

work which demonstrates clearly both the conflicting interests and the intrinsic problems facing those who would see coastal areas managed rationally. It is unashamedly devoted to the problems of the USA. As such, knowledge from other sources is not used fully and thus its value to the cosmopolitan audience may be reduced. Truly outstanding is the exposition by E. A. Pearson of the issues which face the would-be manager of effluent releases. Too often, treatment and the pipeline have been regarded as mutually exclusive solutions to the waste disposal problem; that this is not so is adequately demonstrated in this clear account. E. J. PERKINS

## Matter and Life

*Molecules to Man.* By Sir George Porter, Richard J. Harrison, Paul R. Ehrlich, D. C. Phillips, G. V. J. Nossal and Chapman Pincher. Pp. 410. (Heinemann: London, December 1972.) £2.90.

SOME thirty years ago a series of talks introduced by Sir William Bragg were published by the BBC. Their intention was to show the continuity of principle between studies of atoms and molecules and the behaviour of genes, cells and organisms. The same idea seems to underlie the series of lectures at the University of Sydney which are collected in this book.

It certainly underlies the introduction by Bragg's successor, Sir George Porter, with his elegant account of theories of matter and of life. These connect very neatly with the nucleic acids and proteins which Professor Phillips uses to authenticate, as it were, the mechanism of heredity. Perhaps genetic principles are taken too much for granted at this point, for at the next step we find Professor Nossal grappling with immunity, a problem the crux of which is variation as much as heredity. Indeed, Burnet's theory of clonal selection among variant cells may be seen as assuming three levels of genetic control in variation. But it leads us to ask which of these levels are in the nucleus and which in the cytoplasm, which operate through DNA and which through RNA.

Nossal passes on to connect the immunity system and the study of cancer. He separates cancer induced by chemical carcinogens, cancer propagated by viruses (or proviruses), and cancer as an embryonic property. In immunity reactions these classes may differ but need they be mutually exclusive? Nucleus and cytoplasm as places of origin must be mutually exclusive. This separation is the inescapable one.

From immunity it is a long jump to the environment. Here Professor

Ehrlich is concise and effective. His arguments are by now well known. But behind the visible issues are conflicts of vested interest which need to be better known. They are of two kinds. One is between rich people or advanced countries who produce (and consume) too many goods and poor people or backward countries who produce too many children. The other conflict is between people who are accused of exploiting the physical sciences to the damage of the environment, and people who, mainly on biological evidence, make this accusation.

To recognize these conflicts is to take one step towards resolving them. A second is to recognize that beneath them are instincts for competition between people who firmly believe that they differ in intelligence. Such properties, whether of competitiveness or intelligence, have dominated man's past and, since they are inherited, they are not likely to be dismantled by exhortation. They therefore threaten us with uncontrollable dangers as the world's population approaches the limit which Ehrlich foresees.

To conclude, Mr Chapman Pincher gives his candid views on what the public should be told about science. He reveals the dilemma of the communicator who has to believe in the education of the masses (our masters, he says) although their demand for horoscopes makes him doubt the good it has done them. What they want is stories of sex reversal, instances of sex violence, and perhaps arguments for sex equality. Some of these Mr Pincher is able to provide.

At this point the reader may turn back to the middle of the book. Here there might have been some biological evidence which would have helped the discussion of sex in a serious way. Instead a hundred pages have been inserted on porpoises, pages unconnected with the rest of the book. It is as though the editor wished to persuade us that the appearance of design in his compilation was quite accidental. But perhaps indeed there was no editor.

C. D. DARLINGTON

## "Pop" Propellants

*Ignition!—an Informal History of Liquid Rocket Propellants.* By John D. Clark. Pp. xiv+214. (Rutgers University: New Brunswick, New Jersey, March 1972.) \$10.

THE title of this book is a little misleading, for the dominant topic is propellant chemistry rather than the "ignition" problem, and in my view the suggestion that the contents are "informal" is an understatement. The style is often personal to the point of

embarrassment, though it certainly conveys the atmosphere behind the security curtain which usually screens this field of science from the general public.

The author, Dr Clark, was a senior propellant chemist with the United States Navy and Army for more than 20 years and is well qualified to explain the development of various rocket propellants from contemplation to completion or more frequently catastrophe! In many instances the workers are in an exasperating situation which, as usual, is funny to the onlooker (remember the case of George's shirt in *Three Men in a Boat?*), and while reading these sections I received many doubtful glances from fellow rail passengers. In order to follow large parts of the text, a knowledge of organic chemistry to at least "A" level is required, and the layman would have to be particularly interested in rockets to plough through all the material. The book should, however, be read by anyone with a degree interested in entering the aerospace, propellant or explosive fields, since it contains a lot of background information which is difficult to obtain elsewhere.

Students of the history of science will find the content strongly biased to the American achievements, and even these are regarded from the service rather than the university or industrial point of view.

The presentation is generally pleasing, with few typographical errors. However, I would have appreciated more photographs and diagrams.

In conclusion, the publication of this book gives an intriguing insight into the propellant community upon whom it undoubtedly exploded.

J. SWITHENBANK

## Mathematical Russian

*Russian for the Mathematician.* By S. H. Gould. Pp. xi+211. (Springer: Berlin and New York, 1972.) 27.60 DM; \$8.80.

THIS book is the outcome of a project, sponsored by the American Mathematical Society, for a "crash course" in Russian, precisely adapted to the needs of mathematicians.

In the resulting course, compiled during a nine-months leave of absence from his duties as Editor of *Translations for the American Mathematical Society*, Dr Gould has approached a difficult task boldly, and with due attention, not only to the linguistic needs of his potential readership, but also to their intellectual aptitude. Basing his method on the assumption that "the vocabulary of the Russian language . . . makes a particular appeal to the