

probable, that the micelle carries, condensed on its surface, not only a considerable proportion of the solvent, but also much of the undissociated solute.

In reference to the general aspects of this work, two comments may be made. In the first place, Prof. McBain, in attempting to determine the real character of soap solutions, has tackled one of the big outstanding problems that called most urgently for a clear solution; the six years which he has devoted to this work have therefore been used far more advantageously than in solving the hosts of minor problems which appeal so strongly to workers who are anxious for immediate publication of results. In the second place, the elucidation of the nature of soap solutions by the theory of the ionic micelle is perhaps the biggest advance that has been made in the theory of electrolytic dissociation since the early work of Arrhenius and van't Hoff. Other workers, especially in physiology, have made use of similar ideas, but in no previous case has the experimental evidence been so complete or the theory established on so firm a basis as in the case of the soap solutions investigated in the Bristol laboratory. T. M. L.

### Plant Culture in Denmark.

IN Denmark during the past twenty years there have been great advances in the development of the various branches of plant culture. The organisation and aims of this work are described by Prof. F. Kolpin Ravn in a recent number of the *Scottish Journal of Agriculture* (vol. iii., No. 2, April, 1920). The first Danish experiments on plant culture were commenced in 1860 by B. S. Jorgensen, who took Rothamsted as his model. Later development followed various lines, but one of the most famous pioneers was P. Nielson, who in 1886 became director of the first State experiment station, and laid the foundation of the extensive State experimental work carried on at the present day. In 1893 the root experiments which had previously been instituted by the Society for the Improvement of Cultivated Plants were placed under the control of the State experiment stations, and in 1903 the same thing happened with the wheat and malt-barley experiments of the Royal Agricultural Society.

During the closing years of the nineteenth century various agricultural societies became keenly interested in plant-culture experiments, and by means of special committees on plant industry a large amount of useful work has been carried out. Since 1905 an increasing number of field experiments have been started by the "smallholders'" societies, the members of which have taken up this experimental work with great enthusiasm. All this work is carried out either by the State itself or by institutions with the aid of Government subsidies, the State contributing annually about 25,000*l.* for the development of plant culture. There are eleven State experiment stations, eight of which specialise in agricultural problems and the other three in horticultural problems. Field experiments and laboratory work are included, while various sub-departments carry out investigations on weeds, on plant diseases, and on chemical, physical, and bacteriological problems. The State stations deal with those problems requiring lengthy and very accurate experiments, while the agricultural societies conduct experiments designed to throw light on matters of actual and of local interest. The majority of these experiments deal with the use of fertilisers, and hints as to the final results appear in a very short time. Another section of experimental work is that of plant breeding, which is practised both by public and by private institutions. This work is supported by the

State experiment stations in that all novelties appearing on the market are accurately tested by variety and strain experiments without regard to the person or institution by whom they have been grown. In this way a competition open to all seed-growers and plant-breeders is formed, and this excites great interest, since the results of the experiments determine the market price of the seed.

Prof. Ravn points out that although the work appears to be very much scattered, yet the various institutions keep in close touch with each other by joint meetings, etc., when the general lines of work are discussed and common methods decided upon. It is thought that this type of organisation is most favourable to the development of initiative and to the proper testing of new ideas and products.

### Short-period Meteorological Variations.

NO. 102 of the Publications of the Royal Netherlands Meteorological Institute contains Dr. E. van Rijckevorsel's eleventh communication on the subject of secondary maxima and minima. The author maintains that if sufficient years be taken to mask the long-period variations, and mean values for an element such as temperature or barometric pressure be set down for each day in the year, the resulting figures for any station will show a series of waves of an average period of between ten and eleven days, so that thirty-five maxima appear in the annual curve.

The present contribution is devoted principally to a comparison of the barometer values for thirty-three stations from periods varying from forty-three years at Haparanda to only four years at Honolulu and St. Vincent, with those obtained in the long series of seventy-two years (1838 to 1909) at Christiania. The Christiania data are analysed more thoroughly, as the whole series is divided into two thirty-six-year periods A and B; and also the first twenty-four years of A, the last twelve years of B, and the first six years of B are treated separately. Moreover, the data from Christiania, Nerchinsk, and Innsbruck have been specially examined, the means from an equal number of years of maximum and minimum sun-spots having been taken for each of the three stations. Innsbruck is not one of the thirty-three stations, which are themselves grouped according to latitude, the mean latitude of the groups being 67°, 52°, 42°, and 21° respectively. They are fairly well distributed in longitude. Diagrams are given of twelve pulsations, the groups being separated and the stations in each group arranged in order of longitude, and an attempt is made to indicate a sort of systematic variation in the agreement between the several curves.

A final diagram gives apparently ideal curves of temperature and pressure through the year, showing the subsidiary period only affected by some annual variation which flattens the waves at the equinoxes, compared with actual values from fifteen years' data at Bucharest. Dr. van Rijckevorsel has devoted himself for many years to this particular investigation, but it does not seem to have enlisted much support up to the present time. W. W. B.

### University and Educational Intelligence.

CAMBRIDGE.—Prof. S. J. Hickson, of Manchester, has been elected an honorary fellow of Downing College. Mr. A. J. Berry has been re-elected to a fellowship.

GLASGOW.—Dr. A. J. Ballantyne has been appointed lecturer in ophthalmology in succession to Dr. M. Ramsay.