BOOK REVIEWS

Snippets of science

Donald S. Fredrickson

Puzzles, Problems and Enigmas: Occasional Pieces on the Human Aspects of Science. By John Ziman. Pp.373. ISBN 0-521-23659-2. (Cambridge University Press: 1982.) £12.50, $24.95.

LEXICOGRAPHERS have been slow to embrace them, but John Ziman's inventive nouns, such as *consensibility*, enjoy status among those who appreciate insightful views of the workings of the scientific community. Professor Ziman's readers will be pleased by the arrival of a new compendium of "occasional papers" from the pen of the well-known communicator of science, whose views on the subject come from a position inside it, as Director of the H.H. Wills Physics Laboratory, and from outside it, in his capacity as Chairman of the Council for Science and Society.

This new Ziman release consists of 42 essays, book reviews, BBC broadcasts and other comments written in the years between 1956 and 1979. So eclectic a pudding naturally varies in consistency, but *Puzzles* is chock-full of tasty quotes and observations. A thorough index permits selected sampling and enhances the reference value of the book.

The articles are grouped in eight sets, the largest of which deals with intellectual and social aspects. Of these papers, "Science is Social" (1960), and "Is Science to be Believed?" (1979), represent, respectively, the conceptual birthplaces of *Public Knowledge* (Cambridge University Press, 1968) and *Reliable Knowledge* (Cambridge University Press, 1979), the books by which Professor Ziman is best known to the public and most scientists. None of the short pieces here provides the satisfaction of a thesis fully developed in the manner of the books. There is a different kind of pleasure to be had, however, in scanning the author's broad range of interest in science: research as an art and as a profession, science in the Third World, scientific communications and education, relations with Soviet science, and the confrontations between science and society.

In only two of the essays does Professor Ziman's control of his subject seem to falter. In "Some Pathologies of the Scientific Life" (1971), rage directed against conscious deceit by a few scientists ends, curiously, with a peevish apology for being trivial. And in "From Parameters to Portents — And Back" (1978), he flails unconvincingly at the immensely popular pastime of judging scientific productivity through manipulation of quantitative indicators. We are led deeper and deeper into a bewildering maze of output/input measures which defy comprehension. By the time Professor Ziman's "geometrical metaphor" has reached the *cognitive dimension*, one imagines panels of science advisors groping for the exits. As the essay comes to rest on the observation that "particular indicators may involve circular arguments, but the whole enterprise is not spherically senseless", we sense a talent for farce that merits cultivation.

Such rare excursions aside, John Ziman appears in this volume as a graceful and lucid reviewer, a clear thinker and a most perceptive observer of a profession to which he is intensely loyal. He is at his best in explaining the personal, intuitive and subjective sides of science, especially how they relate to the intellectual transactions which characterize science as a "social product". The lectures on science in Third World countries reveal sensitivity and good sense. Perhaps the best piece in the collection is a recent essay, first published in 1978, on "Solidarity Within the Republic of Science". It is an appeal to scientists and their organizations to recognize that the universality of their community requires more positive action in defence of human rights and scholarly freedom. It is a form of *consensuality* most in accord with the ultimate purpose of science. □

Donald S. Fredrickson is Scholar-in-Residence at the National Academy of Sciences, Washington DC.

Scientific prince of a Victorian kingdom

Roy MacLeod

John Tyndall: Essays on a Natural Philosopher. Edited by W.H. Brock *et al.* Pp.219. ISBN 0-86027-008-4. (Royal Dublin Society, Ballsbridge, Dublin 4, Ireland: 1982.) Ir£10 plus Ir£1.50 post and package.

ASIDE from those whose experience of school physics may recall the mysteries of the Tyndall Effect, the work and influence of the eponymous successor of Faraday is virtually unknown to students of the present generation. Even fewer will recall that Tyndall was, both by birth and by political commitment, an Irishman of the Orange persuasion. Both facts receive belated but welcome recognition in this third volume of the new *Historical Studies in Irish Science and Technology.*

"Science is before long to rule the world", observed *Vanity Fair* in April 1872, "and Mr Tyndall is one of the pioneers of the kingdom". Whether as public lecturer, experimentalist, Alpinist, examiner, educator or advisor to government, Tyndall was among the best known and most cited publicists of Victorian science. Beginning with his *Heat — a Mode of Motion* in 1863, continuing with his *Fragments of Science for Unscientific People* in 1871, and with his *New Fragments* in 1893, he spoke to a traditional culture which, in his view, required a fresh and dynamic appreciation of Nature's wonder and a willingness to apply man's new knowledge of natural phenomena to the purposes of social reform. With Huxley, Hirst and Spencer, he popularized the radical research programme which became associated with the principles of "scientific naturalism", denying the inevitability of materialism, yet rejecting the fetters of religious belief that would limit the domain of scientific knowledge. By his death in 1893, Tyndall's road to agnosticism was well travelled by many who had neither read nor heard his words. With others of the famous X-Club he preached a liberalism that reached beyond party (especially beyond Gladstone after 1855); an Emersonian independence of mind that spoke directly to the working men of England; and a Carlylean hatred of sham that bore witness to the abiding power of the scientific imagination.

Tyndall's own imaginative grasp, and his range of international interests, gave him a wide, if not always a deep command of scientific work in many fields and across the world. His famous lecture-tour in America in 1872–1873 is still commemorated by research studentships created in his honour. In his scientific work personal friendships mattered greatly to him; and a profoundly happy marriage, late in life to Louisa Hamilton, has left us, through their