Langevin and Bernal to try to ensure effective planning, policy making, peaceful application of science, and proper training and conditions of work for scientists. Joliot first raised with Bertrand Russell the possibility of the organisation of a world conference of scientists against nuclear weapons which eventually led to the Pugwash Conferences. The first contacts of the reviewer with both Joliot and Russell were connected with this initiative.

In the post-war period, alongside activities of this kind, Joliot was deeply involved in questions of French science and nuclear energy policy. Soon after the liberation of France he was given the task of reformulating science research policy. He reorganised the National Fund for Scientific Research (CNRS), laying a basis for French scientific research that persists today. On the setting up in October 1945 of the French Commissariat for Atomic Energy, Joliot was appointed its High Commissioner and in this capacity was responsible for planning the highly successful first decade of the French peaceful nuclear energy program.

But Joliot's increasing commitment to the struggle against nuclear weapons led to a virulent campaign against him

in the French press and increasing pressure on the French Government to dismiss him. Eventually in 1950 his one time friend and colleague in the Resistance, Prime Minister Georges Bidault, delivered the *coup de grace*.

Joliot was a sensitive man and his dismissal and the abusive and deeply wounding insinuations that accompanied it saddened his last years. Certainly Irene, to whom he was devoted, and possibly he himself, suffered from the effects of radiation. He died in 1958, surviving Irene for two years.

This is a significant book and successfully portrays the warmth, greatness and vision of its subject. Some parts read as excitingly as a detective novel, as when it describes how Joliot's foresight and initiative led to his arranging for France to acquire the whole Norwegian stock (~ 180 litres) of heavy water to prevent its falling into German hands; and then arranging for its transfer to Britain, just ahead of the Nazi invasion of France. This was a signal contribution to the Allied cause for which he received scant recognition when he was refused permission to enter Britain in 1950 to attend the Sheffield Congress of the Partisans of Peace. Again there is the account of

his courageous work in the French resistance, especially in the preparations for the Paris rising of 1944, for which his laboratory organised the supply of munitions.

But the key question that will be raised by the book and one that still confronts us today is the way in which the scientist must reconcile his duty to his profession of scientific research worker with his responsibility to society as a whole. Joliot had to make this decision under circumstances of very great difficulty and there will certainly be differences of view concerning the correctness of his choice. If, however, the 500 million signatures of the Stockholm Peace Appeal helped significantly to prevent the further use of nuclear weapons then surely one must conclude Joliot's choice was the correct one. □

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Marine mussels

Marine Mussels: Their Ecology and Physiology. (International Biological Programme 10.) Edited by B. L. Bayne. Pp. xviii+506. (Cambridge University: Cambridge and London, June 1976.) £22.

THIS excellent volume is strongly recommended for purchase by universities, polytechnics, museums, and marine biological research stations, on a worldwide basis. It will be an indispensable tool for professional biologists who are concerned with biology of bivalve molluscs, or productivity of coastal waters, and who can afford the price. It will form a stimulating basis for university courses in marine biology.

The editor and authors are to be commended for their lucid, narrative style, for every chapter makes interesting reading. The authors' authority lies in their own contributions to the literature. They comprise: Sir Maurice Yonge (The 'mussel' form and habit); R. Seed (Ecology); D. Roberts (Mussels and pollution); B. L. Bayne (The biology of mussel larvae); B. L. Bayne, R. J. Thompson and J. Widdows (Physiology I, II, Physiological integrations); P. A. Gabbott (Energy metabolism); J. S. Levinton and R. K. Koehn

(Population genetics of mussels); J. Mason (Cultivation).

Mussels have a global distribution in coastal waters and estuaries, and provide a major part of the world crop of bivalve shellfish; and they are important components of their ecosystems. The book deals with the whole range of biology of mussels—how their physiological attributes equip them for their environments and the variables with which they contend. We are informed on the biology of mussel larvae, their food preferences, primary settlement, and subsequent movement to beds of adult mussels. Growth rates at different tidal levels, predators, and parasites, are considered in turn.

Physiology of nutrition, and respiration, and the functioning of the vascular and excretory systems are studied in depth. Physiological features are related to the ecological setting—for example, the ability of mussels to acclimate their filtration rate and oxygen consumption (but not heart beat) to short-term fluctuations in temperature and ration.

Seasonal changes in biological composition of mussel flesh, food reserves, metabolic pathways, and control mechanisms are considered, the last with reference to compensation for environmental change. Population genetics, with reference to isoenzymes, reveals variation on a geographic scale,

and also on a small scale within an estuary or tidal flat.

Consideration is given to pollutants, and to purification before marketing; care must be taken against paralytic shellfish poisoning arising from unusual blooms of *Gonyaulax* or *Gymnodinium*. The book ends with a review of mussel cultivation in Western European seas.

The book is illustrated by 142 text figures which are commendably clear; most of these are graphs and line diagrams, but there are also some good photographs. The reference list, which must contain about 1,500 entries, will be a valuable tool in itself. There is a good index.

Typographical errors are rare. The Reviewer regrets the general misuse of the word 'visualisation' by chromatographers, and the increasing mistreatment of 'data' as a singular noun; and he is disappointed to find both these usages here. What, incidentally, is 'vagile' (p 358)—it is not in the reviewer's copy of the Shorter Oxford English Dictionary. **R. D. Purchon**

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