reviews

Scientific R&D in France

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Le Pouvoir et la Science en France. By Pierre Papon. Pp. 315. (Editions Centurion: Paris, 1979.) Paperback Fr.65.

THIS book is one of the few detailed studies of the politics of scientific research and development in France. The author is professor of physics in one of the Grandes Ecoles, has been involved in the central planning machinery of French government, and is active in advising the French Socialist Party on matters of scientific research.

Professor Papon is extremely informative — the book is full of historical facts and figures; he is critical of French administrative procedures and again backs his criticism with much historical evidence; and in the last third of the book he steps back from the here and now to analyse, with an impressive grasp, the problems of method and objective involved in attempting to plan scientific research at all. Starting with the ideas of Bernal (from whose *Social Functions of Science* he quotes a long passage) he analyses very fairly the temptations, pitfalls and possible benefits of planning applied to science and development, and faces the inescapable conflicts between scientific research perceived as an autonomous liberal profession and science as a servant of the Commissariat au Plan.

An initial chapter reviews the history of the scientific profession in France; there is a tantalising glimpse of 'le grand patron' (he says of Pasteur that "il ne put faire triompher ses idées qu'une fois qu'il eût vaincu le scepticisme d'un patron important"), but that crucial species is not further analysed. Professor Papon then goes on to recount in detail the development and repeated changes in central scientific administration. As in Britain, the changes were many. A wilderness of advisory committees, both general and specialised, interministerial committees and delegations waxed and waned (though some, particularly the Committee of the Twelve Wise Men of which Professor Papon was a member, have shown great staying power). The CNRS, which sets up and finances research teams, and the DGRST, which administers studentships, fellowships and grants, together fulfil the functions of the SRC in Britain. Last year, the various bodies and committees were brought together under the aegis of a specialised Minister of Science — a condition which, for better or worse, Britain has not yet reached.

The author goes on to analyse in some depth the position of scientific research in universities and the Grandes Ecoles. Although recognising the major stimulus CNRS has given French science, he criticises it for having sapped the scientific independence of academic institutions: many CNRS laboratories are off-campus. The engineering Ecoles come in for special condemnation for having neglected research, and this is partly laid at the door of CNRS for being very fundamentally oriented, and partly attributed to the mathematical and analytical bent of the Ecoles, beginning with the nature of their competitive entrance examinations.

A substantial part of the book is devoted to research in industry and in the large quasi-industrial state institutions, especially the Commission à l'Energie Atomique, whose history is recounted in detail. This topic leads Professor Papon on to analyse de Gaulle's hostility to supranational (as opposed to bilateral) scientific arrangements, the cause of his unrelenting persecution of Euratom. A preference for bilateral or trilateral accords survives today: sometimes it works very well, as with the Airbus Consortium; sometimes badly, as with French attempts to foster the computer industry (again the story is told fully). Perhaps the crowning irony in French technological history, as Professor Papon describes, was the CEA's decision in 1969 to replace the home-grown graphite/gas reactors with American-style light-water reactors; Britain, which is more open to American suasions in general, has not yet been persuaded.

For a British reader, perhaps the most surprising claim made by Professor Papon is that it is virtually impossible for a research scientist or engineer to penetrate the top echolons of industrial management. He tells us that the R&D laboratory is a place of exile eschewed by ambitious would-be industrialists, and many Polytechniciens and other graduates of Grandes Ecoles, though trained formally as engineers, go straight into administration. We are often told in Britain that the French approach to engineering education as an elite enterprise ensures proper recognition of engineering skills at the highest level. Professor Papon's arguments suggest that this is only so if the engineers contrive to forget their professional origins. It would be instructive to have chapter and verse, and perhaps the Finniston Committee in the UK will provide it as part of their international comparisons.

Only part of one sentence in the book is devoted to the influence of research workers' trade unions, of which there are several in France. Could this have happened if the book had been written by an English socialist?

Professor Papon is often hard on his fellow-countrymen and on his country's institutions, but he generally documents his assertions, his reading has been catholic, and he freely makes international comparisons. This modestly priced book will be of interest and value to all those concerned with science politics, whatever their nationality. □

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Marine communities

Biogeography and Adaptation: Patterns of Marine Life. By G. J. Vermeij. Pp. 332. (Harvard University Press: Cambridge, Massachusetts, and London, UK, 1978.) £17.50.

THIS thought-provoking book is mainly concerned with the influence of biological interactions, especially predation, on the architecture of hard-shelled marine organisms and on the stability and biotic history of marine communities. It is divided into three main parts and is followed by an appendix, comprehensive reference list and index. The first part points out the occurrence of gradients in shell form of gastropods, bivalves and other organisms along latitudinal gradients and with depth below the high water mark. The author suggests that these primarily reflect anti-predatory defences which are developed to a greater degree and are found in an increasing proportion of species along a gradient from high to low