OBITUARY OF THOMAS S. KUHN (1922–1996)

Thomas S. Kuhn died on June 17, 1996 in Cambridge, Massachusetts, at the age of 73.

He was born on July 18, 1922 in Cincinnati and received his undergraduate education in physics at Harvard. During his graduate work in theoretical solid state physics with John H. van Vleck, who later won a Nobel price, he was introduced to the history of science by James Conant, then President of Harvard. In 1947, while puzzling over passages of Aristotle's physics, he discovered something that set the agenda of his further work. When he read Aristotle with the set of contemporary physical concepts in mind, much of Aristotle's physics seemed either awfully wrong or even outright meaningless. But by changing the meaning of some of the key concepts (in some cases only slightly and in others more deeply), a whole new world of physics became accessible, namely that of Aristotle and his contemporaries. After completing his Ph.D. in theoretical physics in 1949, Kuhn switched entirely to the history of science where he began by applying the insights he gained through his experience of Aristotelian physics. From 1948 to 1951 he was a Junior Fellow of the Harvard Society of Fellows, and from 1951 to 1956 Assistant Professor for General Education and History of Science. From 1956 to 1964 he was a member of the faculty of the University of California at Berkeley, mainly in the History of Science Department. In 1964 he joined Princeton University as a Professor of History of Science; he was also a member of the Institute of Advanced Study from 1972 to 1979. Finally, in 1979, he became Professor for Philosophy and History of Science at the Massachusetts Institute of Technology until he retired in 1992.

The insight Kuhn gained through his study of Aristotle was primarily that there are different possibilities of ascribing meaning to the key concepts of older scientific texts. Moreover, these different possibilities induce enormous differences in the overall understanding of the science represented in the text, in particular in its internal coherence and in its relation to contemporary science. As a very reliable key to the discovery of possible alternative interpretations of a text, Kuhn found a close reading of passages with textual anomalies especially rewarding. Once these anomalies were removed by changing the meaning of some of the basic concepts, the

whole text usually changed its meaning. For the historian, this felt as if the text represented a different world when read in the new way. Of course these insights are not in principle new for someone who is familiar with the continental hermeneutic tradition (Kuhn was not at the time). But the application of techniques of hermeneutic reading to older *scientific* texts was new – it was the distinguishing mark of a new generation of historians of science to which Kuhn belonged, and who were strongly influenced by the work of Alexandre Koyré. As a result, history of science as a field was deeply transformed in the nineteen fifties in the same way as the *historische Geisteswissenschaften* in the 19th century, and it emerged as an academic discipline at the same time in North America.

Well into the first half of the sixties, Kuhn was mainly known in the small community of historians of science. This changed dramatically in the mid-sixties with the broad reception of his essay *The Structure of Scientific Revolutions* which had been published in 1962. In this book, he tried to outline the philosophical consequences of the new hermeneutic historiography of science. The main target of the book was the traditional image of science which arose with the development of modern science, and has been perpetuated ever since by historians, philosophers, and many, if not most, of the scientists themselves. It was the image on which much of the public prestige of science was based (a fact that proved quite consequential for some of the reception of Kuhn's book). For Kuhn, the key element of this image of science was its notion of scientific progress as cumulative, that is, as a steady increase of scientific knowledge. This image of science, according to Kuhn, is essentially the result of a particular way of viewing the history of science which, in turn, is a product of the sciences' own pedagogy.

The different image of basic science and its development that Kuhn presented in *Structure* introduced some new concepts into the philosophy of science which all proved to be highly controversial. The most notorious example is, of course, the term 'paradigm' which has acquired the status of a household term ever since. But its original intended content has been watered down in the process, and Kuhn replaced it in the early seventies by the term 'exemplar', capturing its narrow sense, and by 'disciplinary matrix' for its wider sense. Strongly connected with exemplars was the notion of 'normal science' which was soon the main target of the Popperian critics of Kuhn. This was due to the fact that normal science embodied some sort of dogmatic element which was manifest through Kuhn's assertion that during the period of normal science it is not the paradigms that are tested but, if anything at all, the working scientists and their ingenuity. Kuhn's

stress on paradigm changes or 'scientific revolutions' soon led to a search for revolutions in many different disciplines.

The most recalcitrant notion, which has remained highly controversial even until today, has proved to be the notion of 'incommensurability'. Incommensurability is the focal point of Kuhn's main deviations from the then existing traditions in the philosophy of science. Properly understood, it represents Kuhn's attack on the idea of cumulative scientific progress as it is indicative of breaks in the science's evolution. Scientific revolutions always have some destructive element, and the successor theories, although on the whole more successful than their predecessors, are sometimes unable to reproduce their explanatory achievements entirely. Second, incommensurability attacks the common idea that earlier theories are contained in their successors, as it implies that some of the basic theoretical concepts change meaning. Thus the reduction relation, a cherished piece of the earlier tradition, was accused of yielding an oversimplified picture of critical inter-theoretic relations. Third, and partly a consequence of the second point, theory comparison turns out to be much more complicated than a simple-minded point-by-point comparison of single predictions of the theories involved. Instead, some sort of holistic element enters the scene which allows the possibility that differences of opinion in the theory choice situation do not necessarily have their origin in the irrationality of at least one of the parties involved. Algorithmic procedures do not govern theory choice. Theory choice is governed by judgements that are guided by epistemic values that are not entirely unambiguous. Fourth and finally, incommensurability indicates some distancing from (everyday and) scientific realism. To reality, as it is in itself, we have no access whatsoever. The reality we have access to is always impregnated by our modes of perception and our particular concepts; it can thus be appropriately called 'phenomenal reality'. This position has a decisively Kantian flavor, but it is neo-Kantian in that it allows for temporal change of the genetically subject-sided contributions to reality. In addition, it is not the individual (or some transcendental core of it) that contributes to the constitution of reality, but the respective scientific community.

Much to his distress, Kuhn's *Structure* was widely misunderstood, especially by philosophers. This was due partly to Kuhn's style which allowed anyone to read almost anything into the text. But I venture to guess that it was also partly the result of the fact that the position Kuhn tried to formulate was so foreign to the existing traditions that it was not intelligible to readers who followed their usual pattern of reading texts in the analytical tradition. Nevertheless, the book became extremely successful: it sold more than one million copies in its original English version and was translated into

some twenty languages. It is one of the most widely distributed classics on the history and philosophy of science of all time, influencing people in a vast variety of fields. Its deepest impact was on the sociology of science where it helped to transform a discipline that discussed norms of scientific behavior into the field of social studies of science which continued the earlier tradition of the (German) sociology of knowledge. In history of science, it allowed historians to look, for instance, for paradigmatic problem solutions from which traditions of normal science sprang. In philosophy of science, it urged that the history of science be taken much more seriously than before, and it contributed substantially to the important contemporary movement toward the naturalization of epistemology and philosophy of science.

Apart from his historical work after *Structure* (mainly in the history of quantum physics), Kuhn elaborated on his theory trying to meet those criticisms which he accepted and to refine those parts with which he was not satisfied. In its basic conception, his position remained unchanged although he came to realize that the concept of incommensurability needed much more work than he had anticipated. More specifically, it became clear that within the framework of the current theories of meaning, incommensurability could not be articulated. In his later years, Kuhn thus concentrated more and more on a theory of meaning, especially for empirical kind terms which allowed for the sort of conceptual change he had in mind. In the early eighties, he had started to work on a book basically about the theory of meaning and incommensurability. Due to his death, he could only finish two thirds of it. Those parts that exist will be edited and published.

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