

THOMAS S. KUHN AND L. FLECK
TWO SOCIOLOGISTS OF SCIENCE

Professor Kuhn's socio-psychological approach to the philosophy of science—once fiercely debated and critiqued by the Rationalist and Positivist schools—is now one of the most influential theories (if not *the* most influential theory) in the philosophy of science. Kuhn's catchy terminology ('revolution', 'paradigm', normal science', 'revolutionary science') has become part and parcel of every discussion in the said area of philosophy – and his scepticism regarding the claims of objectivists and rationalists is the basis of new paradigm of thought not only in the philosophy of science but in the whole of the humanities and beyond. This ' New Philosophy of Science ' (as opposed to the positivist ' Received View ') is generally pluralist, relativist and anti-objectivist. It is a different question that Professor Kuhn has integrated many of his critics' criticisms in later versions of his philosophy of science. It cannot be denied that a pop version of his early views is of immense influence.

While the Received View—philosophers were mainly interested in science as a system of knowledge, the ' New Philosophers of Science ' (among whom are Toulmin, Feyerabend, Polanyi etc.) stress the fact that science is primarily a human activity. Psychological and sociological arguments have therefore become increasingly important in the discussion. Professor Kuhn is a well-known thinker today. Hardly known is another thinker of whom some commentators think that he anticipated the more important

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of the ideas which are now known as Kuhnian : the Polish physician-sociologist L. Fleck. Various writers have reported on this alleged family-likeness.¹ We propose to discuss in this article the similarities and dissimilarities in the thought of the two thinkers. Only in a scrupulous reading of the two authors can we determine if Professor Kuhn's claim to originality can be upheld.²

1. *The Thought of Professor Kuhn*³

In 1962 Professor Kuhn published a book which should revolutionize the discussion of science : *The Structure of Scientific Revolutions*. Professor Kuhn tried to show that change in science is discontinuous, that it happens in strange convulsions (called 'revolutions'), followed by periods of relative calm, that some of the factors responsible for their happening are external to science and that some of these external factors could be accounted for by psychology or sociology only. Crucial terms are *paradigm or paradigmatic science* (signifying the said periods of calm, normality and peace, when a community of scientists know *what* they are after and *how* they are after it). Professor Kuhn asserts that in these phases the scientists belonging to the community of investigators proceed according to a set (or sets) of established rules which are not questioned and which are based on a set (or sets) of established examples of scientific behavior. A crucial role in the mediation of these accepted rules is played by manuals and textbooks. Decision-making, seeing, thinking, are all determined by this set of established rules. We can then distinguish the following phases in the development of a theory :

1. a pre-paradigmatic phase; no paradigm as crystallized yet.

2. a paradigmatic phase : a dominant paradigm influences the thought of the community of investigators adhering to the paradigm dogmatically; this influence, even though dogmatic and restrictive, is at the same time the condition for the possibility for success (not ultimate success but all the success possible according to paradigm P);

3. a post-paradigmatic revolutionary phase; the shortcomings of the paradigm are slowly becoming obvious; the world view of the scientists working according to paradigm P crumbles, as too many irregularities become manifest which cannot be accounted by P; a new Paradigm P is in the making; etc.

Professor Kuhn asserts further that succeeding paradigms are at least partially incommensurable (i.e., both community C proceeding according to paradigm P and community C' proceeding according to paradigm P' are imprisoned in different world views (V and V'), and there is now meta-paradigm that would account for and integrate both P and P'). Both communities of scientists see the world through different sets of glasses, and there is no way in which they could communicate to each other their respective findings.

Professor Kuhn names among the thinkers who influenced him most Koyré (1939), Meyerson (1930) ..., Whorf (1956) and Fleck (1935). He acknowledges the fact that Fleck is an author who anticipated many of his (Professor Kuhn's) own thoughts [1981, 8]. In the Foreword to the English translation of Fleck's *Entstehung (Genesis and Development of a Scientific Fact-1979)* Professor Kuhn declares :

...acquaintance with Fleck's text helped me to realize that the problems which concerned me had fundamentally sociological dimension. That, in any case, is the connection

in which I cited this book in my *Structure of Scientific Revolutions*. But I am not sure that I took anything much more concrete from Fleck's work, though I obviously may and undoubtedly should have (viii f.).

Rereading the book now...I find many insights that I might fruitfully have worked into my viewpoint' (ix).

The following texts represent Professor Kuhn's systematic contribution to the philosophy of science (we leave his important historical works aside):

1.1 *The Function of Dogma in Scientific Research* (1961)

This speech Professor Kuhn gave in 1961 anticipates the main ideas of the *Structure*. At this time he still favored the term *dogma* which he used in roughly the sense *paradigm* was going to have later.

1.2. *The Structure of Scientific Revolutions* (1962)⁴

Kuhn proclaims in this text a historiographical revolution; the envisaged new historiography should do justice to the personal element in scientific discovery; the relevant new terms will be 'normal science,' 'revolution' and paradigm; facts will be viewed as theory-related. [1962, 15 ff.]. The student has to go through a painful phase of initiation, during which the ruling paradigm is implanted in his thinking.

Once a paradigm is established it will defend its place and rank not only in the thought of scientists, but also in textbooks and manuals. Goal and purpose of normal science are not the finding of new phenomena, but the elucidation of the paradigm-relevant phenomena. Normative science can therefore be likened to puzzle-solving. A paradigm influences in this sense not only the explanation of current phenomena but also the discovery of yet unknown phenomena.

Paradigm-change begins with the awareness of an anomaly. Nature 'acts' contrary to our paradigmatic expectations. At first nothing happens. Only gradually does the suspicion arise that there is something wrong with the current paradigm. Gradually a new consciousness of a new world emerges. The new paradigm and the old may be so different, that the respective world views are incommensurable, i.e., members of the two groups cannot make themselves clear to each other anymore. Revolutions are changes in the perception of the world. The transition from one paradigm to another is unconscious in the sense that scientists (figuratively speaking) just wake up one day with a different set of glasses on. They see a different *gestalt*. Paradigm-change is *gestalt*-change.

Scientific progress is than nothing but transition from one paradigm to another. One of the possible interpretations of Kuhn's theory is that we do not increase our knowledge of the real world in time; we can call ourselves fortunate if we belong to the group of scientists who adhere to the latest paradigm.

1.3. *The 1969 Postscript*

This Postscript is Kuhn's reply to some of his critics. 'Paradigm' seems to have been misunderstood by a large number of critics and Kuhn proposes various clarifications. He also attempts to analyse phenomenologically the ingredients of a paradigm. In 1974 Kuhn proposed a further clarification of his usage of 'paradigm' by illustrating it with practical examples (e.g. language-acquisition).

2. *A Thought Experiment*

Suppose there is a thinker T who argues that science is a cumulative enterprise. Suppose further that T stresses the fact that science is a human enterprise, fruit of the concerted efforts

of groups of experts. These experts adhere – still according to T – to a specific style of thought. This thought style makes adherents see the world in a specific manner (distinct from other manners based on different thought styles). Suppose T argues that the fact that thought styles make thought group members see the world in different fashions has to do with a *gestalt*-vision of the world. There is then, for adherents to a thought style S a thought obligation (a constraint, almost a moral duty) to see the world in a manner M. Students have to be initiated in the thought style of the thought group, and this initiation has a lot to do with cases we know from anthropology. Initiation is initiation in a *gestalt* view of the world. T would argue further that there are phases of relative calm in science which alternate with phases of unrest and upheaval during which a new *gestalt* view is being developed. Question : Would it not seem to every unbiased observer that T has been most diligently initiated to the pop version of Professor Kuhn's philosophy of science ?

3. *The Thought of L. Fleck*

Fleck's paper *Entstehung und Entwicklung einer wissenschaftlichen Tatsache* (published in Basel/Switzerland in 1935) offers a parallel account of two case studies. In chapters 1 and 3, Fleck thematizes the historical development of the modern notion of venereal disease. In chapters 2 and 4 we can find Fleck's sociological account for what happened epistemologically. Fleck proceeds quasi-inductively from the facts to the interpretation without first establishing an explanatory system.

A science can never get rid of its past. Fleck seems to find ample evidence for this hypothesis of his in the discussion of the notion of venereal disease. The past lives on : in concepts, technical terms, language and institutions. Fleck argues that many so-called 'scientific facts' go back to pre-scientific *Urideen*

archetypal structures which inform thinking and seeing. This linked-ness is, however, hardly conscious to any of the concerned scientists. An *Uridee* in Western thought is e.g. the atom theory.

Thought systems, once established, tend to defy change :

Once a full-grown, closed system of meaning (consisting of many details and relations) is established, it will obstinately resist against whatever contradiction might come up (Fleck 1935, 40, our transl.)

Fleck observes that the attitude of a fixed group of specialists toward contradictory insights is characterized by the following features :

- 1) what does not fit into the system will be overlooked;
- 2) it will remain unmentioned even if it has been noticed
- 3) if it keeps recurring, great efforts will be spent on proving that it is not really contradictory
- 4) it will be described in terms of the established theory.

There is, then, a general 'conservative' attitude among members of a group of specialists and accordingly in the development of theory a phase of calm (Fleck calls it the phase of 'classicality' - *Klassizität* [1935, 42]) in which problems can be solved without changing the prevalent theory, and then a post-classical phase in which problems accumulate and cannot be solved anymore.

All knowledge is socially conditioned, says Fleck. We should, therefore, never claim that 'X knows fact F' but rather that 'X knows fact F based on thought style S as member of thought collective C'. Fleck defines 'thought collective' (*Denkkollektiv*) as

Gemeinschaft der Menschen, die im Gedankenaustausch oder in gedanklicher Wechselwirkung stehen... Träger geschichtlicher

Entwicklung eines Denkgebietes, eines bestimmten Wissensbestandes und Kulturbestandes, also eines besonderen Denkstiles (1935, 54f.)

A thought collective is any community of humans who exchange thought or are in a relationship of thought-interaction. ... the thought collective is the means of transportation for a thought area, a specific pool of knowledge and culture.

A thought collective can, then, be scientific or non-scientific. It is made up of individuals, but it is at the same time a whole, a unity, with inherent synergetics and its specific dynamic. Fleck considers himself a sociologist, but keeps faculty sociologists⁵ at a safe distance.

The profounder a scientist's knowledge of his area of specialization is the more he will depend on thought style, and the weaker will be his ability to think independently and differently. Against the notion of basic terms Fleck holds that observational terms are always unclear. Unclearness is as a matter of fact even proof for the quality and originality of an insight. All really valuable experiments are unclear, incomplete and unique (1935, 112). Once they become repeatable, clear and precise, they are only useful for demonstrations. Fleck describes the course of a discovery according to the protocol of a group of investigation :

- (1) the group hits (by chance) on promising material;
- (2) predominant in the group is a certain guiding psychological ' mood ';
- (3) collective-psychological mental associations add themselves to the general atmosphere;
- (4) a first unreproducible and retrospectively not clarifiable ' first observation ' takes place (Fleck says of this first observation that it is ' chaotic ', 1935, 117);

- (5) slowly an awareness of what has been 'seen' crystallizes;
- (6) this crystallization still depends on the chaos, but it is itself already an artificial product (1935, 117ff.)

There are, then, no mind-independent protocol (or: basic) sentences :

In der Sprache der ersten Beobachtungen sind die Ergebnisse ebensowenig aussagbar wie umgekehrt, die ersten Beobachtungen in der Sprache der Ergebnisse (1935, 118).

In the language of the first observations, the results are as little expressible as vice versa the first observations in the language of the results.

It is possible, then, to speak of two phases in the discovery of a fact :

In a first phase of unclear *gazing* the constraint, the style is absent;

In the second phase we perceive a *gestalt*.

Every empirical discovery will therefore be either an addition to the thought style, an improvement, or a thought style revolution.⁷

Every thought collective is administratively divided into different circles. Every scientist may belong to one or more exoteric circles but only to one esoteric circle. There are accordingly elitist and popular versions of the same thought style—scientific ideals like certainty, exactitude etc. are notions of the popular version (1935, 152). Accordingly there is journal science, vade-mecum science and popular science. Fact is, according to Fleck, a notion that is strictly vade-mecum science. Before vade-mecum science it is a hypothesis, after—'reality.'

4. *Kuhn and Fleck Compared*

It seems indubitable that the popular version of Kuhn's paradigmography (based on Kuhn's early work) shows a lot of similarities with Fleck's work. Are critics now entitled to the contention that Kuhn is nothing but an up-dated version of Fleck 1935?

1. Fleck always held that his sociology of knowledge was more than just philosophy of science. He thought of himself as a sociologist of culture. Thought-styles are not restricted to science—all thinking takes place in languages, groups, group languages, be it scientific, artistic, journalistic etc. Fleck himself was open to all these other manifestations of thinking and thought style and tried to integrate them in his theory. Professor Kuhn, on the other hand, concentrates on science, and there mainly on physics. Fleck tried to show that his theory holds true in general and specifically for science. Fleck has, however, failed to radically prove that this is the case. Professor Kuhn has tried to narrow down the field of investigation and produce more evidence than Fleck did.

2. Fleck's epistemology is basically evolutionary. The avant-garde of the thought-collective are far ahead while the main body of the army of investigators are still trying to get familiar with the basics of yesterday's insights. Culture, science, the arts are therefore always 'on the way'. Fleck does not share the catastrophism of Kuhn's early theory whose terminology suggests revolutions, break-downs, dethronements.

3. Fleck refers to the *Urdein* as some kind of a psychological alphabet, which is crucial for the interpretation of world, because the mind seeks refuge with those whenever it is at a loss: Hand

of God, the atom, regularity of nature e.g. are metaphysical concepts which inform Western thought.⁵ Fleck did not arrive at a clear formulation of these concepts, but he asserts that they exist and are of a tremendous influence. Kuhn abandoned this idea of a subconscious alphabet of metaphysical categories.

4. Kuhn shares with Fleck the dilemma of reductionism. Both authors speak globally of 'knowledge' or 'thought' without specifying what ontological or subjective-criteriological elements are involved in the process of knowing. Both authors tend to forget (or overlook the fact) that there are heuristic anticipations (see Lonergan 1957, Fluri 1987/88): the investigator always knows already a lot about the prospective discovery which is the x of his equation. Lonergan also showed that different kinds of heuristic structures are operative in different fields of investigation.

Both Kuhn and Fleck are preoccupied with the subject and they do not seek objective structures in knowledge

5. Conclusion

Various authors suggested that Kuhn (the Kuhn of the early works and the popular interpretation of this philosophy) is deeply indebted to the almost unknown L. Fleck. Kuhn himself mentions Fleck as an author which was important for him, but he also declares (in the Preface to the English translation of Fleck 1935) that Fleck had not been that important to him after all. Several similarities seem obvious: the thought style—thought collective—thought constraint notion, for example, and the gestalt—interpretation of the theory—ladenness of experience. We mentioned, though, that Professor Kuhn has changed many

of his earlier views. A real evaluation of Fleck's sociological approach to knowledge (scientific and otherwise) has yet to take place.

Philosophy Department
Boston College
Chestnut Hill
Massachusetts-02167-3806

PHILIPPE H. FLURI

NOTES

1. cf. Schäfer-Schnelle/Prefaces zu Fleck-2 1980 and Fleck 1983 (Seiten ix und 10); Wittich [1978, 109]; Baldamus 1979; Baldamus 1966; von der Ohe 1971; Merton 1977; Schäfer 1977, Stock 1980, May 1982.
2. L. Fleck (1896-1961) was a physician by profession; born in Lwow (Galicia) he was interned in Buchenwald during World War II where he was engaged in serological research [cf. Schäfer-Schnelle/Preface ²1980, vii ff.].
3. We will not discuss the whole body of writings published by the two authors but only those we deem relevant for our discussion.
4. Our quotations refer to ⁵1981.
5. He mentions mainly Comte, Durkheim, Lévy-Bruhl, Jerusalem.
6. Similarly it can be shown that Chinese thought is informed by the Yin-Yang and Wu-Xing theory of nature (cf. Fluri, forthcoming).
7. The English translators of Fleck translated his terminology as follows: thought style (Denkstil), thought collective (Denkkollektiv), (thought) compulsion (Denkzwang), ideo-vision (Sinn-Sehen).

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