

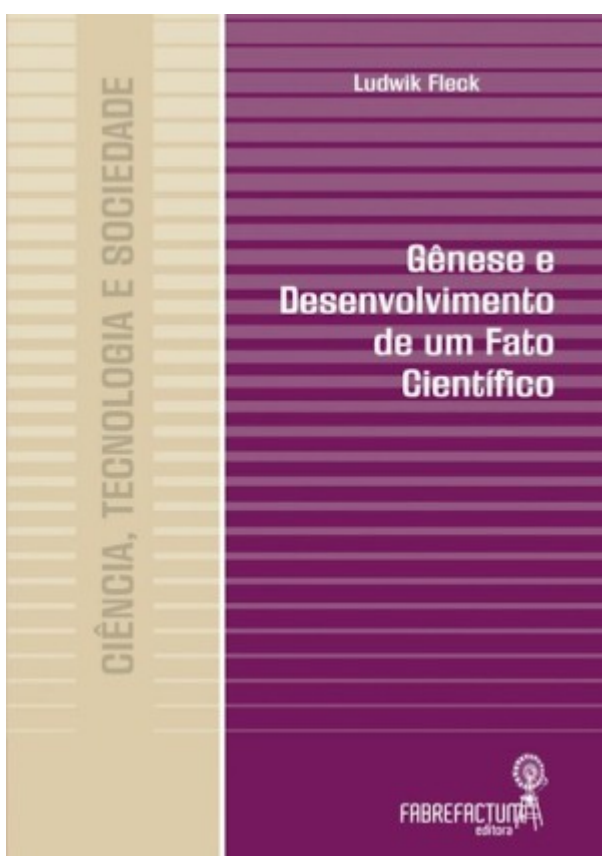
* Book Reviews

Science conditioned by historical and social circumstances: the construction of a scientific fact in the work of Ludwik Fleck

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Having been recently published, for the first time in Portuguese, in Fabrefactum Publishing House's Science, Technology and Society Collection, (2010), Ludwick Fleck's "The Genesis and Development of a Scientific Fact" (translation by George Otte and Mariana Camilo de Oliveira; 224 pages), addresses the historical reconstruction of the concept of syphilis as a scientific fact, thereby bringing important concepts and discussions on the social nature of science to the surface.

The book draws attention due to the history it narrates, the publishing history itself, and the author's history simultaneously. Histories that intertwine and are briefly presented in the "Preface to the Brazilian edition", by Mauro Lúcio Leitão Condé (UFMG), give such cyclical elements an inviting nature when it comes to reading.

Fleck, Polish-Israeli physician, was a practitioner and researcher in the Microbiology field and, as it can be seen with this book, among seven other articles, he also contributed significantly to the Epistemology field¹.

"The Genesis and Development of a Scientific Fact" was originally published in 1935, albeit being ignored for a long time. Condé stresses that the originality of the ideas contained in the book in regard to a different epistemological context, the context of war and of its authors' "isolation" from the most prominent groups of scholars in the period, may have been some of the factors which corroborate for this specific work to have achieved its notoriety, increased only by subsequent translations and replications. The English translation, which includes Kuhn's presentation, can be considered the most significant, and reverberates, decades later, when mentioning Fleck's work in the preface to "The Structure of Scientific Revolutions" (1970), a hallmark for Fleck's work to secure more recognition within the expert public.

The similarities attributed to both works, as well as some critical and disagreeing remarks made by Kuhn to "The Genesis and Development of a Scientific Fact" appear briefly in this part of the book, with some emphasis to what Kuhn argued in the preface to his book, when quoting Fleck.

"The Genesis and Development of a Scientific Fact" gains a prominent role for being considered the first empirical analysis of the social construction of science applied to the case of syphilis, based mainly on the social nature of science by emphasizing *styles of thinking* and *collective thought* category. *Collective thought* appears as a community of people sharing practices, ideas, traditions and norms, thus having a very particular way of seeing and dealing with the object of knowledge from what is determined by their *style of thinking* which, in return, it is what determines the way we think of as a collective community in a given historical moment (LEITE *et al*, 2001). More than a simple discovery, the establishment of a fact is the result of

construction and conditions, often antagonistic in their form, leading to its drafting and acceptance.

What is a scientific fact? Why and how are we seeking a definition, its theoretical and scientific closure? These are some of the various questions presented by Fleck that, in order to explain the scientific fact as such, delineated the development of the concept of syphilis through a historical review and a series of conceptual and practical observations. His thesis is grounded on changes in styles of thought which, on the other hand, are historically and socially conditioned and influence, often imperceptibly, the generation's activity and the development of knowledge, including scientific knowledge. Opposition to the neutrality of the empirical mechanistic model, the emphasis on what is commune and the rejection of individualistic conceptions, given that the act of "knowing" is contingent on social and cultural factors related to the subjects are some of the major topics highlighted throughout the discussion.

The work is divided into four chapters, well integrated and well-focused on specific discussions. Even within each chapter, the author distributes the approaches into other sub-themes many times, which not only greatly facilitates reading as a whole, but also the connection with certain concepts through minor cuts, but still within the general theme, the construction of a scientific fact, as it can be seen later on, by the details of each chapter. But before getting to the content itself, the reader has access to a "Preface to the Brazilian edition", "Introduction" and "Preface" which, in about 50 pages, place the context of the work, part of Ludwik Fleck's personal trajectory and professional career and the author's line of argumentation, as can be carefully observed in the following chapters.

In the preface, Fleck sets the forth hints that, despite the usual opposition between *fact* (characterized as something fixed, permanent and free of investigators' subjective opinion) and *theory* (marked by its temporary character), one should pay attention to an error, in its fundamental perspective, present in the theory of knowledge in relation to this *fact*, since it (theory of knowledge) tends to consider, as basis for research, only everyday life or classical physics facts, which, in turn and in advance, determines flattening of results. Fleck seeks, during these two short pages, to draw attention to the fact that, in a continuous mechanical repetition of a certain act "in the face of a power independent of us; a power we call 'existence' or 'reality'", we can no longer provide critical insight into the mechanism of knowledge on some facts which, for us, become obvious (Fleck, 2010). This opportunity is used by the author to rehearse the first justification for having addressed the Wassermann reaction in particular and its relation to syphilis, a recent fact of medicine at the time. In the author's own words: "more recent fact, discovered not in the remote past and not yet exhausted for epistemological purposes" (Fleck, 2000).

The name of the first chapter already expresses its proposal, being articulated with what had been presented so far, to historically track and tell (up until the late fifteenth century) "how the current concept of syphilis appeared". A movement, rather than a discovery of the concept of continuous construction within a long historical journey marked by changes both in the designation and delineation of "a nosological entity" (specific disease partly differentiated) as well as changes in the disease symptoms. From here on, and at other times of the text, Fleck located mainly what we now distinguish as gonorrhoea and cancrum, among other diseases considered, even today, "nonspecific" because some of them were, throughout history, confused with the ideas of syphilis. What stands out in this first part, is how particular factors of

the psyche and tradition played a critical role in the process of building and fixing of ideas about the disease, since the prevalence of the nosological entity called ethical-mystical "venereal epidemic " (strictly influenced by astrology and religion), the empirical-therapeutic nosological entity (based on reactions to mercury) and the nosological entity pathogenic (related to the idea of corrupted blood, syphilitic); syphilis as a specific etiologic entity, etc., all of them presenting an important mutual relationship both collaborative and antagonistic, simultaneously.

During the change process, the importance of insistence toward the idea of syphilitic blood until the Wassermann reaction was arrived at is highlighted. A reaction which is historically important for the understanding of the text, since it was responsible for the creation and development of serology as a discipline itself, an independent science, now simply called serologic testing. According to Fleck, for the concept of syphilis to exist, he needed an objective and unwavering research, as a "real fact", as it was necessary to stabilize what was then oscillating. The Wassermann reaction can be regarded as crucial understanding in order to resolve the situation.

Even though all these correlated phases have enabled this greater concept, before finishing the chapter, Fleck himself has a warning which undermines any possibility of complete fixation of the concept:

The development of the concept of syphilis as a specific disease is thus incomplete in principle, involved as it is in subsequent discoveries and new features of pathology, microbiology, and epidemiology. In the course of time, the character of the concept has changed from the mystical, through the empirical and generally pathogenical, to the mainly etiological. This transformation has generated a rich fund of fresh detail, and many details of the original theory were lost in the process (FLECK, 2000).

In the second chapter, "Epistemological Conclusions from the Established History of a Concept ", Fleck emphasizes the importance of the historical approach to arrive at a concept of syphilis, exemplifying the strong and clear link between science content and the history of knowledge, since we are not talking about a concept or a process that was just given. "The current research resources are just a result of historical development" (Fleck, 2000). Something directly related to the work for generations of an organized researchers' community who rely on prior knowledge and technical resources they have available. It is during this reflection that Fleck discusses the scientific concept of development as a result of the history of thought and makes use of the comparative theory of the knowledge theory. According to him, a "less egocentric and more universal" way which would allow a broader perception of a greater number of details. As previously announced, the second and the fourth chapters bear specific discussions, but correlated in subtopics, which makes reading more fluid and interesting. This seems to be related to a number of key concepts part of the discussion. Such mention is made for, besides comparing theories, Fleck also conceptualizes and discusses the importance of pre-scientific proto-ideas (a sort of confusing pre-ideas), like the idea of syphilitic blood caused for a long time, while searching for evidence in different approaches. Also, in this chapter, talking "about the trend to the persistence of belief systems and the harmony of illusions" (Fleck, 2000:69), Fleck, referencing the concept of venereal epidemics, speaks of the impossibility of a relationship between formal-logical conceptions and their evidence, and a comparison of the theory of functions, which would investigate how ideas circulate from one

style of thinking to another, how pre-ideas emerge spontaneously, how they are preserved: for the author, "thanks to an illusion of harmony, as persistent and rigid formations" (Fleck, 2000). This leads us to observe once again that this path is continuously conditioned by culture which, along with a series of propositions, determines "what cannot be thought of otherwise". Finally, Fleck emphasizes "the social conditioning of any process of knowledge," thus affirming that all scientific work is collective work, the result of a collective effort, not individual, as many may think. For this reason "the word 'know' only gets a meaning in a collective thought context."

Analogously, the statement "Someone recognizes something" demands some such supplement as "on the basis" of a certain fund of knowledge," or, better, "as a member of a certain cultural environment," and, best, "in a particular thought style, in a particular thought collective" (FLECK, 2000).

Hence, it is possible to consider that

The source of his thinking is not within himself but is to be found in his social environment and in the very social atmosphere he 'breathes'. His mind is structured, and necessarily so, under the influence of this ever-present social environment, and he cannot think in any other way.

"Talking about the reaction of Wassermann and his discovery," in the third chapter, Fleck begins his text by presenting the challenge of addressing a non-specialist audience. Much as a function of not knowing the specific ground behind it, but "gear" ideas and "truths" that have a reciprocating motion and complicate this task. For Fleck, the very act of disclosure is difficult since any field of scientific knowledge is difficult to be completely described through words. This happens, for the author, because such words do not have a fixed meaning. Rather, they are assigned a specific meaning depending on context, the area of thought to which it subscribes. As a result, in order to participate in this task of introducing the Wassermann reaction in an interesting and efficient manner, Fleck then presents a textbook for Citron Julius (a disciple of Wassermann's). It is in this part of the book that the concept of "infectious disease", "disease" and "health" and "immunity", among others, is best discussed from the Wassermann reaction in order to show that all knowledge, even specialized, not only increases, but also undergoes changes, many of them fundamental. After all the description is made, the fact which draws more attention is the finding by Fleck that, although the existence of antigens had been proved, this was not Wassermann and his collaborators' goal. They just arrived there, and still insisted on the search for evidence of syphilitic blood. With this, there comes the paradigm that would be relevant to several other findings: "from false assumptions and many early irreproducible experiments, after many errors and deviations, an important discovery came" (FLECK, 2000), reinforcing the impossibility of a single authorship of any knowledge and scientific fact, but the validity of an authority which is collective and according to the customs of that group.

Finally, in "Epistemological Considerations Concerning the History of Wassermann Reaction," there is an explicit definition of the *scientific fact*, which was being built throughout the work. Even under the characteristic of "provisional", here arises the scientific fact "as a concept relationship in the style of thought, which, although can be searchable through the historical point of view of psychology and individual and collective ways, can never simply be built in their entirety by these points of view" (FLECK, 2000). Time also for coherent discussion within

the specialized field of science, the categorization of science journals and science textbooks, its relationship with what is esoteric, with the author and the community it addresses, with reference to temporary and fixed (representative) propositions and their role in the formation of a scientific fact. Another element which Fleck revisits in this chapter is the style of thought as "a willingness for a directed perception and a corresponding processing of what is perceived" (FLECK, 2000), with examples and comparisons of anatomical parts among them, in order to show how a work becomes legitimate and, thus, a scientific fact.

Not to dwell on the subject, it is possible to say that Fleck, through an interesting and accessible narrative, is able to address and present to the reader, familiar or not with the theories of knowledge and science, the complexity of the constitution "interim" from a scientific fact. He does that through a text permeated by concrete examples not limited to syphilis, but leaving room for questions pertaining to the functioning of society in general (fashion, politics, science, sports, business relationships, etc.), which takes its key concepts continuously throughout the chapters, thickening understanding, making use of short phrases, many of the following headings and subheadings, optimizing connection to the discussion/reflection that would be (re) started. These elements contribute to a good flow for the reader and provide absorption of what has been presented and analyzed around the "scientific fact": definitely a collective process, long and extremely marked by impressions of the scientific community which produced it, and which embraces all knowledge, including that designed in the medicine field, for which reason it does not cease to be partial and dependent on the times and cultures in which it was established.

Author

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Note

1. "Some Specific Features of the Medical Way of Thinking" (1927); "On the crisis of 'reality'" (1929); "Scientific observation and perception in general" (1935); "The Problem of Epistemology" (1936); "Problems of the Science of Science" (1946); "To Look, To See, To Know" (1947); "Crisis in science" (1960). These articles were first published in isolation, but in compilation later on, in 1983, in the German work "Ludwik Fleck Erfahrung und Tatsache", and, in English (1986), in the book "Cognition and Fact: materials on Ludwik Fleck", as highlighted by Condé, in a footnote in the Preface to the Brazilian edition.