NATIONAL INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH

THE first report of the National Institute of Economic and Social Research, which covers the year 1940–41, includes a brief review of the history of the Institute since its formation in 1938. The original research programme of the Institute, which was largely planned upon the basis of a two-year period, was prepared by special committees of the Institute constituted for the following subjects: (1) statistical studies of the national income and changes in its magnitude and distribution; (2) location of industry and the distribution of the industrial population; (3) British commercial policy and the administration of overseas trade; (4) the organization of the credit and capital markets; (5) short-period economic change; (6) economic and administrative problems of unemployment.

The work of 1940 fell into two sections; first, the continuation or completion of pre-war studies, and secondly, the war-time research programme adopted by the Council in December 1939.

In the first section (the national income) inquiry was continued throughout the year under the direction of Prof. A. L. Bowley, and a paper incorporating part of the work has been published in the *Journal of the Royal Statistical Society*. Studies of the location of industry have continued and a study of the social and economic conditions in the Highlands has been completed but not yet published.

A report on some of the results obtained on the location and concentration of industry has already been published, and although the industrial survey of Bristol was suspended in 1940, the results are to be published shortly. A report on part of the results obtained in the fertility studies in Bristol has also been published in the *Journal of the Royal Statistical Society*.

The first and descriptive part of the study of trade regulations and commercial policy in Great Britain has been completed, and work on the remaining part has been suspended. The manuscript is now in the press. A study of the organization of credit and money markets in London has been completed by Dr. Thomas Balogh and awaits publication.

The development of the war-time research programme in 1940 was hindered by the insufficient supply of research workers. Under this programme, grants have been made for studies of the effect of the War on the credit policy and credit mechanism of the City of London; the effect of war on municipal finance, Coventry; economic adjustment to the War in Birmingham; taxation of war wealth; burden of taxation inquiry; studies in Russian economic problems; inquiry into savings and spending and on the social consequences of evacuation in south-west Scotland as well as of juvenile employment in Manchester and in Glasgow, and a study of National Health Insurance by Prof. H. Levy. The programme also includes studies in exchange control by Dr. Thomas Balogh, and a grant has been made for a study of war-time changes in Bristol purchasing power, an investigation substituted for the continuation of work on the industrial survey which was suspended.

Since the heavy air raids on Great Britain in the autumn of 1940, damage to the Institute's premises necessitated alternative temporary accommodation, and hospitality was offered by the Royal Institute of International Affairs. During 1941, the research staff of the Institute was increased and the scope of its work expanded. The initiation of its series of publications was undertaken and arrangements were made with the Cambridge University Press to publish the Institute's researches. The report also refers to the work of the National Service Committee for Social, Economic and Statistical Research and of the Consultative Conference for the Co-ordination of Research in the Economic and Social Sciences in War-time.

In 1941, the greater number of applications were received from individual research workers and fewer from universities and university colleges. A list of studies in 1941 and of publications in 1940–41 is also included.

WHISTLING METEORS

IN an article on "Whistling Meteors" appearing in the November issue of *Electrotechnics*, Chamanlal and K. Venkataraman, of the research department of All-India Radio, discuss the Doppler effect produced by meteors entering the ionosphere.

During observations carried out on short-wave transmitters near the Delhi centre of All-India Radio, it was observed that in certain circumstances when a receiver was tuned to the carrier wave, weak heterodyne whistles of an unusual type were audible. The whistles appear as a high-pitched note which rapidly descends in pitch down to zero frequency where they apparently disappear, or alternatively fade away before reaching zero frequency. The whistles vary in duration from approximately a fifth of a second to several seconds and occur at random time intervals. They are most frequent in the early hours of the morning and are infrequently heard during the day-time, the early morning whistles sometimes occurring very frequently.

A heterodyne whistle which first appears with an initial beat frequency of, say, 3 kc./sec. and, after rapidly descending in pitch, disappears without reappearing on the other side of the fixed carrier wave, can only be explained by the Doppler effect due to interference between the weak carrier wave reaching the receiving centre as a ground wave and a wave returned from a rapidly moving reflecting surface, the latter suffering an apparent change in frequency. Assuming a beat frequency of 3 kc./sec. and that the observation is made on a carrier frequency of 7 mc./sec., the velocity of the moving reflecting surface is found to be about 64 km./sec. The descending pitch of the heterodyne beat note is the result of the moving reflecting surface being rapidly retarded in velocity, and the beat note will reduce to zero frequency if the velocity of the reflecting surface becomes zero. If the beat note disappears before reaching zero, it may be assumed that reflection from the surface has ceased before it has necessarily reached zero velocity.

A consideration of this particular manifestation of the Doppler effect shows that if the reflecting surface is moving towards the point of observation the Doppler effect will appear as a heterodyne whistle on the higher frequency side of the ground-wave from the transmitter. This was confirmed on detuning the receiver slightly from the carrier frequency position. The Doppler effect from a receding

reflecting surface produces a heterodyne whistle on the lower frequency side of the carrier wave.

The only known phenomenon with which sufficiently high velocities are associated and which could cause a Doppler effect of this nature is a meteor entering the earth's upper atmosphere, and confirmation of this was obtained by observations in the early morning hours when the appearance of meteors in the sky coincided with the heterodyne whistle produced in a receiver. The article discusses briefly the number, size, height, and velocity of meteors, the mode of dissipation of meteor energy, and meteor ionization, remarking that the summary provided of some of the known properties of meteors gives ample confirmation of the experimental evidence and deduction that the weak heterodyne whistles observed are due to the Doppler effect caused by the rapidly moving ionized area produced by a meteor. It is evident that, (*a*) the ionization produced by meteors can be sufficient to reflect waves of the frequencies concerned, (*b*) the number of whistles observed is at a maximum in the early morning when the number and velocity of meteors entering the earth's atmosphere is greatest, and (*c*) the velocity of meteors, determined by visual means, is of the same order as that calculated from the Doppler effect observed.

The article concludes with descriptions of the experimental procedure adopted and the results obtained.

NEW DESCRIPTIONS OF SOME INDIAN PLANTS

SOME interesting botanical notes have recently been given by Dr. N. L. Bor, forest botanist, Forest Research Institute, Dehra Dun (*Indian For. Rec.*, Botany, 2, Nos. 2, 3 and 4; Govt. of India Press, Delhi, 1941).

In No. 2 the bamboo *Thyrsostachys Oliveri* Gamble is dealt with. This species, the author writes, flowered in the Katha district, Upper Burma, in 1891. Specimens were sent by J. W. Oliver, conservator of forests, to the late Mr. Gamble, who published a description under the above name in the *Annals of the Royal Botanic Garden*, Calcutta, in 1896. Seeds of the species were also sent and these were planted at Dehra Dun in several places, and also in the Royal Botanic Garden, Calcutta. All those who have known Dehra Dun during the last forty years will remember the magnificent clumps of this bamboo. All the Dehra clumps commenced to flower towards the end of November 1938, the first indication being the fading of the leaves, which soon began to fall off. In the first week of December the flowering shoots, pale purple in colour, were quite evident, and by December 12 the lower sheaths of the flowering shoots were beginning to show the tip of an emerging spikelet. By December 23 two spikelets had completely emerged from each sheath, and the six stamens, pendulous at the ends of long filaments, were visible from each of the three florets of the spikelets. Seed was ripe by January 31, 1939. Dr. Bor says that with fresh material to work upon and unlimited quantities of it, it became evident that the description given by Gamble, prepared from dried material, required modification in several respects.

A lapse of twenty-four hours is quite sufficient for the features of the structure of the delicate palea to be lost, and no amount of boiling will restore them. This fresh material enabled a revised description to be drawn up which corrects some minor inaccuracies in Gamble's description. Two plates portray the details of the inflorescence and spikelets. This reads like a botanical romance, and foresters in Burma and botanists are likely to be equally interested.

For No. 3, Dr. Bor redescribes Dunn's *Vatica Shingkeng*, placing it in the genus Hopea. The original description was based on incomplete material, especially the flowers. I. H. Burkill, who accompanied the expedition into the Arbor Hills of Assam in 1911, discovered the species. He notes: "no general flowering took place during the expedition, and it was with great difficulty that one flowering tree was found". This flowering specimen was not, however, sent to Dunn, who notes in his description "*flores ignoti*".

In No. 4, Dr. Bor describes three flowering plants new to science: *Gleditsia assamica* Bor, *Garnotia puchiparensis* Bor and *Strobilanthes andamensis* Bor. Illustrations are given of each species. Dr. Bor had collected the Gleditsia in the Aga and Naga Hills and Sadiya in Assam without flowers or fruit. He received these collected in Sadiya in March 1938. It is a small deciduous tree about 10 metres in height.

The Garnotia is a grass and was found growing thickly in the clefts of a large rock just west of the Puchipara rest house, Silent Valley, Madras (alt. 3,000 ft.).

The Strobilanthes is a wiry shrub up to 60 cm. tall, gregarious in habit. The species was collected in flower by the sylviculturist of the Dehra Institute during a visit to the Andamans. It was noted that "the species was abundant in regeneration areas on limestone rocks, growing in crowded bushes 1′–2′ high".

DRUG CONTROL IN INDIA

THE problem of drug standardization and drug control in a country of the size and population of India is a vast one. In Great Britain, the United States and other progressive countries a general consciousness of the evils of food and drug adulteration on community health and national well-being was aroused nearly fifty years ago, and the authorities took up the responsibility of safeguarding public health and money by instituting adequate control of the spurious drug trade. In India, on the other hand, although the possible injurious effects of the adulteration of foods were recognized early enough, the seriousness of the situation arising out of the indiscriminate adulteration of drugs and chemicals for the treatment of diseases received comparatively little attention, and India came to be considered the dumping ground of all kinds of substandard, misbranded and poor-quality drugs and pharmaceuticals.

Realizing the need for both legislative and executive action the Drugs Enquiry Committee 1930–31, appointed by the Government of India, recommended that All-India legislation should be passed for the control of the importation, manufacture, sale and distribution of adulterated and under-strength drugs, and that machinery should be established for the regular collection and testing of drugs to ensure conformity to proper standards of purity and strength. It was suggested that for the standardization of drugs a well-equipped central laboratory should be set up with a competent staff of experts