Reading Fleck

Questions on Philosophy and Science

Eva Hedfors

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This doctoral thesis is based on the following papers preceded by an introductory outline:


IV. Medical Science in the Light of the Holocaust: Departing from a postwar article by Ludwik Fleck. Forthcoming in *Soc Stud Sci*

V. Medical Ethics in the Wake of the Holocaust: Departing from a postwar paper by Ludwik Fleck. Forthcoming in *Stud Hist Phil Sci.*


Eva Hedfors, Department of Philosophy and the History of Technology, Royal Institute of Technology, SE-100 44 Stockholm, Sweden. E-mail: ehdfore@infra.kth.se
Abstract


The present thesis is based on a scientifically-informed, contextualized and historicized reading of Ludwik Fleck. In addition to his monograph, the material studied includes his additional philosophical writings, his internationally-published scientific articles and two, thus-far-unstudied postwar Polish papers related to his Buchenwald experiences. The sources provided by Fleck have been traced back to the time of their origin. Based on the above material, it is argued that, rather than relativizing science and deeply influencing Kuhn, Fleck, attempting to participate in the current debates, is an ardent proponent of science, offering an internal account of its pursuit that accords with his oft-contested epistemic concepts, e.g., Denkzwang, Sinnsehen and Kopplungen. The exposure of his description of the Wassermann reaction discloses a highly selective reading of the sources available at the time, but also reveals its relation to the current debate on Einzelwissenschaften, or the standing of new emerging disciplines versus age-old ones, all occasioned by the remarkable progress of science that has also affected philosophy. The divide between philosophers and scientists on the philosophical implications of modern physics is exposed, as is Fleck’s heuristic use of the latter topic in his epistemology. A more realistic account of his often-valued scientific accomplishments is provided. It is argued that the modern interpretation or received humanist view of Fleck is based on the opposition, at the time Fleck’s monograph was rediscovered, of STS writers to a scientifically-informed reading of his texts. An additional corrective to the received view of Fleck is found in some of his postwar Polish papers related his Buchenwald experiences. The latter might also provide an answer to some of the contradictions inherent in the modern mythology surrounding Fleck. In amply exposing the precarious situation of the time, and the complexity of the ethical issues at stake, Fleck’s papers in fact generate age-old philosophical questions still worth contemplating.

Keywords: Ludwik Fleck, Wassermann reaction, Informed consent, Buchenwald studies, Human experimentation.
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Introduction

Although he was virtually ignored by his contemporaries, Ludwik Fleck (1896-1961) is now identified as an important contributor to the contemporary history, philosophy and sociology of science, and is viewed as a pioneer of the sociological approach to science, of constructivist epistemology, of studies of laboratory practises and of investigations focused on the growth, stabilization and diffusion of scientific knowledge (cf., Löwy 2004, p 437 and Sismondo 2004, p 53). His once- neglected monograph, Entstehung und Entwicklung einer Wissenschaftlichen Tatsache (EET), first published in German in 1935, was translated into English in 1979, as Genesis and Development of a Scientific Fact (GDSF). The latter has been the object of extensive secondary writings ever since, mostly within the humanities.

There is agreement bordering on consensus concerning the merits of Fleck’s monograph, not least regarding its alleged anticipation of the theses presented in Structure of Scientific Revolution published by Kuhn in 1962, which was immediately acknowledged and has been immensely influential ever since (Biagioli 1992, p 199, cf. Fuller 2000). The alleged anticipation is exemplified in the vocabulary deployed by Kuhn. His concepts, such as paradigm and scientific community, have been seen as equivalents of Fleck’s much earlier notions of thought style and thought collective. The link between the two writers is found in the now well-known reference to Fleck made in passing by Kuhn in the preface to Structure of Scientific Revolution; this later turned out to be decisive in the serendipitous rediscovery of Fleck’s monograph. Kuhn’s own reluctance to acknowledge a more substantial influence from Fleck, as indicated in his preface to the English translation of Fleck’s monograph, has, if anything had the opposite effect (1979). The supposition that Fleck’s influence on Kuhn was profound is now often depicted as fact (Goldman 1983, Simmons 1991); reservations about this assertion are the exception (Harwood 1986, Wettersten 1991).

Fleck’s work, notably the monograph, has been subject to an interpretative tradition in which the scientific notions used by Fleck in his case histories have been excluded. A cautious estimate would be that almost half of the monograph, and probably more, is directly devoted to scientific issues, mostly bacteriology and immunology. In other words, at least half of the book, or of the basis of his epistemology, has been considered dispensable. That the neglect of these parts could obscure their relationship to the rest of the text has not been considered.
Similarly neglected has been the possibility that those of Fleck’s writings available in easily-accessible translations represent only a selective portion of his work.

**The aim of the thesis**

The thesis is based on five papers, referred to in the text by their Roman numerals. All are related to the reading of Fleck, and include, in addition to two Polish papers, his philosophical and scientific writings in the original German or in English translations; there are as well the different texts written on Fleck from the 1920-1930s onwards, covering the rediscovery of the monograph in the late seventies, and its aftermath.

By digging deeper into the material on Fleck – that is, not only the monograph, but also his additional philosophical writings (III), his highly-acclaimed, though scarcely studied, scientific writings (II), and, not least, his explicit and largely overlooked papers and sources (I, IV, V) – a picture or narrative emerges that, in the proper non-Kuhnian sense of the word, could be used as a paradigm when one attempts to illustrate the different perceptions of science that characterize the sciences and the humanities. As used in the text, the term ‘humanist’ and its derivations include historians, philosophers and sociologists of science, writing on science, though without education or professional experience of science. The notion of ‘science and technology studies’ or ‘STS writers’ is used in the restricted sense that corresponds to its use by its current critics when they refer to the adherents of the school (cf. Koertge 1998 p 3f).

Although several questions could be addressed based on the above material, few could be answered with certainty. The purpose of the study is rather to suggest that a consistent interpretation of Fleck has to take into account the scientific parts of his writings, the proper sources and the context. The tacit background to my efforts is the question of why a tiny book, written in the 1930s by a Polish-Jewish bacteriologist contemplating microbiological questions, mainly addressing his peers, and largely inaccessible to an audience without that training or lacking field-specific knowledge, should develop half a century later into a cult text, or the alleged foundation of the modern sociology or theory of science (cf. Kuhn 1962 p vi-vii, 1979). Although the number of recent theses devoted to Fleck is impressively high, and includes American, Dutch, Danish and Swedish examples (cf. Simmonds 1991, van den Belt 1997, Brorson 2000, Liljequist 2003), all are based on this received, unchallenged view of Fleck as it was initially shaped in the 1980s. Furthermore, though Fleck is nowadays viewed as a pioneer
in the studies of laboratory practices (cf Latour and Woolgar 1979, Gross and Levitt 1994), his own case studies have scarcely been examined (cf Lindenmann 2001).

Materials and questions at issue

The first paper, The reading of Ludwik Fleck (I), attempts to trace the origin of Fleck’s monograph as based on his stated sources, and discusses its possible impetus. It also outlines the rediscovery of the monograph and what could be described as the construction of Fleck as an important figure in modern sociology and theory of science who expounded prescient views that influenced Kuhn deeply; as well, it examines how this construction has influenced the views of the alleged impetus of Fleck’s mission. Fleck has been interpreted as furthering a relativistic conception of science. His account of the Wassermann reaction, which forms the basis of his epistemology, has been praised as having been developed by a scientist well-acquainted with the field in question (cf., Hacking 1999, p 60). Because of the scarcity of available material on Fleck, however, the question of his sources has remained unresolved. In the first paper, an alternative reading is suggested. By focusing on the scientific content of the monograph, largely neglected in modern interpretations of Fleck, and on the previously-overlooked German sources of his writings, a better understanding of Fleck’s account of the Wassermann reaction can be given. The consequences of this alternative reading of the conception of Fleck’s monograph and of the impetus of his mission are discussed.

In the second paper, The Reading of Scientific Texts (II), his widely-praised, if scarcely examined, scientific texts have been traced. By putting them into the context of their time, the modern construction of Fleck as a prominent scientist is disclosed. The description of his production of an effective vaccine against typhus during World War II, while he was imprisoned in Buchenwald, is legendary in the scholarly literature. The claims for Fleck's scientific achievements have been justified by referring to his numerous publications in international scientific journals. Though they are mentioned frequently in the literature, these publications have so far not been studied. The present article discusses differences in interpretation and evaluation of science related to the background of the interpreters. To this end, Fleck's scientific international publications have been scrutinized. In conjunction with other sources that reflect the desperate situation at the time in question, the results of the study provide a more restrained picture of Fleck's scientific accomplishments. Furthermore, reviewing Fleck’s papers makes it possible to articulate certain characteristics of ‘good
science’. The restricted possibilities for those not trained in science or not possessing field-specific knowledge to evaluate science are discussed, as are also formal aspects of scientific papers and questions related to research ethics. Publications exemplifying good and bad science, as well as questions on research ethics, are surveyed. A more realistic account of Fleck’s alleged manufacturing of a vaccine against typhus is also provided.

As alluded to in the title, the third paper, Fleck in Context, (III), attempts to trace the context of Fleck’s philosophical writings in relation to the ongoing discourse in science and the humanities, but also takes socio-political factors into account. The divide between philosophers and scientists on the philosophical implications of modern physics is exposed. Though the neglect of Fleck’s contemporaries has been difficult to account for, the basis of his epistemology has evoked little interest, partly due to the lack of apparent sources. Fleck’s philosophical writings, published between 1927 and 1939, indicate, however, a polemic, deeply ingrained in an ongoing debate, on the standing of old, established scientific disciplines versus new and emerging ones, occasioned by the rapid changes within the natural sciences. Most obvious to the lay community, and also reflected in the new positivist philosophy, were the revolutionary changes within physics. As a participant in the debate, Fleck used modern physics heuristically and as the basis of his epistemology. The tracing of his sources and the contrasting views of other scientists are attempted, including the contemporaneous critique of Fleck.

The fourth paper, Medical Science in the Light of the Holocaust (IV), departs from Fleck’s postwar paper ‘Problems of the Science of Science’, published in 1946. The latter paper has so far unanimously been taken to illustrate the epistemology expounded in Fleck’s monograph Genesis and Development of a Scientific Fact. It has also been deemed to support parts of the received view of Fleck, most notably the matter of his manufacture of an anti-typhus vaccine while he was imprisoned in Buchenwald. However, in comparing Fleck’s 1946 paper with other accounts, also published in 1946 and written by other prisoners alluded to by Fleck in his paper, a different narrative emerges. The situation is further complicated by four papers, published in prestigious scientific journals between 1942 and 1945, by the German medical leader of the typhus studies accounted for by Fleck. In addition, a so-far neglected paper by Fleck published in Polish in 1946 and summarizing his observations on typhus discloses his role in the Buchenwald studies. Despite the obvious difficulties in tracing the history behind these works, the contention is that what was attempted in Buchenwald in the name of medical
science amounted to pseudoscience. This conclusion is amply supported not only by the accounts given by Fleck’s fellow prisoners, but also, indirectly, by his own post-war paper on typhus. The above findings reinforce the suggestion not only that the mythology of Fleck, established in the nineteen-eighties, has been accomplished by a selective reading of his papers, but also that the role played by Fleck was more complex than his modern interpreters have so far contemplated.

The fifth paper, Medical Ethics in the Wake of the Holocaust (V), departs from a postwar Polish paper in which Fleck addresses his peers in discussing the use of humans in medical experiments. Though the paper has so far not been translated or studied, it has been taken to indicate Fleck’s deep commitment to ethical questions, notably the question of informed consent. The paper is of particular interest in that it was written by a former victim of the Nazi policy and a survivor of the Holocaust who acted as an expert witness in the trial of the IG Farben in Nuremberg. Scrutiny of Fleck’s text and related sources, however, discloses not only the complexity of the issue at the centre of the Nuremberg trial, but also the unexpected standing of Fleck, who seemingly adopted arguments both from the German defendants and from the prosecution, which was heavily informed by US scientists. As well, the contentious discussion of the past disclosed by Fleck’s paper reveals its links to modern bioethical discussions. Though the participants in the discussion are sometimes oblivious to that past, the same questions are still at the centre.

Fleck’s philosophical writings contain an abundance of ideas, proposals, suggestions, assertions and apodictic statements, though none is properly worked out. Yet almost any philosophical issue could be brought up with the claim that it is linked to or has been deliberated upon by Fleck, and there is no doubt that his monograph lends itself to multiple interpretations. In my papers, however, I have concentrated on only a few issues which I think constitute his main concerns. The ensuing hypotheses are, firstly, that Fleck’s philosophical writings are part of the previously-overlooked contemporaneous debate (I, II, III, IV, V). Secondly, it is argued that the modern received view of Fleck is based on a highly selective reading of the monograph conforming to already-manifest trends in modern philosophy and the sociology of science (cf. Koertge 1998 p 3f). Thus, disregard for, or simple non-comprehension of, the scientific content has meant that the epistemic concepts used by Fleck – notably Sinnsehen, Widerstandsaviso, Kopplungen and Denkzwang, eso- and exoterisches Wissen, Denkstil and Denkkollektiv – have to a great extent been misinterpreted (I, III). Thirdly, by
neglecting Fleck’s explicit sources, and thereby also disregarding the context, including the historical and the socio-political conditions of the time in question, Fleck’s modern interpreters have, inadvertently, not only opposed some of their own tenets (ibid), but also committed the scholarly mistakes that Fleck sets about to expose and criticise (III). Fourthly, rather than relativizing science, it is argued that Fleck is an ardent proponent of science, offering an internal account of its pursuit that confers sense on his oft-contested idiosyncratic epistemic concepts (II, III). Finally, in drawing on previously-overlooked sources and also taking into account the turmoil of the time, the two final papers (IV, V) reinforce the claims made above. Despite the historiographical complexity of the issue, these papers could be read as an answer to some of the contradictions inherent in the modern construction of Fleck.

The rediscovery and the background of Fleck

For readers not acquainted with Fleck, a recapitulation of the rediscovery of his monograph, his biographical data, and a brief review of the frequently-conflicting received views of his work will facilitate the ensuing discussion.

The rediscovery of Fleck’s monograph in the mid-seventies is credited to W. Baldamus, a former German refugee, and retired professor of the sociology of science at the University of Birmingham. Using the scanty information that Baldamus managed to obtain from Fleck’s publisher in Basel, he concluded that Fleck’s fate was interesting, and anticipated that he might be a possible forerunner to Kuhn. However, he cautiously pointed out that there was not yet enough information to render any conclusions possible. Baldamus also encouraged his German student Thomas Schnelle to work on Fleck. The latter, mastering Polish, became involved in a three-year Fleck project supported by the Volkswagen Stiftung. It was initiated in 1979 and headed by Lothar Schäfer, professor in the theory of science. The project aimed to investigate the biography of Fleck, elucidate the philosophical and cultural background of his thinking, and publish his writings (Cohen and Schnelle 1986a).

Thaddeus Trenn, professor in the history and theory of science, also in Germany, became attracted by Fleck’s monograph in the mid-seventies when lecturing on Kuhn, and included it in his curriculum for further study. Trenn was also, in collaboration with Fred Bradley, responsible for the English translation of the monograph.
Schnelle’s Dissertation “Ludwik Fleck. Leben und Denken. Zur Entstehung und Entwicklung des soziologischen Denkstils in der Wissenschaftsphilosophie” was published in 1982. Following the reissues of the monograph – the English, GDSF, edited by Trenn and Merton (1979), and the German, EET, edited by Schäfer and Schnelle (1980) – two conferences were arranged. The first took place in Hamburg in 1981 and was headed by Schäfer and Schnelle. The second took place in Berlin in 1984 and was headed by Trenn and Cohen. Both conferences aimed to inform an English-speaking audience of the monograph and launch Fleck as an important contributor to the contemporary history, philosophy and sociology of science, and as a forerunner to Kuhn.

The material presented at the two conferences was published in an extensive volume entitled Cognition and Fact (CaF) and edited by Cohen and Schnelle in 1986. The major part of the book consisted of deliberations on Fleck’s epistemology by international scholars in the fields of sociology of science and philosophy. In addition, three articles were included that commented upon the medical and immunological content of Fleck’s monograph, putting it into the context of the science of his period. These articles were inevitably more technical in character, and they have frequently been neglected in subsequent literature.

**Biographical Data**

An extensive biography of Fleck is found in Schnelle’s dissertation, published in 1982. The greater part of the biography is included in CaF. The main features, repeated in numerous articles, include a brief outline of Fleck’s medical studies and his professional career as a microbiologist in the Polish city of Lwów, including the period in the early 1920s when he served as an assistant to the well-known typhus specialist Rudolf Weigl. He was dismissed from that position in 1923. He then worked at various state-owned laboratories as well as in his own private laboratory, set up in 1923 at the time of his dismissal from his position with Weigl. After the Nazi capture of Lwów in 1941, Fleck was evicted from his home along with his wife and son and banished to the Jewish ghetto of the city. Under primitive conditions, he worked in the ghetto hospital on manufacturing a vaccine against typhus out of the urine from patients who had already contracted the disease. After being deported in 1943, first to Auschwitz and then to Buchenwald, he continued his work. After the war, Fleck returned to Poland and worked as a microbiologist in Lublin. After his habilitation in 1946 with Professor Hirszfeld, he became a full professor in 1950. In 1948 Fleck traveled to Nuremberg
as an expert witness in the trial of the IG Farben concerning the typhus experiments undertaken on prisoners in Block 46 in Buchenwald (Schnelle 1986 p 28). In 1952 he moved to Warsaw, which gave him time to focus on research, mainly that involving the phenomenon of leucergy or leukergie. In 1957 he and his wife immigrated to Israel, where he continued his research. In the nineteen-fifties, rumors surfaced, based on the word of witnesses at the Nuremberg trials, about Fleck having collaborated with his Nazi captors while he was imprisoned in Buchenwald (cf., Bayle 1950 pp 1158-63). He defended himself against the charges made by his former fellow-prisoners in a manuscript sent to Warsaw in 1958 (cf Schnelle 1986, p 28f). Fleck died in 1961 at the age of 64.

Besides the monograph, Fleck’s philosophical work includes six articles published between 1927 and 1947. His philosophical articles, and an additional unpublished manuscript from 1961, rejected by four journals, have all been translated and are included in CaF. A complete bibliography, listing more than 150 papers, including his works in natural science, has been added (idem p 445-456). The Polish titles are given in English translations. The English edition of the monograph includes a brief account of Fleck’s biography, in line with the above-mentioned sources. It is written by Trenn (1979), as is a descriptive analysis of the monograph.

Early on, two previously-unstudied postwar Polish papers listed in Fleck’s bibliography (cf., Schnelle 1986, p 449) caught my interest – the first, Kilka spostrzeżeń i doświadczeń z dziedziny duro plasmistego, Some Observations and Experiments from the Field of Typhus Fever, published in 1946, and the second, W sprawie doświadczeń lekarski na ludziach, On the Question of Medical Experiments on Humans, published in 1948 (cf., Schnelle 1986 p 450). The two papers have been included in my study.

**Different views**

The resurrection of Fleck’s monograph has, like CaF, stimulated extensive secondary writings. Broadly speaking, the scientists participating in the discussion belong to one of three different fields of scholarship: philosophy, sociology of science and natural science. Scholars belonging to the first two fields have written the vast majority of the articles.
According to the predominant interpretations, Fleck was a prominent and highly-regarded representative of his professional fields, bacteriology and serology, influencing in particular the development of the latter discipline. In the introduction to the German edition of his monograph (1980), which closely parallels the introductory chapter in CaF, Fleck’s writings in philosophy and sociology are depicted as comparable to Popper’s *Logik der Forschung*, published in 1934. In the English edition (1979), this claim is also made in relation to Robert Merton’s pioneering study of economic relations (p xvii). Fleck’s familiarity with the two fields of scholarship, based on his references to writers such as Jerusalem, Mach, Durkheim and Lévy-Bruhl (p 46, cf., Kelsen 1922), is praised.

Fleck’s opposition to members of the Vienna Circle has been asserted, supported by a reference made in passing to “Schlick, Carnap and others” (p. 50). As well, Bohr and Heisenberg, mentioned in his 1929 article *Krise der Wirklichkeit in Die Naturwissenschaften*, but not in the monograph, have been recognized as influential in his epistemological deliberations (Trenn 1981, Schnelle 1986, Löwy 1990, Borck 2004). Despite these references, the difficulty of tracing and evaluating Fleck’s sources has frequently been articulated. It has also been stressed that he does not always mention his sources. Thus the linking of a particular statement to its postulated origin becomes problematic. A further claim is that after the completion of his work he added references that had not served as material for his writing (Schnelle 1986, p. 12).

This situation easily leads a reader to various speculations. Thus, as noted by Harwood, Schnelle devotes a large part of his thesis to trying to link Fleck to the logic-centered contemporary Polish philosophers at the University of Lwów, Twardowski, Adjukiewicz and Chwistek. However, as Schnelle rightly notes, these were never mentioned by Fleck (Harwood 1986, p 175).

In contrast, Löwy, mentioning that Fleck never viewed himself as a philosopher, gives a detailed and thorough account of the rich medico-philosophical tradition in Poland, including the Polish School of Philosophy and Medicine (PSPM) (Löwy 1990). There is ample evidence that Fleck visited the PSPM meetings in Lwów. He also presented a paper that was published in its journal, *Archiwum Historji i Filozofji Medycyny oraz Historji Nauk Przyrodniczych*, The Archives of History and Philosophy of Medicine. In her thesis, Löwy further includes a
translation of correspondence between Fleck and one of the more prominent members of PSPM, Bilikiewicz, initiated by a comment made by Fleck on a book written by the latter (idem, p. 249). Löwy does not comment upon the correspondence. She mentions, however, that Fleck did not seem to have been accepted by PSPM. His paper was the only one not included in the recount of previous articles published in the *Archiwum*, in connection with the 1937 congress on the history of medicine in Lwów (p 223). Despite his apparent familiarity with the School, Fleck never refers to PSPM or its members in his writings. Löwy’s well-supported conclusion is, rather, that PSPM has to be viewed as part of the formative background of Fleck’s writings.

A more recent attempt to trace contemporary influences on Fleck’s writings is found in the prize-winning article by Bonah, “Experimental rage”: the Development of Medical Ethics and the Genesis of Scientific Facts (Bonah 2002). The hypothesis presented by Bonah is that the main motivator for Fleck’s writings, including what Bonah characterizes as his awareness of the crisis in medicine and medical science, was the impulse to react to what Bonah calls the *Lübeck Totentanz*. In early spring, 1930, the adverse effects of mass vaccination of newborns against tuberculosis resulted in an unprecedented number of deaths in Lübeck, and an ensuing court procedure. Though Fleck never refers to the catastrophe or deals with tuberculosis in his writings, Bonah makes his claim based on the assumption that Fleck must have been well aware of it. Moreover, according to Bonah, and supported by Borck (2004, p 459f), Fleck was deeply committed to ethical questions, notably questions on informed consent, and is also credited with having introduced the latter concept in Poland.

In addition to the diverse speculations, Fleck’s alleged lack of sources in his epistemic writings has also lent itself to the assertion of Fleck’s prescient views of science in general and of the sociology of science in particular. This conception of Fleck is in agreement with the purported indebtedness of Kuhn to Fleck (Biagioli 1992 p 1999), but also with the later claim that Fleck was deeply committed to medical ethics (Bonah 2002, Borck 2004).

**The account of the Wassermann reaction and the representation of syphilis**

Numerous readers have praised Fleck’s account of the Wassermann reaction. References to it include comments such as “masterpiece” (Elkana 1986, p. 310), “first hand experience” (Bloor 1986, p. 387) and “beautifully analyzed historical case study” (Trenn 1979, p. XIV).
Kuhn’s comments concerning his own inability to comprehend the underlying parts of the monograph due to his lack of medical and biochemical background and vocabulary stand out as an exception to the otherwise largely-positive reaction to Fleck in this matter (Kuhn 1979, p. IX). However, in one of the three articles dealing with natural science included in CaF, Zalc gave a thorough account of the Wassermann reaction as viewed today and clarified why it was an unfortunate choice for the basis of an epistemology (p. 399). Löwy (1986 p. 421) and Moulin (1986 p. 407) added to the early criticism of Fleck’s on this head.

Fleck’s representation of the understanding of syphilis as a four-stage transformation of the underlying concept of the disease from the fifteenth century onward, presented in the first chapter of his monograph, has been unquestioningly perpetuated (Schäfer 1993, p. 24). The four stages conveyed by Fleck include that of the disease as carnal scourge (Lustseuche) implying sin, and as befouled blood bearing mystical-ethical overtones, on to the concept of cure, and finally the identification of a causative agent. In this context, the ancient concept of befouled blood has been portrayed as the actual impetus for the search for a blood test – that is, the Wassermann reaction, which, when successful, finally transformed the moral notion into a scientific fact (Trenn 1979, Schäfer 1993). Tsouyopoulos’ rejection of the above account seems to have attracted little attention. The same applies to her remark that Fleck substantiates this first part of his story with only one quotation from 1484, taken from a poem. Her main criticism is, however, not directed against Fleck but rather against the uninformed comprehension of medical science displayed by the humanist interpretation (Tsouyopoulos 1993).

Different accounts

The easiest explanation of my own conception of Fleck as a professional out of step with his time and his science was (after having excluded advanced age) my assumption about his defective scientific background, marginal position and want of literature – in other words, frequently connected phenomena. This seemingly harsh conclusion was based on my reading of the text and relating the statements made by Fleck to the different time periods in which they were made, thus exposing his scientific beliefs and opinions (cf. Löwy 1986). Fleck’s selective references in support of his statements added to my impression. An additional clue was his bibliography, put together in CaF, in which many of the titles suggested speculation rather than substantial data (pp 445-457).
Even stronger evidence was found in the introductory or explanatory sections of CaF and the two issues of the monograph (1979, 1980). Behind the bright and cheerful narrative of Fleck’s glorious scientific accomplishments and progress was another easily-perceived though previously-unarticulated story, austere and dismal, inescapably linked to the histories of Poland and Germany, including the two World Wars, both of which deeply affected Fleck. When one takes that story into account, Fleck can be depicted as a man whose medical studies were interrupted and substantially delayed by his participation in the First World War. His early focus on bacteriology could be linked to the importance of the discipline in wartime conditions, and to his teacher Rudolf Weigl, who was at the time already involved in typhus research. The scientific accomplishments within bacteriology during the preceding decade were not only amazing but of utmost practical importance. Since ancient times, typhus, one of Fleck’s scientific concerns, has been an inevitable companion of war (cf., Snyder 1948, Lindenmann 2002).

Fleck’s brief research experience includes his employment as one of Rudolf Weigl’s assistants. During that time, he also completed his medical studies. This took place in a country deeply affected by the devastating consequences of the war. Aside from an early six-week study visit in Vienna, he was for almost the next 20 years confined to the city of Lwów, precariously located, torn by warfare and German and Russian interests.

The reason for Fleck’s dismissal in 1923 as a research assistant is unclear. It has been portrayed as due to personal factors, the political situation or both (Schnelle 1986 p 37). After this brief research experience, he was confined to non-prestigious (Krankenkasse) routine laboratory work in non-academic settings, and finally, without any employment to support his family, he became dependent on his private laboratory. By that time he had already published his monograph. What followed could be viewed as a brief recapitulation of wartime and postwar European history, epitomizing war’s long-lasting deleterious influence on scientific pursuit in eastern and central Europe.

The above reading, taking the subject matter as well as history and context into account, has, in my further studies, served as a complementary heuristic device in my efforts to comprehend how Fleck’s account of the genesis of the Wassermann reaction could be understood in contrast to the received view provided by his modern interpreters. In tracing previously-
overlooked sources, I have attempted to gain a deeper understanding of Fleck’s mission. Moreover, in uncovering the past, questions concerning the pursuit of medical science and the search for a resolution to the perennial quests on the value of the individual versus the collective, matters which still affect medical ethics, have been illustrated.

The accounts of science

Different notions have been attempted to capture the accounts of science. Frequently applied, though still contested, are notions such as the internal and the external accounts of science (cf. Ziman 1978, Wolpert 1992). The former, meant to account for content as told by the scientist(s), have, according to the STS doctrines, resulted in the highly-distorted view of science that STS writers set out to debunk. As a corollary, the external account of science, as retold by the STS writers, is the only one there is to tell. According to the latter view, this is the kind of account provided by Fleck, as evidenced by his case history on the Wassermann reaction (cf. Trenn 1979, Elkana 1986).

The paradoxical implications of the latter conception of Fleck and his mission, have, however, never been addressed. He is, throughout, unquestioningly viewed as a prominent scientist. Aside from his numerous, though scarcely-scrutinised, publications (II), he is also claimed to have influenced serology, a notion never defined, and further, to have developed a workable vaccine against typhus out of the urine of patients who had contracted the disease, initially in the ghetto of Lwów and later in Buchenwald (cf. Trenn 1979, Schnelle 1986). Altogether, this forms the basis of the mythical narrative of Fleck, by now retold over decades, crediting him with major scientific accomplishments. Moreover, in having relativistic views of science ascribed to him, he is to be counted as a trustworthy ally.

The interpretation that forms the basis of the received view of Fleck is thus accomplished by a programmatically-biased reading that neglects, or does not understand, content, background, context or sources, thus furthering the ingrained agenda (cf. Fuller 2000, p 24). Though none of Fleck’s ardent advocates has ever tried to build on his epistemology (cf Harwood, 1986), Fleck is nowadays routinely invoked as a key forerunner of science studies (cf. Sismondo 2004, p 53). That Fleck’s major scientific deed, his purported manufacturing of a vaccine based on urine, is still unfeasible has never been considered (cf. Weindling 2000).
The epistemic concepts of Fleck and the theory of science

According to a more modest, less-polarized view, propounded by many historians and philosophers of science, the internal account of science demands deep familiarity with the field in question, generally restricted to scientists themselves, whereas the external account of science, expounded upon by scholars within the humanities, can aid in illuminating the broad history and context (cf Koertge 1998). By the standards of a scientific reading (I, II), Fleck’s philosophical writings fit the internal account of science (cf Ziman 1978, Elkana 1986). His epistemic concepts, which are basically unintelligible in a non-science-based interpretation, thus become highly sensible (III).

In his writings, Fleck portrays himself as a scientist, although this is commonly overlooked. As a scientist, he criticises philosophers and the philosophical account of science as uninformed and wanting. In this area he applies concepts such as eso- and exoterisches Wissen, Denkstil and Denkkollektiv, whereas concepts such as Denkzwang, Wiederstandsavisos, Kopplungen and Sinnsehen refer to his opposing account of “hard” science. Thus read, it is understandable that the latter concepts have caused his humanist interpreters great pain, e.g. ‘constraints of thought’, and they have sometimes been left untranslated, e.g. ‘the seeing of Sinn’ (cf. Cohen and Schnelle 1986a, p XVf, III).

However, more important, though frequently overlooked, is the question of that upon which the non-scientists, or philosophers of science, base their accounts of science, whether internal or external. An inevitable Kantian corollary is, of course, the question of just what they can base their accounts upon, which is the issue addressed by Fleck.

In contrast to philosophers, many scientists oppose the existence of a theory of science, and the majority of scientists remain ignorant of what philosophers claim as the basis of their enterprise (cf. Ziman 1978, Chalmers 1978, 1990, Wolpert 1992, Weinberg 1993). Fleck’s monograph can be read as an elaboration on the controversy and an explanation as to why scientists resist the concept of a specific philosophy of science. The controversy is fundamental to the debate in which Fleck is striving to participate (cf. Jordan 1927, 1932, Bohr 1928, Weinberg 1930, Heisenberg 1934, Jensen 1934, Infelt 1934, III). Moreover, the now-perennial issue seems to originate in that debate, notably the one between positivist...

The relationship between the two lines of scholarship or, rather, their synchronic incommensurability, is amply exposed by Fleck in his deliberations upon journal and textbook science versus popular science (1979 p 111f, I) and is also alluded to when he depicts science as a moving river cutting its own bed, or as a marching troop with its avant-garde and its stragglers at the rear (1929, III). Fleck caustically maintains that the philosophers, in belonging to a different thought-collective and adhering to a different thought-style, have to, in their deliberations on science, draw on popular science, aimed at plain and vivid understanding (1979 p 113). As a result, their account of science is based on what they think science is, or rather, what they would like it to be (1929, III, cf. Levin 1988 p 104 ff). Thus, the queried account is either shaped according to the rigid Protokollsätze of Carnap with its barren deductions and the inadequate application of pure logic, or, alternatively, captured by the archaic, eternal concepts of philosophy, utterly unsuited to representing the dynamics and the probabilistic nature of science (cf. 1979 p 89, III). The latter of Fleck’s two alternatives conforms quite well to the Begriffs- dichtung the logical positivists were determined to replace (cf. Grelling 1931, Reichenbach 1930a, III). According to Fleck, however, the futility of the philosophical enterprise is occasioned by the fact that scientific comprehension presupposes esoteric knowledge, ineluctably based on prior initiation (Einweihung), thorough practice and extensive experience (1979 p 54, I). The last two elements are repeatedly stressed by Fleck (idem p 96).

Fleck’s opposing account of science is captured anew by his account here. The Wiederstandsavisos, perceived by the scientists, are mediated by an ontologically-unquestioned reality (cf. 1939, III), restricting and directing the experimental probing of the scientists. Kopplungen and Denkzwang are, likewise, enforced by that same reality (1979, p 82ff, I, II), all exemplified by Fleck’s account of the Wassermann reaction (I). Sinnsehen, or Gestaltsehen, as used by Fleck, captures the sometimes-sudden epistemic intelligibility of experimental observation and data (cf. Collins 1985, Franklin 2000, p 151). Given the esoteric knowledge needed, new facts are created, captured by new concepts appropriate for the particular task, whereas science, headed by its avant-garde, always proceeds in an unforeseeable direction (1929, 1979 p 92, III).
It should be added that the notions employed by Fleck, though somewhat idiosyncratic, basically conform to the scientific vocabulary of the time (cf. Kelsen 1922, Mannheim 1925, p 592, 645, Peterson 1928, Carnap 1928). *Denkstil* and paradigm are frequent.

**Fleck in context**

Though often overlooked until now, Fleck’s different writings are deeply situated in an ongoing debate on the *Einzelwissenscahften*, constituting the basis of the different *Denkkollektive*, exposing the differences between *eso-* and *exoterische Kreise*, as well as *eso-* and *exoterisches Wissen* (Felck 1929, 1979 p 177). The debate also implies the questioning of the standing of age-old disciplines versus new, rapidly-emerging ones, all brought about by the amazing progress of science, which also affects the standing of philosophy (III). Although the changes were daringly welcomed by Fleck, working in one of the new, still-tentative disciplines (cf. Landsteiner 1930, Peterson 1936), his enthusiasm was not always shared by his colleagues, e.g., the ones deeply-rooted in the non-experimental sciences (cf. Bethe 1928, Peterson 1936, Fleck 1979, p 173, III). However, when Fleck, still working outside the academy, was scrutinised by his peers, their main criticism focused on his lack of scholarship and the untenable philosophical implications of his attempted epistemology (Mie 1932, Peterson 1936, Bilikiewicz 1939, III). Fleck, for his part, disclosed his philosophical naïveté by not comprehending the implications foreseen by his critics (1939, III).

It is clear that Fleck’s writings, some of which attempted to provide input into an ongoing debate, are often sketchy, contradictory and basically unfulfilled, reflecting his opposing agendas (III). In particular, his monograph was rapidly completed during a politically-critical period of European history that deeply affected not only Fleck (I), but also philosophy as a whole (Nagel 1936, Koyré 1956, III). Some conclusions, however, seem warranted. Firstly, the current interpretation, or the received humanist view of Fleck, is based on what had already been endorsed by the program of the STS writers. However, making Fleck’s writings conform to that program has necessitated a disregard of old scholarly virtues such as the mastering of the subject matter under study, and the tracing of the history, the sources and the context (cf. Holton and Roller 1958, Holton 1973). The result is not Whig history, but to borrow a recently-coined term (Fuller, 2000 p 24), Prig history, which reads as the promoting of one’s own needs.
Secondly, it seems reasonable to conclude that Fleck, as a partaker in a debate opposing philosophy, aims at an internal account of science based on his experience of his discipline (I). Phrased differently, Fleck’s epistemology equates with his internal account. Though sketchy and unfulfilled, the account provided by Fleck conforms surprisingly well to other more elaborate, erudite and properly-worked-out internal accounts of science, whether past or present (cf. III, Weinberg 1930, Infelt 1934, Ziman 1968, 1978, Chalmers 1982, 1990, Wolpert 1992, Weinberg 1993).

Thirdly, what could be phrased as ‘the Fleck affair’ (cf. Wettersten 1991) exposes with distressing clarity the incommensurability of thought collectives and thought styles, or the deep divide between the two lines of scholarship (cf., Snow 1964). Moreover, what is now encapsulated by the notion of ‘Kuhnified philosophy’, affecting not only the STS writing but also philosophy in general (cf. Fuller 2000), had already been foreseen in the 1920s (cf. Riezler, 1927, III). Thus, instead of viewing Fleck as an early forerunner of relativist philosophy deeply influencing Kuhn, he could rather be read as an early critic of an emergent, already ‘Kuhnified’ philosophy (cf. Weinberg 1930, III). Finally, it is argued that an additional corrective to the modern reading of Fleck is to be found in his three postwar papers, all in different ways related to medical science and medical ethics (IV, V). When read together, they also provide an answer to some of the contradictions inherent in the modern construction of Fleck.

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