

J. R. Carr (Royal Navy) spoke of the design of underwater breathing apparatus. The lungs of the user must be pressurized to the equivalent of the surrounding water, which results in a rapid increase with depth of the mass of gas consumed. Long endurance therefore necessitates either re-breathing or a surface supply of gas. Gases under pressure may affect man adversely, and psychological and physiological hazards may be introduced by limitations of the breathing set.

F. Lavenne and P. Leyh (Institut d'Hygiene des Mines, Hasselt, Belgium) compared the performance of two closed-circuit breathing sets, one working with compressed oxygen and the other with liquid air, and an open-circuit apparatus supplied with compressed air. Exercises performed at different temperatures showed that the inspired air temperature depended mainly on release of heat by absorption of carbon dioxide and was lowest in the open circuit apparatus. Light weight was an important point.

Industrial gas and dust masks were analysed by H. J. R. Letts (C.D.E.E.), who emphasized the influence on design of legislation requiring approved types. Dangers due to limitations of the absorbing medium are not serious, but the risk from leakage at the face-piece is significant and difficult to measure; a 10 per cent leakage due to physical activity was common, and wearability of a mask was an important attribute because of the user's tendency to avoid discomfort by discarding it. Leakage through the face-piece seems to be a fundamental limitation of the container respirator and may have to be avoided by electrically driven individual fan units.

The iron and steel industry uses respirators to a large extent, as was explained by J. Graham Jones

(Richard Thomas and Baldwin, Ltd.). Major problems were carbon monoxide, from blast furnaces, and dust. For the former, only air-line masks had been successful, and compressed-air points were provided on furnace platforms. In the Fire Service, F. C. S. Shirling (Home Office) stated that respirators were useless, because of oxygen deficiency, and self-contained breathing sets were used which had a useful life up to 1 hr. An overriding factor in design was the necessity for instant availability.

The final session was conducted with Mr. A. C. Peacock (formerly of C.D.E.E.) in the chair, who also read a paper on the manufacture and testing of respirators. He suggested that it would be advantageous if users were to collaborate in producing a limited number of designs, which should be manufactured by a single organization.

S. T. Hermiston, R. F. Hounam and R. P. Rowlands (United Kingdom Atomic Energy Authority) listed the various types of apparatus for protecting people who handled radioactive substances. The problems encountered in other applications are here augmented by the necessity of decontaminating the appliances after use. For this reason, a worker is issued with a respirator from a pool instead of its being fitted to him individually, a practice which drew some criticisms.

The final application of respiratory devices discussed was the important one of mine rescue, by C. R. Senneck (Safety in Mines Research Establishment). A new closed-circuit liquid-oxygen set has outstanding performance; it weighs 33 lb. fully charged and gives cool dry air for more than 2 hr. During heavy work at 90° F., respiratory cooling of more than 1 kcal./min. is available and the resistance is only 1 cm. water at 300 l./min.; operation is automatic.

C. N. DAVES

FOUR DECADES OF STATE FORESTRY IN GREAT BRITAIN

THE publication of the forty-first annual report of the Forestry Commission in Great Britain for the year ended September 30, 1960,* marks the first year of State forestry activity in its fifth decade of existence. In temperate countries it takes more than four decades to create new forests, a process which does not end with the planting of so many trees on so many acres. In the year 1959/60 the State planted 61,700 acres and private enterprise 36,900 acres, making a total of 98,600 acres. If this rate continues and if we assume that the average length of rotation, making allowance for the slow growth to be expected on much of the land being planted, is 80 years, then it would seem that the final wooded area will, in that time, amount to 8,000,000 acres plus 2,000,000 acres already existing, or 10,000,000 acres in all. If this is the avowed objective, the position at the moment is reasonably good. The competition for land in Great Britain has not prevented the Forestry Commission from adding during the year some 60,000 acres of plantable land to bring its total holding thereof to 1,618,400 acres. In describing the year's work it is interesting

to find, however, that private forestry is placed before State forestry. This may be merely politeness, but things have certainly moved a long way since the last chairman expressed the view that private enterprise in forestry was doomed. It has greatly strengthened its position in recent years and the policy of paying grants in aid to the tune of £1,150,000 a year has given it a remarkable boost. The dedication of woodlands to productive forestry has advanced to the extent that the area of private woodlands eligible, or about to become eligible, for State aid is now 837,476 acres. There is thus quite a healthy balance between the managed woodlands of the State and those of the private owner. It is surely time to abolish, if possible, the needless complication of having two bases of dedication, for only two of the 562 schemes in operation are on basis II.

The report introduces to the public the concept of the 'working-plan', which is, in fact, a plan of management for the forest. It is defined as being "in effect, a blueprint for a forest or group of forests" and "a direction to succeeding generations of foresters ensuring that in all stages of development the basic objectives are kept clearly in mind". One might ask what is a blueprint? Have British foresters become that mechanically minded? In 1960 a new

* Forestry Commission. Forty-first Annual Report of the Forestry Commissioners for the Year ended 30th September, 1960. Pp. 69+9 plates. (London: H.M. Stationery Office, 1961.) 5s. net.

working-plan code came into operation. The prescribed format contains no fewer than 43 chapters, and, if the code is to be rigorously applied, it would appear that the technical staff will have even less time to undertake essential technical operations and may even be helping to dig its own grave.

So far, the Forestry Commission has been able to sell all its felled material, which amounted in 1959-60 to 20.1 million hoppus feet from a total area of forest of 1,283,256 acres. This presumably included the 500,000 hoppus feet blown down, equivalent roughly to the growth on 10,000 acres. While the problem of marketing is easy in those forests near industrial centres it will become acute in the next decade or two in the more remote forests, the location of which can readily be seen from an examination of the maps provided with the report. Improved methods of exploitation and transport are receiving attention and may be the solution, involving greater use of machines. Too much machinery used in forestry operations will kill employment in the country and increase it in the towns, however, which runs counter to a policy of re-population of the former. The wide scatter of the State forestry operations can be seen from the maps mentioned. This adds greatly to the risk of fire. The cost of fire protection is a heavy item in the creation from scratch of pure coniferous forests and £273,000 was spent thereon in 1960. Out of a total area of 1,618,400 acres of forest, only 1,596 acres, or 0.1 per cent, were lost by fire, the greater part through an excess of zeal.

A paragraph describes what has been done to preserve the remnants of the natural pine forests which are owned by the Forestry Commission. It mentions "a broad belt of the eastern Highlands" where the native Scots pine is a dominant species. The meaning of this is obscure. It is claimed that investigations began in the early days of the Commission into methods of treatment of the natural stands it had acquired. Details are not given, but the investigations were of the most meagre description and the main method of treatment has unfortunately been to plant up the greater part of these areas with introduced exotic conifers. The attention being devoted to other important indigenous species, especially oak and birch, is woefully inadequate, even in the research programme.

Forest research is the subject of a separate annual report. A relatively large staff is engaged in this work but its organization is far from satisfactory. It has engaged in numerous projects, many of which seem to be of minor significance. The main aim of research should undoubtedly be the improvement of

silviculture. This remark owes its origin to a statement in the report that fertilizers have been applied from the air to checked spruce stands in Cornwall, with impressive results. For how long will these results last and what was the cost? Much research work owes its origin to faulty silviculture, and in the improvement in their silviculture British foresters have a great deal to learn. Forestry in Britain has suffered from a lack of trained personnel of the higher ranks and still has a long and arduous task before it is to realize its main objectives.

Regarding the financial cost to Great Britain of the establishment and working of the Forestry Commission, this is an appropriate year in which to consider this, because, when the Commission was set up in 1919, it was claimed that it would be self-supporting in forty years' time. The total net sum spent since the start, after allowing for income other than Treasury grants, is £118,219,420, on which presumably some rate of interest is charged. Far from being now self-supporting, in 1960 payments were £13,930,162, of which only £3,130,639 was met by operational income from sales, etc. A Parliamentary vote of an additional £10,702,000 was still required. There is a somewhat naive explanation of why forestry is not turning out to be the "counter to depopulation in the uplands" that it has for long been claimed to be. Almost any other industry could justify its existence by claiming that it gives indirect employment in other industries.

The manner of presentation of the Forestry Commission report is odd. The author of it is presumably the secretary of that body, but the report is signed by ten other persons and is presented to two Ministers in conformity with legislative requirements. To what extent each of the eleven persons in question takes responsibility for the contents remains uncertain. There is no minority report. Whether the two Ministers who receive it sit down and discuss it in detail, or whether each deals with it in turn, is doubtful. It should be mentioned, however, that the Forestry Commissioners can rely on advice from national committees, regional advisory committees, a Home-grown Timber Advisory Committee, a Committee on the Utilization of Home-grown Timber, a Mechanical Development Committee and an Advisory Committee on Forest Research. In all, between 150 and 200 persons are named in the report as having some say in the running of British forestry. This restricts the number of competent independent reviewers of their activities to a very few and makes their task invidious

M. L. ANDERSON

POTATO VIRUS DISEASES

ALTHOUGH conferences, especially those restricted to a particular subject (therefore small) can be very useful for providing opportunities for exchanging views, their proceedings are often superfluous. Most of the interesting information they contain has already appeared in scientific journals or in reviews as well. Recently, it has become customary to include at the end of each paper the discussion which it has stimulated, but most of it is trifling or irrelevant to the paper.

This criticism applies to the proceedings of the fourth conference on potato virus diseases, held at

Braunschweig, during September 12-17, 1960*. As it is only three years since the last conference, it is not surprising that the twenty-three papers (175 pages) it contains have very few advances to report.

Recently, Dr. Stegwee discovered that potato leaf roll virus multiplies in the vector *Myzus persicae* and has now reported more evidence for this. Of special interest is the finding of P. Ehrhardt that

* Biologische Bundesanstalt für Land- und Forstwirtschaft, Braunschweig. Proceedings of the Fourth Conference on Potato Virus Diseases, Braunschweig, 12-17 September, 1960. Edited by J. Brandes, R. Bartels, V. Völk and C. Wetter. Pp. 175. (Wageningen: H. Veenman and Zonen, N.V., 1961.)