SUMMARY: This paper aims at pointing a particular aspect of the temporality of health, namely the "semelfactivity" (characteristic of what happens only once) of the phenomena that are connected to it. This semelfactivity, which contributes to giving an irreversibility to the temporality of health, stems from the fact that the health phenomena are part of causality networks which are intrinsically entangled. It compels, thus, to set anew, from a more general philosophical point of view, the question of the relationship between causality and irreversibility.

KEY WORDS: health, temporality, irreversibility, semelfactivity.

In previous papers\(^1\), the various aspects of the temporal dimension of health and disease phenomena are investigated. The question is whether time affects them only superficially, that is to say, acts towards them as a mere external determination, or whether it acts on them in a profound and inner way, so that it would be their very stuff; in other words, they would owe it some of their own characteristics. Four aspects of the temporality of health are uncovered: its span of duration, its relationship with the future, the partially retrospective nature of the judgements that relate to it, its irreversibility.

Now a final aspect of temporality, the most difficult one, needs to be examined. It includes the irreversibility itself, and poses the delicate problem of the relationship between temporality and causality.

How can the cause of a phenomenon, such as a disease, be isolated? The standard answer to this question is recalled by Mill in his System of Logic (1843, Book III): In order to isolate the cause of a phenomenon \(B\), one should remove successively all phenomena \(A, A', A''\), etc. that one suspects to be its cause; one carries out the operation until the phenomenon \(B\) effectively disappears. In other words, *sublata causa, tollitur effectus* (remove the cause, you remove the effect).

\(^1\) Arnaud François, “La temporalité de la santé”, in Philosophia scientiae, 16 (2), 2012, 1—23.
But this method of isolation of causes is confronted with several obvious difficulties.

Firstly, it implies *repeatability* of the phenomenon B, i.e. the existence of several copies (a number at least equal to that of the suspected causes and their possible combinations) of the object which contains the phenomenon B. Now, Durkheim notes that the availability of a sufficient number of copies of a given disease, which availability he assumes is possible in medicine is, however, impossible in sociology:

The events occurring in social life, and which are repeated almost identically in all societies of the same type, are much too diverse to be able to determine to what extent any particular one has contributed to hastening a society’s final demise. In the case of individuals, as they are very many, one can select for comparison those that present only the same type of irregularity. This factor is thus isolated from all concomitant phenomena, so that one can study the nature of its influence upon the organism. If, for example, about a thousand rheumatism sufferers, taken at random, exhibit a mortality rate above the average, there are good grounds for imputing this outcome to a rheumatoidal tendency. But in sociology, since each social species accounts for only a small number of individuals, the field of comparison is too limited for groupings of this kind to afford valid proof.\(^2\)

Durkheim’s argument is essentially that the individual living body always exists in sufficiently large number so that one can vary the isolation of causes—even if only by clinical observation—while societies are too limited in number so that it is possible, apart from ethical, economic, or political considerations, to experiment on them. Thus, when confronted by a society, the theorist can do nothing, so to speak, but receive it as it is in its irreducible form, and produce as probable some possible conjectures about the remote causes of the effects that may be perceived.

But a question necessarily arises: Is what Durkheim assumes to be always methodologically possible—at least in principle—for the individual living beings, really so? Are the individual living beings sufficiently similar to one another so that one can consider that the *same initial conditions* were reproduced in two successive experiments on two separate living individuals? The answer can only be negative, given the ‘complexity’ of living phenomena, which itself reflects the uniqueness of each individual living being; but the whole difficulty lies in the reasons for this answer, that is to say, in the meaning that is given to the notion of complexity. Now here, the positions bifurcate.

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One may consider that complexity exists in our knowledge—as a lack of knowledge—and is then supposed to be resolved by a more informed and perceptive mind into simplicity. In this case, one speaks rather of ‘complication’. This position assumes that all causal series, in principle, can be reduced to a unilinear chain of causes and effects. It is supported in a paradigmatical way, in the field of medical theory, by Claude Bernard:

The determinism, i. e., the cause of the phenomenon, is therefore single, though the means for making it appear may be multiple and apparently very various. It is most important to establish this distinction especially in medicine, where the greatest confusion reigns, precisely because physicians recognize a multitude of causes for the same disease. To convince ourselves of what I am urging we have only to open a treatise on pathology. By no means all the circumstances enumerated are causes; at most they are means or processes by which a disease can be produced. But the real and effective cause of a disease must be constant and determined, that is unique; anything else would be a denial of science in medicine³.

However, there are phenomena in which this reducibility of causes and effects to a unilinear chain cannot be found, and such phenomena lead to a different point of view which gives a fuller sense to the notion of ‘complexity’, since the latter cannot, even by a mental experiment, be reduced to simplicity anymore. The complexity, from this second perspective, is no longer only in our consciousness, but in the things themselves. Let us consider the example of the causation of cancer and of its genetic-immune aetiology (about which there has been much speculation in the 1980s), as evoked by Anne Marie Moulin:

It is difficult to establish the equivalence ‘mutated gene = transformed cell = cancer’. Between the potential neoplasia and the confirmed neoplasia, many intermediate appear: translocated/mutated gene, complete/incomplete gene, transcribed/non-transcribed gene… Equilibria may well rebuild themselves, which requires a global approach and discourages any univocal identification of the causal mechanisms (J. Cairns and J. Logan, Step by step into carcino-genesis, Nature, 1983, 304, p. 582–583)⁴.

Thus, a cause never arises alone, but there are always several of them, and the impossibility of disentangling them from one another prevents their reconstruction as unique causal series, as Claude Bernard would wish. Hence the need, as stated

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by Anne Marie Moulin, to use a ‘comprehensive’ approach—one might say a ‘systemic’ one, in the most ordinary sense, that is, in the sense that the whole and the parts interact—to a given organism (an approach somewhat similar to that adopted by Durkheim about society). This organism can be understood only as a purely given sui generis whole, in which causes are combined only once to produce the phenomena that are studied, or rather in which one cannot even come to know if the same causes happened to be combined in the same number, in other organisms. This property of appearing only once, which characterizes a combination of causes and which ensures the irreversibility, together with the absolute originality, of an individual’s becoming, is again a temporal property, and I would call it its ‘semelfactivity’. Hence, on this occasion, one can notice that the real limit of causality is not its ‘gaps’, but the idea of system.

One may wonder, however, if there are several causes for the same effect, should such causes remain forever entangled, and should this idea truly lead us to recast our epistemological categories, as might a proper critique of the Bernardian idea that a causal series is always in principle unilinear. For even if the causes of one effect can remain always in practice impossible to disentangle—and even if their number can be extraordinarily high, which forces us to consider each individual as unique and each particular condition as ‘semelfactive’—nothing prevents us from assuming that a more powerful mind could discern them. However, if one were to establish that not only an effect has several causes, but a cause can have several effects that in turn contribute to producing new effects, then one would be dealing with a genuine system (because a causal series can no longer be isolated from others), with a genuine irreversibility (because the film of the disease, if it went backwards, would not return to its starting point), and with a genuine semelfactivity (since the theoretical possibility does not exist anymore to lead the disease back to a finite number of causes which would act the same way on all individuals).

Now, this seems to happen in some cases. The first example, which was developed by Dagognet, relates to the endocrine system. Dagognet is interested in phenomena where the unilinear causal frame is broken, because they enable him to challenge the anatomo-clinical idea that to one organ is assigned one function, and vice versa. Consider hyperthyroidism which is found in Graves’ disease. It might

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5 Compare to Moulin, ibid., 346—347. A doubled semelfactivity, or, if one may say, an absolute one, is to be noticed in the case of the causes of death. To the very general fact that one cannot know if two individuals have been subjected to the same set of causes, must be added here the fact that the possibility, even merely theoretical, of experimentation on the individual in question, by isolating causes, is removed. See Anne Fagot-Longeault, Les causes de la mort. Histoire naturelle et facteurs de risque (Paris, France: Vrin, 1989).

6 François Dagognet, La raison et les remèdes (1964) (Paris, France: Presses universitaires de
seem feasible to treat the patient by administering to him antithyroid drugs, but this is not enough, and even makes the disorder worse; however, by adding thyroxine to antithyroid drugs—that is to say, by adding the thyroid hormone itself—one manages to cure hyperthyroidism. How can this surprising fact be explained? The cause of Graves’ disease lies not, as one might believe, in a thyroid hypersecretion, but in a pituitary hypersecretion. The pituitary secretion (that is, the pituitary hormone) is at the root of Graves’ disease. Now, the two glands (the thyroid and pituitary glands) maintain a relationship such that thyroxine inhibits the pituitary gland, while the anterior pituitary stimulates the thyroid gland; it is therefore clear that the administration of antithyroid drugs, if done so exclusively, would be the very opposite of appropriate treatment, since it inhibits precisely that which alone is capable of inhibiting the pituitary secretion, and the latter is the root cause of the disorder! Conversely, it is understandable that thyroxine should be added to it, since only this hormone is capable of slowing production, in the pituitary gland, of the pituitary hormone. Thus, the thyroid and pituitary glands are part of a very tight network, whose operation consists of inhibiting inhibitions or, as is the case with the dysfunction just described, consists of stimulating stimulations. The two mechanisms support one another, and it is impossible to say which one is the more important for global functioning. The irreversibility that characterizes this network’s internal relationships is obvious: it assumes a vicious circle created by the administering of improper medication. Giving antithyroid drugs to the patient does, indeed, inhibit what the thyroid alone is capable of inhibiting by its own hormone (thyroxin), that is, the pituitary gland. Such a treatment amounts, therefore, to stimulating the production of the pituitary hormone by the latter, and thus accentuates hyperthyroidism! Further, this kind of network in which cause and effect are strictly indistinguishable is referred to by the term ‘system’, in its most rigorous sense. One thus precisely describes the relationship between thyroid,

France, 2nd ed., 1984). For instance 132—134. About this question, see also Marie-José Imbault-Huart, “L’approche scientifique de la maladie et de la santé: constitution du champ moderne de la pathologie”, in L’homme et la santé, ed. Jean-Claude Ameisen (Paris, France: Seuil, 1992), 100: ‘For the definition given by Xavier Bichat (1771—1802): “All animals are an assemblage of various organs, which, by performing ‘each’ a function, contribute each, in their way, to the preservation of the whole”; biology substitutes the image of an organized totality: the organism, where each function is no longer the work of a single organ but the resultant of several organs that cooperate with each other. There is no organ of digestion anymore, but a digestive function; there is no organ of respiration anymore, but a respiratory function’ (translation mine). The notion of function occupies here the role that will be later played by that of the system.

7 Dagognet, ibid., 124–126.

8 For more on ‘inhibiting of inhibitions’, refer to pages 278—280 of Dagognet’s book.
pituitary gland, and other glands of the organism, as the ‘hormonal’ or ‘endocrine system’.

A second example will help identify more accurately how a single cause may have multiple effects which, in turn, contribute to producing a single effect again such that the whole makes up a totality which cannot be disentangled, and whose deployment in time is therefore irreversible. What puts an end, during an infection, to the immune response? The activating lymphocytes, that is to say, the cells that are responsible for activating the immune response, aided by other immune cells (macrophages, NK cells, complement proteins, etc.), firstly eliminate most antigens. Then, as the amount of antigen gradually weakens, the dendritic cells (that is to say, the cells that are responsible for making the activating cells initiate the immune response, by presenting them with the antigen which was introduced into the organism) return to a state of rest. But here’s the crucial point: ‘Furthermore, the immune cells which produce inflammatory signals (especially the macrophages) gradually cease to produce them, since the antigen is now present in negligible amounts, and in doing so they strengthen the resting state of the dendritic cells’. The process is as follows: elimination of antigens (this is the cause); rest of the dendritic cells, and interruption of the production of inflammatory signals by the cells responsible for producing them (these are the two effects); ‘strengthening’ of the resting state of the dendritic cells (this is the final effect, which is presented as ‘strengthened’ because it was already one of the two intermediate effects). Thanks to this example, one can clearly perceive how, in an organism, a cause may have multiple effects which interact in turn, so that the observer is prevented from identifying unilinear causal series. As a matter of fact, if one asks what is the cause of the resting of the dendritic cells, one can very easily say that this cause is twofold, namely, the lack of requests from the antigens, and the disruption of the inflammatory signals from the immune cells; but the causal frames, then, do not branch, instead they converge back to a single cause, which is the elimination of most antigens by the skilled cells. This characteristic intricacy of causes and effects, which implies the irreversibility of the process, justifies one speaking of a ‘system’ in the case of immunity too.

The health phenomena are thus characterized by a fifth aspect of temporality, namely the semelfactivity. This notion describes a certain type of irreversibility, but also threatens the unilinear conception of causality. Once a cause can have several effects which, in turn, contribute to generate new ones, all these effects make up an

10 Ibid.
11 Ibid., translation and italics mine.
inextricable system, whose complexity does not exist only “for us”, but also “in itself”. If this notion can be extended to other areas of experience than the health phenomena, then it is correct to say that it is likely to take part to the renewal of the whole philosophy.

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