gratulated on having obtained the help of such an eminent European student as Prof. Bezzi, of Turin.

The Imperial Bureau of Entomology begins this year to supplement the Bulletin of Entomological Research by a *Review of Applied Entomology*, issued in two series—A, Agricultural, and B, Medical and Veterinary. Containing records of recent literature, with full summaries, these publications cannot fail to be valuable to students of insect life.

G. H. C.

METEOROLOGICAL REPORTS.

WE have received the meteorological observations made at the Hamburg Astronomical Observatory for 1910–12. This institution was established in the town of Hamburg in 1825, and was for many years under the able superintendence of Dr. Rümker; it is now situated at Bergedorf, 19 km. E.S.E. of its former position, and is under the superintendence of Dr. Schorr. Very complete and careful observations are made five times daily; the amount of cloud is also given for each hour between 6h. p.m. and 6h. a.m. The sunshine is recorded by Campbell-Stokes (burning) and Jordan (photographic) instruments. The average annual difference in the possible percentage for 1910–12 is 6·7 in favour of the Jordan recorder. Although the observations are not strictly comparable, we should not have expected so much difference. An interesting comparison of temperature and humidity in English and French screens is made with the readings of an Assmann's aspiration psychrometer. The hourly means of temperature in both screens are generally higher than those of the psychrometer; the greatest differences occur in daytime, especially in the French screen (open at bottom), but at the 9h. p.m. observation the reverse obtains. Humidity in the screens is generally higher than the readings of the psychrometer, especially during summer.

The report of the Sonnblick Society for the year 1912 contains the results of the meteorological observations on the summit of the Sonnblick, Salzburg (3105 metres), for twenty-five years, 1887–1911, prepared by Hofrat Dr. J. v. Hann. The mean monthly temperatures were:—January, −13·3° C. (February, −14·0°); July, 0·9°; year, −6·6°; mean of absolute extremes, 9·5°−29·7°. Mean yearly precipitation, 1715 mm., on 216·7 days. Fog was observed on 251·5 days. The mean yearly sunshine was 1496·9 hours, being 35 per cent. of the possible amount. The duration of sunshine varies greatly in different years; September, 1895, had 241 hours, August, 1896, only eighteen hours! November and January have relatively the most sunshine, May and June the least. Winter and late autumn are the brightest seasons, April to June the dullest months. Among other useful summaries contained in the report we may mention the observations at the summit of the Donnersberg, Bohemia (835 metres), for the years 1905–9. The observatory is attached to the German University at Prague, under the direction of Prof. R. Spitaler.

The report and meteorological observations at the Royal Observatory, Hong Kong, for the year 1912 have reached us; the results have been carefully prepared by Mr. T. F. Claxton, formerly director of the Mauritius Observatory. The tables include hourly values of the principal elements, five-day means, and results of magnetic observations. The mean annual air-temperature, 71·9°, was about normal; maximum, 92·5°, in September; minimum, 45·3°, in December. The rainfall, 63·9 in., was about 20·5 in. below the average. The colony was not actually visited by a typhoon, but the tracks of those and of the more important depressions which occurred in the Far East during the year are shown on two plates. A weather map and reports from about forty stations are issued daily; the forecasts drawn from these data for various districts show a very high percentage of success. A large amount of data is extracted from ships' logs; this is utilised in determining typhoon tracks, and to some extent for the eventual publication of pilot charts of the Pacific for the area 9° S. to 45° N. latitude, and 100° to 180° E. longitude, divided into two-degree squares.

HORTICULTURAL INVESTIGATIONS AT THE WOBURN EXPERIMENTAL FRUIT FARM.[1]

IN a flower, such as that of an apple-tree, there is a tubular structure in the centre, forming the female portion of the flower, and that is surrounded and overtopped by a number of rods, bearing at their extremities sacs of pollen, this constituting the male element. When a grain of pollen, either of the same or another flower, enters the central tube, or pistil, fertilisation occurs, and a seed, or pip, begins to form near the base of the pistil. As it develops, the woody substance surrounding it, which is really a portion of the stalk of the tree, gradually swells to a remarkable extent, and eventually forms the fleshy or edible portion of the fruit. We commonly call it the fruit, but it is only a metamorphosed portion of the mother-tree: the real fruit of the tree, the progeny of male and female elements, is the pip. When this is sown in the ground, it germinates, and eventually forms a new tree, which, though probably showing some resemblance to its two parents, will be a new variety, and will not bear apples of the same sort as the mother-tree. One reason which makes it all the more improbable that a pip will give rise to a tree bearing fruit like that of the mother-tree, is that in many cases the female portion of the flower cannot be fertilised except by pollen from a tree of a different variety.

As it is impossible to reproduce a fruit-tree of any given variety from seed, other methods of multiplication must be adopted, namely budding or grafting. A young tree of a similar character is taken (the stock), and in the one case a bud, or in the other case a twig (scion), from the tree to be propagated is united with the stem of the stock. All the growth arising from this bud, or buds, is similar to that of the tree from which it was taken; the stock acts as little else than a channel for conveying nourishment to the ingrafted buds; yet it does exert a certain influence on the character of the growth of scion. For apples we use two classes of stocks; the one, the crab stock, is obtained by sowing the seeds of crab-apples, and is characterised by forming a scanty number of roots, but these are stout, and have a tendency to obtain deep hold of the ground; the other, the paradise stock, is derived from a French variety of apple, and forms a much larger number of roots, but smaller, and tending to spread out near the surface of the ground. The grafted tree partakes of the character of the roots of the stock; on the paradise stock it becomes more spreading in its habit, and grows less vigorously than on the crab stock, and, whilst the former is more suitable for growing trees in the bush form, the crab stock is more suited for standard trees.

In the case of pears, the corresponding stocks are: the pear stock for standard trees, and the quince stock for bush trees.

It must be remembered, however, that the effect of the stock on the growth of a tree is a subsidiary

[1] From a discourse delivered at the Royal Institution on Friday, February 21, by Mr. Spencer U. Pickering, F.R.S.