

Book Reviews

EDUCATION OR INDOCTRINATION?

The Teaching of Science

Education, Science and Society. By F. R. Jevons. Pp. 208. (Allen and Unwin: London, April 1969.) 40s boards; 25s paper.

THAT this fascinating book should be written now and that the author should hold a chair of liberal studies in science are symptoms of a contemporary situation as entirely uncomprehended by 20th century narrow specialists as it was unforeseen by the giant pioneers of science and engineering of the 19th century. To the latter, the pursuit of science not only served to satisfy a basic human curiosity but also offered a seemingly limitless power over man's physical environment. Even Thomas Carlyle, not one who would be considered to be naturally euphoric, thought that this potentiality to control the world was the distinguishing characteristic of the human animal, and in 1831 made his famous Professor Teufelsdröckh say:

"(Man is) weak in himself . . . feeblest of bipeds . . . Nevertheless he can use Tools, can devise Tools: with these the granite mountain melts into light dust before him; he kneads glowing iron, as if it were soft paste; seas are his smooth highway, winds and fire his unwearying steeds."

The confident view of the Victorians that to study science is obviously a virtuous act was applauded by all sections of society other than Luddites or religious obscurantists, and has persisted to the middle of the 20th century. Moreover, for many years it was commonly assumed that the young possess an intrinsic desire to learn about science and only recently have we heard of Dr Liam Hudson's romantic "divergers" to whom science is a presumed anathema. Consequently, to ensure the wider spread of scientific knowledge and thereby hasten Utopia, it appeared to require only the provision of human and physical resources to establish science subjects as regular elements in the school curriculum. It was felt that no one would disdain to imbibe the heady liquor from this cup of scientific knowledge knowing that it contained an elixir conferring in equal measure potency and wisdom on the drinker.

Alas, events in the second half of the 20th century have shown all too plainly the danger of this complacent attitude and the pedagogic errors to which it has led. Because we failed to identify agreed social goals and to understand the effects of science on society, we have too frequently allowed science to be misapplied. It is small wonder that, sensing this, the present younger generation increasingly argues that, because the advance of science may create many social problems to which it seems to offer no solution, it can no longer be taken as axiomatic that the study of science is desirable. Indeed, the argument goes further by suggesting that the study of the nature of man is more urgent than the study of Nature by man.

Many of us older scientists must accept some degree of culpability for this situation. We did not give sufficient thought to the problems of science and society. In our headlong and, let us admit it, fascinating search for new knowledge we never held up a mirror to our own activities, nor reflected seriously on science teaching at all levels. Unthinkingly we have permitted rampant specialization

and fragmentation of the curriculum even at school level, and the development of quite artificial subject boundaries. It may surprise readers of *Nature* to know that, excluding mathematical subjects and history and philosophy of science and handicrafts, there are now eighteen subjects classified as science which may be presented for examination at O-level in the General Certificate of Education. We have allowed the syllabuses to become overloaded with unimportant material and too frequently let examination marks be the reward for passive acceptance of revealed doctrine. Is it really a matter for surprise that secondary school pupils, an increasing fraction of whom have enjoyed in their primary schools the discovery method of learning about science, find their enthusiasm diminished, and in some cases totally quenched, as they move through the secondary school—or that university students given the option, as at Keele, vote "with their feet" against science?

Professor Jevons's book must be seen in this context. Its appearance is timely and the subtitle "Education, Science and Society" entirely appropriate. He has done a considerable service to the cause of science education in emphasizing the interrelationships linking these three elements. This small volume contains so many ideas which deserve comment or fuller development that the only adequate review would be another book. This is praise rather than criticism, for even those readers who, unlike myself, do not share many of Jevons's views will, nevertheless, be unable to remain indifferent to them, and it would be a totally insensitive reader who was not provoked to ask himself at least once "What is the educational purpose of my lectures and classes?", "Am I achieving it?", "When did I last really try to rethink the purpose, content and mode of presentation to meet the needs of students today?". I recommend the book to every teacher, researcher and exploiter of science as a stimulus to self-interrogation about his own activity, about the future of his subject and its relation to other areas of study outside, as well as within, science. Some purists are likely to be irritated by some of the author's assertions, but I would guess that much of their irritation would melt before the evident concern of Jevons for students as people which pervades the whole book. Who could resist the warm humanity behind the phrase ". . . the educator must keep at the forefront of his mind that he is teaching students rather than subjects, and for their own sakes . . ." ? Those of us who are teachers know that our real job is to issue to our pupils an attractive invitation to take part in science so that they will wish and be able, with our help if necessary, to learn for themselves. We also know that in recent years we have been less successful than we would wish. Jevons's book may help some of us to discover why, and we must do the rest.

F. S. DAINTON

EXPANSION FOR WHAT?

The School that I'd Like

Edited by Edward Blishen. Pp. 171. 4s.

The Hornsey Affair

By Students and Staff of Hornsey College of Art. General Editor, Willem van der Eyken. Pp. 220. 6s.

The Impact of Robbins

By Richard Layard, John King and Claus Moser. Pp. 153. 6s.

(Penguin Education Specials.) (Penguin Books: Harmondsworth, 1969.)

THESE three Penguins discuss different aspects of the same educational situation. Blishen, who has for many years been one of those who has been introducing new ways of teaching English in secondary schools, has collected a group of short essays and aphorisms by