In the matter of highly purified chemicals another point must be noticed. The reputation of the German makers is high, and deservedly so, and it follows that it will be a long time before possible rivals, even if they produced materials of an equal degree of purity, could obtain the same degree of confidence in the minds of their customers. In order to give this confidence it has been suggested that the object might be most quickly attained by the establishment of a National Chemical Laboratory analogous in constitution and management to the National Physical Laboratory, in which the products of the manufacturers could be tested and the standard of purity guaranteed. The scheme would undoubtedly serve to hasten matters. The guarantee of the National Physical Laboratory is accepted as impartial and accurate throughout the world, and there is no reason why a chemical institution of the same kind should not command equal confidence. Into the question of cost there is perhaps no need to enter, but the fact must be faced that the average man would not expect to pay a much higher price than he has paid heretofore because the substances were made in England. H. B. BAKER.

HOME FORESTRY AND THE WAR.

IN an article in NATURE of December 10, 1914, p. 393, it was shown how dependent we were upon foreign countries for our supplies of pitwood, without which coal-mining could not be carried on. About half the total amount of pitwood exported in normal times into the United Kingdom comes from Baltic ports; and as a result of the action of Germany in declaring pitwood contraband, the supplies from this source have practically ceased, what now arrives from Scandinavia being merely small cargoes from Gottenburg, Christiania, and other ports outside the Baltic. The important supply of pitwood from France, Spain, and Portugal still continues, though at enhanced prices; and in case of need, large quantities can be obtained from Nova Scotia, Newfoundland, etc. Nevertheless, it became necessary to ascertain the available amount of home-grown timber suitable for use in mining; and an inquiry into the subject was undertaken by the forestry branch of the Board of Agriculture, the report of which has been issued with great promptitude. From this it appears that the total area of woodlands in England, 1,884,000 acres, is capable of yielding 380,000 tons of pitwood annually by normal fellings; and that by anticipating the fellings of the next five years almost 3,400,000 tons of pitwood are available in England and Wales alone. Scotland by similar extraordinary fellings could supply about 2,500,000 tons; so that with the aid of a small quantity from Ireland, about 6,000,000 tons of pitwood could be felled, enough to keep the collieries going for eighteen months, as their average annual consumption of pitwood is approximately 4,500,000 tons.

In the *Quarterly Journal of Forestry*, January, 1915, pp. 1–7, Sir W. Schlich, criticising the preceding report, asks what will be the position if the war should last for more than two years; and considers that in this case our coal mines would be obliged to shut down for want of pitwood. As labour in Canada is very expensive, he believes that supplies of mining timber from Nova Scotia, etc., may prove unavailable on account of the prohibitive cost. He urges upon the Government the necessity of taking early steps to increase the area under trees in these islands, and reiterates well-known arguments that, however sound, appear to have little effect upon our rulers. He sums up as follows:—

> Forest schools have been set up for instruction in forestry; a forestry branch has been established in connection with the Board of Agriculture and another in Ireland; an officer has been appointed to convert the Dean and High Meadow Woods into a demonstration area. All this is in the right direction, but *very little has as yet been done to increase the area under forest.* Too much talking and too little action—that is the long and short of it. Let us hope that the new situation will lead without further loss of time to action. Of course, I should not advocate the taking of a single acre out of cultivation, because the production of food goes before everything else; but there are large stretches of land unfit for cultivation and yet quite fit to produce forest crops. Nor should I advocate the formation of large blocks of woodland, all in a ring fence as it were. No, what I look forward to are moderate sized areas scattered over the country. As long as the area is sufficiently large to justify placing a woodman in charge and also sufficient to be placed under systematic management, say a minimum of 500 acres, we shall have all that is required. In that case agricultural labourers and tenants of small areas will in time come forward and do the bulk of the forest work during the winter months, when agricultural work is practically at a standstill, thus improving their resources. Such a scheme will not be perfection all at once, but it will come by degrees. Only let the Government, with funds allotted by the Development Commissioners, start actual work, even on a small scale; it is sure to grow.

Another article in this journal deals also with the subject of pit-timber, and reviews the result of an independent inquiry by the English Forestry Association. Further articles treat of the preparation of yield tables, which are necessary in the estimation of the financial returns that are probable, when waste lands are afforested. Mr. Hiley writes a preliminary report on an investigation at Oxford into larch canker, and advocates a means of treatment which is scarcely advisable on account of the expense, not to mention the fact that the mode of infection on which the treatment is based is not yet clearly demonstrated to be the actual one.

In the *Transactions of the Royal Scottish Arboricultural Society*, xxix., part i. (January, 1915), the production of pitwood on wooded estates in Scotland is investigated by Mr. J. H. Milne Home, both as regards the present crisis and also with a view to a permanent increase in the supplies of mining timber in the future. Mr. Home considers that one-fourth of the normal

amount required by British collieries could be readily supplied from Scotland, if railway rates of freight could be reduced by 25 per cent. An admirably illustrated paper by Mr. P. Leslie deals with the afforestation of the coastal sand dunes at Culbin, between the rivers Nairn and Findhorn. The Culbin sands have a remarkable history, as they conceal an estate of 3600 acres, which was once the richest agricultural district in Morayshire. The incursion of the sand took place suddenly in 1694, leaving a wilderness until 1865, when Major Chadwick began plantations, which have been continued by his son. The species mainly used has been been Scots pine, but Corsican pine wherever planted has given the bes results, producing tall, clean poles of valuable timber. The operations, which include the prior fixing of the moving sands (Fig. 1) by maram grass, are carefully described, and are similar to those used by the French in the Landes.

Photo] [*Geological Survey.*

FIG. 1.—Culbin Sand-hills, Elginshire: near the Binsness Plantations. The background shows a travelling dune of advancing sand. The steep bank with cornice atop and slipping sand on slope, the tails of sand behind the tufts of bent, and the wind ripples in the foreground, indicate that the sand-drift is from left to right, *i.e.*, from west to east.

Wood-charcoal and its uses is the subject of an article by Mr. W. D. Ashton Bost, who states that the only firm in Britain which reduces iron-ore by charcoal is that of Messrs. Harrison Ainslie. Their charcoal furnace at Backbarrow on the river Leven in Cumberland produces annually about 2400 tons of so-called "Lorn" charcoal pig-iron, which is the dearest iron in the market, and is exported for special uses to all parts of the world.

The production of potash salts from woodlands and wastelands is the subject of a timely article by Mr. G. P. Gordon. It is probable that the material obtained by burning lop-and-top and brushwood in plantations and bracken fern on wild hill-sides, together with the ash of furnaces, using sawdust as a fuel, can compete successfully with kainit, which has been for many years the main source of the potash salts that enter into the composition of artificial manures. There is an account of a peculiar witches'-broom infesting willow trees at Hampstead and in parts of Essex near London, which appears to be hitherto undescribed. Prof. A. Henry gives an account, from Japanese sources, of the distribution of *Larix leptolepis* in its native home.

Many useful notes from continental sources are given, of which the following may be cited, taken from the Norwegian *Manual of Silviculture* by Barth:—The limit of the existence of forest trees in Norway is fixed by the mean temperature of the four months of vegetation, June to September. Birch is content with a mean summer temperature of 45° F.; aspen and grey alder with one just under 46° F.; Scots pine and spruce, 47° F.; *Alnus glutinosa*, 54° F.; oak, 55° F.; and beech, 56° F. It would be interesting to obtain similar figures regarding the limit of these species and larch in Britain.