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## Economics of Convention Meets Canguilhem

*Rainer Diaz-Bone* \*

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**Abstract:** »*Economics of Convention Meets Canguilhem*«. The neopragmatist institutionalist approach of economics of convention (in short EC) still is in need of a conception of health that enables EC to work out a critical standpoint in the analysis of health care institutions. French historical epistemology is an early critique of Comtian positivism in the philosophy of science. The work of the historical epistemologist Georges Canguilhem is the most important approach for a non-reductionist, pluralist conception of health and for the anti-positivist critique of medical concepts of the “normal.” This critique has become an influential basis for the critical analysis of quantification in health care. Canguilhem introduced the notions of biological normativity and social normativity, which govern the relation of organisms and their milieus and can be regarded as original sources for value and normative orders. In this contribution, the anti-positivist critique of Canguilhem is presented. Then the link between scientific concepts, knowledge production in the health care system, and health institutions is discussed, which was later on continued by Michel Foucault as a successor of Canguilhem in the field of historical epistemology. It is pointed to the affinities of Canguilhem’s approach to pragmatism but also to the capability approach of Amartya Sen. Consequences of Canguilhem’s work for EC and links to EC’s concepts are worked out. Finally, the relevance of Canguilhem’s work to the ongoing digitalization of health care is sketched.

**Keywords:** Canguilhem, economics of convention, health economics, sociology of health, biological normativity, social normativity, Bachelard, Foucault, Sen, quantification, digitalization.

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## 1. Introduction

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*Valere*, from which value derives, means to be in good health in Latin. Health is a way of tackling existence as one feels that one is not only possessor or bearer but also, if necessary, creator of value, establisher of vital norms. (Canguilhem 1991, 201; emphasis in origin)

The analysis of the health care system<sup>1</sup> and the political economy of health is one of the main domains of economics of convention (convention theory, in short EC). This approach was developed in France and has become a contemporary international and interdisciplinary approach. Convention theory (EC) is an institutionalist and complex (neo)pragmatist approach, which assumes a pluralism of conventions as rationalities and as logics for evaluation, valuation, and interpretation. These conventions have to be conceived as normative orders, which actors in real situations rely on when coordinating with other actors, institutions, and objects (Storper and Salais 1997; Boltanski and Thévenot 2006; Diaz-Bone and Salais 2011).<sup>2</sup> Conventions are therefore also blueprints for production and consumption. Because of the co-existing plurality of conventions, real situations are coined by tensions actors have to deal with when they have to face conflict, critique, and the need for justification. But EC has also demonstrated that the co-existence of conventions does not necessarily bring in tensions overtly, but can also result in stable combinations, in durable forms of co-existent different institutional rationalities, or in solid market segmentation, where market segments are separated by different quality conventions.

Health care, health insurances, health education, and health professions, the organization and financing of the health care system have always been at the crossroads of political debates and social conflict (Batifoulier et al. 2018). For social scientists, the organization and regulation of health care is closely related to core issues such as quality of life and societal progress but also to issues such as social inequality and the exclusion from health services.

In recent years, debates about health and health care have intensified for many reasons. New life styles are centered on the practices to enhance one's "health" and to protect oneself against health risks. These practices are supported and promoted by new digital devices and growing health industries and service providers in Western societies. Here, political policies, public debates, and societal discourses on health rely on simple economic criteria (as cost efficiency) provided by mainstream economics and rely on a concept of

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<sup>1</sup> In this contribution, the notion of "health care system" is used in a broader sense, comprising hospitals, doctor's offices, and surgery as well as nursing homes, etc.

<sup>2</sup> For French presentations of economics of convention, see Batifoulier (2001), Batifoulier et al. (2016), Orléan (2004), Eymard-Duvernay (2006a, 2006b); for a German presentation, see Diaz-Bone (2018).

health, which is mainly based on the notion of health as a commodity and as the absence of disease.

EC brings in a critical perspective in the analysis of health care and the health care system, insisting on the normativity of everyday coordination and the normative basis (Batifoulier et al. 2005, 2018), that conventions provide for the institutions and the way actors handle them. Here, the works of Philippe Batifoulier and collaborators laid down the foundations to make EC a contemporary and also an international approach in the field of economics and sociology of health.<sup>3</sup>

Also, EC has pointed to the need of recognizing different possible notions of health and to draw the conclusions out of this fact for EC's study and evaluation of health care and the health care system. In the field of EC, Nicolas Da Silva has referred to the French *historical epistemologist* and historian of science Georges Canguilhem to work out the argument of different possible notions of health.<sup>4</sup> This way, Da Silva made evident that the health care system, and also health economics, loses the evidence of what health is and how to measure it (Da Silva 2014, 2017, 2018, 2021).

In this contribution, the approach of EC and its contributions to the analysis of the health care system will be related to the work of the historical epistemologist Georges Canguilhem. The aim is to work out the relevance of Canguilhem's concepts for EC to advance EC's capacity as a contemporary neopragmatist approach for the economics and sociology of health.<sup>5</sup> Historical epistemology shares with EC a historical and pluralist perspective on the link of normative orders and knowledge, technology, and institutions. It is regarded as an anti-positivist philosophy of science, which is close to the (mainly) neopragmatist and (also) neostructuralist epistemology applied in EC's research. The contributions of Canguilhem (and of historical epistemology in general) can have different main impacts (especially) in the field of economics and sociology of health. Canguilhem's work *undermines the evidence of health* as a given reality in the sense of (naive forms of) positivism. EC does not provide a health concept itself. Canguilhem's *conception of health* corresponds to main core positions of EC and therefore fits for EC's research.

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<sup>3</sup> For conventionalist contributions from Germany and Switzerland to sociology of health, see Cappel and Kappler (2021).

<sup>4</sup> In France, the notion of "historical epistemology" has a broader meaning and includes a historical understanding of philosophy of science (Lecourt 1975).

<sup>5</sup> Another link, relevant for EC, is the interest of some convention theorists to bring in essential contributions and concepts of another historical epistemologist, Michel Foucault, to the approach of EC. See Gomez (2005), Gomez and Brittany (2000), Grenier and Orléan (2007), Favereau (2014, 2019) and Diaz-Bone (2019a). Georges Canguilhem and Michel Foucault are both representatives of the French tradition of historical epistemology, which was initiated by Gaston Bachelard and has influenced French structuralism and neostructuralism. For the anti-positivist positions of French historical epistemology, see Lecourt (1975, 2016), Tiles (1984, 2011), Lepenies (1987), Renard (1996), Hacking (2002), Chimisso (2003, 2008, 2010), Diaz-Bone (2008), Rheinberger (2005, 2010).

Also Canguilhem's contributions can be mobilized to demonstrate the *inevitable plurality, the historicity of norms, and the normativities* in scientific practices itself – including the practices in subfields such as health sciences, health economics, and sociology of health. But it is especially Canguilhem's conceptual contribution to the theorizing of *different origins and sources of norms, normativities, and normative orders* that pattern actors' practices as coordination with others, oneself, and objects – that are regarded as seminal for health sciences, and should be regarded for non-positivist and non-reductionist, institutionalist approaches as EC, too. Canguilhem's work offers elementary conclusions for a *critique of the institutions* of medical care as well as a *critique of the relation between patients and medical professionals*. And finally, historical epistemology can contribute to the *improvement of methodological strategies*, especially to the identification and analysis of the link between concepts (of health and disease), institutions in empirical situations, and the adequate form of representation of health – preparing a *critique of quantification* of health.

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## 2. Canguilhem's Historical Epistemology of Medical Theorizing about Health

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Being the follower of Gaston Bachelard, who developed the principles of historical epistemology in the field of physics and chemistry, Georges Canguilhem has extended the scope of historical epistemology to medicine and biology.<sup>6</sup> It is important to understand the complex relationship of historical epistemology to positivism. This is due to the fact that in France, *philosophy of science* and the analysis of the history of science have an influential position in the French sciences because of the positivist heritage, which has become highly influential in France itself (Lecourt 1975, 2016; Canguilhem 1979, 2002, 2005; Lepenies 1987; Bourdieu et al. 1991; Chimisso 2008). Already Gaston Bachelard was oriented by the general idea of the progress of the “human mind,” which Auguste Comte worked out in his “law of three stages.” Comte

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<sup>6</sup> George Canguilhem was born in 1904. From 1924 to 1929, he studied philosophy at the Ecole normale supérieure in Paris and worked from 1930 as teacher in different cities in France until 1940. Already in the late 1930s he took up studies in medicine at the University of Toulouse, then at the University of Strasbourg, where he also started teaching in the 1940s. During the German occupation, he participated actively in the Resistance. In 1943, he defended his medical thesis. From 1948 until 1955, he was the “inspector general” of national education. In 1955, he defended his philosophical thesis (supervised by Gaston Bachelard). Also in 1955, he became successor of Bachelard at the Sorbonne University in Paris (as professor of the history and philosophy of the sciences) and he also became successor of Bachelard as director of the “Institut d'histoire des sciences et des techniques” of the University of Paris. In 1971, Canguilhem retired. He died in 1995 (For more detailed information on Canguilhem's biography, see Borck et al. 2005a, Lecourt 2016, chap. 1 and Elden 2019, chap. 1).

presented a model of the development of science, which he assumes to step forward from the theological stage to the metaphysical (or “abstract”) stage and – finally – to the positivist (or “scientific”) stage. This law-like model is intended to present a teleological development, which “purifies” science by eliminating metaphysical elements of thinking and implementing facts and scientific methods as the foundation for human thinking only. For Comte, the validity of this model was not restricted to science in particular, but was meant as a model for social progress in general (Comte 2009). The notion of *philosophy of science* derives from this positivist view on social and scientific progress (Lecourt 1975).<sup>7</sup> Historical epistemology still refers to positivism, but not to identify positivism as a precursor and historical epistemology as its continuation. Instead, Bachelard and his successors have developed a set of anti-positivist positions that characterize historical epistemology and mark its differences to positivism.<sup>8</sup>

(1) It was Gaston Bachelard (2002) who referred to Comte’s law of the three stages of human mind, but who contradicted the concept of science as a progressing process, which continuously accumulates knowledge. Instead, sciences progress by realizing “epistemological ruptures,” which are ruptures (or breaks) with everyday evidence and with the wrong conceptions and metaphors of foregoing but erroneous scientific theories (Bachelard 1968, 1971). The evaluation of scientific progress is always a process that rectifies its former errors. Only in retrospect can the progress be recognized.<sup>9</sup>

(2) Also, Bachelard refused the positivist position, which regards facts as given and as solid ground for science. Facts are not to be discovered, instead, science has to engage theory as well as technology to “generate” new scientific phenomena. This is what Bachelard called “phenomeno-technology” (Bachelard 1971, 2002; Rheinberger 2005b; Diaz-Bone 2008). Seen this way, modern science produces “its facts” on its own, which for Bachelard are to be regarded as a materialization of the engaged theory and technology (Tiles 1984; Rheinberger 2010; Bachelard 2002).

(3) In line with positivist thinking, for Bachelard and for his successors Canguilhem and Foucault it is still possible to decide about scientific progress – although, and in contrast to positivism, this progress, evaluated by

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<sup>7</sup> Lecourt (1975, 2002) characterizes the specific French tradition of historical epistemology, which also represents a normative position in the philosophy of science (which is in the German sciences labeled “*Wissenschaftstheorie*”), and which is different from a history of sciences (Canguilhem 1979b, 2002b; Lepenies 1987).

<sup>8</sup> For Bachelard’s methodological critique of Husserl’s phenomenology and Husserl’s critique of modern science, see Diaz-Bone (2008).

<sup>9</sup> “A science is a discourse which receives its norm from its critical rectification. If this discourse has a history whose course the historian claims to reconstitute, it is because it *is* a history of which the epistemologist has to reactivate its meaning” (Canguilhem 1988, 11; emphasis in origin).

historical epistemology, is not directed and still can be burdened by residuals from erroneous forgoing ways of thinking (Bachelard 1968).

(4) Bachelard and Canguilhem refused the idea of philosophy as the foundation for modern sciences (as natural sciences) and they also refused the notion of a general philosophy of science as the provider of a universal methodology. Every science can and has to work out its own philosophy and methodology (Bachelard 1968, 2002; Lecourt 1975; Canguilhem 1979, 2002).

As Comte did, Bachelard focused on the problems of scientific progress, which Bachelard analyzed as internal to scientific knowledge and which he named “epistemological obstacles.” Thereby, he developed a specific approach to reconstruct the internal organization of scientific theories and to identify misleading metaphors, inadequate language, conceptual incoherence, and conceptual errors.<sup>10</sup> Therefore, historical epistemology is no “history of science,” which Canguilhem dismissed as a chronological description of the objects and discoveries of science and this way as a repetition only. Instead, the task of historical epistemology is to regard scientific theories and concepts as the object under study and to critically inspect science (Canguilhem 1979, 2002). And here historical epistemology focuses on the normativities of scientific practices. As Michel Foucault has stated in his introduction to “The normal and the pathological,” epistemology

[...] is not the general theory of all science or of every possible scientific statement; it is the search for normativity within different scientific activities, such that they have effectively been brought into play. Hence, we are dealing with an indispensable theoretical reflection which a history of science can form for itself in a way different from history in general; and conversely, the history of science opens up the area for analysis which is indispensably in order for epistemology to be something other than the simple reproduction of schemes within a science at a given moment. (Foucault 1991, 17)

Canguilhem can be regarded as the critical inspector of what is called nowadays “life sciences” and their normativities, methods, and concepts (Rheinberger 2005; Borck et al. 2005a, 2005b).<sup>11</sup> Although he had an important impact since the late 1950s on the members of French structuralism and neostructuralism in France, for a long time most of Canguilhem’s work has

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<sup>10</sup> One can speak of a kind of proto-version of French discourse analysis applied to scientific theories, which Canguilhem and Foucault continued and worked out later on (Gutting 1989; Williams 1999; Diaz-Bone 2008).

<sup>11</sup> Michel Foucault was continuing this application of historical epistemology to the life sciences with his study about the “birth of the clinic” (Foucault 1973). Later on, he extended the scope of historical epistemology on the social sciences and the analysis of societies. His lectures about the emergence of what he labeled “governmentality” sketched the link between the rise of economic thinking as part of the modern “biopolitics” (Foucault 2007, 2008; see also Diaz-Bone 2019a). In this regard, Canguilhem prepared Foucault’s works and he contributed also to the preparation of the methodology of Foucaultian discourse analysis (Canguilhem 1979, 2002; Foucault 1991; see also Gutting 1989, 1994; Williams 1999).

had no comparable recognition – even in France<sup>12</sup> (but since the 1980s, the situation has changed in France and also international reception and discussion is growing).<sup>13</sup>

The important exception is Canguilhem's doctoral thesis in medicine, "The normal and the pathological" (Canguilhem 1991), first published in France in 1943.<sup>14</sup> Although published almost 80 years ago, it is this seminal work on the specific nature of concepts as "health," "disease," "normal," and "pathological" in biological and medical theories that has received early recognition but experienced again a growing interest in the last decades. Canguilhem's classical study fuels contemporary debates not only in contemporary historical epistemology and philosophy of science (see references above) but also in other fields – such as health sciences (Giroux 2010),<sup>15</sup> sociology of health (Hehlmann et al. 2018), or philosophy of medicine (Nordenfelt 1995; Fagot-Largeault et al. 2008; Durrive 2014). The positions of mainly this monograph – and some of Canguilhem's shorter articles – are considered here as being significant for contemporary concerns of EC, when applied to health economics and sociology of health.

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<sup>12</sup> Exceptions are publications such as Macherey's essay on Canguilhem (Macherey 1998a) – first published in 1964 – Bourdieu, Chamboredon, and Passeron's (1991) introduction to the philosophy of science for sociologists – first published in 1968 – and Foucault's introduction (Foucault 1991) to the English translation of Canguilhem's "The normal and the pathological" (Canguilhem 1991), which was first published in 1978. In 1960, Canguilhem has examined Foucault's doctoral thesis "Folie et déraison" (see Eribon 1991; Borck 2005a; Elden 2019) and, in 1967, Canguilhem (1967) reviewed Foucault's "Order of things" (1989); Canguilhem supported the publication of Foucault's "Birth of the clinic" (Foucault 1973; see Eribon 1991, Macherey 1998b, Elden 2019), which was published in the book series "Galen," whose series editor was Canguilhem (Eribon 1991; Elden 2019).

<sup>13</sup> The interest in Canguilhem's work was stipulated by the fact that he was seen as a supervisor and mentor of Michel Foucault (Borck et al. 2005; Elden 2019). For this impact of Canguilhem's work and the growing international reception, see Borck et al. (2005a, 2005b). For a list of Canguilhem's publications and publications about Canguilhem's work, see Limoges (1994), Borck et al. (2005a) and the appendix in Borck et al. (2005). Since 2011, the French publisher Vrin has been editing the complete works of Canguilhem ("Oeuvres complètes" in six planned volumes, see Elden 2019 and Talcott 2019). In the last years new books have been published that serve as an introduction to the work of Canguilhem; see Braunstein (2007), Lecourt (2016), Elden (2019), and Talcott (2019). Also, there have been special issues published devoted to Canguilhem such as *Revue de métaphysique et de morale*, 90(1) in 1985, *Prospectivité et santé* 40 in 1986/1987, *Economy and Society* 27(3) in 1998, *Revue d'histoire des sciences* 53 in 2000, *Dialogue* 52 (4) in 2013, and *Transversal* 4 in 2018.

<sup>14</sup> In France, Canguilhem's medical thesis was published in 1943 as "Essai sur quelques problèmes concernant le normal et le pathologique," the second edition was published in 1950. A revised and extended edition was published with the title "Le normal et le pathologique" in 1966. It was translated into German in 1974 and into English in 1978. Canguilhem's doctoral thesis in philosophy was directed by Bachelard and published 1955 as "La formation du concept de réflexe aux XVIIe et XVIIIe siècles" (Canguilhem 1977).

<sup>15</sup> See also Giroux (2016; introduction and the contributions in part II "Health, normativity and naturalism").

## 2.1 The Rupture with the Tradition of Medical Positivism

Already in the beginning of “The normal and the pathological,” Canguilhem makes clear how Auguste Comte was influenced by the medical theories of the early 19th century and how Comte transferred ways of thinking from medicine to his view of society. This is an influential transfer of concepts of health to positivist theorizing about society, and a first aspect, which makes Comte’s work relevant for Canguilhem and makes Canguilhem’s critique significant for the EC.<sup>16</sup> His points of departure are traditional medical conceptions of disease. He presents two main ways of thinking about disease: one conception explains disease by an external cause; the other conception explains disease by an internal dis-balance.

Medical thought has never stopped alternating between these two representations of disease, between these two kinds of optimism, always finding some good reason for one or the other attitude in a newly explained pathogenesis. Deficiency diseases and all infectious or parasitic diseases favor the ontological theory, while endocrine disturbances and all diseases beginning with dys- support the dynamic or functional theory. However, these two conceptions do have one point in common: in disease, or better, in the experience of being sick, both envision a polemical situation: either a battle between the organism and a foreign substance, or an internal struggle between opposing forces. Disease differs from a state of health, the pathological from the normal, as one quality differs from another, either by the presence or absence of a definite principle, or by an alteration of the total organism. (Canguilhem 1991, 41)

Here, the notions of the normal and the pathological as *counter-concepts* are introduced. To critically inspect these and their relation is the main concern of this first part, which is entitled “Is the pathological state merely a quantitative modification of the normal state?” Canguilhem scrutinizes the theories of French medical scientists, François Broussais, Claude Bernard, and René Leriche. He is a close reader of their classical works, but although he appreciates their efforts and discoveries, he is mainly interested in the inspection of their conceptions of health and disease and their interrelation.

François Broussais has introduced medical notions of the normal and the pathological in the first decades of the 19th century.

Broussais described all diseases as consisting essential excess or lack of excitation “in the various tissues above or below the degree established as the norm.” Thus, diseases are merely the effects of simple changes in intensity in the action of the stimulants which are indispensable for maintaining health. (Canguilhem 1991, 47-48)

Comte called this the “Broussais’ Principle,” which became a general principle for Comte’s project to argue for the existence of social laws and of Comte’s idea to separate the normal and the pathological. In discussing Comte’s

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<sup>16</sup> For Comte as a point of reference in Canguilhem’s work, see Renard (1996) and Gane (1998).

interpretation of Broussais, Canguilhem detects the assumption of an asserted identity of principles, which govern health and disease. Because of this identity of principles, the position of Broussais and his school is to regard pathology as a branch of physiology only. For Canguilhem, these assumptions are not convincing. And more seriously, Canguilhem criticizes Broussais' and Comte's failure, not to present a definition for what exactly is a normal phenomenon – which could only be done by introducing a norm. This way, Comte and Broussais achieve only qualitative statements about the normal and the pathological.

From here on, one can outline the major objection to this thesis according to which pathology is an extended or broadened physiology. The ambition to make pathology, and consequently therapeutics, completely scientific by simply making them derive from a previously established physiology would make sense only if, first, the normal could be defined in a purely objective way as a fact and second, all the differences between the normal state and the pathological state could be expressed in quantitative terms, for only quantity can take into account both homogeneity and variation. (Canguilhem 1991, 57)

*Claude Bernard* has developed his theory from the middle of the 19th century on. It is presented by Canguilhem as a positivist approach, as already influenced by Comte. Bernard is appreciated by Canguilhem for his experimental approach to health and disease, and because Bernard can offer verifiable arguments.<sup>17</sup> The approach of Bernard assumes the identity of the underlying principles of pathology and physiology – both should be conceived as determined by the same laws. Like Comte and Broussais, also Bernard cannot solve the problem to offer a substantial criterion to separate the normal and the pathological. In the discussion of Bernard's position, Canguilhem prepares an important critique, which has epistemological and also institutional relevance. The experimental laboratory approach of Bernard identifies symptoms that are isolated from their natural contexts and, in case of disease, isolated from the clinical context. For Canguilhem, this methodology cannot validly detect the normal (and norm-setting) relation of a living organism to its proper milieu and it cannot detect the specificity of disease which, for Canguilhem, needs to be identified in a clinical context.

But in the living organism all functions are interdependent and their rhythms are coordinated: real behavior can be only theoretically divorced from the behavior of the organism functioning as a whole. [...] It seems very artificial to break up disease into symptoms or to consider its complications in the abstract. What is a symptom without context or background? What is a complication separated from what it complicates? When an isolated symptom or a functional mechanism is termed pathological, one forgets that what makes them so is their inner relation in the indivisible totality of individual behavior. [...] Pathology, whether anatomical or physiological,

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<sup>17</sup> Elden discusses the influence of Bernard's (2019, 62f) later works on Canguilhem.

analyzes in order to know more, but it can be known as pathology, that is, as the study of the mechanisms of disease, only insofar as it receives from clinical practice this notion of disease, whose origin must be sought in the experience men have in their relations with the whole of their environment. [...] These quantitatively different results would have no quality, no value in a laboratory, if the laboratory had no relationship with a hospital or clinic where the results take on the value or not of uremia, the value or not of tetanus. Because physiology stands at the crossroads of the laboratory and the clinic, two points of view about biological phenomena are adopted there, but this does not mean that they can be interchanged. (Canguilhem 1991, 84, 88, 111)

For Canguilhem, the clinic as medical institution is superior to the laboratory and the results of the latter have to be integrated in the evaluation procedures of the former. Non-normal values of single indicators cannot be evaluated without taking into consideration the situation and behavior of the whole organism. This critique of Canguilhem is preparing his own rupture with the introduced positions of a physiological foundation of pathology. For Canguilhem, there is need to keep the complexity of diseases, whose reality can only be identified and cured with regard of their embeddedness in their environment.

It is the theory of *René Leriche*, which was worked out in the 1930s and which supports Canguilhem's insistence to focus organisms in their proper environment and which supports Canguilhem in rupturing with Comte, Broussais, and Bernard's position of the normal and the pathological. Leriche is the first (of these three medical scientists) to offer a definition of health. His definition is a starting point for Canguilhem. For Leriche, health is a quality, which is understood as everyday evidence and as a norm, so that it is indirectly experienced as soon as this norm is violated (Canguilhem 1991, 118).

"Health" says Leriche "is life lived in the silence of the organs" [...]. Conversely, "disease is what irritates men in the normal course of their lives and work, and above all, what makes them suffer" [...]. The state of health is a state of unawareness where the subject and his body are one. Conversely, the awareness of the body consists in a feeling of limits, threats, obstacles to health. Taking these formulae in their full sense, they mean that the actual notion of the normal depends on the possibility of violating the norm. Here, at last, are definitions which are not empty words, where the relativity of the contrasting terms is correct. (Canguilhem 1991, 91)

Canguilhem took over this definition and he drew the consequences out of it.<sup>18</sup> A consequence of Canguilhem's interpretation of Leriche's theory is

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<sup>18</sup> Canguilhem confirmed this definition some decades later (in 1988, thereby also adding the social aspect of health as a societal evidence). "The patient calls for help, draws attention; he is dependent. The healthy man who adapts silently to his tasks, who lives the truth of his existence in the relative freedom of his choices, is present in a society that ignores him. Health is not only life lived in the silence of the organs - it is also life in the discretion of social relations. If I say that

breaking with the positivist unity of principles governing the normal and the pathological. This implies also the rupture with the supremacy of physiology's concepts in pathological theorizing. The ontology of the disease is fundamentally different in relation to the ontology of health, there is no homogeneity and continuity between these two realities (Canguilhem 1991, 105) and Canguilhem refuses determinism as ontology of biological and social phenomena as it is assumed by Comte and Bernard (Canguilhem 1991, 107-108). Another consequence is being aware of the role of the individual, because it is human beings who experience pain and express the need for medical service. But it is to add that neither Leriche nor Canguilhem place a concept of an autonomous individual with full self-consciousness as subject into the center of their argument, but the whole individual body as an organism in relation to its environment.<sup>19</sup> In many instances, which Canguilhem reports, individuals are not aware of diseases that they carry in their body. Or their body has "anormal" properties, which do not disturb the organism in its normal relation to its milieu.<sup>20</sup> For Canguilhem, it is the standpoint of the patient that defines the experience of being sick. In some cases, doctors can detect an illness before the patient knows about it, but Canguilhem's argument is that today's medical knowledge is the result of the past medical experience initiated by former patients and patients' needs (Canguilhem 1991, 91f). Canguilhem's understanding of medicine entails a specific relation of patients in face of medical professions and medical institutions.

Hence medicine always exists *de jure*, if not *de facto*, because there are men who feel sick, not because there are doctors to tell men of their illnesses. The historical evolution of the relations between the physician and the sick man in clinical consultation changes nothing in the normal, permanent relationship of the sick man and disease. (Canguilhem 1991, 93; emphasis in origin)

This view, worked out by Canguilhem decades ago, centers the interpretation of the disease starting not with the view of the medical expert, but with the individual in its environment. Scholars as Nicolas Dodier (2013, 124-126) and Nicolas Da Silva (2017, 2018) have referred in their critiques of the contemporary relation between patients and medical doctors on Canguilhem's interpretation of Leriche's theory.

Canguilhem's presentation of the theories of Broussais, Bernard, and Leriche in the first part of "The normal and the pathological" also

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I am well, I block, before they are uttered, the stereotypical inquiries" (Canguilhem 2008a, 474). Also, he realized that Kant, at the end of the 18th century, had delivered a very similar interpretation of health (Canguilhem 2008a, 468-469).

<sup>19</sup> For the anti-humanist and in this regard structuralist position of Canguilhem, see Foucault (1991, 23-24).

<sup>20</sup> Examples are "heterotaxies," which are "the complete transposition of the viscera or *situs inversus*. We know that, while rare, the heart on the right-hand side is no myth" (Canguilhem 1991, 133f; emphasis in origin).

demonstrated the link between the discursive policies in medicine, which – by trying to define the pathological – concern the question of a hierarchy between the medical subdisciplines of physiology and pathology. And this, in turn, prepares the hierarchy of professions in medicine.

This goes hand in hand with the opposition between the organizational logics of the laboratory and the clinic, which has already been addressed. And now it is evident that the considerations of Canguilhem should not be restricted to the contemporary critique of the patient-doctor-relation, but need to extend to a study of the inter-professional relations and the relations of medical subdisciplines to explain the power-knowledge-effect in the health system – to use Michel Foucault’s notion (Foucault 1995). As long as the physiologists’ discourse can enforce their concept of pathology being only another field of application of general principles of physiology, this discourse will be able to restrict other conceptualizations of health and disease, and this discourse has consequences on the institutional power relations between the medical professions themselves. The study of these power-knowledge-effects has to transfer the methodology of historical epistemology from the field of medicine as a science to the field of health care institutions.<sup>21</sup>

## 2.2 Norms, Normativity, and the Normal

In the second part of his book, Canguilhem approaches conceptions of the normal, of norms, and of normativity. Referring to Karl Jasper’s psychopathological theory, Canguilhem can identify the normative nature of definitions of health and disease. Conceptions of disease depend on patients’ view and the social context. Canguilhem concludes that conceptions of disease form a judgment of virtual value and that disease represents a negative value, something to be avoided by living human beings. Canguilhem consults some of the scientific dictionaries to develop a clearer idea, how life itself can be thought of as a source of norms. And he is not satisfied with the established view, that it is solely (speaking) human beings, who can attribute norms and values to biological facts.

The entry in the *Vocabulaire philosophique* seems to assume that value can be attributed to a biological fact only by “him who speaks,” obviously a man. We, on the other hand, think that the fact that a living man reacts to a lesion, infection, functional anarchy by means of a disease, expresses the fundamental fact that life is not indifferent to the conditions in which it is possible, that life is polarity and thereby even an unconscious position of value; in short, life is in fact a normative activity. Normative, in philosophy, means

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<sup>21</sup> An example of the application of the approach of historical epistemology outside of the field of medicine as discipline only is Foucault’s study of the emergence of the clinic as medical organization, which centered medical knowledge and routines around the physician (Foucault 1973). But this study does not track the impact of medical discourses on the power relations between medical professions.

every judgment which evaluates or qualifies a fact in relation to a norm, but this mode of judgment is essentially subordinate to that which establishes norms. Normative, in the fullest sense of the word, is that which establishes norms. And it is in this sense that we plan to talk about biological normativity. (Canguilhem 1991, 126-127)

The concept of biological normativity is one of Canguilhem's most relevant contributions to life sciences and significant for EC, too. This concept introduces other sources for generating norms and value than society and culture.

Thus, the traditional perspective concerning the relationship of life and norms is reversed: it is not life that is subjected to norms, the latter acting on it from outside; but it is norms that are produced by life's very movement in a completely immanent way. Such is the central thesis [...]: there is an essential normativity of the living [...]. These norms account for the fact that the living is not reducible to a material datum but is a possibility, in the sense of a power, that is, a reality which is given from the beginning as incomplete because it is confronted intermittently with the risks of illness, and the risk of death permanently. (Macherey 1998b, 110)

With regard to EC, one can find an affinity of Canguilhem's concept of biological normativity to Laurent Thévenot's neopragmatist concept of regimes of engagement (see section 3). The notion of biological normativity, when applied to disease and patients in their milieus, has made Canguilhem aware of the individual norms of the pathological. This way, Canguilhem can develop a clear concept of the individual norm and of sickness.

When it comes to a supra-individual norm, it is impossible to determine the "sick being" (*Kranksein*) as to content. But this is perfectly possible for an individual norm. [...] The borderline between the normal and the pathological is imprecise for several individuals considered simultaneously but it is perfectly precise for one and the same individual considered successively. [...] Disease is still a norm of life but it is an inferior norm in the sense that it tolerates no deviation from the conditions in which it is valid, incapable as it is of changing itself into another norm. The sick living being is normalized in well-defined conditions of existence and has lost his normative capacity, the capacity to establish other norms in other conditions. (Canguilhem 1991, 181-183)<sup>22</sup>

It is important to recognize the general idea of a healthy organism to set and to change norms in situations. This capability is called "normative" (Canguilhem 1991, 196). Sick organisms have lost this capability, although they are regarded as a new and different mode of living, but only for a situation specific for and adequate to their disease, which – of course – can be experienced as confusing and as painful (Canguilhem 1991, 193f). Canguilhem points to the etymology of the word *value*, which in Latin means to be in good health; also health means to *create value* (Canguilhem 1991, 203),<sup>23</sup> which again

<sup>22</sup> Here, Canguilhem adopts the view of Kurt Goldstein (Canguilhem 1991, 118-119), who has been a contemporary scholar and has exerted an important influence on Canguilhem.

<sup>23</sup> See full original quotation at the beginning.

emphasizes Canguilhem's standpoint, to conceive health not only as a state or condition, but as a capability, a resource for agency.

Canguilhem criticizes the misleading medical interpretation of the "anormal" as "abnormal" and insists that "anormal" does not denominate a pathological deviation. An anormal organism can have its individuality and autonomy in face of "medically normal" and can live healthily in an environment that fits to it. There is a plurality of life forms possible that are neither normal nor pathological. The core position of Canguilhem is to regard *normality as a relation* of the organism to its environment instead of being a property of the organism itself.

An environment is normal because a living being lives out its life better there, maintains its own norm better there. An environment can be called normal with reference to the living species using it to its advantage. [...] No fact termed normal, because expressed as such, can usurp the prestige of the norm of which it is the expression, starting from the moment when the conditions in which it has been referred to the norm are no longer given. There is no fact which is normal or pathological in itself. (Canguilhem 1991, 142, 144)

In this context, Canguilhem questions laboratory medical research, because an organism can establish such norms for it, which lack validity beyond the limits of the laboratory. And laboratories are only one out of many possible environments to which organisms can adopt (Canguilhem 1991, 149, 191). And Canguilhem also approaches the usage of statistical measure in demographics. Here, his argument is to resist the misinterpretation of statistical averages as adequate measures for a biological or biometrical notion of norm or normality. The calculation of averages does not correspond to the characteristic of life that variation of and deviation from the average is compatible with viability. It would therefore be a mistake to equate proximity to the average with better viability. Also, averages cannot represent an ideal type because the empirical individuals deviate from these average and real average individuals do not exist. And Canguilhem also points to the fact that some deviations from an average in the population may even allow for extended survival. Canguilhem depicts the problem of missing conventions to discriminate between the normal and the anormal (Canguilhem 1991, 154f). He agrees with Maurice Halbwachs' critique of Adolphe Quételet's approach to identify the average (of human height) with a norm in a given population. Canguilhem's contention is to question the argument that deviations from averages can be regarded as pure random deviations. Instead, biological phenomena articulate in constellations of many elements, which are interrelated. Again, Canguilhem insists on the biological normativity to be variable and not to follow quantitative laws.

Now, against the positivist idea that the normal is a statistical mean, Canguilhem, in the name of the vitalism he defends, points out that this conception amounts to treating the living as a system of laws instead of

seeing in it an “order of specific properties”. An order in the dual sense of the term, since for Canguilhem the essential feature of the normal is to be “normative”, i.e., to be institutive of norms and capable of changing the norms that it has instituted. (Lecourt 1975, 175)

As the work of Nicolas Da Silva (2017, 2018) has shown, Canguilhem’s critique on these strategies of quantification is of significance for EC’s own critique of the invalid ways of standardizing health and health care services by implementing invalid quantitative indicators. EC has its own tradition in the analysis of quantification, which can be traced back to the seminal work of Alain Desrosières (2008, 2011a, 2011b).<sup>24</sup> Evidently, for EC, the critique of quantification does *not* intend to abandon quantification. Quantifying is not to be equated with normalizing as such.<sup>25</sup> EC’s argument is that measurement has to be done on the basis of valid measurement conventions (Desrosières 2008; Diaz-Bone 2016). For EC, this normativity should be deliberated transparently (by the involved “stakeholders”) and the conventions for measurement should be related to a common good, so that the resulting numerical data can serve for collective action. Therefore, EC criticizes the application of quantifying strategies for the purpose of standardization and normalization, when the aim is to transform health into a homogeneous and industrialized product, which disregards the nature of health (Batifoulier et al. 2018; Da Silva 2018).<sup>26</sup> With the introduction of conventions as a basis for measurement, the character of measurements is inevitably normative. Without valid measurement conventions, measurements are degenerated numbers only – void of substantial content. The corresponding argument in Canguilhem’s study is the critique of the biometrical average. The average is an invalid representation of biological normativity – although averages are influenced by it. Canguilhem has been introduced in the social sciences for his fundamental critique of positivism in biology and medicine, but he himself already includes the social in these considerations by extending his notion of biological normativity to social normativity.

But we believe that if Quételet made a mistake in attributing a value of a divine norm to the average of a human anatomical characteristic, this lies perhaps only in specifying the norm, not in interpreting the average as a sign of a norm. If it is true that the human body is in one sense a product of social activity, it is not absurd to assume that the constancy of certain traits,

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<sup>24</sup> For the work of Desrosières and its impact on EC, see the contributions in Bruno et al. (2016) and in Diaz-Bone and Didier (2016).

<sup>25</sup> For a systematic presentation of Canguilhem’s theory of norms, see Le Blanc (2008). Michel Foucault continues Canguilhem’s work on normalizing in his analysis of the panopticon as a paradigm for modern organization as the prison, the school, or the factory (Foucault 1995). The massive digitalization advances the possibilities to combine normalization and quantification; for an application of Foucault’s work on panopticism to contemporary processes of digitalization, see Diaz-Bone (2019b).

<sup>26</sup> In fact, Canguilhem has evaluated quantification as problematical, when quantification is undermining the qualities of the quantified entities (Canguilhem 2008b, 102).

revealed by an average, depends on the conscious or unconscious fidelity to certain norms of life. Consequently, in the human species, statistical frequency expresses not only vital but also social normativity. A human trait would not be normal because frequent but frequent because normal, that is, normative in one given kind of life, taking these words kind of life [...]. (Canguilhem 1991, 159-160)

The critique of interpreting averages as normality is linked to the notion of *social normativity*. Because averages of medical indicators can also be the result of social normativity, averages should not be conceived as an articulation of norms. They are themselves caused by foregoing social influences.

If it is true that the human body is in one sense a product of social activity, it is not absurd to assume that the constancy of certain traits, revealed by an average, depends on the conscious or unconscious fidelity to certain norms of life. Consequently, in the human species, statistical frequency expresses not only vital but also social normativity. A human trait would not be normal because frequent but frequent because normal, that is, normative in one given kind of life, taking these words *kind of life* in the sense given them by the geographers of the school of Vidal de la Blache [...]. (Canguilhem 1991, 160; emphasize in origin)

And as American pragmatists did, Canguilhem's notions of biological and social normativity emphasize the co-existence of natural (biological) and cultural (societal) foundations of norms and values, without implying a sort of "biologism" (in the sense that the cultural and social should be regarded as determined by biological laws). The insertion of other origins for norms and normativities is in line with classical pragmatist thinking, resulting in a plurality of ontological principles. This corresponds to Williams James' concept of pluralism as the opposite of monism (James 1920, 33). With a pluralist view, indeterminism can be thought of, but monism involves determinism (James 1920, 310). Linked to these considerations is the concept of milieu, which Canguilhem conceives *not* as an external and determining condition for the living, but as an environment, which is in interrelation with the living. He developed his concept starting with its use in biology and extending its domain to the society.

Vegetation grows in natural ensembles, in which different species limit each other reciprocally and where, in consequence, each contributes to creating an equilibrium for the others. The ensemble of these plant species ends up constituting its own milieu. Thus, the exchanges between plants and the atmosphere end up creating a sort of vapor screen around the vegetal zone, which limits the effect of radiation, and this cause gives rise to an effect that will in turn slow down the cause, and so on. The same approaches must be applied to animals and to man. However, the human reaction to provocation by the milieu is diversified. Man can give several different solutions to a single problem posed by the milieu. The milieu proposes, without ever imposing, a solution. To be sure, in a given state of civilization and culture, the possibilities are not unlimited. But the fact of considering something as an obstacle that may later be seen as a means to

action ultimately derives from the idea, the representation, that man (collective man, of course) builds himself out of his possibilities, his needs. In short, it results from what he represents to himself as desirable, which is inseparable from the ensemble of values. (Canguilhem 2008b, 109)<sup>27</sup>

And Canguilhem continues to emphasize that the living can influence and “make its milieus” itself (Canguilhem 2008b, 111) because the interrelation between the living and the milieu is understood as influencing each other. This conception of milieu is close to pragmatists’ conception of the situation and therefore close to EC’s methodological situationalism (see next section). Organisms and human beings, but also social processes, interact in their milieu and with their milieu.

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### 3. Consequences of Canguilhem’s Historical Epistemology

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To re-study Canguilhem’s work from the perspective of EC is mainly done because of the consequences of historical epistemology in the field of biology and medicine for EC as an institutionalist approach. Also, the presentation of Canguilhem’s work does not only intend to portray his affinity to EC. Instead, there is a set of consequences which can be drawn from Canguilhem’s work for EC.

The starting point for EC to recognize Canguilhem’s work can be seen in Canguilhem’s critique of the positivist strands, which intend to ground medicine in physics and chemistry. This way, positivist sciences have not succeeded to deliver an adequate understanding of life. The specific qualities of life cannot be explained by physical or chemical principles. This is a classical result for French epistemologists and it reassures early insight of the limits of scientific norms and methods, which should be regarded as valid for their domains only (Bachelard 1971, 2002). Instead of asserting universal principles of sciences, as positivism does, Canguilhem worked out the limits of physiology as a basis for pathology. The limits of physiology as a foundation for pathology is based on the general problem of explaining the pathological as being of the same kind as the normal (albeit of different intensity).

With the work of Canguilhem, EC finds a conception of health, which offers perspectives for the analysis of health care institutions as part of individual milieus. To take Canguilhem’s notions of individuals and their agency in their milieu seriously as an object for policies leads to Amartya Sen’s notion of the capability of human beings to cope and to adopt when facing problems of

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<sup>27</sup> And Canguilhem also criticizes the behavioral interpretation of the milieu as a conditioning environment for organisms’ behavior by referring to the critique of the pragmatist John Dewey (Canguilhem 2008b, 110).

health in their real living situation (Sen 1992, 1999).<sup>28</sup> Claude Le Pen has characterized this affinity of Canguilhem's view on health to Sen's critique of utilitarian thinking in economics.

Canguilhem defines health not as a norm but as the possibility to act on the environment, to "normalize" the environment, to create norms of living corresponding to an individual's physical and mental state. Normality is not the absence of illnesses (it is normal to be ill from time to time) but the capacity to overcome illness. And illness (especially chronic illness) is a certain way of living just as health is. This is why Canguilhem's philosophy is sometimes described as a "rational vitalism". Life blows into sickness just as it does in health; the difference lies in the norms of life that structure both states. Canguilhem's view of pathology thus resembles Amartya Sen's – another opponent to utilitarianism – view of poverty. The poor are not the rich with less money; the sick are not the healthy with less health. Both the poor and the sick reconstruct their living norms at the level of their possibilities, expectations and hopes. The choice sets are disjoint, thus it makes no sense to measure the preferences of the sick over items that do not belong to their universe. The consequence is a holistic view of the sick person considering all dimensions of his life and not only those of an altered organ. The consequence is also a humanist view of medicine, where the medicine of the sick is preferred over the medicine of the illness. (Le Pen 2009, 122)

In this regard, the evaluation criteria would be how health care institutions support and advance individuals' capabilities to set norms and normativities which govern individuals' relation of living and their social environment. Moreover, Canguilhem's conceptualizing of health points to many different states of health, which could be regarded as "anormal," but are viable for organisms to live with. There are many different ways of well-being possible and well-being and health have to be related to different environments and ways of living. "Normality" as a ruling concept has to be replaced by a plurality of normativities, which have to be acknowledged.

This questions the strategy to quantify health conditions and also to quantify illness. Again, as Batifoulier, Desrosières, Salais, Thévenot, and others in EC have highlighted, the question of how quantification is implemented is essential to evaluate institutions (Batifoulier et al. 2018; Desrosières 2008, 2011a, 2011b; Salais 2010, 2012; Thévenot 2019).<sup>29</sup>

Benchmarks based on simple averages cannot be justified as norms for health care. For EC, this is of significance when health economics relies on medical quantification to quantify its own measures as efficiency. When the first strategy of quantification is invalid, the second will fail too. Nicolas Da Silva has pointed to this substantial problem for governing the health care system by numbers (2017, 2018).

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<sup>28</sup> For the introduction of Sen's capability approach into EC, see the work of Robert Salais (1998, 2003, 2008).

<sup>29</sup> See also the contributions in Diaz-Bone and Didier (2016) and in Bruno et al. (2016).

One consequence is to approach the development of valid forms of representation of health and disease – be it as a combination of quantification with qualitative information (as verbal report) or in another form. But in any case, the representation has to mirror the different ontologies of health and disease, their pluralities, and the embeddedness of human beings in their social, urban, ecological, and cultural environment. There will be a plurality of cognitive formats needed. Reading Canguilhem anew, there seems to be no alternative in face of this complexity but to include these normativities in the development of measures and policies. The consequence is to take over the stance of individuals in their environments and not to regard the laboratory as paradigm for the adequate research situation about health and health care needs.<sup>30</sup>

Canguilhem's theory converges with classical pragmatist theories (Dewey 1938) and with EC at the methodological position of methodological situationism. As Storper and Salais have proposed and realized in their study, EC has to use the situation first as an analytical unit and to explain the actions and processes out of actors' perception of the situation (Storper and Salais 1997, 14f).<sup>31</sup>

The processes by which actors interpret their situations and then enter into pragmatic forms of coordination with other actors constitute the work of constructing the economy. Actors select and build meaningful courses of action in production by engendering routinized, largely implicit forms of coordination, which we call conventions. (Storper and Salais 1991, 18)

Comparing this notion of convention with Canguilhem's notion of normativities, both resemble each other in their mode of operation to enable individuals' situational capacity to coordinate with their environment (which includes one's own body, but also other individuals, objects, cognitive forms).

It is of importance to acknowledge the range of logics of coordination covered by Canguilhem's concepts of normativity. Some of these normativities can be based on culture and cultural "narrations" as part of social normativity. But for Canguilhem, the biological normativity is not in need of "any semantics," which is to say that biological normativity cannot be interpreted by culturally established ways to justify this normativity.<sup>32</sup> The latter is the case, when EC is referring to the conventions of Boltanski and Thévenot, which work as orders of justification (Boltanski and Thévenot 2006). But biological normativity cannot be justified by culture or by societal arguments. Laurent Thévenot has invented the concept of *regimes of engagement* to grasp forms of coordination between human beings, objects, and cognitive forms,

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<sup>30</sup> This limits the validity of experiments as provider of medical knowledge about health, the causes of illness, and the effects of medical treatment (for this critique, see also Da Silva 2017).

<sup>31</sup> See also Salais (1998, 2003).

<sup>32</sup> For the distinction between conventions with semantic content and conventions without semantic content, see Diaz-Bone (2016).

which are not patterned by orders of justification (or quality conventions) and which do not “obey the imperative to justify,” which is to explain one’s intention to contribute to a common good. Thévenot has characterized these different regimes, which are the engagement in an individual plan, the engagement in familiarity, and the engagement in exploration (Thévenot 2007, 2009, 2014). Real situations are patterned by a combination of several of these orders of justification and Thévenot’s regimes of engagement.

A core consequence would be to acknowledge Canguilhem’s normativities as relevant to the design and governance of health care institutions and health care services. The institutionalist consequences from Canguilhem’s work would be to respect pluralities of (biological and social) normativities of health, instead of standardizing health care and health services for whole populations. Health institutions, therefore, are in need of more adequate procedures to produce knowledge (as argued above) for the governance of health care institutions, including more distributed experiences from the individuals’ milieu. Canguilhem’s critique of physiology as the basis for pathology also results in challenging the existing order of medical professions as well as the ongoing specialization in medical health care and the concentration of clinical services and hospitals. For example, professions such as family doctors are better integrated in the individuals’ milieu than medical specialists are. To equip human beings with capabilities to face changes in their milieu and their state of health would challenge the general institutional design of the health care system. To support individual’s capabilities would be contributing to the production of health, which is not the contemporary institutional logic of health care system (Batifoulier et al. 2018).

When applying Canguilhem’s perspective and focusing on the situations of individuals, tension arise that are relevant for EC to approach. Only some can be provisionally sketched here as an outlook for future research.

Issues of “public health” and health care economics are mostly addressed on a more general level – such as the community level, the national, or the international level. The civic convention (emphasizing the same rights for all members of the community) and the industrial convention (promoting standards and scientific planning) also enforce an extensive range of coordination and values. For such wide-ranging policies to be successful as forms of governance, these policies have to achieve a “lock in-effect” of the everyday practices of individuals. If so, then individuals include standards and routines from these policies into their engagement in an individual plan or the engagement in familiarity.<sup>33</sup> A well-known example for this kind of governance of the individual milieu was presented in Michel Foucault’s (2008) analysis of US American neoliberalism. Foucault argues that neoliberalist strategies do not

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<sup>33</sup> This effect can also result in individual’s misperception, to believe to act on the basis of one’s own free will. Foucault has identified this misperception (in the field of sexuality) as a power effect that subjects are not aware of (Foucault 1978).

access the individuals' bodies directly, but accesses the individuals' milieu and transforms them into market like environments. This has also become a strategy for applied policy in health care in many countries – may it be partly (as in France) or as the general principle (as in the USA).<sup>34</sup> When health policies and health care organizations apply medical standards as normal (and normalizing) values, this countervails the plurality of Canguilhemian normativities. This is not only an issue of individuals or social groups. If these normativities are a real pluralist structure, the tensions with the sketched more general policies are empirical realities too, and in some part also have their own resilience, resistance, and bias. This is also articulated in pathological forms and new kinds of sickness.

With the uprising of digitalization, more and more individuals are equipped with personal devices such as health apps to collect individual data. Many users of these apps embed this information in their everyday life and adopt their behavior towards this kind of “digitized health” without having sound knowledge about health and the relation of their quantitative data and their personal health status. As Valeska Cappel (2021) argues, this data represents new forms of “digital daily health.” She points to the problem that apps collect data on body conditions but also on more and more everyday practices related to health. The categories (and algorithms) have been implemented by technology companies and the resulting categories and data are in many cases neither controlled nor understood by users or adopted to their health practices and their health situation. The underlying measurement conventions are invisible for users and in case the data is transferred to the provider of the app, there is also an informational asymmetry in data analysis and its economical exploitation. In this situation, tensions can arise and formerly established individual, social, or cultural forms of normativities can be undermined and disrupted. Another possibility is users developing their own ways of interpreting and integrating health app data, thereby deviating from the primary intentions of the app developers. Both possibilities undermine the coherence of normativities and practical health concepts, and both reduce the capabilities of individuals to stabilize their health-related practices in their environment.

Digitalization of health care and health care institutions is changing the whole “institutional set up.”<sup>35</sup> Technology companies (as the big Internet enterprises), but also health insurance companies are gaining power because of the huge collection of health-related data (Zuboff 2019). Medics, who have been data collectors for centuries, lose their center position, which is taken

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<sup>34</sup> Christian Laval has argued that Foucault's analysis of neoliberalism is influenced by Canguilhem's notions of the living and its milieu (Laval 2018, 69).

<sup>35</sup> For this, see also the research in the field of EC on telemedicine (Raully 2016; Da Silva and Raully 2016).

over by the private tech companies. Academic health research and public governance will be placed step by step on the second rank (Diaz-Bone et al. 2020). Without a critical theory of science, the link between health concepts, the production of scientific knowledge, and the impact of health institutions cannot be approached – neither for health economics nor for sociology of health. It has been George Canguilhem who has extended the French approach of historical epistemology to the life sciences and its institutions. His follower, Michel Foucault, has extended historical epistemology to the social sciences on the whole, but also to the analysis of societies. To be clear: For EC, the resounding impact of historical epistemology will be the insight to regard the link between conceptions of life (as health), ways of knowledge production (as quantification), and power-knowledge effects (as the formation of health categories or the normalizing power of health concepts).

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