

Comparison of the Approaches of Fleck, Foucault and Laura on the Influence of Medical Knowledge on the Development of Modern Science

Fleck, Foucault ve Laura'nın Tıp Bilgisinin Modern Bilimin Gelişimine Etkisi Konusundaki Yaklaşımlarının Karşılaştırılması

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Abstract: The paper raises the issue of how medical knowledge and its historical evolution have affected the development of scientific theory. The conducted analysis of methodological programs demonstrates a close relationship between cognitive problems and the historical and social context in which they emerge and are addressed. The fact that this connection is the most pronounced in works on medical issues suggests that it was the research of medical nature that led the theory of science in the second half of the 20th century to increasingly consider the historical and cultural context of scientific research in addition to epistemological issues.

Keywords: Episteme, institutionalization of knowledge, bio politics, polysensory view.



1. Introduction

The question of the source and criteria of true knowledge, which was the main focus of the first philosophers, with time, as knowledge grew more and more at the helm of the human world-transforming practices, gradually transformed into the question of how knowledge is incremented. In this new perspective, the problem of the relation between the conceivable and the empirical was seen as the problem of the relation between scientific theory and scientific fact. Further, research into the logic of the expansion of scientific knowledge paid more and more attention to the historical and socio-psychological factors accompanying and to a large extent determining this expansion. From a subject-methodological point of view, this progression can be defined as an evolution from gnoseology to epistemology and on to the methodology and sociology of science.

Reflecting on this journey of self-discovery of science, it is apparent that at the stages of gnoseology and epistemology, medicine hardly attracts any attention. In turn, at the stages of the methodology and sociology of science, medicine is not simply considered on a par with other areas of scientific practice but often becomes the sphere in which analysis inspires conclusions regarding the entirety of scientific research practice, as can be observed in Ludwik Fleck's "The Genesis and Development of a Scientific Fact", or even regarding the practice broader than scientific, i.e. transformative work overall, which includes technological and social innovations along with political activity, as presented in various works of Paul-Michel Foucault and Bruno Latour.

The purpose of the article is to compare the main ideas and methodological principles of the works of Fleck, Foucault and Latour, which present three approaches to medical knowledge.

2. Methods

The objectives of this article are to demonstrate to what degree research into the methodology of scientific knowledge, the main empirical basis of which is the history of medicine, participates in the process of the self-comprehension and self-substantiation of science while placing it in its socio-historical context.



The main research method is comparative. Through this method, the authors research main ideas and methodological principles of the works of the authors, embodying three significantly different approaches to medical knowledge. The material of the article is comprised of the works of Ludwik Fleck (1999), Paul-Michel Foucault (1997; 1998; 2006), and Bruno Latour (2013; 2015), then Latour & Woolgar (1986). The comparison itself is carried out according to the principle of comparing both close and opposite statements of the corresponding authors in order to clarify their positions and to identify those problems of scientific knowledge, the interpretation of which is irremovably ambivalent.

3. Results and Discussion

Analysis of Fleck's approach

The approach taken by Ludwik Fleck can be most conveniently analyzed, building on a specific quotation from obsolete medical treatises, which are scattered throughout the text of his own book "The Genesis and Development of a Scientific Fact". For example, here is one quote taken from a medical treatise of the early 19th century: "Here before me is a book by Jozef Low, M.D. (Landhut, 1815) 'On Urine'" (Fleck, 1999): "The picture of fever (Synochus) can be traced by the urine, which changes its color, becomes turbid, cannot be boiled and stirred evenly (Mängel an Kochung), is stained crimson or dark red, becomes sticky, and has a flaky, dirty white, sometimes otherwise stained, more often gray, slimy sediment in it, which consists of decomposed mucus, protein, urea and phosphorus" (Fleck, 1999, p. 155).

Fleck's book essentially raises only one question – what is the epistemological status of this text and others like it? Fleck continues to say, that the problem is that this text could not be accurately translated with the medical terminology available to his contemporaries in the second half of the 20th century, as it was not definitively known what had been meant by "fever" a century before, or even what had been referred to as "phosphorus".

Fleck further adds that since there is no reason to accuse Low of deliberate cheating, it is only left to admit that we are dealing with a kind of *historical scientific fact*: "Low saw it directly, while we today cannot" (Fleck,



1999, p. 156). At the same time, reading Low's book, it is easy to conclude that this is not an author's study, but rather a practical guide for physicians, whose author belongs to a particular tradition, the origins and distribution of which could be understood through careful analysis and comparison of these kinds of texts. Possibly, this kind of research could reveal what Kuhn calls a "scientific paradigm", yet Fleck uses a more flexible and more appropriate to his own approach concept of the "style of thinking". This concept is sometimes used by Fleck in the broad sense of cultural and historical premises (by the example of treating syphilis as a punishment, i.e., in a religious and ethical context), but more often in the narrow sense of the scientific tradition established within a specific, most importantly, scientific community ("thought collective").

Fleck's notion of a "thought collective" is critiqued in a foreword to the English translation of "The Genesis and Development of a Scientific Fact" by Thomas Kuhn (who generally praised Fleck's book). In this concept, Kuhn sees a kind of collective subject who completely subordinates the thinking of the individual members of the collective³. Indeed, Fleck's book does present assertions that "the individual is never (or almost never) aware of a collective style of thinking which almost always has an absolutely coercive effect on his thinking and against which nothing can even be thought" (Fleck, 1999, p. 66). However, Fleck's categorical approach may be explained by the fact that, speaking of science in general, he bases himself primarily on medical knowledge, whose conservatism and adherence to tradition are associated with the extreme difficulties that stand in the way of individual research experimentation in this field. Together with that, medicine, and first of all, medicine not yet framed in institutional forms, was not so much a knowledge as an art passed on from master to apprentice. Hence, it could, over the long period of its existence, produce not one but many traditions, even if related to some semblance of a common paradigm (like the "humor theory" mentioned by Fleck), then related in completely different ways. Yet it is these exact qualities of coerciveness and locality that Fleck attributes to the "style of thinking".

Fleck certainly does not deny that the styles of thinking succeed each other, ascribing importance to a "hypothesis" that "grandiose chang-



es in thinking style, and consequently significant scientific discoveries, often occur during periods of general social confusion” (Kuhn, 1999, p. 120). This topic, however, remains on the periphery of his book, and for a better understanding of the change in styles of thinking, one should probably refer to the works of Paul-Michel Foucault (we will return to Fleck’s theory later), whose notion of episteme is closer to Fleck’s “thinking style” than to Kuhn’s “paradigm”. Foucault also ascribes to his notion of “epistemes” an obligatory and unconsciously accepted status, not limiting it, however, to any field of knowledge or practice, but expanding it to the boundaries of all culture, boundaries that are outlined only by the change of one episteme by another (“epistemological gaps” in Foucault’s terminology).

Analysis of Foucault's approach

It is based on the example of change in medical knowledge (more precisely, medical practice) that Foucault in “The Birth of the Clinic” (Foucault, 1998) explores the shift in epistemes, the backdrop for which is also “social confusion” (the French revolution), but also something entirely opposite, namely the rapid institutionalization of medical knowledge that took place in the same era and the years that followed. As an example, we can consider the fever mentioned in the earlier quote. Unlike Fleck, Foucault is not limited to stating that the term of the early 19th century can only be roughly translated into the language of medicine of the mid-20th century. His objective is to demonstrate *how* and *why* the meaning of this term changed in a relatively short time (about two decades in the early 19th century; Foucault even gives a specific date of 1816) from the designation of a disease (or rather, a set of diseases) to the designation of a sign indicating localized inflammation in one way or another.

In his chapter “The Crisis of Fevers”, which concludes “The Birth of the Clinic”, Foucault illustrates the process of reorganization of medical theory and practice, at the “entrance” of which an illness was interpreted by the doctor as a set of symptoms (for example, pleurisy is formed by: rapid pulse, increase in temperature, difficulty in breathing, spitting up blood from the patient, pain in the side; if some symptoms are missing, it can be said to be “not real pleurisy”, “not entirely pleurisy”, etc.) (Fou-



cault, 1998), and at the “entrance” – as a somehow localized organic pathology (pleurisy, in this case, would be inflammation of a certain type of tissue (lung lobes) with corresponding *external manifestations* (see above) referring to an *internal* inflammatory process) (Foucault, 1998, p. 278). This revolutionary change in the doctor’s gaze, which, penetrating into the patient’s body, becomes truly polysensory (Foucault, 1998, p. 249), Foucault refrains from interpreting in terms of medical progress or as a consequence of particular technological innovations that have come into medical practice (for example, in the spread of the stethoscope, Foucault sees not a cause, but a consequence of a new unspoken philosophy of illness adopted by doctors). Instead, Foucault closely associates this transformation with a change in the social status of medicine, the formation of what is usually called “state healthcare policy”, among the direct manifestations of which the author mentions the institute of the clinic.

Investigating Paul-Michel Foucault’s understanding of clinical medicine, scholars often highlight his words that, similar to his historical predecessors, the clinic provided care and medical assistance primarily to the poor, who in return provided as the object of medical examination their own bodies, which in a sense were “designed to get to know others better” (Foucault, 1998, p. 135). Yet Foucault relates this thesis closely to a different point – to the fact that from a certain point in time clinical experience was included as a necessary element of medical training, in which “practice and manipulations will be combined with theoretical instruction. Students will practice chemical experiments, anatomical autopsies, surgery, instrumentation, a little reading, a lot of seeing, and a lot of doing” (Foucault, 1998, p. 131). In Foucault’s vision, the combination of therapeutic, teaching, and research practices within the clinic was a peculiar materialization of the myth that took shape at the turn of the 18th and 19th centuries, the one about “a nationalized medical profession organized by the clerical type, embedded at the level of health and body, with a power similar to that of clerics over souls” (Foucault, 1998, p. 64). But what is a power over the body that can be likened to power over souls? At the very least, it is the right to touch the body⁴. Yet punishment in the form of tapping and listening is already penetration into the



body, a certain epistemological limit of which is the autopsy, i.e., the dissection, when “the corpse becomes the clearest moment of the appearance of truth” (Foucault, 1998, p. 246) and pathological anatomy becomes “an objective, real, and unquestionable foundation for the description of disease” (Foucault, 1998, p. 198).

Foucault would most likely disagree with the opinion of medical historians that the history of medicine agrees very poorly with Kuhn's theory of science since it has no pronounced paradigms and depends on discoveries made in related disciplines (primarily biology and chemistry) and must be regarded as pre-paradigmatic (Müller-Wille, 2011). “The Birth of the Clinic”, however, asserts the opposite: new medical practices initiate new accents in artistic creation⁵, but also, perhaps even more importantly, creates new possibilities for scientificity as such, for through the new medical research practice, “the old Aristotelian law that forbade scientific reasoning about the individual has been eliminated ... thus space has opened to view a differentiated form of the individual” (Foucault, 1998, p. 258).

However, in Foucault's idea, the medical paradigm is not so much a theory recognized by the majority of the scientific community or a universally adopted practice. Instead, it is primarily a form of social organization, which in its formal aspect shows definite similarity with other social systems created (or reformed) around the same historical period, for instance, reorganized army, public governance system, the overall education system, city maintenance services. In this sense, Foucault continues, “the medical space coincides with the social, or rather crosses it and is completely immersed in it” (Foucault, 1998, p. 62).

Nevertheless, Foucault suggests that the medical sphere cannot fully dissolve in the social, i.e. be reduced to what Foucault calls “biopolitics”. On the contrary, in the meeting of the specific doctor and patient, medical practice, in a sense, constitutes the individual itself, which, oddly enough, appears to Foucault as a byproduct of the growing Cartesian dichotomy of medical practice, in which the doctor becomes “more and more of a subject” and the patient gets “further and further objectified”. Foucault indicates that as the clinical experience spreads, “the doctor and the patient are drawn into an infinitely increasing intimacy and bond: the



doctor – by a gaze that is wary and always aimed to comprehend more; the patient – by a set of indispensable and mute qualities that give him away” (Foucault, 1998, p. 41). Foucault then argues that it is at the basis of this individual pole of the medical space that “the majestic violence of the Enlightenment, which was its own master, abolished the dark realm of privileged knowledge and established the limitless empire of the gaze” (Foucault, 1998, p. 72).

This quote vividly illustrates Foucault’s characteristic convergence of the concepts of “gaze”, “knowledge”, and “violence”, which form in his concept a real semantic triangle that allows Foucault to separate violence from the acts of normalization and regulation inherent in biopolitics. As he notes, “the first objects of normalization and regulation were medicine and the doctor. Normalization was first applied to doctors and only after that to patients” (Foucault, 2006, pp. 86–87). Violence, in this case, is not mentioned. Foucault adds that although this predominant attention to medicine applies only to Germany, and in France, the initial priorities were different (Foucault, 1998, p. 87), the general vector of social efforts of the authorities of the European nation-states was the same: increasing regulation and normalization of various practices and institutions and, as far as possible, improvement of the living environment, mainly in the cities. The totality of these measures (which, we might add, can be called “medicine without a doctor”) led to the fact, writes Foucault, that “the plague, or the set of diseases so called by chroniclers, historians, and physicians, disappeared during the 18th and 19th centuries even *without the causes and mechanisms of this research-worthy phenomenon being discovered*” (Foucault, 1998, p. 79). Foucault continues to note that administrative measures had similar success with regard to tuberculosis, the death rate from which in 1882 was halved compared to 1812, again without any knowledge of what tuberculosis is and how it should be treated.

The argument that modern medical practice is a manifestation of social polity is also voiced by Fleck, who writes that compared to research on sexually transmitted diseases, in particular syphilis (the main subject of Fleck’s book on scientific fact is the discovery of the Wasserman reaction), “tuberculosis research did not receive as strong a stimulus from society, nor was there a corresponding social tension to be defused by



research” (Fleck, 1999). The answer to why society did not produce a strong enough stimulus, which Fleck is for some reason reluctant to give, is quite obvious: syphilis as a “disease of the military” was a much more acute problem for a state, especially a state at war, than tuberculosis (as we know, Fleck himself was involved in this problem as a prisoner in one of the Nazi concentration camps).

Analysis of Latour's approach

The texts of Bruno Latour, who, as we will show later, is similar to Foucault in bringing political and scientific practice together (although Latour does so on different grounds), also offer analogies between the military and medicine. Latour suggests that “the role played by the military in the recruitment, training, and submission of people was also performed by doctors, surgeons, and healthcare workers across centuries. Amateurs were kept at bay, charlatans and swindlers were prohibited from practicing, laws were passed, and ordinary people were forced to take an interest in the problems of medicine. By the time biologists committed their lives to the problems of medicine, most of the preparatory work was already done. Hence it is unsurprising that so much research is performed in the sphere of healthcare. When researchers and engineers are unable to tie themselves to one of these two budgets, military or medical, things do not go so well for them” (Latour, 2013).

These words, which may have been inspired by Foucault's ideas, Foucault himself would hardly agree with (in his own interpretation the military and doctors are not so much organizers as they are participants in the process of recruiting, organizing, and training). The main point, however, is different. Foucault's analysis of social practice, particularly medical practice, includes two poles: the “politics pole” and the “knowledge pole”; the “politics pole”, respectively, is related to the common and normalization, and the “knowledge pole” – to the individual and violence. It is unclear whether this dichotomy, which is lacking in the works of Fleck, who subordinated the individual to the “thought collective” and which, as we shall see, Latour tries to avoid, weakens Foucault's position, or, on the contrary, reinforces it. In any case, it is apparent that in Foucault's view, the pole of the individual in the sphere of medicine is not a researcher faced with a difficult problem, like August Wasserman



for Fleck and Louis Pasteur, Roger Guillemin, or Andrew Schall for Latour. Instead, it is a practicing innovator, one like Philippe Pinel, who, by “freeing” (in Foucault’s text, in quotation marks) the locked and bound patients in his mental asylum, uses against them actual violence, all the more dangerous because it comes as if from the patients themselves⁶ (Foucault, 1997, p. 492). In this, “in the eyes of the patient, the doctor becomes a miracle worker; it seems that the power and authority which he had formerly borrowed from order, morality, and family, are now concentrated in himself” (Foucault, 1997, p. 497). Thus, at the pole of the individual in Foucault’s concept lies not striving for new knowledge in spite of the universal but obsolete dogma (as is the case in T. Kuhn’s concept of scientific revolutions), but instead violence and myth-making, done in the name of truth, asserting themselves in the penetrating gaze of power-cognition. In contrast, scientific revolutions (epistemological gaps) are not associated by Foucault with comparable power epistemologies: not only do they have no authors, but they remain usually unnoticed by their contemporaries.

Bruno Latour, emphatically detaches himself from the approaches of Kuhn and Foucault (especially the latter), in particular by saying that when we see radical “differences in style or way of thinking, we speak of a revolution (to use the language of politicians) or even of an epistemological rupture (this time borrowing language from the butcher shop)” (Latour, 2015b, p. 90). Latour continues that to explain the ongoing changes “by the rupture of ‘times’ is to explain nothing at all”.

Meanwhile, Latour’s idea that the development of medicine, a critical point in which was the establishment of scientific bacteriology by Pasteur, contributes to further alienation of the patient from the treatment applied to them (i.e. the patient’s right to judge the effectiveness of treatment is recognized less and less)⁷ could well belong to Foucault. Yet this idea is not developed by Latour further, remaining, as it were, on the outskirts of his epistemological analysis of Pasteur’s discovery, which in Latour’s interpretation appears to be much closer to Kuhn’s “scientific revolution in understanding” than to Fleck’s interpretation of “scientific discovery”. At the same time, the idea that the progression from a hypothesis to an established scientific fact is manifested primarily in the



stylistic and terminological evolution of scientific publications on the subject undoubtedly brings Fleck's position closer to that of Latour. Still, this similarity is also a difference, as Fleck speaks of "journal science", in which assertions voiced by the researcher have the status of their personal viewpoint (from this Fleck derives "the specific discreet tone of the articles published in journals: it can be noticed by characteristic expressions like: 'As I tried to show...', 'It seems possible that...'" (Fleck, 1999, p. 146)) and the stylistically opposite "textbook science", in which expressed opinions turn into facts: "only in the already impersonal compendium of scientific knowledge can one find expressions such as: 'This exists (or does not exist),' 'This and that take place,' or 'It is definitely established that...'" (Fleck, 1999, p. 146).

In his turn, Latour agrees that "a fact is nothing but a statement devoid of modality and traces of authorship" (Latour & Woolgar, 1986). However, he is convinced that this transformation occurs within "journal science" when debates on the new discovery in subsequent publications die down and the discovery detaches from its author and historical context, turning into a recognized fact or what Latour himself calls in one of his works "the black box". To put it differently, Latour's scientific fact is not a simplified and, in a certain sense, dogmatic statement that has passed from a narrow circle of specialists to a broader, less competent public, but a statement that, while remaining within the limits of research science, has changed its status from an opinion of a specific researcher (or research team) to a generally recognized fact with the status of a natural datum.

Nevertheless, when discussing revolutionary changes typically associated with the name of Pasteur, Latour resorts to a different level of analysis, in which the vector of transformation lies not within science, denoting a transformation of one scientific paradigm into another, but is directed from inside science outside of it, turning into a sort of social movement (the hygienist movement) under the banner of science. At this level of analysis, Latour's material is not scientific articles but "purely newspaper texts" (Latour, 2015b), and his methodological foundation is Kutuzov described by Tolstoy in "War and Peace", where the wise commander "had the courage not to give any orders, giving in the form of



orders what his commanders suggested he do”⁸. The analogy here is that Pasteur, according to Latour, found himself the head of an already existing army – activists of a broad public campaign for the recovery of the French nation, who set themselves the task of “reviving not only a humiliated and defeated France... /but also – M./ reviving the human race in general, and in particular the urban masses” (Latour, 2015b, p. 49). The goal proposed by the Pasteurians – the struggle against pathogenic microbes – is enthusiastically embraced by hygienists, who turn out to be adherents and promoters of Pasteur’s ideas (“sometimes more depends on the person who readily grasps the discovery than on the person who makes it” (Latour, 2015b, p. 170)).

Could the process described by Latour be considered a scientific revolution in the sense of Kuhn’s theory? As Latour notes, Pasteur needed to “just open his mouth for everyone else to extend his achievements to all diseases. A highly unusual revolution!” (Latour, 2015b, p. 63). The difference between the approaches of Kuhn and Latour is not even that the Pasteurians were not opposed by a majority of the scientific community committed to outdated views⁹. More importantly, the ideas proposed by Pasteur, in Latour’s interpretation, cannot be considered a theory per se. Instead, at issue is the spread of a new *technology* – vaccination technology. Here we can recall that Fleck, speaking of Pasteur’s discovery in his book, virtually anticipates Kuhn’s concept of pre-paradigmatic and paradigmatic science. As Fleck notes, “the pre-Pasteurian time was the age when, despite the diversity of opinions and little related observations, belief in the variability of bacteria dominated nonetheless... Then came the classical period of Pasteur and Koch. Under the effect of the convincing practical successes and personalities of these researchers formed the dogmatic style of bacteriological thinking. Recognized were only quite orthodox methods that delivered limited, unified results. For example, bacterial cultures were inoculated only after 24 hours. Cultures that were too fresh (2 or 3 hours) or too old (about 6 months) were not considered as research subjects” (Fleck, 1999, pp. 114–115). The result, Fleck writes, was that “for a long time bacteriologists overlooked the phenomenon of microbial variability,” as if in captivity to Pasteur’s methodological paradigm. But what Fleck sees as an example of asserting a dogmatic “think-



ing style,” Latour describes as an extremely effective practice. On the other hand, Foucault, speaking of the formation of social medicine in 19th-century Europe, similarly to Latour, considers this process in terms of more or less successful social policies aimed at improving the health of Europe’s population, without, however, viewing this process as initiated by the ideas and activities of specific transformers like Napoleon or Pasteur. In Foucault’s epistemology, iconic names, as we have seen, have a very different meaning: they, like Pinel or Bichat, not so much create a new practice as they mythologize the figure of a new type of actor, who is simply a personification of the new episteme. As if polemicizing in absentia with Foucault (and Fleck), Latour writes: “I see no reason to avoid the term ‘genius’ ... one who is able in a particular place and time to summarize what others do must surely command boundless admiration. This is what Tolstoy does with Kutuzov, and this is what I do with Pasteur’s primary disposition” (Latour, 2015b, p. 136). Yet Pasteur in Latour’s work does not simply “summarize” what others do. His genius manifests primarily in the ability to *convince* others: “Pasteur’s genius is in what should be called the theater of proof... Pasteur devised experiments so dramatized that the phenomena he spoke of appeared to the audience as if written ‘in black on white’” (Latour, 2015b, p. 134). The transfer of laboratories to the field, the simulation of anthrax epidemics among domestic animals in which only pre-vaccinated individuals survived, even the scientific career of Pasteur, which was a movement from one scientific field to another – all were due, Latour is convinced, to “his desire to recruit as many supporters as possible” (Latour, 2015b, p. 135).

A prime example of such a recruited supporter in Latour’s book is classical medicine, which the movement of Pasteurian hygienists first intended to simply eliminate and replace by itself¹⁰, and which responded in its print media with skepticism regarding the suggestion that general preventive measures could replace concrete treatment practices. In the end, the right strategy for Pasterurians turned out to be not a war with doctors but bringing them to their side as a kind of local health watchdogs. Thus, “the conversion of the doctors took place. They turned from victims into agents. They took up the cause” (Latour, 2015b, p. 179). But much more powerful unifying agents were the serums produced in the



Pasteurian laboratories, in particular, serums against diphtheria: “Vaccinations do not interest doctors too much; but they are very interested in serums, because they allow them to continue to do their usual work” (Latour, 2015b, p. 186).

The work of Pasteur himself, same as that of his associates, can be defined in Latour’s interpretation as scientific-political. More precisely, a scientific laboratory for Pasteurians is the political capital, which they repeatedly put into circulation, constantly receiving profit in the form of rising influence and, eventually, as we could continue and as Foucault definitely would have, in the form of getting power. Yet Latour stops here and decidedly separates influence and power (“be strong, but never overbearing”) (Latour, 2015a, p. 282), as if minding Foucault’s warning that power always presupposes the overpowered, and these are subject-object relations, possibly, in their most intricate form.

This separation, however, does not prevent Latour from likening scientific work to political, even if referring not to the mobilization of a social movement, as with Pasteur, but to the publication of scientific articles in specialized journals by laboratory staff. The goal here is the same: “weaken your enemies, try to paralyze those you cannot weaken (...), help your allies if they are attacked, maintain steady communication with those who supply you with the necessary tools (...), make your enemies fight each other (...); if you are not sure of victory, show modesty and choose streamlined wording” (Latour, 2013, pp. 71–72). As Latour notes on scientists, their “political capabilities lie at the heart of the science they create. The better politicians and strategists they are, the better science they are creating” (Latour & Woolgar, 1986).

Meanwhile, emphatically likening his own strategy to that of the Pasteurians¹¹, Latour clearly communicates that scientific work can sometimes do without a laboratory but can never do without politics. As far as we can grasp, Latour does not suggest that the career of an individual researcher is, so to speak, scientific in content and political in its form. Rather, the scientific in his interpretation is political, but speaking the special language of a narrow subject area, whereas “science’ itself does not exist. This name, which is given to some parts of some networks, is so unstable that it would escape attention altogether if, by some exaggera-



tion, it were not attributed universality... There is no knowledge – and what would that mean? – There are only skills. In other words, arts and crafts” (Latour, 2015a, pp. 285, 288).

With respect to observable scientific work, Latour is clearly correct. The core of his own epistemology was the experience of observing and analyzing the laboratory work that produced the hormones thyrolyberine and somatostatin, which, even less than Pasteur’s microbes, would qualify as empirical data just waiting to be discovered, but are precisely the skills being created and perfected in the production of these drugs. Fleck makes roughly the same point with regard to the development of the clinical diagnosis of syphilis (the Wasserman reaction), in the course of which the researchers’ general understanding of their own activities also changed. It had changed so much, Fleck notes, that when they retrospectively reconstructed the path that led to their discovery, they inevitably misrepresented it, seeing it as a focused search for what they eventually found¹².

In Fleck’s book, however, the collision of theoretical knowledge and practical art in the field of medical practice is a critical methodological problem, since medicine, which almost exclusively presents art, the theoretical foundations of which have practically no effect on practice, turns out to be fully dependent on tradition, which is more likely to be susceptible to random mutations than radical changes. In Latour’s terminology, medicine should have been called “inactive practice”, i.e. practice that is capable of “reassembling the social” no more than carpentry. Concluding on the incompatibility of the medical language of the early 19th century and of the early 20th century, Fleck offers no answer in his book on how the first tradition transformed into the second. The answer is given by Foucault and Latour: the art of medicine was increasingly invaded by theoretical knowledge, and it was the invasion of theory that ensured a systematic change in practice. Yet while Foucault incorporates changes in medicine in the overall process of *industrialization* of European society, Latour considers them a special case of *technological modernization*. Accordingly, Foucault’s New European model of multiplying knowledge is presented in terms of an increasingly diverse and pervasive power, and



Latour ascribes to the same knowledge the meaning of a reorganizing and, in general, *creative activity*.

As applied to medical practice, this duality can be expressed in terms of two different perspectives: one belonging to the patient, the other – to the physician. The first (Foucault's position) reveals itself as a duality of subject-object relations: the patient can overcome the alienation of himself as an object of the penetrating gaze armed by science only in the gesture of exposing the doctor's claims to the role of Master and Father. The second (Latour's point of view) conceptualizes itself as an activity in the space of more or less freely constitutable objects (say, pathologies), where the very notions of "human" or "social" simply lose their meaning.

4. Conclusion

Speaking in a more general sense, the Cartesian attitude is unconditionally transcended in one of these approaches (by Latour), while in the other (by Foucault), it is infinitely modified and deepened. But can the opposition of both points of view be contained within the classical methodology of science? Or do the works of Foucault and Latour definitively overcome its theoretical preconditions? The concept of "knowledge," having disintegrated into "power" and "activity," can in no way be reassembled; nor can it be reduced to the sum of the two. In any case, this suggests that the medical problem, which, historically, may have been a fertile ground for the transformation of epistemology into the methodology of science, as Kuhn says in reference to Ludwig Fleck's book, with time became a kind of epistemological temptation for this transformation, constantly shifting its subject field either toward ideology or toward broadly understood social innovations, including the development and marketing of new goods and services, which also require the ability to mobilize supporters, neutralize competitors, etc.

In the face of such temptations, should science persist in its epistemological purity, that is, its irreducibility to neither politics nor economics? The political-economic reality permeates the whole field of science; it is the real body of science, a body that is becoming more and more perfect. But does not the methodology and sociology of science, which in one way or another is derived from medical practice, deny that science also has a "soul," that is, a spontaneity of discovery, akin in some ways to



a religious revelation? Scientists themselves will most likely radically oppose such analogies, but is the “out of this world” position within scientific activity and scientific communities not becoming one of the most important themes in the self-justification of science? However one may answer this question, it can hardly be disputed that the active participation of medical issues in the development of the methodology and sociology of science served as a logical prerequisite for the very question of the degree of scholarly detachment from both the subject of research and the social context.

Notes

1. The opposite of applied knowledge, the object of which is available for direct manipulation, is certainly astronomy. For instance, the values of maximum elongations of Mercury given in Ptolemy’s “Almagest” differ only slightly from the results of modern observations (Ptolemy, 1998). This mismatch merely stems from observational technique and has nothing to do with what Ptolemy knew about the planet Mercury or even about the solar system as a whole.

2. Fleck mentions in his book the theory of “protocol sentences” by R. Carnap, which belongs to the “epistemological” explanatory model of scientific knowledge, arguing that Carnap’s theory “lacks only one thing: recognition of the social determinism of thinking” (Fleck, 1999, p. 131).

3. On Fleck’s “thought collective”, Kuhn writes: “I find this notion internally flawed, leading to many difficulties in Fleck’s book...it seems that the thought collective functions as a kind of super-individual mind” (Fleck, 1999, p. 21).

4. As Foucault writes, “For thousands of years, physicians have been eventually tasting urine. It was very late in the day that they began to touch, tap, and listen” (Foucault, 1998, p. 246).

5. As Foucault states, “The 19th century will obsessively speak of death: the wild emasculated death of Goya, the visible muscular sculptural death of Géricault, the stirring voluptuous death of Delacroix, the Lamartine death of swampy miasms, the death of Baudelaire” (Foucault, 1998, p. 259).



6. As Foucault writes, “The ‘emancipated’ patient must constantly give an account of his own behavior, control himself... the positivist hospital, which Pinel is credited with creating, is not a space of freedom, where patients are observed, diagnosed, and treated; is a space of justice, where a person is accused, tried and sentenced, and where liberation is achieved only by moving the judicial process into the depths of one’s own psychology, i.e., through repentance” (Foucault, 1997, p. 492).

7. (Latour, 2015b, p. 159). Here, however, Latour cites the work of N.D. Jewson (1976, pp. 224–225), not mentioning. Nevertheless, Jewson’s work itself does mention “The Birth of the Clinic” by Foucault (1998, p. 242).

8. Latour’s “Kutuzov – Pasteur” analogy throughout the book clarifies the meaning of the title of Latour’s book about Pasteur, which refers to Leo Tolstoy’s novel of the same name.

9. Mentioned in Latour’s book attempts to criticize Pasteur’s ideas, or at least to criticize the excessive enthusiasm for them (Latour, 2015b, pp. 66–67), should serve as further confirmation of the unanimous acceptance of them by society and the futility of the efforts of their opponents.

10. As said by Latour, “the Pasteurian desire to swallow medicine has as its goal to redefine pathology, which will henceforth be prevented rather than cured” (Latour, 2015b, p. 179).

11. As Latour writes, “my arguments are no more irrefutable than those of the Pasteurians, and no less controversial. They need to find friends and allies, interest them, direct their attention to the entries made... and answer possible objections in advance to convince the reader and make it difficult for them to form judgments like those offered here” (Latour, 2015b, p. 210).

As Fleck writes about Wasserman’s retrospective assessment of his discovery, “It is interesting to note that Wasserman himself thought about this afterwards. ‘I ask you to consider that in developing the serodiagnosis of syphilis, I was guided quite consciously by the idea of searching for a diagnostically significant amboceptor, i.e., a substance that binds the antigen’... If one considers these statements dispassionately, in no way,



with the most positive attitude toward the author, can one agree with his words. Wasserman did not look for a “diagnostically significant amboceptor” in his early works (Fleck, 1999, p. 97).

References

- Fleck, L. (1999). *Vozniknovenie i razvitie nauchnogo fakta: vvedenie v teoriuu stilii myshleniia i myslitel'nogo kollektiva* [The Genesis and Development of a Scientific Fact: An Introduction to the Theory of Thought Style and Thought Collective]. Moscow: Ideya-Press, Dom intellektual'noy knigi.
- Foucault, P.-M. (1997). *Istoriia bezumii v klassicheskuiu epokhu* [History of Madness in the Classical Age]. St. Petersburg: Universitetskaya kniga.
- Foucault, P.-M. (1998). *Rozhdenie kliniki* [The Birth of the Clinic]. Moscow: Smysl.
- Foucault, P.-M. (2006). Rozhdenie sotsialnoi meditsiny [The Birth of Social Medicine]. *Intellektualy i vlast: Izbrannye politicheskie vystupleniia, stati i interv'iu. [Intellectuals and Power: Selected Political Speeches, Articles, and Interviews]*. Moscow: Praxis, 79–107.
- Jewson, N. D. (1976). The Disappearance of the Sick-Man from Medical Cosmology, 1770–1870. *Sociology*, 10(2), 225–244.
- Kuhn, T. (1999). Predislovie k angliiskomu perevodu [Foreword to the English translation]. *Vozniknovenie i razvitie nauchnogo fakta: vvedenie v teoriuu stilii myshleniia i myslitel'nogo kollektiva* [The Genesis and Development of a Scientific Fact: An Introduction to the Theory of Thought Style and Thought Collective]. (Ed. L. Fleck). Moscow: Ideya-Press, Dom intellektual'noy knigi, 19–25.
- Latour, B. (2013). *Nauka v deistvii: sleduia za uchenymi i inzhenerami vntri obshchestva* [Science in Action: How to Follow Scientists and Engineers Through Society]. Saint Petersburg: Izdatel'stvo Yevropeyskogo universiteta v Sankt-Peterburge.
- Latour, B. (2015a). Nesvodimoe [The Irreducible]. *Paster: Voina i mir mikrobov, s prilozheniem “Nesvodimogo”* [Pasteur: The War and Peace of Microbes, with an Appendix of “The Irreducible”]. Saint Petersburg: Izdatel'stvo Yevropeyskogo universiteta v Sankt-Peterburge, 215–307.
- Latour, B. (2015b). *Paster: Voina i mir mikrobov, s prilozheniem “Nesvodimogo”* [Pasteur: The War and Peace of Microbes, with an Appendix of “The Irreducible”]. Saint Petersburg: Izdatel'stvo Yevropeyskogo universiteta v Sankt-Peterburge.



- Latour, B., & Woolgar, S. (1986). *Laboratory life. The Construction of scientific facts*. Princeton: Princeton University Press.
- Müller-Wille, S. (2011). History of science and medicine. *The Oxford Handbook of the History of Medicine* (Ed. M. Jackson). Oxford: Oxford University Press, 469-483.
- Ptolemy, C. (1998). *Almagest ili matematicheskoe sochinenie v trinadtsati knigakh [Almagest, or The Mathematical Work in Thirteen Books]*. Moscow: Nauka-Fizmatlit.

Öz: Makale, tıbbi bilginin ve onun tarihsel evriminin bilimsel teorinin gelişimini nasıl etkilediği konusunu gündeme getirmektedir. Metodolojik programların yürütülen analizi, bilişsel problemler ile bu problemlerin ortaya çıktıkları ve ele alındıkları tarihsel ve sosyal bağlam arasında yakın bir ilişki olduğunu göstermektedir. Bu bağlantının tıbbi konularla ilgili çalışmalarda en belirgin olması gerçeği, 20. yüzyılın ikinci yarısında bilim teorisini bilimsel araştırmanın tarihsel ve kültürel bağlamını ek olarak giderek daha fazla dikkate almaya yönlendiren şeyin tıbbi nitelikteki araştırmalar olduğunu göstermektedir.

Anahtar Kelimeler: Episteme, bilginin kurumsallaşması, biyopolitika, çokduyulu görüş.

