. In this paper, we propose that the history of ecology may give a valuable example of a scientific elaboration from various elements and from diverse skills: ideologies that announce or extend a scientific construction also affect this discipline.

**Keywords:** history of science; epistemology; Canguilhem, Georges; vital activity; scientific elaboration

## Canguilhem: uma filosofia de vida e uma história filosófica das ciências da vida

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**Resumo:** A princípio, a filosofia de Georges Canguilhem é uma filosofia da medicina que reconhece a principal contribuição do conhecimento biológico para a medicina. No entanto, essa filosofia também questiona a natureza da vida. A vida envolve processos biológicos, mas a vida também é normatividade. Neste artigo, questionamos a normatividade e a história epistemológica nas obras de Canguilhem para entender sua relevância para as questões científicas atuais. Segundo Canguilhem, a história epistemológica das ciências da vida diz respeito a uma atividade de constituição de disciplinas científicas (biológicas). A relevância de Canguilhem está na ideia de que um historiador da ciência não tem apenas que restaurar uma história das teorias científicas ou uma história do desenvolvimento das ciências em seu contexto, mas também explorar a relação e os limites entre ciência da vida e seu contexto no processo de gênese e elaboração científica. Um trabalho científico é uma atividade vital do ser humano, a história da ciência é a história dessa atividade axiológica, e isso implica uma abordagem filosófica. Neste artigo, propomos que a história da ecologia pode dar um bom exemplo de uma elaboração científica a partir de vários elementos e de diversas habilidades: ideologias que anunciam ou ampliam uma construção científica também afetam essa disciplina.

**Palavras-chave:** história da ciência; epistemologia; Canguilhem, Georges; atividade vital; elaboração científica

## 1 INTRODUCTION

The difficulty we face today is the increased power of some scientific – in particular, biological – disciplines in their claim to be the ultimate reference in fundamental knowledge as in the technological applications. We are interested in considering the implication of this question in the medical field but also in that of ecology, for example to have some questions about the possible regulation of the scientific, economic and technological developments by other fields: ethics, philosophy and political sciences, history, and philosophy of science. In medicine as in biology and ecology, philosophy and the human sciences also bring more and more appreciated elements of understanding. Since Georges Canguilhem's (1904-1995) masterful work – in particular, since *Le normal et le pathologique* –, we have understood that not only “disease is another way of life” but that in a disease, the subject has some difficulty in adapting himself to new standards (Canguilhem, [1966] 2005, p. 51). Rooted in the subject, life is, therefore, normativity (*Ibid.*, p. 116).

This produces consequences to the medical plan (several possible standards, which tend to reduce with the aging and the disease) and to biological relations (man-life-environment). The disease involves the reduction of the standards of behavior and environmental adaptation, but every human being remains normative, even when this normativity is extremely limited, as animal life and plant life remain normative towards the environment, even in unfavorable conditions.

In France, Canguilhem developed a philosophy of medicine with a philosophy of life opened at the same time to biology and to anthropology (concerning biology, see Joubert, 1999, p. 498, 516). There is a limit of science as soon as the human being is involved. What is wright for medicine (the human normativity), is it also for everything that concerns the activity and the behavior of man in society? This activity is not that concerning the use of techniques, but it is supposed to organize and to order an environment of life.

## 2 IMPLICATIONS AND LIMITS IN THE BIOMEDICAL SCIENCES

Let us return to Canguilhem and into the questions of medicine. He evoked the question of the demarcation between the scientific viewpoint and the methods of human and social sciences about medicine and disease in the *Studies of history and philosophy of science concerning the alive and life*, in the article “Therapeutics, experiment, responsibility”:

In the Faculty of Medicine, we can learn the chemical composition of the saliva, we can learn the vital cycle of the intestinal amoebas. [...] But there are subjects on which we are sure to receive never the slightest education: psychology of a sick person, the vital meaning of the disease, duties of the doctor in his relationships with a sick person (and not only with his colleagues or with an investigating judge), social psychology of the disease and of medicine. (Canguilhem [1968], 1983, p. 390)

Canguilhem published this paper in 1968, and he had the will to provide this education to the students “as the compulsory part of a specific medical foundation course”. However, he insisted on the fact that it was not enough: for him, agreeing to care is “agreeing to

experiment” and “getting an institutional responsibility” (Canguilhem [1968], 1983, p. 391). The physician is a scientist, but his responsibility towards the patient confers on his art an ethical dimension. Canguilhem represented medicine as an objective science indissolubly associated with the relationship between subjects; this involves a particular epistemological status with a sum of applied knowledge, but its application requires ethics. Medicine thus gives the example of scientific practice, the objectivity of which is not doubtful; but the limits are the good and dignity of a human subject.

Who will put limits or maybe determination in the field of the therapeutic experiment? Canguilhem asked himself the question: which judge has the authority to say what is good for the patient and so to order the medical practice? He eliminated straightaway the concerned man, the patient, because he lives in “the illusion on his own good, even organic” (Canguilhem [1968], 1983, p. 385). Canguilhem eliminated then the philosopher because we suppose he represents an idea, a possibility; and finally, a philosopher judges himself incompetent on the subject. We think, unlike Canguilhem, that the philosopher keeps all his capacity of judgment regarding the ethical and human good of the patient, even if he needs specific information in the medical field to be able to establish his point of view. According to Canguilhem, the theologian, “unlike the philosopher, accepts himself as such, ‘but’ he will not be recognized by all the parts of the debate” (*Ibid.*). The jurist “has no decision-making power [...] in these subjects” (*Ibid.*, p. 386). Therefore, the conclusion is that there is no specific skill today in the statement of rules, in some “uncontested limits by the moral sense”. Canguilhem expressed here a fundamental problem, in the foundation of bioethics, a question that amply legitimizes the existence of a dialogue and Ethics Committees. A reflection about medicine opens thus to the other disciplinary skills. A contribution of diverse disciplines is necessary for medicine and science; this is an epistemological and ethical question. As in medicine, ecology needs some reflection in ethics and epistemology.

If Canguilhem insisted on the scientific experiment in medicine, he also always referred to “the real-life experience of the diseased” (Canguilhem [1968], 1983, p. 409). There is a conflict, but also a

complementarity between scientific experiment and human experience: “Experiment comes up against experience” (Le Blanc, 1998, p. 23). We think that this conflict is present somewhere else, for example in the environmental issues which concern at the same time science, ethics and the future of humanity. Céline Lefevre explains that applying science to medicine is the origin of new knowledge. “In medicine, scientificity is a condition to therapeutic effectiveness: to care about the relief of a sick person make indispensable rationality and scientific creativity” (Lefevre, 2014, p. 203). Canguilhem concluded with the role of the State on the health of the citizens:

Our contemporaries, in the western societies, think, in a platonic sense, that the State has power over the health of the citizens, through the services of public health. Naturally, this is contrary to Plato, as far as they expect from it, “the opportunity to be sick and to be cured” and the recognition of their right<sup>1</sup>. (Canguilhem [1968], 1983, p. 410)

Thus, a greater requirement of efficiency and communication in the “medical rationality” the “anguished solitude of the sick person” together with myths conveyed in the diverse cultures. According to Canguilhem, the change to be incorporated to the medical rationality is caregiving. In this paper, we focus on the philosophy and history of the life sciences; however, it is important to assert with Canguilhem the change of registers employed by the sciences (and their history) applied to medicine and employed in caregiving of the sick person involving its real-life experience.

From a philosophy of medicine and normativity in medicine, Canguilhem came to a philosophy of life. He wrote:

What Whitehead tells about future, Goldstein tells about life. For a normal living, to live, it is to face risks, to accept the eventuality of catastrophic reactions. Would the embarrassment of reason in front of life as an object not be a form of caution to be classified among the reactions of the instinct of self-preservation, reactions translating, according to Goldstein, a state of pathological life? It is necessary to admit a paradox, there at least. It is nevertheless indisputable that life

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<sup>1</sup> Concerning Plato, Canguilhem refers to *Republic III*, 406c-407e.

is an object of thought little reassuring for reason. Reason is lucidity and righteousness. With regard to reason, life is shady, measured by reason, life is elusive. The reason is regular as an accountant; Life is anarchic as an artist. (Canguilhem, 1947, p. 326)

According to Canguilhem, life involves vital operations but also a risk, some reactions, an uncertainty; life is as a source which auto-regulates, producing its standards. Life is neither rectilinear nor monotonous; life shows itself “if necessary, superior in its expected capacity” (Canguilhem [1966], 2005, p. 131). This thought of Canguilhem seems to be transposable from medicine to biological and ecological problems. In ecology and environment, life is neither rectilinear nor monotonous, superior in its expected capacity. According to Guillaume Le Blanc, “Life is a plurality of perspectives” (Le Blanc, 2010, p. 305) but “the meaning of life is registered in life” (*Ibid.*, p. 316). As an organized material and as a specific reality, life is power, subject of operations, transmission of messages (Canguilhem [1968], 1983, p. 362; Le Blanc, 2010, p. 322). Life is also normative, but the biological norms have to confront with the environment (Ancet, 2008, p. 39; Canguilhem [1966], 2005, p. 91).

### **3 CANGUILHEM, THE PHILOSOPHY OF LIFE AND THE HISTORY OF SCIENCE**

Today, education of the scientific mind regarding biology and ecology supposes a thorough reflection on life itself and on the contributions of the different sciences and the philosophy in the problem of life. To speak about ecology and give meaning to feelings towards nature is good. However, at first, it seems necessary to specify the legitimacy of the scientist and of the philosopher to undertake some research on nature and life, to speak about environmental changes and ecological crisis. About life and the relationship between philosophy, ecology, and biology, can we specify even today the field of a philosophy of nature and life? What is, in this domain, the legitimacy and the contribution of an epistemology? To what extent can it help to specify borders and limits of legitimacy between the diverse scientific domains? Is a philosophy of nature and a philosophy of life, as well as epistemology, capable of contributing to overcome the limits of the specialization of various scientific

researches, for example in the ecological domain, and to approach the problem globally?

It is necessary to assert at first what recovers the philosophy of nature: does it limit itself to an epistemology? Does it take into account all that is human life, beyond what is reachable by the different sciences? A philosophy of life goes beyond the particular determinations rooted in our organism (biological sciences) or psychology or society (human sciences). A philosophy taking into account an epistemology but situated beyond this epistemology also looks at the specificity of the human being as an object in his activity and his vital orientation. Henning Schmidgen bases himself on the position of Canguilhem (*Le normal et le pathologique*), according to whom any life means a preference and so, an exclusion (a choice).

He is certainly not the first and not the only author who attempted to ground the intellectual judgment function of human beings in the elementary behavior of lower organisms and, eventually, in life as such. Before him, Nietzsche and Freud did the same, and Bergson proceeded in a similar manner. (Schmidgen, 2014, p. 248)

Therefore, the human being has a specific activity, the operation of judgment at the intellectual level. This operation is rooted in his own life; so, for one to understand that philosophy, the person has to take into account at the same time the biological foundation and the thought, by taking for object the vital activity in a moral aspect. This link between the biological foundation and thought is crucial for our subject: to raise the educational problem in the scientific mind, but also in the ecology and the sustainable development, supposes to base thinking in the physical nature of man, in his biological foundation. The human being is connected at the same time with nature and with other men because he has a biological body; then this relation imposes on him to be fair and to respect both the environment and other humans. Concerning biological individuality, Jean Gayon wrote:

In the context of medical philosophy (questioning the nature of illness), Canguilhem viewed individuality as an axiological rather than as an ontological notion. (Gayon, 1998, p. 308)

According to Canguilhem, the biological dimension and the mind take part in a unique individual with an axiological perspective.

However, a philosophy of life (and a philosophy of nature and environment) also supposes a critical work towards objects and scientific disciplines. In the *Studies in history and philosophy of science concerning the living and the life*, Canguilhem places the object in the history of science as having “nothing common with the object of science” (Canguilhem, [1968] 1983, p. 17). Compared with the natural object, the scientific object is second; history of science applies on these second objects. In other words, it concerns the historicity of the scientific speech, but it does not concern the object of science directly. In this connection, Claude Debru wrote:

Claiming that the object in the history of science has nothing in common with the object of the science is an assertion which is not obvious and which does not correspond to a collectively shared opinion. (Debru, 2004, p. 69)

In other words, contrary to what we often believe, a contribution of the history of science is not to evoke the emergence of such or such scientific object – thus to join its inscription in the time – but to restore what Canguilhem calls “the effectuation of a project inside normalized but crossed by accidents” (Canguilhem [1968], 1983, p. 17; Debru, 2004, p. 69). Besides, he sees science as constituting at present his object (and not as extracted from the nature of objects and phenomena that would pre-exist). Claude Debru considers that the history of science studies than “the own constitution of the diverse sciences”, which constitute their objects (Debru, 2004, p. 71). From this point of view, a history of science joining an epistemology can do the current task of criticism of the constitution of the scientific disciplines and their limits. This criticism of the scientific disciplines shows itself essential in our subject because it is a question of educating in the scientific mind; it is complementary to the rediscovery done by a philosophy of nature and by a philosophy of the living beings. In the same paper, Canguilhem considers that history of science has an object that does not resolve in a set of facts, “an object not given there, an object to whom incompleteness is essential” (Canguilhem [1968], 1983, p. 18). “History of science concerns an axiological activity” (*Ibid.*).

In fact, the epistemological history of science according to Canguilhem looks at a scientific activity, at an activity of constitution

and emergence of the scientific disciplines. In this way, History of science would allow an investigation of what is at present constituted in model and in scientific theory, an investigation of what emerges as scientific discipline because of the human activity. Claude Debru wrote:

As well as science establishes its object by cut, also the historian of science constitutes his object, he limits it by “decision”. He establishes, in a way, a problem. In the double break corresponds a double constitution. It is remarkable that Canguilhem’s presentation goes from the second constitution, that of history, to the first one, that of science, and not the opposite. (Debru, 2004, p. 73)

The question of the object in history of science, in the thought of Canguilhem, is a difficult question. In a slightly different view, Henning Schmidgen writes:

In traditional history of science, the formation of concepts often seems to follow a one-way street: from the subject to the object. In Canguilhem’s view, it follows both ways. It also goes from the object to the subject because life itself produces the forms that prepare the formation of concepts in vital networks of research. (Schmidgen, 2014, p. 250)

The remark is interesting because it completes the point of view of Debru and because it allies in a way subjectivism and objectivism. Canguilhem is doubtless one of the contemporary philosophers that has best noticed that the division of object-subject is incomplete and unsatisfactory. In a philosophic history of science, the subject certainly establishes the concepts; but they also suppose the objectivity of the vital forms, little by little discovered in sciences. This activity of discovery and scientific elaboration constitute the object of the history of science. Concerning the scientific elaboration, Jean Gayon has explained Canguilhem’s “epistemological history” or “historical epistemology” (Gayon 1998, p. 307). Concerning “epistemological history”, Gayon refers to Dominique Lecourt (Lecourt, 1972, p. 64); about the expression “historical epistemology”, he refers to Lecourt in François Delaporte (Delaporte, 1994, p. 43). Gayon writes:

According to Lecourt, who coined both “epistemological history” and “historical epistemology”, the latter applies to Gaston Bachelard, the former to Georges Canguilhem. The origin of these expressions is quite interesting. When he was writing his masters’ thesis on Bachelard under the direction of Canguilhem, Lecourt told Canguilhem that he would describe Bachelard’s philosophy of science as “historical epistemology”. Canguilhem answered: “epistemological history” [...] See also *L’Epistémologie Historique* de Gaston Bachelard (Paris: Vrin, 1969). Finally, Lecourt retained the first expression on the title of his thesis and of the corresponding book. It is obvious that “epistemological history” corresponds better to what Canguilhem himself did. (Gayon 1998, p. 307)

This question of the object in a philosophic history of science refers to the question of the object seen by the philosopher, regarding ecology and regarding environment. There, the division between subject and object turns out unsatisfactory because the subject is not neutral towards its object. The one who speaks on the relationship to the environment is involved in the object of his speech himself.

The history of science seen by Canguilhem cannot only concern the sciences and their constitution, but also “the ideology, the political and social practice”. The object of the history of science would be an act of constitution of a model, theory, scientific discipline, but from a scientific practice involving scientific objects and data or unscientific practices. Therefore, history of science would be a discipline allowing an exploration of the limits between science and non-science in an auto-constituent process of a scientific discipline. From this point of view, it would be very current because its ambition is to place the link between science and non-science in the scientific elaboration. Ecology and environment and, consequently, the educational practices that are relative to them, are places of debates where science and non-science confront. Claude Debru wrote:

Non-scientific practices, scientific practices, theory are the strong terms of Canguilhem’s philosophic elaboration of the history of science. (Debru, 2004, p. 75)

We shall have understood that ecology is an example of scientific discipline involving ill-assorted elements in its elaboration. There is a

question of relevance in works regarding ecology and regarding environment today; this question refers to the question of diversified scientific skills, their relations, and their limits.

#### 4 SCIENTIFIC IDEOLOGY

Borders between disciplines and skills may represent a high complexity, particularly in biological sciences; we see it in the field of ecology. Certainly, Canguilhem's viewpoint sometimes seems a little bit incomplete for the base of a philosophy of nature, because limiting too much the question of the life to the medical and biological approach. According to Canguilhem, we only consider the specificity of man in the context of the subject and the standard; we never see it with the prospect of mind and purpose. However, the interest of Canguilhem's approach is to establish an epistemological history of science, and this is necessary to understand the constitution of the disciplines and their scientific skills and limits. Canguilhem is still present because the historian has not only the responsibility to restore the history of the scientific theories or the contextualized history of the development and the institutionalization of science, but he would have the mission to explore the relationship and the limits between science and its context in the process of genesis and scientific elaboration. Ecology gives an excellent example of a scientific supposed elaboration from ill-assorted elements and diverse skills.

In this precise context of an epistemological history of science, Canguilhem puts the problem of the scientific ideology at the end of his career in *Ideology and rationality in the history of the life sciences* (Canguilhem [1977], 2000). In fact, one originality in the thought of Canguilhem is to connect scientific ideology and the construction of scientific thought. Elements of non-science, ideology, fiction, mythical representations could thus feed elements of hypotheses that must be cleansed to end in scientific thought. Paradoxically, Georges Canguilhem, upholder of a discontinuous epistemology, would have tried to establish the ideological origin of the grand scientific theories. This dialectic made by continuity and discontinuity in the relationship between ideology and science also has doubtless an interest to estimate the relationship between certain current scientific projects

and ideologies. It would be necessary to be able to discern what is scientific and what is ideological in research projects; for example, consider genomics or diverse domains of the biological sciences and their applications.

In this time, Canguilhem insisted on the difference between “scientific ideologies” and “scientists’ ideologies”:

[...] the scientific ideologies would be rather philosophers’ ideologies, speeches with scientific claim held by men who are still, on the subject, only presumptive or presumptuous scientists. (Canguilhem [1977], 2000 p. 44)

Canguilhem proposes to confine the nature of the scientific ideology within three points:

- The scientific ideologies have a “hyperbolic” object and are understood “with regard to the standard of scientificity which is applied indirectly to them” (Canguilhem [1977], 2000 p. 44). They are thus indirectly related to science, and their object is not directly scientific.
- The scientific ideologies precede or follow science. Thus, there is a continuity of thought between science and non-science, contrary to what could persuade the thought of Bachelard.
- We define a scientific ideology as a “faith” which aims towards “an already established science” without being situated on the same ground, without using the same methods or aiming precisely at the same objects.

According to Canguilhem, history of science, looking at activities and processes, is also interested in the ideologies, in what they announce, or in extend elements of scientific construction. Besides the ideologies, elements of culture and philosophy accompany not only the construction of a scientific specialty but also its technical applications. It is thus very difficult, otherwise impossible, to reduce the history of science to a history of scientific contents, its links with the “non-science” are multi-form, and they intervene upstream and downstream to the grand theories or the main discoveries. From an epistemological standpoint, making a critical analysis of ecological

questions can also bring to do a discernment between scientific and ideological elements. So, from some questions of borders between disciplines and skills, we move towards the questions of relationships between diverse skills, between experimental sciences and human sciences, even between science and non-science. Even there, the current questions of genetics or ecology are in the center of a connection of speech and scientific skills, but also legal, political, technological, ethical skills. Among these skills, the limits and the links are often difficult to discern. Ecology supplies an exciting paradigm to deal with the contemporary questions of environment and their possible solutions; but ecology is also a center of inextricable connections between very different skills, speeches, disciplines. An ideology can easily include or follow scientific conclusions of an ecological study. In educational terms in the scientific approach regarding ecology and environment, a discernment is imperative.

## 5 CONCLUSION

Our perspective in this paper was to question the normativity and the epistemological history in Canguilhem's works to understand their relevance for current scientific questions, particularly in ecology. Firstly, from a philosophy of medicine and normativity in medicine, we understood that life involves vital operations but also a risk, some reactions, an uncertainty; life is also as a source auto-regulating, a subject of operations producing norms. Environmentalists are increasingly pointing to the connections in ecosystems and ecocomplexes<sup>2</sup>. Here, the question is: what is the role of life and normativity within these systems? Unfortunately, ecologists often forget life in their systems. The problem is how the biological organisms, in their biodiversity, and the human activities can regulate

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<sup>2</sup> Blandin and Lamotte proposed the term "ecocomplex" for the use of decision-makers (Blandin and Lamotte, 1988). It emphasizes a higher level of integration than the ecosystem.

the natural environment and to establish a normativity, to avoid a destruction of the ecological balance. As a living subject, human beings can be actors of the dynamic adaptation of human societies to the environmental changes (Janssen & De Vries, 1998). This adaptation establishes a regulating ecology (Bourg, 1996) where the responsibility of man is committed and where his action would be normative. The preservation of biodiversity would allow better preservation of a natural environment where the living things favor the natural balances.

About the epistemological history of science, we consider in this paper that this discipline would allow an exploration of the limits between science and non-science in an auto-constituent process of a discipline. An epistemological history of ecology and environment give rise to debates where science and non-science confront. We have already discussed that ecology is an example of scientific discipline involving ill-assorted elements in its elaboration. Actually, at the same time, ecology can be an object of studies and a project of society.

The last point of the philosophy of Canguilhem that we approached is the question of the scientific ideologies. With Canguilhem, we consider that a history of science looking at activities and processes is also interested in the ideologies in what they announce or extend elements of scientific construction. It is easy to understand that an ideology can easily include or follow scientific conclusions of an ecological study. The sustainable development becomes integrated into the international texts on the environment as an ideology. However, there is a continuity between this ideological posture and the scientific approaches. In the current structure of ecology and environmental sciences, we thus need to maintain a critical approach of this synthesis between science and ideology. In this connection, a particular meaning of the ideology in ecology can lead to ethical choices and political action (Simmoneaux, 2007).

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