Science Studies: A Gathering of the Clan in Edinburgh

Edinburgh. It would be hard to think of a better place for the biggest international gathering to date of people engaged in science policy studies than the city of David Hume. For Hume makes a highly suitable intellectual ancestor. He excelled in formulating old questions in new ways. His writing was lucid. And his interests and talents cut across disciplinary boundaries. His "Essay on the Balance of Trade," for example, forced a rethinking in his own day of that perennial British problem.

The occasion for an International Science Studies Seminar in Edinburgh from 3 to 5 November was the inauguration of a science studies unit at the University of Edinburgh. Among the roughly two score who attended the seminar were researchers—most of them from Western Europe and the United States—and government officials concerned with the making, and the results, of science policy.

An original purpose of the meeting was to consider whether activities in the field of science studies added up to a coherent whole. A consensus was reached very early in the meeting that any attempt to define the scope and methodology of these activities or even to give them a name ("science of science" was a main contender) was at least premature. The meeting, therefore, turned out to be no constitutional convention but, rather, an opportunity for many there to meet their colleagues for the first time and to talk shop.

Interest in the effects of science on society, which united most of those attending the Edinburgh meeting, is hardly new. The *philosophes* in the 18th century and Marx, Spencer, and Henry Adams in the 19th are random examples of theorists concerned with elucidating the part of science in the development of society. What has given rise to a new breed of scholars in search of a discipline, however, is the 20th century's Scientific Revolution and, particularly, since World War II, the growing entanglement of government with science. Not only is the interrelationship between science and government less elusive than that between science and society, but studies in science and government have both a professionally interested audience and, so to speak, a market.

The muster of researchers at the meeting not unexpectedly showed the United States and the United Kingdom leading in the number of university-based groups specializing in science studies. In Britain, while there is interest but as yet no formal organization in the subject at Oxford and Cambridge, groups are in being, or are being established, at Manchester, Birmingham, the new University at Sussex, and Bath University of Technology, as well as at Edinburgh. In the United States the number of university units is now about 20. (A conference on science and public policy, sponsored by the AAAS, to which representatives of the U.S. groups are to be invited, is being planned). On the Continent, science studies tend to be carried on within government or in centers financed directly by the government.

The U.S.S.R. was not represented at the Edinburgh meeting, but interest in science studies appears to be on the upswing in the Soviet Union. An institute of history of science and technology in the Soviet Academy of Sciences has done little research in the science policy sector in the past, but reportedly new initiatives are being taken, specifically studies in the psychology of scientific work, with a focus on productivity of researchers in the Siberian science centers.

In the less developed countries there is considerable concern with science planning, but so far there are few instances of science policy research being carried out.

Many interests and disciplines were represented at Edinburgh, ranging from the established subspecialties of philosophy of science and history of science, across the spectrum of the social sciences, and including those concerned with the politics, economics, sociology, and psychology of science.

It was obvious that the question of whether the methodology of science can be extended into the process of making decisions for society still holds attractions for at least some who were at the meeting, and that hopes for "empirical government" are not dead. The sense of the meeting, however, was clearly that major attention should be given to more accessible problems. The suggestion was made, for example, that science studies are now at a stage analogous to medicine's "descriptive and anatomical phase"—that science studies should be regarded as a technology rather than a science.

In an opening survey of the state of the art, Stevan Dedijer, head of a research policy program at Sweden's Lund University, warned that the study of science policy will be more effective if it doesn't develop too many pretensions too early. If the flashes of professorial wit at the meeting are symptomatic, the danger of a loss of perspective is not too great. (One researcher sending his regrets at being unable to attend noted that, since the meeting was ending on Guy Fawkes Day, it would be appropriate to have a paper read on the role of the explosives industry in the development of British parliamentary democracy.)

Dedijer made the point that one criterion researchers might usefully apply to their work was to ask themselves whether it provided any real assistance to those who make policy decisions.

The practical problems in the ambit of science policy studies are numerous and formidable. As the cost of R & D rises, every country must try to choose the best ways to deploy finite resources in money and manpower. How to organize national science policy apparatus, how to measure the productivity of research, how to improve the management of basic and directed research, have all become international problems.

That science, education, and the economy are vitally interconnected is now so generally recognized as to be a truism. But prescribing action in these areas involves science policy researchers and economists, dealing with unknowns and uncontrollables. The demand for answers here is most insistent, however, and nobody at the meeting disputed the assertion of one speaker that, at least for the present, science policy

studies will be the center of the science of science.

To the outsider it appears that those engaged in studying science are faced with the chronic problem of the social sciences: how to make research more "scientific" and, at the same time, more significant. At the Edinburgh meeting, because the host country is going through a protracted and fairly agonizing reappraisal of its governemntal science organization, the discussion kept swinging in that interesting direction and the dichotomy received little attention.

The two tendencies were apparent, however, in the documents and remarks prepared for the meeting. They are best exemplified perhaps in the work of Don K. Price of Harvard, who attended the meeting, and of Derek J. de Solla Price of Yale, who was expected but was unable to attend.

Derek Price's pioneering work in science policy is based on the analysis of expenditure, scientific publications, and manpower statistics. His *Little Science, Big Science*, with its central thesis of the exponential growth of science and the implications of this growth, is a milestone in science studies.

Don Price, who gave the inaugural address at Edinburgh, is the best-known exponent of a historical and institutional approach to the study of science policy problems. His books *Government and Science* and *The Scientific Estate* and his activities at Harvard have unquestionably played a large part in making science policy studies academically respectable.

While science studies will obviously continue to be the sum of these approaches, the tension between the two tendencies was put neatly, in conversation, by Professor Donald Marquis of M.I.T., in the pun "What Price science policy studies?"—JOHN WALSH

HEW: Gardner Proposes Reorganization

On 7 November, the day after Defense Secretary Robert McNamara captured headlines around the country with news that the U.S. troop buildup in Vietnam would continue but at a slower pace, Secretary of Health, Education, and Welfare John Gardner drew his share of attention by announcing a proposal for a "major and far-reaching reorganization" of his department. The two events were not entirely unrelated: both stories emanated from the Texas White House, where the President had gone to rest before surgery and to contrive a bit of preelection headline-snatching to which his leading officials were requested to lend their weight. The result in the case of McNamara was a statement that was quickly labeled a ploy to represent as a cutback what is in fact an increasing commitment of U.S. troops. In the case of Gardner, the result was the evidently premature unveiling of a reorganization plan as yet so undetailed in its formulation that it exists not as a document or blueprint but only in a corner of the Secretary's mind.

Despite precipitous announcement of the plan—in circumstances that belied the President's introduction of Gardner to newsmen as "a Republican [who] maybe . . . can discuss some of his plans without being accused of playing politics"—reorganization of HEW is something that has stood high on Gardner's list of priorities since he took over the Department; a great deal of serious thinking has already gone into it.

Gardner's proposal would remodel HEW along Pentagon lines, with three subcabinet-level departments each headed by a Secretary reporting to the overall Secretary of HEW. The departments —Education, Health, and Individual and Family Services—would condense functions and responsibilities now spread through eight major HEW agencies. Education would include the present Office of Education, together with responsibilities for manpower training and perhaps some related functions that are now handled elsewhere; Health would include the Public Health Service (including NIH), the Vocational Rehabilitation Administration, and the Food and Drug Administration; Individual and Family Services would take in the Social Security Administration (and the administration of Medicare), and the Welfare Administration together with its major constituent units such as the Children's Bureau.

In addition, the reorganization might ultimately transfer to HEW a number of related programs now handled by other agencies. If the Office of Economic Opportunity is dismantled for example—a recurrent rumor—the Department of Education would be likely to take over the administration of Project Head Start; the Department of Health, the Neighborhood Health Center program. Other federal activities that could conceivably find a new home range from the operation of Indian schools (currently a function of the Interior Department) to the development of new science and mathematics curricula (now supported chiefly by the National Science Foundation).

The plan for reorganization represents an instinct for bureaucratic rationality and, in addition, a desire for stronger departmental control over the independent agencies that comprise HEW. Whether that result can be attained will depend at least in part on whether the separate agencies are themselves reorganized internally and their functions redistributed. As it stands now, the individual units frequently undertake parallel or identical missions, each in a fashion befitting its own traditions, without coordination. Gardner has assembled what is perhaps the brightest and most creative group of men ever employed at HEW to work under him at the Department level; but, while they hold titles such as "assistant secretary," they are technically in a staff relation to the Secretary—not in a position of independent authority over the operating agencies (*Science*, 3 December, 1965). As often as not, what they say should happen fails to occur, and what they say should stop continues. Last year, for example, the two highest departmental health officials recommended funding of an experimental