

Present-day methods of gathering and processing by mechanical power might be improved—manufacturing costs, per ton, reduced to an economic level. There is evidence now that seaweed would provide food for farm animals in the years after the War, and profitable by-products for industry.

A considerable business has been created on the Californian coast to exploit the enormous jungles of giant kelp (*Macrocystis pyrifera*) which grows in the Pacific up to lengths of 500 ft. A machine mounted on a barge shears off the tops to a depth of three feet, which is the maximum permitted by the Government. Taken ashore, the kelp is treated in a similar way to that used in Scotland—dried in steam-heated or hot-air cookers, and ground to a fine powder, which must pass through a twenty-mesh sieve. The product is known as kelp meal and is mixed with a proportion of fish meal and sold as a seameal concentrate. Apparently not more than one tenth of the kelp meal harvested on the Pacific coast is prepared for stock food; all the rest is used for the extraction of iodine and for sodium salts.

The urgent need is for carefully checked records of the sea vegetation available, of the chemical value as a feeding stuff, for detailed digestibility trials, for the quantities required by stock to secure maximum results, and of its effect upon the health of all farm stock—a wide programme but one that should ultimately bring to agriculture thousands of tons of valuable home-grown feeding stuffs, from the sea-bed.

FORESTRY IN MALAYA

ONE reads with intensified interest the report of the progress of forestry in Malaya, now, we may trust for but a brief period, put to an end by the irruption of the Japanese. J. G. Watson, the head of the Forestry Department (if we omit the local inter-divisions of forestry administration of but little interest to the outside world), has written the "Annual Report on Forest Administration in Malaya including Brunei for the year 1940" (F.M.S. Govt. Press, Kuala Lumpur; 1941). In the report for the preceding year his predecessor, very fortunately as may now be thought, gave a valuable and interesting history of the growth of the Department from the year 1883 (see also NATURE, 148, 312; 1941).

In a general review of the year Mr. Watson mentions some small additional reservations of forest (347 square miles), bringing the total area of Government forest reserves to 10,879 square miles or 20.4 per cent of the total area. The actual area covered with forest of one type or another in Malaya is almost 77 per cent, 56.6 per cent of forest land being still unaccounted for. It is the existence of this mass of tropical forest covering the region which enabled the Japanese to penetrate so easily through the country.

Some interesting silvicultural work was being undertaken, an all-Malayan regeneration *coupe* having been laid down for the conversion of inland forest. This annual *coupe* has been tentatively fixed at 12,088 acres; 1,000,000 acres have been set aside for this intensive management, of which 34,458 acres had been fully regenerated. The director of forestry says of this scheme that it is not yet fully operative in the more backward States where State land resources are still large. Differentiation between hard-wood and soft-wood areas is not possible as yet, but

preference is given to those rich in the former. Eventual control will have to be on the basis of volume rather than area so far as hard-woods are concerned. It is sad to think that a certain proportion of this work will probably be lost, smothered by a victorious jungle of weed growth now that the attention of the forester will temporarily be no longer available. For those with a knowledge of the processes of growth in the tropical jungle are well aware that regeneration work of this kind can only be successful if carefully watched and given full assistance during the early critical periods. Already this work was becoming more difficult owing to the reduction of the staff through members joining the fighting forces.

This latter strain was, however, perhaps even more heavily felt in connexion with the timber industry and the numerous saw-mills of which there were eighty at work in connexion with the forests; fifteen of these mills are in the Straits Settlements (Singapore and Penang), forty-five in the Federated Malay States (Perak, Selangor, Negri Sembalin, Pahang) and twenty in the Unfederated States (Johore, Kedah, Perlis, Kelantan, Trengganu, Brunei). The combined outturn of all mills outside the Straits Settlements was 123,183 tons of 50 cub. ft. as compared with an estimate of 98,580 tons from Penang and Singapore. Apparently these two latter also saw up logs coming from Sumatra.

War conditions threw a heavy strain on the timber industry, which was (and, says the report, "will continue to be") hard put to meet emergency orders without dislocation of normal undertakings. The total outturn of logs was nearly 3,000,000 higher than the preceding year, the sawn timber running roughly each year at the same figure of 4,900,000 cub. ft. The one ply-wood factory produced 20,000,000 sq. ft. of three-ply sheets, and the four match factories seventy-three million boxes of forty matches apiece. The revenue from the forests during 1940 was 2½ million dollars.

In spite of the absence of a number of officers detached to war duty, a certain amount of research work was continued throughout the year under various heads. It may be hoped, however, that when the department once again starts work in its forests more attention may be paid to preparing some working plans, the absence of which, in so advanced a department in many respects, is a curious anomaly.

If the annual report of 1940 is likely to be the last to be printed until the Japanese are sent out of Malaya, what can be said for the present prospects of the *Malayan Forester*, the December 1941 number of which has just been received?

An article on "The Contribution of Tropical Forests to War Economy", by H. E. Desch, wood technologist in the Forest Research Station in Malaya, is not without interest. In fact, it stresses without being aware of the fact, some of the dangers of the war exploitation of tropical forests already mentioned in NATURE. "A country rich in forests", says the author, "is obviously under an obligation to ensure that full use is made of its forests in War." This is undeniable, but it is just that "full use" in the case of the tropical forest which requires to be definitely understood. Too often the forest, at the mercy of the fellings of the timber merchant without expert supervision, has been ruined. The surprising demands which modern war make upon the forest are exemplified in a paper, "Forest Products and Defence", by C. P. Winslow, director of the U.S. Forest Products

Laboratory. To house a division of approximately 17,000 men in barracks requires 2,000,000 cub. ft. of timber; rather more than half if the men are quartered in a tent camp. Battleships are said to require 40,000 cub. ft. of timber and ocean transports 60,000 with an additional 300,000 sq. ft. of ply-wood, and so forth. The output of local sawn-timber and ply-wood in Malaya in 1940 has been already mentioned. Mr. Desch considered that the forests would be drawn upon to produce much larger amounts than that, and yet the forest service had already been called upon to allow a proportion of its gazetted staff to join the Forces. This was the position and in the absence of a recognition of the part played by the tropical forest in the economy of a country it appears probable that war demands would have similarly upset the good work which an excellent staff have been inaugurating during the past twenty years.

Mr. Desch regards this matter from the research and utilization point of view. His argument appears to be that the tropical forests of Malaya should be regarded as a source of sawn-timber and other produce for industries already existing in the country; but that their products should not be utilized for setting up, that is, supplying, the raw produce for new industries which, while interfering with the settled economy of the country, would require possibly new imports for their maintenance.

In how far the author's ideas would receive acceptance from the practical forest officer is open to doubt. But his ideas and these doubts must now remain for a future consideration.

SEISMIC PERIODICITY

THIS subject has been discussed by Archie Blake, who states that classical methods for detecting and measuring periodicity have suffered from two serious defects¹. First, the Schuster periodogram does not provide adequately for non-sinusoidal types of variation. Secondly, the smoothness encountered in almost all time series and many other types of data introduces a spurious appearance of periodicity which vitiates the test of significance unless proper allowance is made for the smoothness. New statistics designed to detect effects not contemplated in the Schuster periodogram are being tried in a study of the series of aftershocks of the Helena Montana earthquakes of October 1935. This work is being done by use of punched cards, which greatly alleviate the labour of the computation.

In the case of two types of departure from randomness, such as periodicity and smoothness, each effect disturbs the statistics designed to detect the other. The only rigorous treatment is to study them together, but approximate methods (for example, that of Bartels) for discounting the effect of one type of variation in studying the statistics designed to detect the other may be very useful. Thus the accurate detection of periodicity demands a treatment of the problem of detecting, describing and measuring the smoothness exhibited by the series under test. This problem has been discussed by Bartels, Jeffreys and others, and from a different point of view by Shewhart.

¹ Progress Report on Periodicity and Time Series, by Archie Blake, Transactions of 1941 of the American Geophysical Union.

FORTHCOMING EVENTS

(Meetings marked with an asterisk are open to the public)

Friday, March 13—Saturday, March 14

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (DIVISION FOR THE SOCIAL AND INTERNATIONAL RELATIONS OF SCIENCE) (at the Royal Institution, Albemarle Street, London, W.1).—Conference on "European Agriculture: Scientific Problems in Post-War Reconstruction".

Friday, March 13

10.15 a.m.—"Measures for Reconstruction". (Chairman: Sir John Russell, F.R.S.)

2.15 p.m.—"Economic and Kindred Problems". (Chairman: Mr. F. L. McDougall.)

Saturday, March 14

10.15 a.m.—"The Future Betterment of European Farming". (Chairman: Dr. A. J. Drexel Biddle.)

2.15 p.m.—(Chairman: Sir John Russell, F.R.S.)

Monday, March 16

ROYAL SOCIETY OF ARTS (at John Adam Street, Adelphi, London, W.C.2), at 1.45 p.m.—Mr. H. P. Rooksby: "X-Ray Technique in the Industrial Laboratory" (Cantor Lecture, 1).

ROYAL GEOGRAPHICAL SOCIETY (at Kensington Gore, London, S.W.7), at 5 p.m.—Colonel Orde Wingate: "Geography of the Ethiopian Campaign".

Tuesday, March 17

ROYAL SOCIETY OF ARTS (DOMINIONS AND COLONIES SECTION) (at John Adam Street, Adelphi, London, W.C.2), at 1.45 p.m.—Mr. Ernest Marsden: "Recent Developments in the Scientific and Industrial Research Programme of New Zealand".

CHADWICK PUBLIC LECTURE (at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1), at 2.30 p.m.—Dr. William A. Brend: "Nervous Shock in Peace and War".*

ROYAL INSTITUTION (at 21 Albemarle Street, London, W.1), at 2.30 p.m.—Sir Lawrence Bragg, F.R.S.: "Metals", 3: "Magnetic Properties of Metals".*

ROYAL STATISTICAL SOCIETY (at the Royal Society of Arts, John Adam Street, Adelphi, London, W.C.2), at 5.15 p.m.—Mr. R. G. Glenday: "Economic Reconstruction after the War".

Wednesday, March 18

OIL AND COLOUR CHEMISTS' ASSOCIATION (MANCHESTER SECTION) (at the Engineers' Club, Albert Square, Manchester), at 2 p.m.—Dr. J. G. Gillan: "Some Aspects of Camouflage".

INSTITUTE OF PHYSICS (Joint Meeting of the LONDON AND HOME COUNTIES' BRANCH and the LONDON AND SOUTH-EASTERN COUNTIES' SECTION of the INSTITUTE OF CHEMISTRY) (at the Royal Institution, Albemarle Street, London, W.1), at 2.30 p.m.—Prof. H. Levy: "Social Implications of Science in War-Time".

ROYAL METEOROLOGICAL SOCIETY (at 49 Cromwell Road, London, S.W.7), at 4.30 p.m.—Dr. H. Spencer Jones, F.R.S.: "The Atmosphere of the Planets" (Symons Memorial Lecture).

Thursday, March 19

INSTITUTE OF FUEL (at the Connaught Rooms, Great Queen Street, London, W.C.2), at 2.30 p.m.—Dr. Ezer Griffiths, F.R.S., Dr. R. W. Powell, and Mr. M. J. Hickman: "Thermal Conductivity of Some Industrial Materials".

INSTITUTION OF ELECTRICAL ENGINEERS (at Savoy Place, London, W.C.2), at 6 p.m.—Dr. A. P. M. Fleming: "A Critical Review of Education and Training for Engineers".

Friday, March 20

PHYSICAL SOCIETY (in the Lecture Theatre of the Science Museum, Exhibition Road, London, S.W.7), at 4.30 p.m.—Sir Edward Appleton, F.R.S.: "Ionospheric Influences on Geomagnetism" (26th Guthrie Lecture).

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

LECTURER (MAN OR WOMAN) IN PHARMACEUTICAL SUBJECTS in the Plymouth and Devonport Technical College.—The Director of Education, Education Offices, Cobourg Street, Plymouth (March 18).

TECHNICAL AND CONSTRUCTIONAL ASSISTANT in the Borough of Luton Electricity Undertaking.—The General Manager and Chief Engineer, Electricity Offices, St. Mary's Road, Luton (March 20).

LECTURER IN ENGINEERING SUBJECTS in the Cardiff Technical College.—The Director of Education, City Hall, Cardiff (March 25).

ASSISTANT DRAINAGE OFFICER to the Lancashire War Agricultural Committee.—The Executive Officer, Institute of Agriculture, Hutton, Preston (March 28).

COLLOID CHEMIST OR PHYSICIST.—The Director of Research, British Pottery Research Association, Queens. Road, Penkhull, Stoke-on-Trent.