IMRE LAKATOS

FALSIFICATION AND THE METHODOLOGY OF
SCIENTIFIC RESEARCH PROGRAMMES*

1. SCIENCE: REASON OR RELIGION?

For centuries knowledge meant proven knowledge – proven either by the
to power of the intellect or by the evidence of the senses. Wisdom and intel­
lectual integrity demanded that one must desist from unproven utter­
ances and minimize, even in thought, the gap between speculation and
established knowledge. The proving power of the intellect or the senses
was questioned by the sceptics more than two thousand years ago; but
they were browbeaten into confusion by the glory of Newtonian physics.
Einstein’s results again turned the tables and now very few philosophers or
scientists still think that scientific knowledge is, or can be, proven know­
ledge. But few realize that with this the whole classical structure of in­
tellectual values falls in ruins and has to be replaced: one cannot simply
water down the ideal of proven truth – as some logical empiricists do – to
the ideal of ‘probable truth’¹ or – as some sociologists of knowledge do –
to ‘truth by [changing] consensus’².

Popper’s distinction lies primarily in his having grasped the full impli­
cations of the collapse of the best-corroborated scientific theory of all
times: Newtonian mechanics and the Newtonian theory of gravitation. In
his view virtue lies not in caution in avoiding errors, but in ruthlessness in
eliminating them. Boldness in conjectures on the one hand and austerity
in refutations on the other: this is Popper’s recipe. Intellectual honesty
does not consist in trying to entrench, or establish one’s position by
proving (or ‘probabilifying’) it – intellectual honesty consists rather in
specifying precisely the conditions under which one is willing to give up
one’s position. Committed Marxists and Freudians refuse to specify such
conditions: this is the hallmark of their intellectual dishonesty. Belief may
be a regrettably unavoidable biological weakness to be kept under the
control of criticism: but commitment is for Popper an outright crime.

Kuhn thinks otherwise. He too rejects the idea that science grows by
accumulation of eternal truths.³ He too takes his main inspiration from

S. G. Harding (ed.), Can Theories be Refuted?
Einstein’s overthrow of Newtonian physics. His main problem too is scientific revolution. But while according to Popper science is ‘revolution in permanence’, and criticism the heart of the scientific enterprise, according to Kuhn revolution is exceptional and, indeed, extra-scientific, and criticism is, in ‘normal’ times, anathema. Indeed for Kuhn the transition from criticism to commitment marks the point where progress – and ‘normal’ science – begins. For him the idea that on ‘refutation’ one can demand the rejection, the elimination of a theory, is ‘naive’ falsificationism. Criticism of the dominant theory and proposals of new theories are only allowed in the rare moments of ‘crisis’. This last Kuhnian thesis has been widely criticized and I shall not discuss it. My concern is rather that Kuhn, having recognized the failure both of justificationism and falsificationism in providing rational accounts of scientific growth, seems now to fall back on irrationalism.

For Popper scientific change is rational or at least rationally reconstructible and falls in the realm of the logic of discovery. For Kuhn scientific change – from one ‘paradigm’ to another – is a mystical conversion which is not and cannot be governed by rules of reason and which falls totally within the realm of the (social) psychology of discovery. Scientific change is a kind of religious change.

The clash between Popper and Kuhn is not about a mere technical point in epistemology. It concerns our central intellectual values, and has implications not only for theoretical physics but also for the underdeveloped social sciences and even for moral and political philosophy. If even in science there is no other way of judging a theory but by assessing the number, faith and vocal energy of its supporters, then this must be even more so in the social sciences: truth lies in power. Thus Kuhn’s position would vindicate, no doubt, unintentionally, the basic political credo of contemporary religious maniacs (‘student revolutionaries’).

In this paper I shall first show that in Popper’s logic of scientific discovery two different positions are conflated. Kuhn understands only one of these, ‘naive falsificationism’ (I prefer the term ‘naive methodological falsificationism’); I think that his criticism of it is correct, and I shall even strengthen it. But Kuhn does not understand a more sophisticated position the rationality of which is not based on ‘naive’ falsificationism. I shall try to explain – and further strengthen – this stronger Popperian position which, I think, may escape Kuhn’s strictures and present scien-