

out of hand and destroy an entire crop; but, even so, they exact a toll of from 1 to 5 bushels per acre unless control measures are adopted. Experiments seem to show that ploughing under the stubble is the most effective remedy, as wholesale destruction of the insects is thus brought about. It would be necessary to arrange the crop rotation so as to allow the wheat-stubble to be ploughed up, but if this could be done it is estimated that millions of dollars could be saved yearly.

Parasites such as lice and mites cause considerable loss in the poultry industry by reducing egg-production and injuring the quantity and quality of the flesh of the birds. A cheap but effective remedy is therefore much to be desired, and it is now claimed by F. C. Bishop and H. P. Wood (Farmers' Bulletin 801, U.S.A. Dept. Agric.) that sodium fluoride fulfils these conditions, and that, if properly used, one application will completely destroy all the lice present on any bird. The treatment can be carried out by dusting or by dipping. In the former case pinches of the fluoride are placed among the feathers close to the skin on the parts most frequently attacked; dusting with a shaker is less effective, and also causes more irritation to the nose and throat of the operator. In the latter case $\frac{3}{4}$ -1 oz. of commercial sodium fluoride is dissolved in a gallon of tepid water, and the birds are then dipped for a few seconds. The lice die more rapidly in this case than when the dry powder is used. It is estimated that the cost of treatment works out to about one farthing per bird, 1 lb. of sodium fluoride sufficing for about a hundred hens.

Investigations of the Upper Air.¹

THE interesting publications referred to below deal with the investigation of the upper air, the first two being written in German. Dr. Everdingen, in Holland, has experienced the same difficulty that has occurred in England and elsewhere in carrying on the investigation owing to the scarcity and badness of the necessary materials, on account of which the mean height of the kite and captive-balloon ascents, when compared with that of previous years, was reduced considerably. The two years' reports contain full particulars of each ascent made; they are noteworthy as showing the increasing importance of aeroplanes compared with the old method of kites as a means of observation.

The third publication, Geophysical Memoirs, No. 14, gives an account of the pilot-balloon ascents made in November and December, 1911, by Capt. Cave and Mr. J. S. Dines in the Scilly Isles. Plenty of information about the relation of the wind to the surface-pressure gradient up to a few kilometres height over land is available, but similar information about the wind over the sea is very scarce. The expedition to the Scilly Isles was planned and carried out by Capt. Cave expressly to meet this want, and the results, which contain a large and useful amount of information, have at last been published.

The islands are noted for their fine formation of rock, and they are exposed to the full force of the Atlantic gales; in no part does the surface rise much above the sea-level, and the whole land area is small, thus the influence of the land on the air-currents must also be small. Moreover, except to the south-west, readings of the barometer are available, and hence the isobars on the daily weather charts can be

drawn in the neighbourhood of the islands with fair precision.

The balloons were mostly followed by two theodolites at the ends of a base line of 5260 metres, but on a few occasions, on account of the difficulty of reaching the distant station, only one was used. The period covered was from November 22 to December 8. The weather was mostly rough and stormy with a prevalence of clouds, so that the balloons could seldom be followed to any great height, but the conditions were very favourable for the purpose of the observations. The authors found, as they expected, that the effect of surface-friction is far less at St. Mary's than inland, and they give the loss of velocity at the anemometer head at Scilly as 20 per cent., against 35 to 50 per cent. at Ditcham Park.

The question of the rate of ascent of pilot balloons is considered. The same kind of balloon was used as at Ditcham Park and the same free lift given. The mean rate of ascent was 160.6 metres per minute. It has been found inland that balloons show a tendency to rise faster in the first half kilometre, but this was not the case at Scilly. The rate of ascent varied considerably from minute to minute, but no systematic difference was found, and hence the authors conclude that the general results obtained from single theodolites may be looked upon as quite trustworthy.

The last section deals with the type and height of the clouds prevalent during each ascent, and some evidence was found of the motion of the upper clouds away from the centre of the depression which dominated the weather at the time.

The whole memoir is very interesting and should be read by every student of meteorology.

Bionomics of *Glossina palpalis*.

NO. XVII. of the Reports of the Sleeping Sickness Commission of the Royal Society (H.M. Stationery Office, price 4s. net), which has recently been issued, includes the third, fourth, and fifth reports on the bionomics of *Glossina palpalis* on Lake Victoria by Dr. G. D. Hale Carpenter, of the Uganda Medical Service.

Interesting descriptions are given of the natural features and of the fauna and flora of the thirty-six islands visited. These should be consulted in the original by those interested. From a study of the conditions prevailing in these islands it was deduced that the conditions for the prevalence of fly above the average are (1) suitable breeding-grounds, viz. dry sand or gravel ridges representing old lake-shore levels; (2) abundant shade combined with open spaces to permit of the movements of the fly; and (3) absence of large spiders (?Nephila).

The characters of a suitable breeding-ground are the following: (1) Loose soil, (2) dry soil, (3) well-ventilated soil, (4) adequate shade, and (5) within 20-30 yards of water. Further research will probably enable us to define these conditions still more precisely and to decide whether they, as one would expect, are also the optimum for the development of pupæ.

The practical suggestion is made that fly may be controlled by constructing artificial shelters with the characters above defined which would be attractive to the fly as breeding-grounds, and where the pupæ would be regularly collected and destroyed. It might be possible to add some chemical to the soil in these shelters which would obviate the necessity of collection and destruction. The author has established the fact that flies pupate in these shelters.

¹ "Koninklijk Nederlandsch Meteorologisch Instituut," No. 106. "Ergebnisse Aerologischer Beobachtungen," parts v. (1916) and vi. (1917). Air Ministrv. Meteorological Office. Geophysical Memoirs, No. 14: "Soundings with Pilot-balloons in the Isles of Scilly."

The report is an example of the value of the methodical collection of data. Whether the destruction or control of *Glossina*, which seemed at first sight an almost hopeless quest, can be achieved by this method we shall no doubt soon learn.

J. W. W. S.

Dante and Trepidation.

IN a note entitled "La trepidazione in Dante?" (Atti della R. Accad. di Torino, vol. lii., p. 353) Signor O. Z. Bianco discusses the novel interpretation given by Duhem ("Le Système du monde," t. iv., chap. x.) of a well-known passage in the "Paradiso" (xxvii., 142-48):

But ere that January pass to spring
 Though that small hundredth men neglect below,
 These higher spheres shall with loud bellowings ring;
 The tempest fierce, that seemed to move so slow,
 Shall whirl the poops where now the prows we see,
 So that the flier shall on its right course go;
 And following on the flower, the true fruit be.
 (Plampin's translation.)

The first two lines clearly allude to the difference between the Julian year and the true value of the tropical year, which Dante assumed equal to 1/100 day, the neglect of which was gradually making the spring equinox occur earlier, and would (if the error were not corrected) eventually make the spring begin in January. Duhem suggested that the second half of the passage alludes to the so-called trepidation of the equinoxes. According to the theory formulated by Tâbit ben Korra in the ninth century, the equinoxes do not move uniformly from east to west, but alternately advance and recede in a period of more than four thousand years. This imaginary phenomenon is not alluded to by Al Fargani, from whose text-book Dante seems to have derived his astronomical knowledge. Signor Bianco rejects Duhem's suggestion, which is at variance with what Dante says elsewhere ("Convito," ii., 6; "Purgat.," xi., 108) about the slow motion of 1° in a hundred years. It is surely much more natural to suppose that the poet simply meant that long before the spring equinox after some thousands of years had moved back into January, great upheavals would take place in Italy.

Japanese Botanical Work.

THE Journal of the College of Science of the Imperial University of Tokyo, vol. xliii., contains (article 1) an admirably illustrated monograph (in English) of the genus of brown seaweeds, *Alaria*, by Prof. K. Yendo. The author has studied the various species on the west coast of Vancouver Island, along the coast of the Kurile Islands and of Kamtschatka as well as in Japan, and also the material in some of the important European herbaria. The descriptive portion is preceded by a general account of the morphology, structure, and development. The vexed question of the cryptostomata in the brown seaweeds is discussed at some length, and the author concludes that these tufts of hairs, at any rate in the *Laminarias*, may be regarded as absorptive organs. A *résumé* is also given of the differing views held as to the life-history, especially as to evidence on the manner of renewal of the blades, of *Alaria*, which, the author considers, "may be either gradual or sudden, according to the conditions of the place where the plant grows." As regards the economic uses of *Alaria*, though *A. esculenta* was extensively used for food in earlier times in North-West Europe, and this and other species are still eaten in various sub-Arctic

areas, the author concludes that the genus has very little value as human food or for kelp-ash. For manure it may be used equally well with other brown seaweeds. The species inhabit the colder northern seas, the greatest number being found within a range from about 42° N. up to the Arctic Circle. Fifteen species are recognised. Of these full descriptions are given, variations in form and synonymy are discussed, and a list of localities is cited. The form and structure of the species are illustrated in nineteen excellent double-page plates.

The same volume contains a short paper (article 2) by T. Matsushima describing investigations on the transpiration of cut branches, and an ecological study (article 3) by Y. Yoshii of the Ota dunes—both in German.

In the "Icones Plantarum Formosanarum," vol. viii., Bunzo Hayata continues his descriptive work on the flora of the Island of Formosa, based on the study of the collections of the Botanical Survey of the Government of Formosa. The present volume contains descriptions of species and varieties of flowering plants in various families, and of ferns; 111 new species and 17 varieties are included. The total number of species of the flora is brought up to 3458, contained in 1174 genera representing 169 families. The genus *Citrus* (orange, lemon, etc.) is treated at some length, as also are the figs, *Ficus*, of which the author recognises 29 species in Formosa. In addition to eighty-eight text-figures, the species are illustrated by fifteen excellent full-page plates showing habit and floral dissections.

Researches on Egyptian Cotton.

THE newly appointed Cotton Research Board for Egypt has issued a Preliminary Report, in which a sketch is given of the general significance of the Egyptian cotton crop and the formation and proposed operations of the new Board are described. Plans of the buildings under construction are shown, and a few illuminating figures serve to bring home to the reader the immense volume of detailed information required in the modern study of crops. An outline of the field of work to be undertaken by a staff of eleven non-Egyptian scientific workers and twenty Egyptians is given for the botanical, entomological, chemical, and physical sides, though the Board is rightly careful not to bind itself to a definite programme.

Those interested in cotton or in Egypt cannot fail to be very glad that this Board has at last come into existence, but the matter is of wider interest in that a move has here been made towards the separation of administration from research. Both functions have been hampered in the past history of many agricultural services by mutual confusion, and we anticipate that the step taken by Egypt in this matter will be generally adopted.

The only criticism we would offer on this report is upon the reason given for the establishment of the Board, to wit: "Past experience of . . . the disadvantages attaching to the investigation of cotton problems from the point of view of any one branch of science." We would rather have judged that Egyptian cotton had been singularly fortunate in the informal and voluntary co-operation of every branch of science, the schools of medicine and engineering, and the departments of survey and geology, as well as the agricultural organisations, having given invaluable help in all directions. We would suggest that past experience showed rather the need for a body (such as this Cotton Research Board) which would