Province, China, is much more than a flora of that particular province. While the Fukien species of the families treated are considered in detail, with keys to genera and species, descriptions, synonymy and citation of specimens, a great many species from neighboring provinces are included, particularly those of Chekiang, Kiangsi, Kwangtung, Hunan and Kwangsi. In addition to the introductory and historical matter appertaining to the Province of Fukien, many species occurring in neighboring provinces are described. The first part, now available, considers the families and genera of the Gymnospermae and the dicotyledonous families from the Casuarinaceae to the Fagaceae, inclusive. The work is published by Lingnan University, 150 Fifth Avenue, New York.

E. D. MERRILL

REPORTS

THE NATIONAL HEALTH IN GREAT BRITAIN AFTER NEARLY THREE YEARS OF WAR[1]

GOOD reports on the national health during the war have previously been given. The survey can now be extended to the third winter of the war and most of the third year, with similar results. In the House of Commons the minister of health, Mr. Ernest Brown, stated that after one thousand days of war the health of the nation was in many respects better than in days of peace. The birth rate of 1941 was 14.2 per thousand as compared with 15.1 in 1938 and 20.9 in 1916. (This only exemplifies the falling birth rate, which was causing concern before the war). But for the first quarter of 1942 the rate was 15.5, the highest in any March quarter since 1931. The rise can be accounted for by the increase of marriages promoted by the allowances paid for wives and children of the young men joining the fighting services. The infant mortality rate for 1941 was 59, as compared with 53 in 1938 and 91 in 1916. The rate for the first quarter of 1942 was 61, the lowest rate for any first quarter on record. The maternal mortality rate in 1941 was 2.77 per thousand births as compared with 2.97 in 1936 and 4.12 in 1916. Thus while over a long period the birth rate had been falling, over the same period the survival rate had increased. The "crude general death rate" was 12.9 in 1941 as compared with 11.6 (the lowest on record) in 1938 and 14.4 in 1936. The risk of epidemic disease calls for special care in wartime, but during the past two and one half years of war the infectious disease rate has been normal and, on the whole, below the average.

Apart from tuberculosis, the only infectious disease which has shown a rise during the war is cerebrospinal fever. This was expected, since cerebrospinal fever has always been a wartime disease. In 1916 there were about 2,000 cases and in 1938 and 1939, 1,500 and 1,300, respectively. But in 1940 there were nearly 13,000 and in 1941 over 11,000 and, for the first half of 1942, 4,000. The fatality of the disease has been reduced from a percentage of 69 in 1935 to 34 and more recently to 20.

[1] London correspondent of the *Journal* of the American Medical Association.

The problem of tuberculosis is causing some concern. There were 28,669 deaths due to it in 1941, compared with 28,144 in 1940, 26,176 in 1938 and 53,858 in 1916. The steady fall in tuberculosis which has been a feature of the twenty-five years of peace has been interrupted in the last two years. Wartime conditions, such as the blackout, overcrowding and the cessation of house building, predispose to tuberculosis. In the past we tended to concentrate on treatment rather than on early diagnosis. The recent developments in miniature radiography are providing a new weapon to detect cases for more detailed examination. From earlier diagnosis better results in treatment are expected. Also rehabilitation and securing gradual return to suitable employment is to be tackled on more comprehensive lines.

The incidence of diphtheria, the chief killing disease of children between 4 and 10, has not fluctuated very widely in the last twenty-five years, but the number of deaths has fallen from 5,300 in 1916 to 2,600 in 1941. During the past year the Ministry of Health has been engaged in a campaign for immunization of children against diphtheria, and this has given striking results in reducing both incidence and fatality of the disease. Scarlet fever has become a scourge of the past, and there were only 133 deaths from it in 1941. In that year there were only 148 deaths from typhoid and fewer than 5,000 as compared with 6,000 cases and 1,100 deaths in 1916. During the heavy bombing of our cities not a single death from typhoid was due to pollution by water-borne infection, in spite of the continuous bombing of our crowded areas. American visitors marveled at this. The number of deaths from pneumonia was much greater in 1941 than from all the other infectious diseases combined other than tuberculosis. There were 50,000 cases and 26,000 deaths, compared with 29,000 deaths in 1940 and 23,000 in 1939.

An increase in venereal diseases was not unexpected in view of war conditions but was not so great as in the last war. At the outset steps were taken to expand the existing services. We have always relied on propaganda and education for controlling these diseases. But the work of limiting the spread of infec-

tion was hampered by lack of powers to deal with persons unwilling to submit to treatment and known to infect others. This difficult problem is engaging attention.

At the end of April, 1939, the number of state-registered nurses was 94,200. In April, 1942, the number had risen to 103,700. But there is still a shortage, and 12,000 more are required. The tuberculosis service in particular has exceptional difficulties in securing adequate numbers. Fear of contracting the disease in sanatoriums appears to be a factor, though the authorities hold that there is no greater risk than in other hospitals.

The demand for doctors in the fighting forces has entailed a shortage for civilian purposes. The government has asked the public to recognize the difficulty and do what it can to limit calls to what is essential.

SPECIAL ARTICLES

ABSORPTION OF SELENIUM BY CORN FROM ASTRAGALUS EXTRACTS AND SOLUTIONS CONTAINING PROTEINS

BESIDES being highly toxic to livestock, selenium indicator plants serve as converters of selenium. They absorb selenium from the soil, change it into water-soluble compounds, and through decay return it to the soil in forms readily available for absorption by all types of plants, including farm crops. Soil-plot experiments by Beath and his associates[1] have shown that selenium derived from a water extract of an indicator plant is much more readily accumulated than selenium from an inorganic compound such as sodium selenite.

We have recently made a quantitative comparison of a water extract of *Astragalus bisulcatus* and sodium selenite (Na_2SeO_3) as sources of selenium for absorption and accumulation by young corn plants growing in solution cultures. Another phase of our study dealt with the possible influence of proteins and their derivatives on the absorption of inorganic sodium selenite.

Pioneer hybrid corn no. 307 was germinated in quartz sand. When the seedlings were about 8 cm high they were transferred to a mineral culture solution of the usual composition[2] to which either *Astragalus* extract or sodium selenite had been added. The culture solutions were renewed twice a week, and after the plants had grown for three weeks they were dried, weighed and analyzed for selenium. The extract was prepared by soaking finely ground seleniferous *Astragalus bisulcatus* in culture solution for 16 hours at room temperature and then filtering with suction; about 75 per cent. of the selenium in the *Astragalus* powder was removed, and the extract contained approximately 40 ppm of selenium.

The curves in Fig. 1 show far greater absorption and accumulation of selenium from a water extract of *Astragalus* than from sodium selenite. The selenium content of the corn seedlings receiving the *Astragalus* extract was from 12 to 20 times as high as that of the seedlings receiving sodium selenite. Maximum accumulation was 3,150 ppm[3] in the *Astragalus* extract series as compared with only 235 ppm in the sodium selenite series. Although reduction in growth was

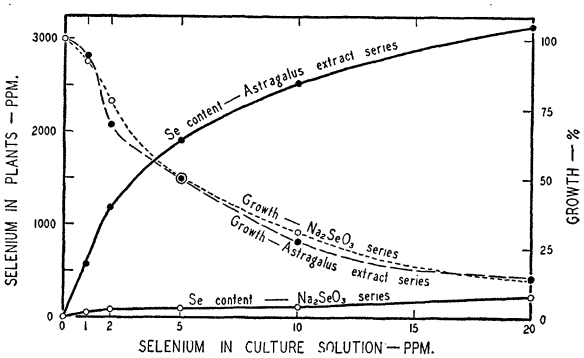

FIG. 1

about the same in both series for equivalent concentrations of selenium in the culture solution, it is evident that, per unit of selenium accumulated, the selenium in the *Astragalus* extract was much less toxic than the inorganic sodium selenite.

The selenium occurs in the extract as part of an organic compound—not as the selenite or selenate ion. Dialysis has shown that the selenium is present in molecules sufficiently small to diffuse readily through a Cellophane membrane (Du Pont or Visking), since it became equally distributed on both sides of the membrane within 48 hours at 5° C. The dialyzed selenium and the selenium in the original extract exhibited the same toxicity, and they were accumulated to the same degree by young corn plants.

In view of the much greater accumulation of selenium from an *Astragalus* extract than from sodium selenite, it seemed of interest to determine whether the addition of an organic substance to the culture solution would increase the absorption of inorganic sodium selenite. Various proteins, protein derivatives and

[1] O. A. Beath, H. F. Eppson and C. S. Gilbert, *Wyo. Agr. Exp. Sta. Bull.*, 206, 1935.

[2] S. F. Trelease and H. M. Trelease, *Am. Jour. Bot.*, 26: 530–535, 1939.

[3] This is one hundred times the maximum reported for lethal corn from naturally seleniferous soils. See: S. F. Trelease, *Scientific Monthly*, 54: 12–28, January, 1942.