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Dossier Georges Canguilhem

When the Content to Be Taught Is a Norm: Canguilhem-Inspired Contributions to Educational Practices

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Abstract:

It has become customary since Foucault to present Canguilhem as a man whose work is voluntarily restricted to a particular domain of the history of science. Yet the current edition of his Complete Works reveals that Canguilhem has never considered himself a true historian of science. If he traced “the history of the formation, deformation and rectification of scientific concepts”, it is above all to nurture his profession of professor of philosophy with “unknown material”. On the assumption that Canguilhem subordinates the history of science to teaching, this article will try to make a further step and show that its inter-regional approach of knowledge can serve as a paradigm in educational sciences, when the knowledge to be transmitted is a-disciplinary and has a strong normative dimension.

Keywords:

Georges Canguilhem; Education; Regional epistemology; Norms; Values

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In philosophy, there is no segregation
Canguilhem 1991

In 1987, Canguilhem received the prestigious gold medal from the French “Centre National de Recherche Scientifique”. It came as the crowning of a rich and long career as a philosopher and historian of science. While thanking the management of the CNRS for the attention paid to his work, Canguilhem confided at the ceremony held in his honor that he did not understand what could justify such a distinction:

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What merit of originality can I, without pretension, attribute to myself? I studied and started teaching at a time when “research” did not exist as an activity outside the academic career. It did not occur to me that one could work in any other capacity than as a teacher and to teach. Teaching is not necessarily rehashing. I have never confused philosophy with the fact that textbooks contained quotations accumulated under the headings of a program. (Canguilhem 1987, 1)

Canguilhem could not have been clearer. If he had studied history of science, it is above all to support his activity as a professor of philosophy. Such a subordination of the history of science to neither epistemology, nor even to philosophy, but to the teaching of philosophy, is surprising. It is especially so since it has become customary, since Foucault, to present Canguilhem as a “man, whose work is austere, intentionally and carefully limited to a particular domain in the history of science” (Foucault 1991 [1978], 7-8).

“I’m not Really a Historian of Science”

However, the ongoing work surrounding the editing of Canguilhem’s *Complete Works* in 6 volumes reveals that this retrospective statement is in fact part of a long series of declarations, whose coherence commands admiration. Twenty-five years earlier, in 1972, Canguilhem actually declared in an obscure medical journal recently traced by Camille Limoges:

I am not really a historian of science, I am actually a professor of philosophy who is interested in a number of issues, which are the relationship between philosophy and science and in particular that of manufacturing, of birth, the import and export of a certain number of interpretive concepts of biological functions. (Canguilhem, as cited by Limoges 2015, 29)

A Professor of philosophy and not a historian of science, or at least “not really”? Certainly, Canguilhem taught eleven years in secondary schools since 1929, when he began his career as a teacher, until his refusal to serve the Vichy Regime in October 1940; and after the war, from 1948 to 1955, he was an inspector-general for philosophy at the Ministry of “Éducation Nationale”, where he was both feared and respected. Still, such a statement remains odd coming from someone who had just spent 16 years at the head of the “Institut d’Histoire des sciences et des techniques” in Paris (1955-1971). This is because, according to Canguilhem, the object on which he worked all his life is not, as one might expect, “science in its history” (Canguilhem 2002 [1968], 200). In 1972, he mused that the heart of his investigations consisted in the examination of “relations”: the relations between philosophy and science respectively. And more precisely, he says he is interested in the trajectory (formation, import / export) of “interpretive concepts of biological functions”. This summons reference to the famous studies devoted to the concepts of “reflex”, “milieu”, “regulation”, and of course that of “norm”. What does it all suggest?

The sibylline nature of such an assertion seems to be able to receive some light from another statement of Canguilhem’s, made a few years earlier in a televised interview bringing together, among others, Paul Ricoeur, Michel Foucault, Jean Hyppolite and the young Alain Badiou. Interviewed in 1965 alongside his colleagues about the nature of the relationship between “Science and Truth”, Canguilhem wanted to remind the viewers of the show that “all modern philosophy, especially since Kant, is characterized by this, that the knowledge of the truth is not sufficient to solve the total philosophical question” (Canguilhem 2015 [1965], 1131).

Assuming that one day one can answer in a peremptory way the question “What can I know?”, the questions “What should I do?” and “What can I hope for?” are nevertheless not answered. The critical attitude in philosophy breaks definitively with traditional dogmatism in that “Reality”, “Being”, “Real”, cease to be absolutes to which the Ancients used to subordinate thought. With Kant, it is no longer the Being who confers his value on thought; it is, on the contrary, thought that confers a value on Being. And philosophy becomes precisely the court where the judgment of knowledge is itself judged, and this is so due to the relation of the value of truth – which is proper to the judgment of knowledge – with other values, such as moral values, politics or aesthetic. We begin to see why Canguilhem considers that he is not a “true” historian of science. Not that the history of science is worthless to him; on the contrary. But it has the value of a means: it is indeed worthy as an essential part of the work of the philosopher, whose objective is to formulate a response to what Canguilhem calls “the total philosophical question”. This “total” philosophical question basically consists of a problem of evaluation, or, to put it better, a hierarchy. It is a matter of determining what the value of truth is in relation to the other values included in the human experience (Roth 2013, 238-240). This is why Canguilhem states, in the wake of the 1965 television interview, that “philosophy has to confront certain special languages [i.e. those of the sciences], certain codes, with what remains fundamental and fundamentally naive in lived experience”. (Canguilhem 2015 [1965], 1123). And the history of science, “which treats a science in its history as an elaborate purification of norms of verification” (Canguilhem 1977, 44), is for the philosopher an excellent tool for determining the proper place to assign to the truth in the hierarchy of values of a given historical experience.

“I am Actually a Professor of Philosophy”

Considering that the philosophical practice consists essentially in an examination of the relations between heterogeneous values, Canguilhem fully follows in the footsteps of Kant. To understand this, it is useful to recall here some socio-historical elements. At the time when he was studying in the 1920s, critical philosophy had dominated the French academic institution for half a century (Schmaus 2003). At the university, Leon Brunschvicg's neo-Kantianism (1869-1944) ruled the Sorbonne. In secondary education, following the example of Jules Lachelier (1832-1918) and Jules Lagneau (1851-1894), the illustrious Émile Chartier known as Alain (1868-1951), of whom Canguilhem was the pupil and then the disciple at the Lycée Henri IV de Paris, considered Kantian philosophy as the insurmountable philosophical horizon of his time. Canguilhem also testifies retrospectively, at a symposium devoted to his former teacher in December 1992:

Neither Lagneau nor Alain relinquish [i.e. Kantian philosophy], and thus when I entered Khâgne in 1921, I was invited, like all my comrades, to obtain the *Critique of Pure Reason*, translated by Barni and reviewed by Archambault. (Canguilhem 1995, 69-70)

Like all apprentice philosophers under the Third Republic (1870-1940), Canguilhem had been initiated into Kantian philosophy very early. Now, at the end of *The Critique of Pure Reason* (Transcendental Doctrine of the Method, Architectonic of Pure Reason, Ch. III), Kant focuses very precisely on showing that “philosophy is the science of the *relation* [Beziehung] of all cognition to the essential ends of human reason” (Kant 1998 [1781], 694-695). This definition is due to the essentially critical nature that the Königsberg philosopher attributes to philosophical activity. The word *krinein* means both an examination that discriminates elements, but also, and above all, the appreciation of a fact in the light of a right (Guillermit 2008, 20-21). Which is to say that, for Kant, philosophy is fundamentally a matter of evaluation. It is the discipline that must determine the value of this or that knowledge in

relation to the “essential ends of human reason”, which are in the Kantian approach of a practical nature. In other words, and to use the words used by Canguilhem in the 1972 interview, the object of philosophy is “the relationship between philosophy and science”. Now, like Canguilhem, we remember that for Kant, “one cannot learn any philosophy; for where is it, who has possession of it, and by what can it be recognized? One can only learn to philosophize” (Kant, as cited by Canguilhem 2015 [1953], 534).

One could only legitimately claim to be a philosopher who has managed to unify, in a peremptory manner, the plurality of conflicting values in experience. But this philosopher, where is he? Barring usurpation, it can only be found in the world of Ideas, as a regulative ideal of philosophical activity which aims at the harmonious articulation between the True, the Good and the Beautiful. This is why Canguilhem has always refused the title of philosopher: if one can only learn to philosophize, then the philosopher is only a professor of philosophy. It does not have the power of the philosopher to fix definitively the sense of the hierarchy of values included in the experience; but as a professor of philosophy, it is his task to make these axiological conflicts appear, to rely on his knowledge of the different ways in which the great authors of the tradition have striven to coordinate these values, in order to enlighten the individual’s judgment today. As Canguilhem wrote in 1953 in a report on the “Teaching of Philosophy” in the world commissioned by UNESCO: “The philosopher does not have to exhort, to convert, not even to moralize. To make values appear is not to preach” (Canguilhem 2015 [1953], 541). That is why there are no philosophers; there can only be “philosophers-teachers”. In the sunset of his life, Canguilhem will especially insist on this point when, in 1991, he was asked the question: *What is a philosopher in France today?* (Canguilhem 1991).

A History of Science Subordinated to the Teaching of Philosophy

The retrospective statements made by Canguilhem in 1987 and 1972 contain much that is disconcerting to the reader: a professor of philosophy and not “really” a historian of science... And yet, they have a familiar ring to the ear of a reader of Canguilhem’s works, including the best known ones. Consider, for example, the case of *Knowledge of Life*, published in 1952. In many respects, this book may be regarded as a remarkable collection on the history of science and epistemology. Nevertheless, Canguilhem affirms in the first lines that “the attention every philosophy preoccupied with the problem of knowledge gives to the operations of knowing distracts it from the meaning of knowledge” (Canguilhem 2008 [1952], XVII). In 1952, the one who will be considered twenty years later as the tutelary figure of “historical epistemology” (Lecourt 1975 [1972]), explicitly proclaims the inanity of any epistemological enterprise that would be conducted for its own sake:

knowing only in order to know is hardly more sensible than eating in order to eat, killing in order to kill, or laughing in order to laugh, since it is at once an avowal – that knowledge must have a meaning – and a refusal to find in knowledge any meaning other than itself. (Canguilhem 2008 [1952], XVII)

What is this to say, except that epistemology can have no other value than that of a means? For Canguilhem, epistemology and history of science are subordinate disciplines. And now we know that their only value is that they pose problems for the teaching of philosophy. In this connection, no text is more explicit about the nature of the business that Canguilhem wants to conduct than his masterwork: *The Normal and pathological*. Canguilhem actually presents himself from the first page not as an epistemologist or historian of science, much less as a philosopher, but as a “professor of philosophy [...] having taken up medical studies

some years after the end of [his] philosophical studies” to benefit from “an introduction to concrete human problems” (Canguilhem 1991 [1966], 33-34).

The Anteriority of “Unknown Material” to Philosophical Reflection

In general, little attention is paid to the fact that his famous medical dissertation – devoted to the study of “some problems concerning the normal and the pathological” – opens with an original definition of philosophy. “Philosophy is a reflection for which all unknown material [*matières étrangères*] is good, and we would gladly say, for which all good material must be unknown” (Canguilhem 1991 [1966], 33). When commentators pay attention to it, with a few rare exceptions (Le Blanc 1998), their focus is most often on the second part of the statement, because of the philosopher’s call to “unknown material” (Schwartz 2000). Yet such an expression is fully intelligible only so far as it is referred to the first part of the proposition, where Canguilhem explicitly identifies philosophy and reflection. Reflection is an act of thought by which it reacts to itself after experiencing “unknown material” [*matières étrangères*] that have broken its happy and innocent continuity. So to identify philosophy and reflection is to recognize the necessarily secondary nature of philosophy in relation to the problems that have aroused it, and to which the philosophical doctrine once constituted tries in return to provide an answer. From there, in a course taught during the writing of his dissertation, Canguilhem concludes by affirming the “corrective, normative character” of philosophical speculation. And this is so because of the functional anteriority of the problems to the philosophical examination itself:

The same goes for philosophy as it goes for all norms. It has already been mentioned that the abnormal, as ab-normal, is secondary to the definition of the normal, that it is a logical negation, even as it is the anteriority of the abnormal that arouses one’s normative attention, which motivates the normative decision and provides the use of the norm with the opportunity to instore the normal [...] So, practically and functionally speaking, the normal is an operative negation of the state at hand, which thereby becomes its logical negation, so that the ab-normal which is logically secondary, finds itself to be functionally primary. Philosophy can therefore only be secondary moment. It doesn’t create any values since it is the result of their conflicts differends. (Canguilhem 2015 [1942-1943], 87)

If dealing with “unknown material” in the traditional field of philosophy is an obligation for the philosopher, it is because the starting point of an authentic philosophical reflection can not be of a philosophical order. It is certainly destined to become one, according to the dynamics of problematisation that his reflexive activity will impel. But at first, if he wants to renew himself and not “necessarily rehash” as Canguilhem says in 1987, the philosopher-teacher must put himself in a learning situation with “unknown material” to philosophy.

In 1929-1930, Canguilhem thought of this “unknown material” in terms of knowledge about tools and techniques. From 1936 on, medical matters took over; then, from 1955 to 1971, it is the history of the life sciences which came to feed into the philosophical teaching of Canguilhem (Limoges 2012). Today, in 2018, it is the question of the epistemological conditions of the transmission of the memory of the Holocaust and its links with civics that will serve as “unknown material” for philosophical reflection.

Citizenship Education as “Matières Étrangères”

In accordance with the “corrective, normative character” of philosophy, the need to put Canguilhem to use in the field of education was triggered by the experience of two problems



encountered while participating in the design and implementation of educational pathways within a memorial-site dating from the Second World War.

Located near Aix-en-Provence, Les Milles Camp is the only large French internment and deportation camp still intact (1939-1942). It now houses a museum of which more than half of the visitors are made up of schoolchildren (60 000 for the year 2016-2017). Its purpose is to rely on the analysis of the tragic history of the place and the genocides of the twentieth century, to reinforce, the visitor's vigilance and responsibility of facing threats of extremism, racism and anti-Semitism through the historical, memorial and reflective aspects of its museography. In short, it is a question of supplementing the traditional and necessary memorial approach with the pedagogical presentation of a multidisciplinary understanding of the individual, collective and institutional mechanisms that led from racism or anti-semitism to mass crimes. Thus, in the three sections of the Site-memorial, there is an articulation between the multi-sensorial experience of the visitors who walk through the places of internment on the one hand, and an awareness of the dynamics that have conditioned the genocides of the past (historical and reflexive components) on the other hand.

Problem n° 1: How to educate when the knowledge to be transmitted is no longer regional?

One of the first difficulties encountered by the educational service in charge of designing educational programs of Les Milles Camp concerns the articulation of the plurality of the knowledges involved in citizenship education. In a nutshell, this is the problem of practical implementation of interdisciplinarity contents. Unlike multidisciplinary, which "can be understood as a juxtaposition of disciplines on an object, each discipline using its own concepts", interdisciplinarity aims at the construction of "a common representation of a problem", thus constituting "islands of rationality or intelligibility" (Lange 2013, 51, Lange 2014). The need to move from multidisciplinary to interdisciplinarity is due to the educational project of the Museum: to rely on the history of Les Milles Camp to explain how democratic processes have been transformed to such a point that they very quickly became capable of genocidal acts. The Museum of Les Milles Camp is based on the idea of a "convergence of memories" of the different genocides of the twentieth century. The historical and comparative analysis of the gears that led democratic societies to mass crimes reveals that such processes are fully intelligible only by adopting a point of view at the crossroads of different disciplines such as history, law, political science, sociology, psychology, etc. (De Swaan 2015, Semelin 2005). It is this point of view that is progressively being introduced into the museography. However, it turned out that a certain number of pupils had difficulties in adopting such a point of view. For the most part, the difficulty lies in the co-ordination of the different "regions of knowledge" (Bachelard 1986 [1949]) mobilized to understand how societies could very quickly prove themselves capable of genocide acts. There is in this operation of coordination of heterogeneous knowledge what can be considered an a-disciplinary condition imposed upon the practice of multidisciplinary. Borrowing a term from Kantian epistemology, it seems that the acquisition of a point of view at the crossroads of several "regions of knowledge" results from an operation of synthesis of the various disciplinary contributions, when this operation itself is not disciplinary.

Here we face a problem that following Kant, the philosophical tradition has called the problem of the unity of experience (Roth 2013). At the existential level, the meaning we give to our experience is a function of the degree of conciliation – and therefore of unification – that we are able to institute between multiple more or less convergent norms. This is what Wittgenstein saw when he states that "A philosophical problem has the form: 'I don't know my way about'" (Wittgenstein 1958 [1953], § 123). The discomfort and confusion experienced by the individual arise precisely from a mixture of "language games" whose respective normativities do not overlap; so, Wittgenstein says "That we are therefore as it were

entangled in our own rules” (§ 125). The normality of our experience, including the experience of finding oneself in a learning situation, therefore depends on our ability to allow for the convergence of norms that, in themselves, do not converge. Recall here the thought of Bachelard, according to which “Thinking an experience means therefore giving coherence to an initial pluralism” (Bachelard 2002 [1938], 22).

Thus, the conditions of possibility of any “education towards” (education toward citizenship, health, sustainable development, etc ...) appears. This is reminiscent of the well-known paradox developed by Plato in *Meno*, all knowledge already presupposes the presence in the pupil of this that they aim at the same time to develop. This is the “judgment” – we would speak today more of critical thinking – as defined by the reflexive tradition in philosophy following Kant (Merleau-Ponty 1945). By judgment (or critical thinking), we mean here a synthetic, a-disciplinary activity from which the individual enacts the convergence of a plurality of norms and knowledge that he encounters into a unity the. At the didactic level, the question is then how to activate and stimulate such a synthetic activity in the student?

Problem n° 2: How to train critical thinking when the content to be transmitted are norms?

The second problem encountered by the teachers in charge of the design of the educational programs of the Les Mille Camp is that of pedagogical correctness. Like all “educations towards”, civics education is problematic epistemologically since the knowledge transmitted consists of norms that seek the rectification of practices deemed unsatisfactory (Barthes, Lange and Tutiaux-Guillon 2017). This is not without posing some problems in terms of education. How can the teacher coordinate the epistemic requirements of the human sciences to establish *what is*, with the normativity of educations seeking the institution of *what ought to be*? How far can an apprenticeship lead to a lasting change in practices without neutralizing the critical thinking of students? In short, how can one ensure that, in a place like the Mille Camp, pedagogy does not proceed by the injection of “moraline” (Nietzsche 1991 [1895])? Too often in education the researcher François Audigier laments, the values on which the norms guaranteeing communal life are “presented as obvious, tolerance, respect for the law and others [...] The fact that the values are in tension or in conflict with each other is avoided” (Audigier 2015, 19). If this is the case, we understand that the whole challenge of the educational act is therefore, paradoxically, to complicate the falsely immediate relationship that the student maintains with his own values, without losing it. This, in a sense, has always been the subject of philosophy. “The function of philosophy is to complicate the existence of man” writes Canguilhem (1977, 139), echoing the formula of the master of his own master, Jules Lagneau, for whom “to philosophize is to explain, in the vulgar sense of the word, the clear by the obscure, *clarum per obscurius*” (Lagneau 1964 [1950], 96). In short, it is a matter of questioning the conditions of a civics education that does not do away with the reflexive aspect of such learning. Neutralizing the reflective dimension, may be comfortable for the teacher. But this comfort is at the cost of an unacceptable dogmatism. Hence the need to develop the student’s critical sense – the Kantian double sense of discernment and evaluation – so that he can assess for himself the value of democratic values.

Educational Sciences and “French Epistemology”

As the history of science illustrates, epistemological reflections are most often triggered by problems encountered in practice (Gingras, Keating, Limoges 1998). Education sciences, like all other sciences, do not escape this dynamic. There are also obstacles encountered in the exercise of the teaching profession which gradually led the pedagogues to reflect on the epistemological conditions of the transmission of knowledge.



In general, Canguilhem is far from occupying a position as central as a figure like Dewey in the epistemological French debates in education (Fabre 2015, Bulle 2016). But we cannot say that he is completely absent either (Cornu 2009). Canguilhem is thus at the heart of an epistemological quarrel opposing the supporters of “education towards” to the defenders of disciplinary knowledge. The dispute here concerns the legitimacy of the reversal of traditional ways of thinking about the knowledge to be taught. For Alain Beitone (2014), the proponents of “educations towards” would seek, “against a backdrop of exaltation of post-modernity and relativism [...] to challenge the scientific process and the existence of scientific knowledge”. However, believes Beitone, they would not have the epistemological means to think to the end of the educational reversal that they wish for. Indeed, the author continues, their criticism of disciplinary teachings is characterized by the fact that

The epistemological references used are extremely fragile [...] We can have respect for Jacques Ardoino’s pedagogical reflection, but epistemologically speaking, to situate it on the same level as G. Bachelard and G. Canguilhem is frankly ridiculous. (Beitone 2014)

Alain Beitone mainly supports his argument with a collective text where researchers make use of the “multi-referential approach” of French pedagogue Ardoino (1927-2015) against “regional epistemology” that would have been developed by Bachelard and Canguilhem after him. According to these researchers in education sciences, it is necessary to determine which epistemology would be suitable for the field of education towards sustainable development:

Starting from a reflection related to this field, a reflection deeply rooted in the history of the science at hand, some authors build a philosophy of science or even a philosophy such as that of Bachelard or that of Canguilhem. Here we can see how a regional epistemology seems to us, at first glance, not very adapted to the economic-socio-scientific concepts of sustainable development. The multi-referential approach of Ardoino (1988), because it takes into account, without exclusivity a priori, islands of rationality related indifferently to the fields of the sciences of nature, social sciences, or human sciences, and because it questions the values involved and accepts zones of ignorance, seems to be more appropriate to the aim of exceeding this limit (Simonneaux J., Simonneaux, L., Lange, Girault, Victor, Fortin-Denart 2006).

What Simonneaux et al. criticize as “French epistemology” is essentially the compartmentalisation of the field of knowledge. For example, with regard to Bachelard, the need to delimit “distinct regions in the rational organization of knowledge” (Bachelard 1986 [1949], 119), and thus to recognize “regional rationalisms”, involves that scientist methods differ depending on whether one is interested in electricity or mechanics. This is why Bachelard declares that he has “fragmented rationalism in order to associate it well with the matter it informs, with the phenomena it regulates, with the phenomenotechnics it supports” (Bachelard 1986 [1949], 119). It is such a fragmentation of rationalism into distinct regions (“electrical rationalism”, “mechanical rationalism”) that stands as an obstacle for those researchers trying to reflect on the knowledge involved in “educations towards”. Because it is fragmented, such an “applied rationalism” seems at first sight hardly appropriate “to the intermediary nature – between natural science and human sciences – of the kind of knowledge involved by ‘educations towards’”. Whether we talk about education towards sustainable development, education towards health, or citizenship education, each time, what is appealed to are “ideas of catch-all concepts, drawers, intersections, or complexes” (Simonneaux and al. 2006).

Is Canguilhem's Epistemology "Really" Regional?

One may nevertheless wonder if "French epistemology" is not taken here by these authors in a way that is far too monolithic? Let's go even further. It is widely held that Bachelard and Canguilhem practice a "regional epistemology". Jean-François Braunstein, to whom we undoubtedly owe the most enlightening studies on the history of the history of science in France, considers that

Whereas "philosophical history", like Hegel's, is based on the point of view of universal reason, the history of science according to French epistemology is essentially a regional history. (Braunstein 2002, 934)

If talking about regional epistemology to describe the work of Bachelard is entirely legitimate, the same does not go for Canguilhem, whose texts seem on this point much more ambiguous. He is certainly the author of advanced studies in a particular area of the history of life sciences. Consider for example "The effect of bacteriology at the end of medical theories in the nineteenth century", "Pathology and physiology of the thyroid in the nineteenth century", or the thesis for the doctorate of philosophy, with its undoubtedly bachelardian title *La Formation du concept de réflexe aux 17e et 18e siècles*. But at the same time, what makes the originality of these stories of scientific concepts, and thus contributes to their value, is that the teaching that the reader draws from it goes beyond both the information of a scholarly study of the history of science like René Taton's, but also the framework of epistemology *stricto sensu*. It is because, in the words of one of Canguilhem's former students, "his thought was mainly elsewhere" (Debru 2008, 9). Indeed, if a work as specialized as the *Essay on some problems concerning the normal and pathological* spoke to all of us in the past, as it speaks to all of us today, it is because

it also speaks of something other than its ostensible themes, physiology and pathology, science and technology, norm and value, or diabetes, electroshock, neuroglioma disease, diseased cells. It tells us about what is alive in us. It relies on this to give us a masterful lesson of life and in this way achieves the highest goal of philosophical thought. (Debru 2008, 9)

There is in these few lines of Claude Debru much more than just a game about the polysemy of the word life. Maintaining his reader within the context of acute problems in a well-defined area of the history of the sciences of life – life being understood here in its biological sense –, Canguilhem would show him at the same time, but without ever saying it explicitly, a life lesson taken in its existential sense. This "paradox" had not completely escaped the notice of Foucault, who had made a point of raising it when he had to introduce his master to the American public. However, this paradox disappears as soon as we know that Canguilhem subordinated his concise incursions in the history of life sciences to the exercise of his profession as a professor of philosophy. Now, it has always been clear to him that philosophical practice is not a work of specialization. On the contrary, it is an effort to "totalize the experience of an era" (Canguilhem 1965). This is a perennial position, which runs through all of his work, and so since his early writings. Already in 1938, he associated himself with his friend and teacher René Le Senne (1882-1954) to declare: "We defined the philosopher as a teacher of unity" (Le Senne). Everyone will agree on it otherwise we will not get along" (Canguilhem 2011 [1938], 501). And in the *Traité de logique et de morale*, which he published the following year for the benefit of his High school students, he declared at the outset that "if a philosophical teaching has an educational meaning, it is in so far as it can give the taste of this unity" (Canguilhem and Planet 2011 [1939], 635). Philosophy is a quest

for unity: it aims at the unification of a subjective experience made problematic in that the values included in it are in conflict (Roth 2013). If the contemporary world is a “problematic world” (Fabre 2011), it is because modernity is characterized essentially by a “polytheism of values” as Max Weber had diagnosed it. On the existential level, the modern individual faces a real axiological puzzle: how to reconcile the moral requirement, the political need to live together and the thirst for beauty on the one hand, with the aspiration to truth that on the other hand, continues to grow with the innumerable successes that the sciences have encountered for four centuries? It is understandable then that regarding this requirement of unity, a “regional epistemology” is essentially unsatisfactory.

This is why we cannot legitimately bring Canguilhem’s approach back to that of Bachelard, his predecessor at the Sorbonne, to whom he is too often reduced (Gayon 2006). Far from defending a strict epistemological regionalism, Canguilhem, like Foucault in *The Order of things*, believes on the contrary that the profession of epistemology consists, in “challenging the specialization of the specialists and trying to become a specialist, not of generality, but of inter-regionality” (Canguilhem 1967, 609). Without adopting an inter-regional point of view in epistemology, how can anyone account for the emergence of a scientific ideology such as Spencer’s evolutionism (Canguilhem 1977)? How to understand that the concept of milieu has become “a universal and obligatory mode of apprehending the experience and existence of living beings”, without retracing “the historical stages in the formation of this concept, the various forms of its utilization, and the successive inversions of the relationship in which it is one of the terms – in geography, in biology, in psychology, in technology, in economic and social history” (Canguilhem 2008 [1952], 98)? How to explain the popular success of a scientific concept such as reflex, without bringing it back to the socio-economic context of “an industrial civilization [which] cultivates rather the reflex reaction, whereas an agricultural civilization cultivates rather a slow or delayed reaction” (Canguilhem 1977 [1955], 163)?

One could import a concept drawn from the sociology of law into the field of epistemology, and say that the objects of Canguilhem’s history of science are “phenomena of inter-normativity”. His examination is not concerned with the objects of the different sciences, but with “the whole of the phenomena constituted by the relationships that are formed and resolved between two categories, orders or systems of norms” (Carbonnier 1988, 313), namely epistemic norms on the one hand, and social norms on the other. To be convinced of this, one just needs to enumerate some of the inter-normative concepts whose history he has retraced: the concept of “milieu”, “reflex”, “regulation”, and of course, that of “norm”. All these concepts could be considered as standing at the crossroads of several regions of knowledge. And it is precisely because of their composite nature that Canguilhem was interested in them. Inspired by the Kantian gesture, he effectively demands that these concepts produce their titles, and judges their potential usurpations in and through the social field. Hence his interest in 1972 in the question of “the manufacturing, of birth, the import and export of a certain number of interpretative concepts of biological functions” (Canguilhem, quoted by Limoges 2015, 29).

Canguilhemian Landmarks for Educational Practices

Back to problem n° 1: An “inter-regional approach” to knowledge in education

This inter-regional approach to knowledge is rich in lessons for thinking about the objects of “educations towards”. Foucault defined his master’s approach as “a search for the normativity internal to various scientific activities, as they have actually been implemented” (Foucault 2001 [1985], 1590). From this point of view, reflecting upon sustainable development or civics education, is therefore showing the norms and values of the various

regions of knowledge they involve, and revealing their interference. If environmental or political issues are the subject of public controversy, it is because they consist of activities whose “internal normativity” do not overlap - or even conflict. Hence the need, in terms of didactic transposition, to practice a pedagogy centered on the construction of problems involving conflicts of norms by the students. This is materialized empirically in the practice of French philosopher Erick Prairat (2017) which he calls “a pedagogy of dilemmas”. Based on the reflections of the English philosopher Bernard Williams, Prairat means by dilemma a moral conflict whose logical structuring is presented in two ways: “In the first, it seems that I must do A, and that I must do B but I can not do both A and B; in the second, it seems that I must do this and not do it” (Williams, quoted by Prairat, 2017). In sum, the pedagogical challenge consists in activating and stimulating the student’s synthetic judgment on the basis of the examination of inter-normative situations that are problematic insofar as they all imply interferences between conflicting normative frameworks.

Back to Problem n° 2: Make values appear by experiencing their anti-values

Examining the composite nature of the objects of the “educations towards” from the inter-regionality of knowledge seems to respond in part to the aforementioned problem concerning the obviousness with which one too often presents the values of living together in citizenship education. In their text of 2006, the proponents of “educations towards” believe that “another limitation of the French epistemological approach concerns the lack of attention given to the question of the values involved in scientific knowledge” (Simonneaux and al. 2006). Here again, the criticism seems illegitimate in the case of Canguilhem. Let us remember already that he worked for twenty-five years on the concept of norm, which can be precisely defined as a technical means of inscribing into some value into the real:

When we know that *norma* is the Latin word for T-square and that *normalis* means perpendicular, we know almost all that must be known about the area in which the meaning of the terms “norm” and “normal” originated, which have been taken into a great variety of other areas. A norm, or rule, is what can be used to right, to square, to straighten. (Canguilhem 1991 [1966], 239).

Moreover, his examination of the relationship between the normal and the pathological reveals that only the “experience of negative values” of the pathological can bring out the value of the regulations of the normal. Extending Bachelard’s reflection on “epistemological obstacles” (2002 [1938]), Canguilhem defends the idea that “every value must be earned against an anti-value” (Canguilhem 1991 [1966], 239). A dynamic and controversial concept, the norm draws indeed its value from the rectification it imposes on an abnormal logical second (normal + *ab* privative), but historically prime. The abnormal is the condition of possibility of the norm, which normalization subsequently aims at. In other words, it is through the experience of “negative values” that the value of the norm is dynamically revealed: “In order to truly enjoy the value of the rule, the value of regulation, the value of valorization, the rule must be subjected to the test of dispute” (Canguilhem 1991 [1966], 242).

In terms of citizenship education, understood as an “education towards the law, an education towards power” to which is added “a work on belonging” (Audigier 2009), the memory section of the Les Mille Camp is devoted to this essential point. The republican philosopher Charles Renouvier wanted “to teach the child to feel the evil, while we try to disguise it” (Renouvier 1930 [1903], 92). Without perhaps going quite so far, consider the following hypothesis. Experimenting during the visit of the internment places still intact the terrible conditions in which the internees lived, realizing that it is the tilt of democracy in the authoritarianism of Vichy which provided the institutional framework of the deportation of

more than 2000 innocents, it can be hypothesized that students actually experience these “negative values”. This is why an empirical investigation currently under way is trying to verify whether such an experience makes the students look dynamically at the value of the values of the Republic, the negation of which made such a place possible in the years 1939 - 1942. Several studies will be conducted with a population of students who will visit the site-memorial in a school setting. Based on measurement tools developed in social psychology, we will seek to determine the nature of the influence of a visit of the Les Mille camp, which stands as a reminder of the anti-value of the values of the Republic. We shall observe the adherence of students to republican principles. In doing so, we believe that we follow the requirement previously formulated by Canguilhem regarding the function of the professor of philosophy: “The philosopher does not have to exhort, to convert, not even to moralize. To make values appear is not to preach” (Canguilhem 2015 [1953], 541).

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