

vegetable sources and probably something like the mucilage extracted from Irish moss. However, paint made in this way might very well suit Indian conditions, and it would be interesting to know more about the actual tests on paints made up with this material and their keeping qualities. Mention is also made of the prospects of growing tung trees in India.

Thames Valley Rainfall

SOME interesting facts and figures relative to the recent rainfall and floods in the Thames Valley were given by Lord Desborough, chairman of the Thames Conservancy Board, at the meeting of the Board on January 13. In the course of his observations, Lord Desborough said that, following the drought which began in July 1933 and continued into August 1935, last year was the wettest year since 1924. The total rainfall, as determined from the twelve stations in the Thames catchment area, was 33.9 inches, that is, 5.66 inches above the standard annual average and greater even than that of the year 1894, which was the year notable for the unprecedented volume of a flood, recorded at Teddington as 20,000 million gallons during a 24-hour day in the month of November. On August 12 last, the flow was only 261,300,000 gallons, the lowest ever recorded on a single day. During the recent heavy rains, the flow at Teddington had reached 9,000 million gallons on January 3, as compared with 2,407 million gallons which was the standard daily average for the month of January. On January 13, the flow had fallen to 6,000 million gallons, which was still 1,500 million gallons above the figure at which the river ran bank high. Lord Desborough thinks the public can look forward with some confidence to a good supply of water next summer from the springs and tributaries, despite the fact that since the drought of 1933 there is still a deficiency of 4.27 inches in the rainfall, a fact which shows the severity of the drought. He alluded to various schemes which have been mooted for dealing with floods in the Thames and other areas, and stated that a scheme brought out in 1914 for dealing with the Thames floods was estimated to cost £3,000,000. The authorities concerned said they would prefer the floods. The cost at the present time would be about double that amount. As regards the construction of reservoirs to contain the surplus flow, the Queen Mary Reservoir of the Metropolitan Water Board, the largest they have, cost £2,000,000 and holds 6,600,000,000 gallons—only about one day's flow under such conditions as have recently prevailed.

Wireless Equipment on the *Queen Mary*

ACCORDING to an article in *World Radio* of January 10, the 75,000 ton Cunard-White Star liner, the *Queen Mary*, will possess wireless equipment in keeping with the high reputation she has already acquired as a modern trans-Atlantic express liner. The transmitting and receiving rooms are on the boat deck and separated by a distance of about 250 feet. The four transmitters are operated remotely from the receiving end, which acts as the control room for the whole of the ship's radio equipment. This room

contains eight operating positions, the radio-telephone exchange and the emergency installation; and it is in direct telephone connexion with the bridge and all other important positions in the ship. The various services to be undertaken by the *Queen Mary* while at sea will involve the use of thirty-two wave-lengths, eleven of which are for short-wave telegraphy, nine for radio-telephony, seven for long-wave and five for medium-wave telegraphy. By co-operation with the British Post Office and the International Telephone and Telegraph Corporation of New York, two-way radio-telephone conversation to practically any part of the world will be possible at any time; and two independent conversations may take place simultaneously with the aid of the usual devices for ensuring secrecy. This service will be available from any one of the five hundred state-rooms, each of which is fitted with a bedside telephone, while for passengers in all classes, numerous telephone booths in various parts of the ship will be available. In addition to the apparatus for normal radio communication, a music- and speech-amplifying installation is provided for the simultaneous relaying of three different programmes in the public rooms through thirty-eight loud-speakers. An extensive library of gramophone records of all types will be carried in the ship to supplement the orchestral music and broadcasting programmes normally provided.

Australian National Research Council

DEFINITE proposals for a radical modification of the Australian National Research Council have been drafted for submission to its members and to those of the Australian and New Zealand Association for the Advancement of Science. Though constituted under the ægis of the latter body in 1921, the Research Council has hitherto functioned quite independently of it. It is now proposed that the A.N.Z.A.A.S. should institute a limited fellowship, the original fellows to be past and present presidents, general treasurers and general secretaries of itself and of the A.N.R.C., together with presidents and past presidents of sections and not more than fifty others selected for special qualifications, giving a total of between 120 and 150. Subsequent elections would be made annually by the fellows, with adequate safeguards to ensure the maintenance of a high standard. The fellows of the Association resident in Australia would then be appointed a Committee with the title "Australian National Research Council" and with duties similar to those of the body at present carrying that name. The new Council would take over the assets of the existing one, and the A.N.Z.A.A.S. would place at its disposal for research and other purposes a sum not exceeding one half of the subscriptions of fellows and annual members.

THIS plan, if adopted, will bring about a very desirable intimate contact between the Research Council and the Association, which in itself is a loose federation of practically all the scientific societies and institutions in Australia and New Zealand. The

Association will, it is hoped, be further strengthened by the institution of regular annual membership in addition to the present ordinary (biennial) membership. Another suggestion is that the Research Council shall arrange for the publication of a monthly scientific journal. The ultimate decision on the plan will rest with the A.N.Z.A.A.S. at its Auckland meeting in January 1937.

Physicists at Stuttgart

THE double number of the *Physikalische Zeitschrift* of December 1 devotes 185 of its pages to reports of the papers and discussions at the meeting of German physicists at Stuttgart in September last. More than half the fifty-seven papers read dealt with the electrical conductivity of non-metallic materials, cosmic rays and atomic nuclei. In each of these subjects, the opening papers consisted of reports on the present position of our knowledge, which enabled the audience to appreciate more completely the points made by subsequent speakers. Prof. F. Hund of Leipzig outlined the 'energy band' theory of conduction so far as it concerns the movement of electrons in non-metallic conductors. This leads to a conductivity proportional to $e^{-B/T}$ where B is a constant and T the absolute temperature, which Dr. W. Meyer of Berlin showed is only a first approximation to the actual facts. Prof. P. M. S. Blackett gave a summary of our knowledge of the dependence of the number of cosmic rays incident at a point on the earth's surface, on the latitude and longitude of the point, the time of day, the direction of incidence and the thickness of absorbing layer surrounding the recorder. Prof. C. F. von Weizsacker of Leipzig showed the progress made in determining the forces which hold together the protons and neutrons of the atomic nucleus.

Misuse of Forest and Soil Resources

THE rather wide title "The Use and Misuse of Land" is given to a report by Dr. R. M. Gorrie of the Indian Forest Service, published in the *Oxford Forestry Memoirs* No. 19 (Oxford: Clarendon Press, 1935). As a Leverhulme research fellow, Dr. Gorrie spent four months in the United States, his subject being "The Correlation of Erosion Damage and Grazing in Forest Lands". He states that the present report deals, in addition, with the wider implications of the misuse and abuse of forest land. Dr. Gorrie has considerable experience of the over-grazing and other abuses to which the land of the outer hills of the Punjab has for long been subjected. Few will disagree with his assertion that "Much of the land classified as 'forest' in the arid tropics and the semi-tropics in British dominions and possessions is incapable of producing crops of commercial timber, but is of considerable social value for grazing, flood control, water conservation, or game management, which would justify some form of working plan being prepared and operated with these values in view". Thirty years ago this policy was being ardently advocated by far-sighted forest officers, and large areas of land in the British Empire and outside it

would have been saved for useful economic purposes had the administrators of the day understood the real value of the forest in tropical and semi-tropical regions. The United States is not the only country which has misused its forest and soil resources; parts of India, East and West Africa and Australia are presenting similar problems to the administrator. Various bodies in the United States, including the Federal Forest Service, are, and have been for some years, giving attention to the position to which land values have been reduced. Dr. Gorrie's report draws some valuable parallels with Indian conditions.

British Empire Naturalists' Association in Gloucestershire

THE council of the British Empire Naturalists' Association has decided to make the North Cotswolds the subject for its 1936 field-meeting and holiday, which will take place on June 13-27; most of the local arrangements will be made by the North Cotswold Branch of the B.E.N.A., of which Mrs. A. B. Lane is honorary secretary. Though with little out of the ordinary in the way of birds and mammals, the area is especially rich in flora. It contains one of the two British haunts of the adder's tongue spearwort, *Ranunculus ophioglossifolius*, which has been safeguarded by the generosity of the Cotswold Naturalists' Field Club. Other rare plants in the flora include the lizard orchid, which was recorded from Birdlip in east Gloucestershire; the rare green-berried 'virescens' variety of elder by the side of the Chelt near College Road, Cheltenham; the great earth-nut, *Carum bulbocastanum*, in a cornfield near Cheltenham, previously thought only an eastern county plant; one of the rare vetches, *Lathyrus tuberosus*, previously thought to be confined to eastern counties, but now recorded from near Cirencester; and three stations for the rare cotton grass, *Eriophorum latifolium*. The flora of the area also includes grass-of-Parnassus, wintergreen, pasque-flower, lily-of-the-valley, fritillary (including an albino form that persists near Elmore), herb Paris, deadly nightshade, meadow-saffron and the two sundews. Regarding fauna, the hobby and hoopoe are much rarer than formerly, but specimens of these occur on migration most years; hawfinches nest in many woods in large numbers, and it will be interesting to see if any of the crossbills, immigrants from the Continent last year, remain to this year.

'Singling' of Double Track Lines

THE Great Southern Railways of Ireland have singled 220 miles of double track railway, that is, trains can travel in both directions along each track. It has been found that many of these double track lines which have never been worked to full traffic capacity can be operated as single tracks with little or no reduction from the flow of full traffic. This method of working has led to a very special and improved method of signalling which is described in a paper by Mr. H. Birchenhough, read to the London Students' Section of the Institution of Electrical Engineers on November 27. Permission to occupy a section of the line is given to the driver