

Wrong science and right science

The attack by T. Theoharis and M. Psimopoulos on philosophers of science continues to provoke correspondence. This week's Commentary pages are turned over to the matter.*

SIR—In their article, Theoharis and Psimopoulos claim that recent philosophers such as Popper, Lakatos and Kuhn (1) have betrayed the old ideals of objectivity and truth and (2) have thus played important roles in putting British science in its endangered plight.

They present not a shred of evidence for the second claim. But in the unlikely event that those who influence the purse strings have been mugging up on their recent philosophy of science, perhaps some of them have noticed passages like the following: "Science, as such, has no social responsibility. . . . [I]t is society that has a responsibility — that of maintaining the apolitical, detached scientific tradition and allowing science to search for truth in a way determined purely by its inner life."

This is from Imre Lakatos; and as for Popper, surely very few can join Theoharis and Psimopoulos in having read him without being impressed by his respect for science, that "magnificent adventure of the human spirit" and its "miraculous

success". Both Popper and Lakatos claimed to defeat the sceptic by accepting what is cogent in his argument and showing that objective (but no longer utopian) standards of scientific progress can still be developed. If their claims ultimately fail, it is for rather complicated and arguable reasons that are hardly likely to be the talk of Whitehall.

Of course Theoharis and Psimopoulos are right to point out that British science needs to fight back if its alarming predicament is not to worsen still further. But matters are not likely to be improved by attacking people who in all probability have no influence and who are anyway on their own side; nor by basing that attack on unsupported claims, caricatures of their supposed "opponents" and elementary misunderstandings.

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SIR—Theoharis and Psimopoulos suggest a simple, albeit naive, solution for the deep and widespread malaise of British science — the putting forth of adequate definitions of such fundamental concepts as objectivity, truth, rationality and the scientific method. But they fail to mention that this is exactly what Karl Popper, Imre Lakatos, Thomas Kuhn and Paul Feyerabend attempt. They also ignore the fact that some of the greatest minds of our century, who certainly do not qualify as "betrayers of the truth", have expressed similar opinions.

Thus Werner Heisenberg said: "The hope that the new experiments will lead us back to objective events in time and space, is about as well founded as the hope of discovering the end of the world in the unexplored regions of the Antarctic"¹. According to Max Planck, "it is impossible to separate the law that we are seeking to discover from the methods that are being used to bring about the discovery"². And Albert Einstein wrote, "The fact that in science we have to be content with an incomplete picture of the physical universe is not due to the nature of the universe itself but rather to us"³.

The authors also list three actual

dangers not only to science but to society in general. I suggest that science presents another, and in my opinion a more serious danger to society, namely elimination of God in the name of the objective truth. For example, in their book *The Third Millennium*, Stableford and Langford foresee no place for religion or God in their brave new world. Many scientists would argue that their activities have nothing to do with those issues, but for some unexplained reason a majority of them are stern atheists. At the same time, lay nonbelievers point to the achievements of science and technology as a proof for the nonexistence of God. They are convinced that scientists must know something that laymen do not; otherwise, they argue, the proportion of nonbelievers to believers in these two populations should be the same, which is not the case. Although the danger of living in a world without God is obvious to the believers, it may not be so apparent to nonbelievers.

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1. Heisenberg, W. *Philosophical Problems of Quantum Physics* (Ox Bow Press, Woodbridge, 1979).
2. Planck, M. *Where Science is Going?* (Ox Bow Press, Woodbridge, 1981).
3. Einstein, A. *Ideas and Opinions* (Crown, New York, 1954).
4. Stableford, B. & Langford, D. *The Third Millennium. A History of the World: AD 2000 - 3000* (Knopf, New York, 1985).

SIR—Theoharis and Psimopoulos comment on the ignorance of scientists about their vocation and the effect that has had, of late, on funding for research.

What I do not understand is why the two small volumes written by John Ziman have had so little influence on those worried about this problem. First in *Public Knowledge*, then in *Reliable Knowledge* (Cambridge University Press, 1968 and 1978), Ziman sets out in clear language just what distinguishes science from other scholarly pursuits and from the professions. Other scholarly disciplines do not accumulate theory and build upon it in the same way as science. On the other hand, the professions which apply scientific knowledge, such as medicine and engineering, focus on solving individual practical problems (however complex some of them may be); the art of problem-solving peculiar to each of these is an essential part of the training these professionals receive.

Ziman says that what science provides, at bottom, is best described by the title of his later book: reliable knowledge. The value of reliable information to anyone who makes decisions can obviously be very great, as is shown by the recent scandal in the United States over 'insider trading' among bankers.

Clearly, the scientific research supported by societies through their governments should be selected partly on the basis of what is likely to be important for decisions in the future. Just as clearly, that should be broadly based, both because we cannot predict all the knowledge that will follow from a particular line of investigation and because we cannot predict what kinds of decisions we will have to make some years hence. In large measure we have to argue that research of a general nature supported on general principles has proved valuable in the present, and that the past is a better predictor of the future than any other we have. Yet it is hard to argue that in a society with declining income — such as Britain — this generalized investment in the future should receive an increasing fraction of that income. The need is to tackle the difficult task of assuring that basic research does not get cut more than its share, and that the declining remainder is spent as wisely as possible.

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*"Where science has gone wrong" *Nature* 329, 595-598 (1987). Previous correspondence appeared in *Nature* 330, 308 and 689-690 (1987).