

# EDITORIAL

## Marksism: The Shape of Things to Come?

Following the success of the first Radical Philosophy special number (RP34 on Women, Gender and Philosophy), and as an extension of our long-standing interest in the subject, we are devoting this issue to the theme of Science, History and Philosophy. As Peter Osborne explained in the last editorial, our working practices have taken a slightly new turn. While the editorial collective continues to maintain overall control over the contents and direction of the magazine, the preparation of each number has now passed into the hands of an individual member of the group, the issue editor. The reward for circulating, photocopying, correcting and reading all the articles submitted to us is a small space at the head of RP. Here the issue editor can introduce the contents, discuss a favourite interest, admire or abuse a book, bring a subject to the attention of our readers or otherwise exercise his or her intellectual muscles.

I would like to use this opportunity to notice a work which has also been reviewed elsewhere in this issue: John Marks's Science and the Making of the Modern World. John Fauvel has made plain his opinion that this is a bad book, so it might be thought prudent to let the matter rest there. But without wishing to be provocative or unduly pessimistic, I think it would be wrong to let Marks's work pass quietly into oblivion. Not so long ago, a right-wing attack such as this on the content and structure of an academic discipline would have been treated with derision and ridicule. I know more than one erstwhile subversive who felt it insulting to be excluded from Julius Gould's 1977 report on 'Marxist infiltration' into higher education. Nowadays such attacks carry more weight and come clothed in a variety of disguises. Far from shrugging them off, radicals now recognise that assaults by the right demand serious attention and equally serious rebuttal.

That the so-called 'radical right' is currently engaged in a major offensive on polytechnic and university courses in philosophy, sociology and liberal studies is hardly news. Thus far, however, small and young disciplines like the history and philosophy of science (HPS) have not been singled out for particular attention by Keith Joseph and his henchmen. That HPS is to undergo what is euphemistically termed 'natural contraction' has been greeted with a measure of relief by teachers and students of the subject.

The message of this book, as I read it, is that this relative security may soon be greatly disrupted. What Tory plans purportedly entail is not the destruction of our educational system but its replacement by another kind of training, one which aims to be relevant to the needs of the current economic and political structure. The purpose of Marks's text is to create a different kind of HPS, one which as we shall see would fit admirably into these plans. By altering the fundamental nature of the discipline, HPS departments and courses on the social studies of science

based in the humanities would become unnecessary. Hence the danger of this book.

### HPS in from the cold

To be sure, Science and the Making of the Modern World seems innocent and innocuous enough. With its lavish illustrations, superb designs and careful lay-out - not to speak of the reputable publisher's imprint it bears - some may even judge it a positive contribution to the subject. After all, textbooks such as this establish courses rather than undermine them. Yet, peculiarly, this is a textbook searching for a market in which for many years few historians and philosophers of science have gone about their business with manuals of this kind. In a sense, the whole purpose of HPS has been to put into question those cosy historical and philosophical scenarios which scientists enjoy painting for themselves. To think of science as one mode of thought amongst others, or as a practice with a variety of social and political consequences, is to encourage critical reflection. As the articles on Newton and Darwin in this issue suggest, even apparently straightforward scientific advances involve a wide range of issues. Darwinism continues to require study not simply because of its founder's prestige as a scientist, but because evolutionary theory concerns a rich diversity of themes. Most evidently, this 'biological' problem cross-cuts a series of political and philosophical notions which impact directly on our conceptions of place, time and social relations. Our approach to Darwinism, then, must be searching, exacting and critical. Neat and tidy textbook summaries of the 'Plato to Nato' kind which Marks aims to provide must fail to capture the critical import of HPS. They sanitise the subject with great effect, but they also deprive HPS of its raison d'etre. To claim boldly to offer an 'authoritative' and 'well-balanced' treatment of evolutionary theory in a dozen pages, a person would need to be very wise or very foolish, misguided or mischievous.

To say that HPS is by its nature a critical activity is not to suggest that Marks's attempt is the first to make it conservative. The three major textbooks in HPS are all to varying degrees reactionary works, and Dampier's History of Science (1929), Butterfield's Origins of Modern Science (1949), and Gillispie's Edge of Objectivity (1960) have all inspired Marks in his own labours. Moreover, the last of these - by one of the most influential figures in the profession and the editor of the monumental (and highly selective) Dictionary of Scientific Biography - should stand as a reminder of how much HPS owes its early development to the conjuncture and requirements of the Cold War. To the US government of the 1950s, it was clear that science needed to develop rapidly and without hindrance if it was to combat the menace of the East. In like manner, society had to be defended by countering the menace at home. Two

sides of the same coin minted by the new HPS: science would develop by being defended from society and society would be protected by relying on the products of science. Once accepted, this ideology could be usefully reinforced by those whose job it now was to explore the interface between the two spheres. While McCarthy and his cohorts took charge of culture, HPS with suitable funding and opportunities would look after science; tidy up the loose ends, reassure the sceptics, and show how scientific progress was bound up with the American (or Western) way of life.

While American HPS was doing its best to earn its keep, the Congress on Science and Freedom in Europe was showing how, in the words of its Chairman Michael Polanyi, science was a free market in ideas just as society was a free market in commodities <1>. Everything was fitting together nicely. History, philosophy, sociology and good old-fashioned common sense taught how science could only develop in open, liberal and spontaneous societies. Science developed in the West and could only have developed in the West. The real problems would arise once 'alien' cultures got a slice of the action, once (as Gillispie put it) 'the instruments of power created by the West come fully into the hands of men who are not of the West'. Societies which had not chosen to follow the capitalist path could neither produce their own scientific knowledge (the disastrous Lysenko episode was a great help here), nor should they be free to poach that of other nations. Science may have had its roots in a unitary and unified method, but its fruits had to be preserved from those 'formed in cultures and religions which leave them quite devoid of the Western sense of the ultimate responsibility to man in history' <2>.

The immediate backdrop to the rise of HPS as a profession was the Cold War. And, on centre stage, the bomb. 'What' asked Gillispie rhetorically, 'will the day hold when China wields the bomb? And Egypt?' <3>. After all, just think what use the 'cultured' West with its ultimate responsibility to mankind made of it ...

This is a question Marks himself addresses. Yet in a book packed from end to end with a mass of statistics, graphs, diagrams, tables and other assorted forms of data, we are never presented with details of the deaths resulting from the devastation of Hiroshima and Nagasaki in 1945. Indeed, Marks has the gall to suggest that dropping bombs on Japan actually caused less destruction and loss of life than would have resulted from an invasion. This, of course, is nonsense, and Marks knows it is nonsense. Each of the Joint Chiefs of Staff advised that it was highly probable that Japan could be forced into unconditional surrender without deploying the atomic bomb and indeed without an invasion <4>. It is clear that the bomb was not used primarily against Japan to save American lives but in order to intimidate the Russians into accepting Western objectives in Europe <5>.

### **When atoms were atoms, and students knew their place**

Dr. John Marks is currently a lecturer in physics at the Polytechnic of North London. His speciality is nuclear physics and before he turned to the academic life he worked at the Atomic Weapons Research Establishment, Aldermaston. Some readers may remember him as the author with Keith Jacka and Caroline Cox (who contributes four chapters to the book) of The Rape of Reason, a wretched little volume published nine years ago in a series edited by Rhodes Boyson which also included such classics as Goodbye to Nationalisation and Down with the Poor.

The Rape of Reason was an account of the four-year struggle by students and some staff at PNL for more student participation on academic boards, in defence of the sociology department, and in opposition to the appointment of the white refugee from Rhodesia, Terence Miller, to the post of Director. Marks, dubbed by his own proud admission the 'most unpopular man in the polytechnic', devoted a good deal of his time away from the laboratory and the

library scribbling notes to the press exposing 'corruption', 'subversion' and 'infiltration' in the polytechnic and giving 'evidence' that a carefully-managed conspiracy orchestrated by Moscow and Peking was threatening the collapse of Western Culture as we know it. No point in dropping the bomb this time, since the conspirators had found a home in the unions, amongst the New Left, sociologists and social workers, the British Sociological Association, the NCCL and CAFD, and even under the very pillars of the establishment. 'Week after week,' wailed Marks, recounting his battles, 'the skilful satirists of Private Eye and BBC Television destroyed the faith of the young in those who occupied any official position or held any enduring values... A new mode of sensibility appeared: amoral, nihilistic and trendy. This cultural revolution - apparently spontaneous - in which Britain was the pioneer for the Western world, was a key event. It made for the defenceless society' <6>. Confronted with such a formidable array of 'ideologues', Marks, Cox and Jacka made a final rallying call: 'The defenders of tolerance (!) must now move to the attack' <7>.

Marks quickly played his gambit. Having established unimpeachable credentials as an expert on education (his expertise on HPS would develop later), he joined other better-connected figures to produce the infamous Black Paper 1977. Amongst the aims of the group which produced this report were to institute severe cuts in arts and social science departments in higher education, to support private schooling, and to lobby for the introduction of student loans. To the contributions of Patrick Moore, Hans Eysenck, Max Beloff and Jacques Barzun, Marks added his own neat typology of academic life. Universities and polytechnics were made up of two kinds of people: Academics on the one hand, and on the other Marxists. The first were logical, constitutional, pluralist and tolerant; the second were devious, irrational, conspiratorial and not to be tolerated. The purpose of the contrast was clear. Not only were the two groups locked in conflict, but that conflict was irreconcilable. The 'new ideologues' (a category which included anti-racists, feminists, sociological relativists, and Marxists) could not be brought into line by means of debate or academic confrontation. They had to be booted out of the universities, schools and polytechnics.

Up to this point, as I have indicated, such rantings were heard on the outer fringes of the educational debate and treated by most with a mixture of incredulity, contempt and abuse. Marks's writings were simply too hysterical, highflown and bizarre to be taken seriously either by the left or the right. But of course the political climate of the 'eighties is very different to that of the previous decade. In 1982, the Tory Centre for Policy Studies issued a document on education, The Right to Learn, which actually gave the stamp of approval to ideas which had been discredited only a few years before. By this time, Marks had turned his attentions to the history and philosophy of science. His course on 'Science and the Making of the Modern World' has been enforced on all science students at PNL for the past few years. So along with the view that the number of sociology and social studies departments throughout the country should be 'drastically reduced', Marks now argues that science students should be encouraged to 'appreciate the influence of social factors in the organization of the social institutions concerned with science' <8>. Bad news for sociology, but good tidings for HPS.

Not quite. The problem is that so many sociologists, historians, and philosophers of science are highly critical, 'partisan', 'biased', 'agitational' and frankly incompetent. Here then is the proposal. Only those who can identify with the aims and aspirations of contemporary science should be entrusted to lecture on HPS. Posts involving this subject should only be filled by staff who have 'direct experience of work in those, or related fields' - that is, by scientists or ex-scientists <9>. Only by these means will a relevant and meaningful kind of HPS be developed. It is, say

our two authors, 'a very different approach from the one-sided "doctor-bashing" and "science-knocking" attitudes which characterize some courses' <10>. Enter John Marks (ex-Aldermaston) and Caroline Cox (ex-nurse).

All of which, I would suggest, places a big question mark over the future of HPS in this country, particularly since such views may well become (if they have not done so already) official Tory education policy. After all, Keith Joseph has already rejected calls for the introduction of HPS components in science A-level courses. Scientists possess the necessary experience of their subject to teach HPS. Moreover they are trained (unlike sociologists, philosophers, historians and the 'new ideologues') to accept two fundamental criteria as the sine qua non of any academic qualifications. Firstly, their discourses are logically coherent; and secondly, they have a 'commitment to an attempt to take account of all available relevant evidence' <11>.

If scientists do possess the right experience and right outlook for the job, they do however lack the historical and philosophical skills to teach HPS. This is a gap the textbook is designed to fill. The textbooks of Butterfield, Dampier and Gillispie are showing their age; clearly they have not been able to 'take account of all the available relevant evidence'. This is where Science and the Making of the Modern World comes in to provide what its publishers modestly term 'indispensable reading'. Some fifteen to twenty neatly-packaged lecture notes each with its own succinct conclusions; all the prospective lecturer needs is here. HPS is no longer a deeply problematic enterprise. It is actually quite simple. And just in case anyone doubted the authority of the text, it comes complete with a glowing tribute from Mary Hesse, Professor of the Philosophy of Science at Cambridge and the only representative of HPS on the University Grants Committee. The book, she writes in a foreword, has 'broken new ground'. Its author 'has succeeded admirably in setting out what the educated scientist or scientific layperson needs to know to bring an informed and critical mind to the contemporary place and influence of science and society'.

### Simple tales of genes and bombs

I have suggested that Marks's book may be more than at first appears. But it is also less than it claims to be. It is only fair to see how it measures up to the standards the author would impose on others - those of logical coherence, intellectual honesty, and the need to keep abreast of current developments in the field.

One of Marks's complaints about historians and philosophers of science is that they 'concentrate, as a matter of policy, on case studies on specific controversial issues - such as nuclear power or genetic engineering' <12>. For once Marks is quite right. Those who teach HPS find it more helpful to discuss such issues than to worry overmuch about the history of the modern flush toilet or the place of the automatic typewriter in today's office complex. Unlike the situation that appears to hold at PNL, in most establishments courses on HPS are elective, so one has a pretty good idea of what are students' interests, likings and dislikings. Not unnaturally, the majority of students seem to find it more diverting, not to say pressing, to tackle topics like the Manhattan Project, sociobiology and the analysis of risk than to rehearse other less controversial matters. But unlike Marks, most teachers of the subject think it important to have the views of their students represented when planning courses.

If the concentration on such topical and relevant issues is a problem, what is Marks's solution? His account of genetic engineering may stand as an example. There is no account. Nor is there any controversy. Just a nice short story with a moral. In the early 1970s, some biologists began to be concerned about the possible harmful implications of their work. Fortunately other scientists thought up 'adequate' safety standards and these were - and still are - implemented to the satisfaction of all. Those who created

the problem later solved it. The moral: there is no need for outside concern, still less for interference and meddling on the part of those 'not directly involved'. To dig up past history and create problems is unnecessary and divisive. There we have it - a familiar picture of scientific self-management. And a reassuring picture in part because it is wholly unburdened with disruptive figures, with evidence of any sort, or with references to secondary literature. So much for keeping in touch with all available evidence.

Much the same applies in the case of nuclear power, except that here Marks speaks with rather more authority. I have already mentioned his lapses of memory regarding the events of 1945 in Japan. When he turns to the development of atomic physics Marks seems to be in the grip of a model of scientific historiography which I haven't seen anyone champion for the past thirty years. This is the 'clearly cumulative' school of thought (see p.363). Here everything in history gradually gets better, science uncovers more and more of the world, knowledge grows slowly step by step, and even so apparently disruptive an event as the development of Einstein's theory of relativity is 'part of the continuous development of physical science from the time of Galileo onwards' (p.251). There are, to be sure, a few hiccups on the way, but these Marks conveniently passes over lightly or in silence. So one looks in vain for a treatment of the uncertainty principle in the relevant chapter. Marks thinks it best to bury it somewhere else in the book, in a section on computing (p.336).

Einstein plays a pivotal role in the story. He is a key example of the manner in which a critical consciousness develops in the mind of a scientist. Thus Marks is led to quote in full what he describes as a 'momentous letter', signed by Einstein and dispatched to Roosevelt in 1939. As with almost everything else Einstein put his name to, the message of the letter is open to a number of interpretations, but along with the other physicists who drafted the note, Einstein appears to have been drawing the president's attention to Germany's potential bomb-making capacity and to the need for the US government to speed up its nuclear research programme. By citing the letter in full, Marks seems to indicate that it is both historically important and that it represents the politically insightful opinions of the scientist.

The problem is quite simply that this 'momentous' letter had little impact and wholly failed to galvanise the American government into concerted action. This is well-known and has been fully documented. Equally misleading is Marks's claim that the letter is evidence that 'Einstein had thus completely abandoned his former pacifism in the face of the threat from Hitler and National Socialism' (p.270). Einstein's pacifist beliefs remained complex throughout his life, but however ambiguous and equivocal, they did remain part of his political philosophy after 1939. This again is well-known and accepted, even in popular accounts such as Ronald Clark's Einstein. To make Einstein into the influential militarist fits Marks's picture nicely, but unfortunately the picture itself is quite wrong. To add to the story that Einstein's work was 'strongly attacked in the Soviet Union' (p.268) is not only misleading and factually incorrect; it is designed to serve as part of a thinly-veiled political argument of the kind established in the 1950s and 1960s by Gillispie and others.

Before I finish, let me turn briefly to another section of the book, one of the most technical and, one would therefore imagine, a portion least liable to distortion by political and ideological suppositions. Marks, it should be remembered, places great weight on the need for scientists to teach HPS and in some measure he does so in the belief that their training allows them to speak authoritatively about the subject. The fact that scientific training is no qualification to be able to reflect critically on the nature, development and social relations of science is a lesson which it is gratifying to be able to draw from this text. And having done so, Marks's intention to subvert and replace a body of work and an intellectual activity must be

seen as almost embarrassingly naive. Normally speaking, it would be unnecessary and rather a painful duty to have to point out that an author had failed to grasp even the fundamental axioms of a scientific field. In this case however, I do so with a measure of relief.

The portion I choose contains I would judge a typical harvest of errors. I count three in some fifteen pages, and these on a subject on which I am far from being an expert - genetics and molecular biology. First of all, Marks asserts that 'of all the possible amino-acids, only 20 occur in proteins' (p.291, my emphasis). A few pages earlier, we read that insulin from the cow consists of 51 different amino-acids. Now, insulin does indeed consist of 51 amino-acids, but these are not all different. There are only twenty different amino-acids in the primary products of gene action, but owing to secondary modifications there are many more than this in mature proteins. Not perhaps the kind of information readers of Radical Philosophy would be expected to carry around in their heads, but, it hardly needs saying, essential basic information for anyone even contemplating the task of writing cogently about the subject.

Turning to Marks's account of Mendel's hybridization of peas, we are told that it was influenced by reading Darwin's Origin of Species (1859, German translation, 1860). Yet Mendel's research was planned in the mid-1850s and reported without even a mention of Darwin's name. It is well-known that Mendel's concern was not with Darwinian evolution, but with a contemporary central European debate about the stability of species. And lastly, according to the diagram on page 277, Mendel used the modern notation of double letters for homozygotes. The fact is that he didn't. And this truth raises a whole host of fundamental issues about Mendel's conception of the hereditary determinants, just as the origins of Mendelism pose problems for anyone who would seek a unitary development threading through biology for the past 150 years. I have already suggested that Marks has misunderstood the complex character of scientific history with his 'clearly cumulative' model of the growth of knowledge. Much the same reassuring one-dimensional model of knowledge itself dominates his panorama.

The truth is that for some while now historians and philosophers of science have questioned the status of individual theories and logical products as the bases of appraisal and evaluation in their work. The result has been a proliferation of broader and deeper units which now figure within scientific historiography - notions such as Kuhn's 'paradigm' and 'disciplinary matrices', Lakatos's 'scientific research programmes', Toulmin's 'intellectual disciplines', and Popper's 'metaphysical research programmes'. As the discipline of HPS has turned its attention to the nature of competing scientific ideologies, simultaneous discoveries, dissonant theories, and the character of periods of synthesis, integration, calm and hibernation within the development of a body of scientific knowledge, so it has been forced to eschew the notion that such knowledge simply coalesces around a single theorem or theory. The shift might be simply represented as one from the history of scientific ideas to the social history of the sciences.

That Marks seems unaware of this changed perspective is clear from the banality of so much of this book, its politics as much as its history. For theories are not contested, complex and overlain with values, metaphors and interests. To Marks, they simply exist, out there, in the minds of scientists who go about their business free from outside interference and for the good of the community. I would end by suggesting that the need to respond to this archaic, reactionary and dangerous model of the nature and development of science is both pressing and necessary. To do so would, of course, make HPS a critical and in many ways radical performance. But this is not to suggest that merely pointing out the faults with the model is in itself enough.

With his background and affiliations, and bearing in mind the current political climate, no one should under-

estimate the damage even so incompetent a propagandist could cause. We need to show that Marks's text is corrupt, both theoretically and factually. But a political assault on HPS, if and when it comes, needs to be met with an equivalent response. The fact that the history and philosophy of science has thus far escaped such direct political attacks carries no lessons for the future. So it will be particularly instructive to see what reception and notice is given to Science and the Making of the Modern World.

Mike Shortland

#### Footnotes

- 1 See Congress for Cultural Freedom, Science and Freedom, 1955, pp. 36-46.
- 2 C.C. Gillispie, The Edge of Objectivity, Princeton, 1960, p. 9.
- 3 Ibid.
- 4 See G. Alperovitz, Atomic Diplomacy, 1966, pp. 237-38. According to the post-surrender study by the US Strategic Bombing Survey, 'certainly prior to December 31, 1945, Japan would have surrendered, even if the atomic bomb had not been dropped' (quoted in P.M.S. Blackett, Military and Political Consequences of Atomic Energy, 1948, p. 122). Hiroshima was destroyed on 4 August, 1945; Nagasaki 3 days later.
- 5 See Brian Easlea, Liberation and the Aims of Science, 1973, pp. 239-41.
- 6 The Rape of Reason, 1975, p. 145.
- 7 Ibid., p. 146.
- 8 Caroline Cox and John Marks (eds.), The Right to Learn, 1982, pp. 83, 71.
- 9 Ibid., p. 84.
- 10 Ibid., pp. 84, 77.
- 11 Ibid., p. 82.
- 12 Ibid., p. 78.

Articles and Essay Reviews of interest to readers of this special issue in previous numbers of RP include:

- Alison Assiter, 'Marxism and Science' (RP 12)
- Martin Barker, 'Racism - The New Inheritors' (RP24); 'Sociobiology' (RP24)
- Ted Benton, 'Lysenko' (RP24); 'Realism and Social Science' (RP27)
- Roy Bhaskar, 'Scientific Explanation and Human Emancipation' (RP26)
- Georges Canguilhem, 'What is Scientific Ideology?' (RP29)
- John Fauvel, 'Is the Philosophy of Biology Diseased?' (RP31)
- Paul Feyerabend, 'How to Defend Society against Science' (RP11)
- Roger Harris, 'Popper for the People' (RP6)
- Nicki Jackowska, 'Seeds of Freedom. Reply to Feyerabend' (RP12)
- John Krige, 'Against Empiricism' (RP12), 'Revolution and Discontinuity' (RP22), 'Progress in Science' (RP24), 'Witches, Magic and Philosophy' (RP29)
- Les Levidow, 'Towards a Materialist theory of Ideology: the IQ Debate as Case Study' (RP22)
- Mike Shortland, 'Vestiges of Positivism' (RP28), 'Introduction to Georges Canguilhem' (RP29), 'The Fabric of Explanation' (RP29)
- Aaron Sloman, 'What are the Aims of Science?' (RP13)
- Alfred Sohn-Rethel, 'Intellectual and Manual Labour' (RP6)

Other periodicals of interest are:

- Antipode - A Radical Journal of Geography (PO Box 225, West Side Station, Worcester, MA 01602, USA)
- Cahiers Galilee (BP Galilee 160, B-1348, Louvain-la-Neuve, Belgium)
- Critique of Anthropology (PO Box 178, London WC1 6BU)
- Dialectics Notebook (Hy Cohen, 130 St Edward Street, Brooklyn, NY 11201, USA)
- Fundamenta Scientiae (4 Rue Blaise Pascal, 67070 Strasbourg, France)
- I&C (Graham Burchell, Westminster College, North Hinksey, Oxford OX2 9AT)
- Medicine in Society (74 Brookdale Road, London E17)
- Radical Statistics (9 Poland Street, London W1)
- Radical Science Journal (9 Poland Street, London W1)
- Science and Society (Room 4331, John Jay College, CUNY, 445 West 59th Street, New York, NY 10019, USA)
- Science Bulletin (27 Bedford Street, London WC2)
- Science for the People (9 Poland Street, London W1)

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