brusque rejection of the Plan as by the inadequacy of the Government's whole approach to such problems. Mr. Marples declined to consider it as an alternative to the inland route for the motorway to Scotland and intends to proceed with the route running east of Shap through Tobay.

Mr. Marples did not dismiss entirely the coastal route over the barrage, but while he emphasized the importance of the time-factor, he was more than a little naïve in suggesting that the barrage route must be considered as a regional project. Mr. Medhurst's lecture makes nonsense of that idea and Mr. Marples's hasty refusal should stimulate the technical colleges and universities in the north-west to take up urgently Mr. Medhurst's suggestion and undertake some of the research needed within the scope of the scheme, presenting the findings to the Government with a request for combined regional action. Meanwhile, Mr. Marples's decision should be firmly challenged, and every effort made to expedite the surveys and enquiries which are necessary before technical decisions on the scheme can be reached. It is also essential that the full implications of the scheme, not only in respect of road transport between England and Scotland but also no less in respect of water supply for Lancashire, and the revival of industrial west Cumberland, not forgetting the marginal implications in respect of agriculture and land utilization, should be brought to public understanding. If such a scheme is to be rejected it should be in a rational perspective and not through departmental myopia.

A GREAT ENGLISH BOTANIST

Joseph Dalton Hooker

Botanist, Explorer, and Administrator. By Dr. W. B. Turrill. (British Men of Science.) Pp. xi+228+25 plates. (London: Thomas Nelson and Sons, Ltd., 1963.) 21*s*. net.

JOSEPH DALTON HOOKER was twenty-two at the start of his Antarctic voyages in 1839: in 1911 his botanical work came to an end only a few months before his death at the age of ninety-four. From that long life one can select four chapters for comment: Antarctic botany, Indian botany, the association with Charles Darwin, and the directorship of Kew. Any one of these would rightly give Hooker a place in the series, *British Men of Science*, and Dr. Turrill's achievement in condensing all this, and more, into 228 pages is considerable. Author, editor and publisher all earn our gratitude for presenting, at a reasonable price, this concise and interesting account of a great botanist.

The Antarctic and Indian phases are well summarized and numerous passages in Hooker's own words add authentic flavour to the story of the discomforts and the rewards of pioneer botanical work in the field. Hooker not only wrote vividly of his experiences, he was always busy with his sketch books, and selected pages from these provide the most attractive illustrations in this volume. In telling us of Hooker and his work, Turrill says enough about the items he selects for comment to make them botanically informative. For example, Hooker's account of the Kerguelen cabbage (*Pringlea antiscorbutica*) is brought up to date with more complete information on its distribution and vitamin C content. Throughout, there are frequent references to more recent evaluations of Hooker's data, so that the student who reads these pages is in no danger of coming away with a lot of out-of-date ideas. Not that Hooker's views on classification or plant distribution need much modernization; perhaps only his positioning of the gymnosperms (as on pp. 81–82) now seems grossly inaccurate.

One amusing point in the preparation of this review may be mentioned. I found (p. 60) what seemed to be a very surprising statement: that the upper limit of *Pinus longifolia* (= *P. roxburghii*, the *chir* pine) in Sikkim was at 2,500 ft. This seemed incredibly low. Surely there must have been a slip somewhere? But no; Hooker carefully records that it is restricted to this altitude in southern Sikkim because it is a plant of the dry hills: elsewhere it may ascend to 7,000 ft., but only where its habitat is found at that height. Southern Sikkim above 2,500 ft. is too wet for this species. Hooker was not known as an ecologist: the term was not yet in use.

The enigma of Hooker's life, as Turrill brings out quite clearly, lies in the nature of his scientific thinking between 1844, when he read Darwin's preliminary essay, and 1859, when the publication of *The Origin of Species* threw Darwin's views on evolution open for public discussion. Excerpts from Hooker's writings of this period are quoted, and these show that he was by no means fully satisfied with the idea that species were immutable, yet for practical purposes he did accept them as fixed entities. Did he feel obliged, out of loyalty to Darwin, to suppress his own thinking on this subject? Or was he, in fact, so fully occupied with prosecuting his practical classificatory work that the theoretical side did not greatly concern him? Hooker was Darwin's friend and his adviser on botanical matters and provided him with many taxonomic (and phytogeographical) data. They were in constant communication. One can scarcely avoid the conclusion that Hooker was content to stick to taxonomy and leave evolution to Darwin. When Turrill (p. 212) seeks reasons why Hooker did not, after his open acceptance of Darwin's views, "attempt to work out a classification of plants on evolutionary principles", he surely misses a simple point. Darwin had provided the evolutionary explanation, in acceptable terms, for Hooker's taxonomic facts. What need was there to alter the taxonomy?

Turrill's own association with Kew ran from 1909 until his death in 1962 and, although he met Hooker but once, he lived surrounded by the Hookerian tradition. Naturally, therefore, he gives due attention to Hooker's achievements as director of Kew. Yet here one is conscious of the biggest gap in this biography. Hooker's lasting influence on Kew was not in re-organizing the Gardens' water supply, not in the extension to the Herbarium nor in planting the Cedar Avenue. He did not build Kew with pipes and bricks, nor even with plants: but with men. Daniel Oliver, J. G. Baker, Sir William Thiselton-Dyer, W. Botting Hemsley, Otto Stapf—these were the men Hooker gathered around him at Kew, yet they scarcely figure in these pages. W. B. Turrill was in the direct line of succession; it is strange that he failed to recognize in them the final proof of Hooker's greatness.

B. L. BURTT

HAZARDS OF SMOKING

Smoking and Health

Report of the Advisory Committee to the Surgeon-General of the Public Health Service. (U.S. Department of Health, Education and Welfare: Public Health Service.) Pp. xviii+387. (Princeton, N.J.: D. Van Nostrand Company, Inc.; London: D. Van Nostrand Company, Ltd., 1964.) 27*s*. 6*d*.

IN 1963 the Surgeon-General of the United States Public Health Service set up an advisory committee to undertake a comprehensive review of all data on smoking and health. This book represents the fruits of their labours. It is in fact the latest in a series of evaluations of the evidence relating smoking and health which have been published during recent years. It covers much the same ground as the report on the same theme