

Thinking about thinking

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Science as a Commodity: Threats to the Open Community of Scholars.

Edited by Michael Gibbons and Björn Wittrock.

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"SHOULD university teachers or researchers display patriotism by undertaking work for the armed forces which will inevitably be secret and unpublishable?" "Should they help pay for their institutions in hard times by making contracts with industrial firms whereby publication of research must be delayed, perhaps for a year or two, until intellectual property rights have been safeguarded by patents?" "Is public funding of university work best guided by simply choosing the best men, and leaving them to choose their research topics as best they can?" "Would the best women, if so funded, choose differently from the best men?" "For such privileges, who are the best people and how do you choose them?"

These are good questions, the resolution of which is of great importance for the maintenance of democracy and survival of freedom of inquiry and speech. It is therefore eminently reasonable to convene a conference to discuss them in detail. One would invite people from a cross-section of backgrounds: university teachers currently doing research in the humanities, engineering and science (and, if possible, across more than one field); practising men of business and public affairs; and some military people, to relate their problems and experiences. One would cover diplomacy, matters of public order, economics, investment, taxation and technology, with science and philosophy bulking large in the background. There would doubtless be difficulties of language and psychology, and many important differences in priorities and chosen compromises, but the result would be very fruitful.

Conversely, it might seem one-sided to conduct such a conference in the virtual absence of the practitioners of science, and to publish essays only by (admittedly able and clever) university teachers whose specialism is mainly the study of those who study engineering and science, in the absence of practitioners of finance, law, psychology and medicine. And it might seem confusing to use the title *Science as a Commodity*.

There used to be a gibe that you could always find the Germans in a crowd by inviting everyone to choose between two doors marked "Heaven" and "Lectures on Heaven". Excessive specialist theorizing is now spread throughout the Anglo-Saxon world, to the extent that it is no longer fair to pick on the Germans. Those of us who have worked hard to encourage

interest in broader matters in the choice, conduct and exploitation of research, feel a little frustrated because success in drawing attention to this synthesis has created another band of specialists, engaged not in practice, but only in a new branch of theory.

There are wise thoughts in this book, the published record of the meeting, but there is also an overdose of theology, and repetitious concern with a few causes celebres (such as Faust, Bacon, the Manhattan Project — described rather inaccurately by one of the contributors — and the arrangements between Hoechst and Mr Whitehead on the one hand, and the universities in Boston, Massachusetts, on the other). And there is very little about the actual products, processes and services which most illuminate the connection between free inquiry and practical application (or which comes first), or whether the great increase in society's investment in technology seems to have helped or hindered such basic research as the astronomical study of the Universe, its cosmological interpretation, the structure of matter and energy, and the origins of life and inheritance. It may be that the practical men (inside and outside the universities) were in fact invited but would not come; if so, their contributions should have been sought by other means, and not beaten into shape with theory.

The unconfused title for the book could well be *Technology as a Tradeable Investment* or *Should Scientists do Secret Military Research?*, but these would not sound sufficiently mysterious and profound. Professor Wittrock, in his summing up on p. 156, says "Science has not become a commodity; it always was". Professor Salomon, on p. 78, says "Science as a commodity? Only half a century ago, such a question would have appeared as a provocation, and a century ago, as an aberration". This apparent disagreement between gurus stems, of course, from different interpretations of the word "science", and the problem is intensified for two other reasons: first, the words science, technology and research are repeatedly used interchangeably. Secondly, in this context the term "commodity" is less appropriate than the term "investment". The trading of investments is a rather different process from trading in consumer goods. Technology, rather than science or research, is our most comprehensible kind of intellectual investment. It has been traded always, but most particu-

larly since the patent system was introduced four centuries ago to prevent (not assist) secret operation; the method was the award of a temporary monopoly in return for disclosure, to allow the recoupment of the investment cost. Inventive applied science can sometimes be traded as a component of technology, but the ways of nature cannot be closed to astronomers, high-energy physicists or geneticists. These subjects can be kept secret only for as long as there is military control over the instruments needed for the work (rockets to launch the satellite: detectors to measure the radiation). By contrast a commercial firm would want to go public and sell the gear.

So the real problem is that of the military restraint of the dissemination of technology, with its attendant economic penalty for all, and not that of the selling of university science by commercial interests. Commerce requires the most temporary protection of knowledge that will make long-term research and development worth while, and the earliest practicable publication. Men of good will such as Sir Cyril Hinshelwood, President of the Royal Society from 1955 to 1960, regarded applied research, of whatever kind, as one of the most valuable sources of ideas for scientific discovery; they sought to participate in both discovery and invention. When military secrecy hindered this natural exchange, they sought means for distilling the clues for science into publishable form.

Once this confusion is cleared up, the book becomes a useful quarry with some interesting thoughts on a variety of matters. For instance it is hard not to agree with Helga Nowotny that women would choose different research topics from men, and hard not to conclude that both science and technology are impoverished by the small number of influential women involved. But the real need is for much more study of individual examples, for example to help decide whether peacetime science and the technology-based business that funds it depends heavily, lightly or not at all on science conducted for military purposes. Did polythene, radar and the gas turbine (all invented in peacetime) require wartime funding to reach peacetime use? Was anything at all invented in wartime; does war merely accelerate and enable the development of peacetime ideas that were languishing? More broadly, would cephalosporin have been discovered by a firm, and could the semi-synthetic penicillins have been developed in a university? More pragmatism, please, before the next bout of analysis. □

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