	Tons.
Blown away	31,480
Temporary deposit in the town	3,472
Permanent deposit in the town	48
	35,000

The method of determining the permanent deposit was by means of glass plates a foot square, which were exposed at different stations for three months at a time. The surface was then rinsed with water to remove any loose material, and the deposit removed and analysed. As this tarry material is much the most deleterious ingredient of the soot, the method of comparing the translucency of these plates after exposure with certain standards may be recommended as a rough test of atmospheric pollution by smoke.

Cohen and Ruston have calculated that in a domestic fireplace about 6 per cent. of the fuel escapes as soot, whereas in a boiler or other furnace the loss may be reckoned at $\frac{1}{2}$ to $\frac{3}{4}$ per cent. Taking the estimated coal consumption from both sources, we get for the whole country a loss in the form of soot of :—

	Tons
6 per cent. on the estimated domestic consumption of 32 million tons ...	1,920,000
0·5 per cent. on the estimated factory consumption of 100 million tons ...	500,000
	2,420,000

From the ratio of soot emitted to soot deposited in Leeds, the above 2,420,000 tons will yield a deposit of nearly 300,000 tons in the neighbourhood where the coal is consumed; for it must be remembered that the whole quantity will sooner or later reach the earth.

Comment is unnecessary. On the ground of the discomfort, dirt, waste, and pecuniary loss which smoke entails, the evil is one which should receive serious consideration, and it is to be hoped that the forthcoming conference and exhibition which is being promoted by the London Coal Smoke Abatement Society will be successful in directing more attention on the part of the authorities to the disastrous effects of smoky chimneys.

J. B. C.

BELGIAN BOTANICAL INVESTIGATIONS.[1]

THE supplementary part of the seventh volume is entirely occupied with a sketch of the geographical botany of Belgium by Dr. J. Massart, providing a continuation of the more specialised account of the vegetation of the littoral and alluvial districts by the same author published in the original volume, and previously noted in NATURE. The sketch does not contain any such detailed observations as are recorded in the botanical surveys carried out in Great Britain by W. G. Smith, C. E. Moss, and others, but incorporates the results of various Belgian researches, notably the modification of leaves in dry and moist localities furnished by Miss M. Ernould, the periodic phenomena of vegetation carefully studied by the meteorologist, Dr. E. Vanderlinden, in connection with climatic variations, as well as several geological and agricultural investigations. Geology occupies a more prominent position than is usual in an œcological botanical memoir, and practically supplies the basis of treatment in the most important chapter. The classification of associations is artificial. Uncultivated and cultivated areas are placed in antithesis. As might be expected in a country where mountain ranges are wanting and intense cultivation is general, there are few natural associations; apart from the dunes, the most important are the types of vegetation growing on cliffs and rocks.

A notice of Dr. Massart's able contribution would be quite incomplete without an expression of cordial admiration of the excellent photographs and maps that are collected in the "Annexe." Of the photographs, more than half are stereoscopic, and to ensure that they shall be fully appreciated a simple but effective stereoscope is provided. It will be observed that the author has paid particular attention to the photography of cryptogamic plants; fungi are the most suitable for the purpose, but the lichens (Figs. 434 and 636), the mosses (Figs. 332 and 414), and the algæ (Fig. 222), also the mycorrhiza of beech (Fig. 320), are particularly well defined. Discrimination between the photographs of flowering plants would be idle where nearly all are successful and convey their special meaning.

The eighth volume contains three extensive papers, a study by Dr. V. Gallemaerts of the phanerogams growing on willows, an investigation by Mrs. J. Schouteden-Wery as to the factors which regulate the distribution of algæ off the south-western region of the Belgian shore, and the observations of Dr. Vanderlinden mentioned above; in the last the observations, concerned chiefly with the comparative dates of flowering, extend over a period of fourteen years.

[1] "Recueil de l'Institut Botanique Léo Errera (Université de Bruxelles)." Publié par Jean Massart. Tome Supplémentaire vii.bis, pp. xii+332. Annexe au tome supplémentaire vii.bis, pp. iv+466 photographs+9 maps +2 diagrams+pp. v-xiii. Tome viii., pp. ix+383, avec Stéréoscope. (Bruxelles: Henri Lamerton, 1910 and 1911.)

BIOLOGICAL STUDIES IN JAVA.[1]

THE memoir referred to below contains a series of articles embodying the results of six months' study and observation in Java in the winter of 1909–10. The subjects dealt with are:—(1) climbing organs within the genus Randia; (2) Javan Myrmecodia; (3) the "silver-field" of *Haplochilus panchax*; (4) the microbiological processes in the humus of certain humus-collecting Epiphytes; (5) the bacteria nodules on the leaf-margins of *Ardisia crispa*.

Not the least interesting is the account of the author's investigation of the biological phenomena of *Myrmecodia tuberosa*, of *Hydnophytum montanum*, and, incidentally, of *Polypodium sinuosum*. Miehe briefly reviews the work of his predecessors, Beccari, Treub, and others, on the same subject, and adds a bibliography relating specially to the interrelations of ants and plants. The tuberous-stemmed rubiaceous genera Myrmecodia and Hydnophytum are among the most remarkable vegetable productions of the Malay Archipelago, alike in habit of growth and the economies of nutrition. These plants are epiphytes, usually gregarious, and commonly associated with the equally singular *Polypodium sinuosum*. They form irregularly shaped fleshy stems or tubers, ultimately 6 to 9 inches or more in diameter, with chambers and intersecting or blind galleries, in nature perhaps eventually always inhabited by a certain kind of ant and a fungus. A few short branches bearing a tuft of crowded leaves are given off from the tuberous stem, and the flowers are small and inconspicuous.

How far the association of these three organisms is an instance of beneficial symbiosis is still uncertain. Beccari, one of the earliest investigators and illustrators of this class of plants, came to the conclusion that the shape and development of the stems was entirely dependent on the action of the ants. But Treub proved by experiments with seedlings and older plants that the development of the thickened stems and the formation of galleries was absolutely independent of the ants. Hence some other use had to be sought for the passages and chambers open to exterior influences. Treub and subsequent investigators claim to have proved that these interior surfaces, which are of two kinds, play an important part in the economy of the plant, furnishing, in effect, the channels of absorption and transpiration. The absence of stomata from the exterior parts of the stem and tuber is advanced in support of this theory.

Miehe instituted further experiments to determine the nature of the vital functions of these two different surfaces of the galleries and chambers. In certain parts of the system the surface of the walls was smooth and of a "leather-yellow," in others black and warted. The result of numerous experiments was the same, namely, that the warty surface rapidly absorbs water, whereas the smooth surface does not possess this property. The fungus which inhabits the tubers has not been determined, but it is probably allied to Cladosporium and Cladotrichum.

[1] "Javanische Studien." By Hugo Miehe. Pp. 299–431. (Des xxxii. Bandes der Abhandlungen der Mathematisch-Physischen Klasse der Königlichen Sächsischen Gesellschaft der Wissenschaften, No. iv.) (Leipzig: B. G. Teubner, 1911.) Price 6 marks.