

elements that must be taken into account in reaching a decision. There are obligations here for the Government as well as the scientist—questions of communication—and it is entirely appropriate that the adequacy of the arrangements should be considered by such a body as the Trend Committee. They are not, as Mr. Mitchison suggested, being asked to take political decisions, but rather to report on the adequacy of the arrangements for ensuring that the scientific and technical aspects of a problem are correctly presented to the Government as a basis for decision.

What, of course, could be observed is that some such inquiry might well have been instituted much earlier and also that although the Zuckerman Report has been accepted as laying down a standard of practice, its recommendations appear to be put into practice very leisurely. It is to be hoped that further delay will not result from the recent reconstruction of the Government, and since the Minister for Science and his Parliamentary Secretary have retained their offices, they should at least do their utmost to ensure that delay is kept to a minimum. Moreover, there is a large field in which it would seem that the final responsibility rests with the Minister for Science and that he alone is to be held responsible for any delay or failure to correct recognized weaknesses. The debate in the House of Commons at least affords a pointer to some prodding that he might institute forthwith.

NUCLEAR POWER FOR INDUSTRIAL PURPOSES

Nuclear Power Today and Tomorrow

By Kenneth Jay. Pp. viii + 270 + 16 plates. (London: Methuen and Co., Ltd., 1961.) 25s. net.

IT is just twenty years since Enrico Fermi's atomic pile went into action in Chicago and in that twenty years unprecedented effort, whether measured in money or in number and quality of scientific investigators, has been spent in the development of large-scale installations for producing from nuclear energy a supply of electrical power on the scale required by modern industry and modern domestic needs. A large number of technical books have appeared in recent years dealing both with the general range and with particular aspects of the new subject of nuclear engineering. Hitherto, however, there has been lacking a book, accessible to readers with no particular knowledge of nuclear matters or of engineering, which gives an accurate and authoritative account of what has been accomplished in the field as a whole and what may be reasonably anticipated. This need is now supplied.

The book before us makes clear, in the first place, the scientific foundations of the subject, in particular the reaction with appropriate nuclei of the neutron: "This incredibly tiny, electrically uncharged, particle is in fact the key to the new age", as the author says. He develops the theme with a skill and happy phraseology that makes the subject simple, explaining such matters as the difference between thermal and fast reactors; the types of nuclear fuel, uranium isotopes and plutonium, that can be used; and the

different possible processes involving them. Having pointed out that only nuclear fission, and not nuclear fusion, is in question in these industrial applications, he calls the type of nuclei which can be split "fissile fuel", in contrast to coal, which is fossil fuel.

The all-important question of cost, especially capital cost, of nuclear power is considered in comparison with that of ordinary electrical power generation. The subject is a complicated one, but the various factors which have to be borne in mind are set out with admirable clarity. The author then proceeds to give a survey of the nuclear power programmes of the countries most active in the field, namely, the United Kingdom, the United States, the U.S.S.R., Canada, France and Federal Germany. The existence at Winfrith in Dorsetshire of an installation, supported by international collaboration, for developing a particular type of gas-cooled reactor will come as news to many.

The general functions of moderators, coolants and pressure vessels having been described, the different classes of reactor systems, with their peculiar advantages and difficulties and the circumstances which determine them, are discussed in some detail—the gas-cooled graphite-moderated reactors, hydrogen-moderated systems, fast reactors, the sodium-graphite systems and liquid-fuelled reactors. The way in which the essentials are selected bears witness to the width of the author's knowledge: it requires much less understanding to give every detail than to set down just what is material. The last chapter deals with general questions involved in developing a reactor, such matters as radiation damage to fuel and metals, safety and other outstanding problems being discussed.

The diagrams representing in outline the various processes are excellently designed and executed, there are a number of photographic plates showing reactors as a whole and details of construction which bring home the nature of the installations; there is a glossary of technical terms in which the reader will find at once what is meant in the reactor world by, for example, breeding. An additional recommendation is that the price is very moderate. The author is to be congratulated on outstanding success in a very difficult task, having provided an account of the complex subject which is at the same time comprehensive and comprehensible.

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BIOPHYSICS AND MOLECULAR BIOLOGY

Molecular Biophysics

By Richard B. Setlow and Ernest C. Pollard. (Addison-Wesley Series in the Life Sciences.) Pp. xiii + 545. (London: Pergamon Press, 1962.) 84s. net.

BIOPHYSICS has been defined as the application of the concepts and techniques of physics to biological problems, often with the instinctive approach of a physicist who believes that thought, inspiration and experiment can pick out the essential elements underlying apparently complex phenomena and may often provide satisfyingly simple ways of accounting for them. Molecular biology is concerned with the basic properties and interactions of biologically important molecules, studied by whatever approach—biophysical, biochemical, genetical—seems most opportune, and this large and ambitious book