

AFFORESTATION OF UPLAND HEATHS

FORESTRY Commission *Bulletin* No. 32 purports to deal with what are termed 'upland heaths', which are said to occur along the eastern side of Scotland and northern England, and to be distinguishable from lowland heaths formed farther south*. They are distinct from the peat-covered lands in the western parts of the country, which were the subject of an earlier *Bulletin*—No. 22—by the same author, entitled: *Experiments in Tree Planting on Peat* (H.M. Stationery Office, 1954). It reviews experimental work carried out over a period of thirty-six years during 1921–57, and records all that was attempted by the Forestry Commission, "with an assessment of the results so far".

The last phrase gives the clue to one of the major obstacles which research workers encounter when they undertake experiments on a field scale with the view of improving silvicultural and management techniques. It is not possible to bring such experiments to a conclusion within less than a century, especially when they are conducted on such infertile sites as the degraded forest soils of early centuries, now covered with ericaceous vegetation, which go by the name of heaths. These soils, it is now generally accepted, have arisen as a result of forest destruction in the past, and of repeated burnings and heavy grazing which have killed off the woody vegetation. Whatever the original composition and structure of the former forest soils may have been, these have been lost, and the problem of the restoration of the soils to their original relatively fertile state is immense.

Since these heath sites are almost entirely unproductive from an agricultural point of view and should never have been deforested, it is only right and proper that they should, if possible, be reforested; and it is not to be wondered at that the Forestry Commission has acquired, and continues to acquire, extensive areas of such 'marginal' land, and rightly so.

The length of time which this kind of study requires has another important effect, namely, that no one individual can commence the work and bring it to completion in his life-time. If he could, it is more than likely that by the time he reached the end of his span he would have forgotten what the conditions were when he began his experiments. In these experiments no fewer than eight senior officers and three junior officers are credited with having played an important part, not counting the author himself. The difficulty of seeing the work as a whole and in its proper perspective is increased by so many changes over such a relatively short time. Another embarrassment to the forest research worker is that, no sooner do his experiments begin to indicate apparent success, than the inexperienced general practitioner draws his own conclusions and immediately applies a new method before it has been tested thoroughly. The older forester is more wary.

This particular experimental project was begun in 1921, and the major experimental areas were at

first concentrated in six forests, four in Scotland, and two in the north of England. Later on experimental work was extended on a less-intensive scale to other forests. The kinds of experiment attempted were many, too many to be handled adequately, but the principal projects dealt with were: methods of ground preparation; various kinds of ploughing; trials of species; use of manures at time of planting; and later, use of nurse trees and mixtures of species, besides a variety of miscellaneous procedures. The result of all this was an accumulation of a vast amount of mensurational and other data. The earlier experiments were somewhat crudely set out, but later widespread use was made of approved methods of layout and of statistical methods of handling the results. Mr. Zehetmayr is to be congratulated on having presented his information in a very readable form and on treating the problem with admirable judgment. The *Bulletin* contains a mass of information on method and species. The conclusions are presented in an excellent summary, and it must be said that they do not differ essentially from those reached by tree-planters in Britain long before the Forestry Commission was born, except in respect of the newer species. The early work of the Commission was bedevilled by an idea that spruces, because they are highly productive on suitable sites, should be grown everywhere, even on upland heaths. Another herring drawn across the trail was the idea, imposed from above, that the deeper one ploughed the better. The unjustifiable opinion was held, and often still is, that the trees could be compelled to extend their roots down into the execrable material on which the heath grows. Fortunately, the experiments indicate that it is more effective to prepare the surface-layer than to bring up a mass of inert mineral matter, containing a small proportion of soluble minerals, which in time return to the depths whence they came. On sites with richer sub-soils nearer the surface, deep ploughing seems to be more useful—at least for a time. There is an undoubted stimulus to tree growth on ploughed land due to improved mineralization of the organic matter, but how long it continues remains to be seen. It is claimed that ploughing has extended the area on which planting is economically possible and has improved growth on moderately fertile areas. The possibility of future troubles is not overlooked.

It is interesting to find that the author believes, and rightly, that for these upland heaths, Scots pine will remain the most important tree. Corsican pine and Japanese larch—more exacting trees—do not seem to be suitable substitutes, but the shore or lodgepole pine from North America is a promising introduction.

This publication, like certain others produced by the Forestry Commission, can be criticized on a number of points. In the first place, some attempt should have been made to use the classification of heath-types dealt with in Chapter 1, and to treat them by classes. For example, upland heaths on the Red Sandstone areas of Scotland are radically different from those on the Jurassic of the Cleveland

* Forestry Commission. *Bulletin* No. 32: *Afforestation of Upland Heaths*. By J. W. L. Zehetmayr. Pp. v+145+34 plates. (London, H.M. Stationery Office, 1960.) 17s. 6d. net.

Hills of Yorkshire. The so-called 'pans' differ markedly, depending on the looseness of texture of the underlying glacial deposits. The essential difference between the upland heaths of Britain and the continental heaths of Denmark, Germany and the Netherlands is clearly explained in Chapter 2. While such differences may justify the adoption of a completely independent attitude in Britain they do not excuse the neglect of the important work done in France by Duchaufour on heath soils or by Scandinavian, other than Danish, workers. Nor is the ignoring of the heath afforestation carried out in Great Britain long before the Forestry Commission was constituted excusable. Whether Continental heaths have "a longer history of systematic afforestation than our own" depends on what is meant by 'systematic'. The skilled tree-planters of Britain, in the eighteenth and nineteenth centuries, with a life-time of experience behind them, came to very definite conclusions about suitability of species, the value of ploughing and other techniques, and in forestry a life-time of experience in one locality may compensate for lack of intensive experiment at heavy cost, and the use of statistical methods to support the very obvious results which the intelligent observer sees and records in his memory, if not in his note-book. This is possibly rank heresy, but when one is confronted with the meagre conclusions from thirty-six years of intensive experiments, involving a multitude of measurements and calculations, one may be permitted to wonder if the capacity of the human brain is not nowadays underestimated.

Mr. Zehetmayr deserves great credit for the immense pains which he has taken to range over space, at least, and make himself conversant with heath-land planting. He has dealt with the enormous accumulation of experimental data in a masterly manner and makes good use of figures and illustrations. As a result of his breadth of vision, his conclusions are sound and are devoid of the exaggeration and puerile propaganda which sometimes detract from the value of forestry technical publications. He also places the important work so far achieved in its correct perspective historically, although perhaps his glance has been directed too far ahead and not enough backwards. Much more intensive soil research, as opposed to more-or-less empirical experimentation, is now required if further real progress is to be made. Meanwhile, adopting the same cautious attitude as the author, foresters and tree-planters would do well to be conservative, rather than rash, in their attitude, and to eschew the high-living tree species in favour of the abstemious. They should read and apply the lessons so far learned with discrimination, paying special heed to variation in locality conditions. In particular, deep ploughing on a large scale should not be used indiscriminately; it is often not only unnecessary but also harmful, especially in its effect on the drainage of catchment areas. The dweller in the lowlands is often unaware of what is happening in the uplands in these days. The excellence of Mr. Zehetmayr's interpretation will give great satisfaction to all who have participated in this project.

M. L. ANDERSON

REORGANIZATION OF BRITISH NATIONALIZED TRANSPORT UNDERTAKINGS

NEITHER in the White Paper on the *Reorganization of the Nationalized Transport Undertakings** nor in the debate on January 30, in which the Minister of Transport, Mr. E. Marples, asked the House of Commons to take note of the proposals for reorganization, was any reference made to the importance of research or of a sufficiency of scientific and technical man-power in Britain. Furthermore, the organization chart appended to the White Paper gives no indication as to how the organization for research is affected. The White Paper puts as the Government's aim undertakings soundly based on organization and finance, providing efficient services and giving a good livelihood and worth-while jobs to those who work in them. It directs attention to the fact that the railways are a vital basic industry, employing 500,000 people and representing an investment of nearly £1,600 million, still growing by more than £100 million each year. A railway system of the right size is regarded as an essential element in the British transport network, and will remain so for as long as can be foreseen, but the White Paper does not discuss the vital question: What is the right size? The related question of congestion on the roads is ignored, and while the idea of the railways as a social service is rejected, the question of uneconomic services such as branch lines is reserved for further consider-

ation; it is merely stated that for the time being railway losses on any such services will be covered by the contributions proposed from public funds.

This point was stressed during the debate by Sir Toby Low, chairman of the Select Committee on Nationalized Industries, who, while agreeing that, in the main, the Government's proposals were in line with the recommendations of the Select Committee, was doubtful whether full control over the finances of the railway system could be achieved until the problem of dealing with uneconomical services had been decided. Sir Toby insisted that we could find out why losses are incurred, and he urged in conclusion that the real problem was not money but morale. Success can only be achieved by the vigorous use of every instrument of management and of science. Apart, however, from the Minister's announcement that the Government had decided that the main-line electrification scheme from Euston to Crewe, Manchester and Liverpool should go ahead as quickly as was consistent with the best use of the available resources, nothing in the debate clarified the uncertainty about the progress of modernization or the future of the uneconomical services. The Joint Parliamentary Secretary to the Ministry of Transport, Mr. John Hay, did not accept Sir Toby Low's challenge, and only stated that in 1960 the Treasury provided £160 million and in 1961 £140 million for investment in the railway industry, as a result of which more than seventy major projects had already

* Ministry of Transport. *Reorganization of the Nationalized Transport Undertakings*. Pp. 14. (Cmd. 1243.) (London: H.M. Stationery Office, 1960.) 1s. net.