

light controllers to race-course totalisators, in order to show the importance and versatility of automatic machines for handling information. The component parts of such machines are simply the storage mechanisms and arithmetical units, etc., already described in Section 2, but connected in a particular way to suit a particular purpose.

Section 5 is mainly an account of a very simple machine (SIMON) which the author (E. C. Berkeley) built to illustrate the principles on which full-scale machines operate. The machine employs electro-mechanical relays and is almost small enough to be regarded as an educational toy to be built from a 'home-construction kit'. Section 6 describes some of the machines which have now become commercially available in the United States (and in Britain, too, if people can afford them). These include the UNIVAC, I.B.M. types 701, 702, 704, 705, and the ERA 1103.

Section 7 discusses possible applications of computers and is probably the most fascinating part of the book. The authors start by listing the occupations in which people earn their living chiefly or partly by (routine) mental work, and considering to what extent they can be replaced by machines. All kinds of business applications are suggested, including payroll computation, sales analysis, production scheduling and stock control. It will be clear from this that their use in computation laboratories, which is to a large extent the main location of such machines in Britain, will account for only a small fraction of their total employment. Moreover, if digital calculators are linked up to other kinds of machinery, for example, machine tools, then it is possible to envisage a very wide field indeed (automation).

Section 8, the last part of the book, contains a list of references to books, periodicals and other sources of information about automatic digital computing machinery, a list of organizations (mainly in the United States) making computers, and finally a glossary of terms and expressions used in the literature.

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## ECONOMIC ASPECTS OF FORESTRY

### Economics of Plantations

By W. E. Hiley. Pp. 216. (London: Faber and Faber, Ltd., 1956.) 25s. net.

### Profitable Forestry

By Lord Bolton. Pp. 126 + 9 plates. (London: Faber and Faber, Ltd., 1956.) 15s. net.

ONLY a few years ago it would have been true to say that there was a serious dearth of English books on forestry. Schllich's famous "Manual of Forestry", published in five volumes between 1889 and 1896, with later—not very basically—amended editions of the two more popular volumes on "Silviculture" and "Management", was until the 'twenties the only comprehensive account. During the 'thirties the one important addition was Hiley's "Economics of Forestry" (1930), though a series of American monographs on the major aspects began to appear from the McGraw-Hill Publishing Company. Of books suitable for the interested layman, we had only Ackers's "Practical British Forestry" (Oxford Univ. Press, 1938). Of recent years, however, there has

been a rapid advance, particularly in the category of books aiming at presenting the major issues of forestry to the important class of owner-managers and land-agents. Now within a year we have from the same publisher two books by very well-known authors, one writing chiefly for the professional and the other for the amateur, describing and discussing the financial and economic aspects of forestry with special reference to conditions as we have them in the United Kingdom.

Hiley's new book is a natural development of part of the earlier one referred to above and his "Woodland Management", making a most thorough examination of the relative returns to be expected from plantations under the wide range of conditions encountered in practice, and the range of species and treatments that appear to be suitable for a given site. As indicated on the dust jacket, the author concludes that "we might halve the cost of growing trees of sawmill size", as compared with current practice, in both State forests and private woodlands. The means for doing this are three-fold, namely, more appropriate choice of species to be grown, much heavier thinning procedure, and shorter rotations. The implied criticism of State forest policy, or at least practice, is severe, though it is admitted that there are complications and practical difficulties such as quality of land available, amenity considerations and the prescribed requirement for holding a large standing stock of timber against a natural emergency. In Hiley's view, his recommendations could usually be applied without significant infringement of these requirements, and despite the limitations involved. Foresters are very well aware that they can obtain far better plantations and get much better returns on good land than on poor land, and that from the economic point of view a considerably higher price for the former—higher than tends to be viewed as the present acceptable limit—is justifiable. The rejoinder that it is not the national policy to compete with agriculture for the better land must be accepted, but Hiley is justified in insisting that on much of the poorer land a profit should be possible under his methods where at present there seems little or no chance of any. The case is certainly made out for systematic research to determine how far these procedures will give satisfactory results under the poorer conditions, the doubt chiefly concerning the tree's power of rapid response to more growing-space.

Lord Bolton, with his long experience as a leading owner-manager, is in full agreement with Hiley on the question of the need for heavier thinning. There are also good grounds for his view that there is an urgent need for improvement in methods of marketing timber and other forest produce, which have been even more neglected by the owners than has thinning; inadequacies in this direction have been a major factor in the widespread belief that forestry does not pay. Individual markets should be sought and middlemen avoided, and the opinion is expressed that sale by private treaty has points over sale by tender, because goodwill is so important in times of low prices and poor markets. In view of the fact that 82 per cent of British woodlands are in private ownership, Lord Bolton's book should be of considerable importance not only in giving an interesting and easily read general account for the interested layman, but also for the stress put on the practical aspects of the work. It should be encouraging to the hesitant that he is able to illustrate many important points from his own confessed mistakes.

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