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The natural and social process of science

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RECONSTRUCTING SCIENTIFIC REVOLUTIONS: THOMAS S. KUHN'S PHILOSOPHY OF SCIENCE
BY PAUL HOYNINGEN-HUENE
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SINCE ITS first publication in 1962, Thomas Kuhn's *The Structure of Scientific Revolution* (*SSR*) has sold close to a million copies, and somewhere around 20 foreign-language versions have been produced. It is a true rarity, a serious study of the natural sciences which has become a classic text. Everyone now knows the outlines of its story: how scientists are committed to the paradigms of their field; how most scientific research is detailed work concerned with the application of paradigms and their minor elaboration; how there are scientific revolutions wherein old paradigms are discarded and new ones brought into use; how "reason and experience" alone are insufficient to account either for initial commitments to paradigms or for changes from one paradigm to another.

The objectives of Paul Hoyningen-Huene's study of Kuhn's work, originally published in German in 1989, are modest ones. He offers neither a critical analysis of Kuhn, nor a creative development of his ideas. He seeks simply to set out and systematise what Kuhn himself is actually saying, and thereby to elucidate his philosophy of science. The task is carried out with Germanic thoroughness, in a text considerably longer than *SSR* itself, and so well-referenced that it will almost serve as a concordance to it. Moreover, the text comes close to being an authorised account. Hoyningen-Huene, Kuhn tells us in his foreword, "knew my work better than I and understood it nearly as well". This is a generous acknowledgement, for Hoyningen-Huene is no hagiographer, and does not shrink from emphasising the inconsistencies, obscurities and vacillations which inevitably emerge from a close reading of *SSR*. In appraising an account of Kuhn there are a few key questions which can serve as touchstones. What are paradigms? Initially and primarily, Hoyningen-Huene tells us, they are "concrete problem-solutions that the profession has come to accept"; they are model, socially accepted procedures for investigating and effectively intervening in the natural world. Are paradigms accepted on authority or because of their relationship to nature? Both are involved, and the two operate in such a way that it is impossible to disentangle them and consider their role independently of each other. Does the world change when paradigms are replaced and a scientific revolution occurs? Yes and no. "Nature", the world-in-itself as perhaps we should call it, does not change, but the phenomenal world of the scientific profession does indeed change. The phenomenal world always has a "subject-sided" aspect or "moment", which can never be separated or even identified separately from its "object-sided moment", which does indeed change with time and place, and which changes profoundly when scientific revolutions occur. This is why Kuhn feels obliged to make the apparently paradoxical yet well-considered claim that "though the world does not change with a change of paradigm, the scientist afterward works in *a different world*".

The form of these answers is of just the right kind, and testifies to the soundness of the author's understanding. Kuhn is often misunderstood as a radical idealist who treats the growth of scientific knowledge as a social or political process unconditioned by inputs from the external world. The truth is the opposite: his great insight is that research is ineluctably a social process, but one which *is* conditioned by inputs from an external world. In Kuhn, "the natural" and "the social" always run together, as in the examples above. If Kuhn's position is correct, then to ignore the one in favour of the other, or even to presume that the one can act in the absence of the other, is bound to lead to a failure of understanding.

This is what makes Kuhn's work so important, so challenging and yet so easy to misunderstand. Both in everyday life and in philosophical discourse there is a tendency to speak of science in a dualist idiom with strongly evaluative overtones. In so far as science is objective, a product of experience and our monitoring of the external world, it is considered valid and trustworthy; in so far as it is conventional, a product of human judgement and decision, its validity and trustworthiness are called into question. Kuhn helps us to transcend this dualism, to recognise that science is both these things and necessarily so, and that this implies nothing in the way of criticism or distrust.

All this has long been recognised in the social sciences, where Kuhn helped sociologists to realise that research can be studied as a social activity, and scientific knowledge as a cultural product, without denying either the authenticity of the one, the validity of the other, or the relevance of the external world to both. The result has been the development of a fully general sociology of knowledge over the past two decades, which has made a valuable contribution to our understanding of the natural sciences.

Hoyningen-Huene apparently knows nothing of this work. On the occasions when he refers to it, it is to criticise it for advocating the kind of exclusively subject-sided point of view which in point of fact it vigorously opposes. Thus it is fortunate that Hoyningen-Huene's concern is entirely with Kuhn as philosopher of science.

Fortunate though this may be, however, it none the less constitutes a fundamental flaw in Hoyningen-Huene's work. For it is impossible simultaneously to set out what Kuhn actually says *and* to present him purely and simply as a philosopher: to refer to purely philosophical claims in *SSR* is inevitably to introduce some imprecision into any account of what the text itself asserts. Kuhn's work needs to be understood in relation to a much wider context than this, in a way which takes proper account, for example, of his extensive experience as a historian of science and his continuing interest in what essentially are sociological issues. All this needs emphasis. Because, classic though it be, the proper understanding of Kuhn's work, and hence its serious use and development in the appropriate academic fields, have been seriously inhibited by their unduly narrow frameworks of evaluation. The detrimental consequences of the petty politics of disciplinary boundaries have nowhere been more readily apparent than in the context of the reception of *SSR*.

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