must have occurred during the elevation of the Andean ranges; at such a time a water communication may have been established between the two oceans and the fruits of a Polynesian Pritchardia deposited on an island in the Caribbean Sea.

The fruits, which are plum-like in structure, but with comparatively little flesh, vary in the different species from the size of a large pea to that of a date. The smaller ones would attract pigeons, which, though now unknown in Hawaii, may at some time, when greater land connections existed between the remoter islands of eastern Polynesia and those of Papuasia and western Polynesia, have contributed to stock the islands of the Hawaian group. But there is still the difficulty of explaining the presence of large-fruited Pritchardias on the most inaccessible summits of the mountains of Hawaii. Prof. Beccari suggests that these represent a surviving element of the vegetation which covered the plains before the cataclysms which resulted in the elevation of the present mountains and broke into fragments the originally much more extensive land area. The monograph is illustrated by twenty-four plates, mainly reproductions of photographs taken by Prof. Rock.

Agricultural Experiments at Ithaca, N.Y.

THE Report of the Agricultural Experiment Station of Ithaca, N.Y., for 1919 contains a number of memoirs of considerable interest, especially from the botanical and entomological points of view.

Work on the stimulation of growth by various chemical compounds indicates that treatment with potassium permanganate may result in a very marked increase in the root-growth of various woody cuttings. Other compounds of manganese, iron, and boron may show at times a slight stimulating effect, but nutrient solutions are, as a rule, injurious to the root-growth of cuttings. In another paper the effect of manganese compounds on soils and plants is discussed. The general conclusion reached is that with wheat, manganese salts presented in high concentrations exert a toxic effect, but in lower concentrations a marked stimulation is observable. When added to soil, manganese salts were found to form manganese dioxide in proportion to the basicity of the soil and to develop a power to oxidise organic matter.

In genetics two papers deal with chlorophyll inheritance and aleurone colour in maize, and another with the weak awn in certain Avena crosses. In some crosses of awned and awnless varieties (as Burt and Sixty Day) there is an almost complete dominance of the awnless condition, the factor for awning being apparently prevented from operating by an inhibition which is closely linked with the factor for yellow colour in the variety concerned. Environment seems to affect the production of awns, and observations suggest that an increase in the moisture-content of the soil and of its organic matter and nitrogen tends to decrease the number of awns.

Soil conditions are dealt with in memoirs on the translocation of calcium and on the reversibility of the colloidal condition of soils. In the first case it was found that the translocation of calcium through a clayey silt loam soil with a rather large lime requirement is extremely slow, since in the experiment no upward or downward movement of this element was perceptible twelve months after various amounts of calcium salts had been applied to the soil. In the second case it was demonstrated that drying a surface soil once produces as much effect in the colloidal material as repeated dryings alternated with moistenings, the drying producing a change in the colloidal material from which it does not immediately recover on being wetted. The drying indirectly affects the reversibility of its colloidal condition, the change being directly produced through biological and chemical action.

On the bacteriological side attention is directed to the effect of low temperature on soil bacteria and to the number and types of bacteria found in ice-cream during storage. In the soil there appears to be no change in the bacterial flora due to freezing, the bacterial activities being influenced only in so far as the physical properties of the soil are affected. The concentration of the medium, the length of time of exposure, and the degree of cold are the three important factors that determine the power of resistance of the bacteria to low temperature. The death of the bacterial cell when exposed to low temperature seems to be due to the withdrawal of water from the semi-permeable membrane or outer layer of the cell.

An outline is given of the life-histories and methods of control of various insects injurious to the hop in New York, special attention being devoted to the hop grub (*Gortyna immanis*, Guenee) and the hop redbug (*Paracalocoris Hawleyi*, Knight). The hop grub causes considerable financial loss, and in years when the insects are plentiful they may cause an almost total loss to some growers. The larvæ damage various parts of the vine, working in the buds, stem, and roots, thus weakening the plants in various ways. For control, clean cultivation is advised, with a ploughed border several yards wide round the field. The use of carbon bisulphide as an insecticide is unsatisfactory, but paradichlorobenzine has been successful when added to the soil of each hill in May.

The plant-lice injuring the foliage and fruit of the apple (*Aphis pomi*, de Geer, *A. sorbi*, Kaltenbach, and *A. avenæ*, Fab.) are described and fully illustrated, and the first part of a detailed systematic account of the crane-flies of New York is issued, dealing with the distribution and taxonomy of the adult flies.

W. E. B.

The Lhota Nagas.

AT a meeting of the Royal Anthropological Institute held on March 14, Dr. W. H. R. Rivers, president, in the chair, Mr. J. P. Mills, of the Indian Civil Service, read a paper on the Lhota Nagas of Assam. He said that in spite of its long contact with the plains of Assam, this tribe has retained its primitive dress and customs. It occupies a portion of the Naga Hills lying to the S.E. of the Brahmaputra Valley, and numbers some 18,000 souls. Like the Angamis, the Lhotas trace their origin to a mythical hole in the earth near the Kezakenoma stone. In dress they resemble closely their neighbours, the Aos, the men wearing a small apron and body cloths of various patterns, and the women a small skirt of very dark blue, with a light blue median band. Warriors in full dress wear human hair tails, elaborate baldricks with fringes of goat's hair dyed scarlet, and bear's hair wigs ornamented with hornbill feathers.

The villages, which are permanent, may contain any number up to 300 houses and are built on the tops of the ridges. The highest is at about 5000 feet. Each village contains one or more "bachelors' halls" in which boys and unmarried men sleep. In the middle of the village stands the head-tree, usually a *ficus*, on which heads taken in war were hung. Under it are

kept the "luck-stones" of the village, to which the Lhotas attach great importance. Other "luck-stones" are kept in the "bachelors' halls" and in the houses or granaries of individuals. Cultivation is of the shifting type known as *jhuming*, and there are numerous ceremonies connected with it.

The tribe is composed of three *phratries*, each of which contains a number of clans, which are in turn often subdivided into kindreds. Formerly a man was forbidden to marry a woman of his own *phratry*, but now intermarriage in the clan is often allowed provided the parties are of different kindreds. The classificatory system of relationships obtains. Inheritance is in the male line. Each village is run as a separate unit by an informal council of old men, and has an old man duly qualified who takes the lead at religious ceremonies. They believe in no Supreme Being, but in a world of godlings above the earth. The underworld is occupied by the dead, and elaborate precautions are taken at funerals to ensure that the soul goes there in comfort. Each male Lhota tries to perform the full series of feats of merit, and, like the Angami, sets up a monolith to mark their completion. A man's cloth varies according to the stage which he has reached in the series.

The Development of Ceylon.[1]

CEYLON has large and successful agricultural industries, and in 1916 a Commission was appointed to consider the development of existing industries and the establishment of new ones, in other branches of activity. The report of the Commission has just been issued, and is a very practical document, fully recognising that scientific knowledge is only one item, and that not the chief, in ensuring success. Many industries, desirable in themselves, do not offer sufficient financial prospects to attract any one away from the established agricultural and other trades.

The report goes on to say, "We have been profoundly impressed by the importance of scientific research in the progress and development of most of the industries we have examined"; and this theme is developed at some length, the final recommendation being that as private individuals can rarely afford the cost of the necessary research, this should be largely the affair of the Government, which is urged to establish a Bureau of Industry and Commerce, that should aim at a greater degree of co-ordination between the various scientific departments, and prevent overlapping of work. It should also establish a central Economic Museum, collect and collate statistics, foster new industries, aid them with scientific and other advice, and do other things. This would involve the establishment of a staff of research workers, and it is to be hoped that they may be generously paid, for, as it has been said, "A paternal Government may desire investigations to be made on some defined subject, and may duly engage an explorer to map that bit of country. . . . Then the poor sportsman, if he is to carry out his part of the agreement, is no longer free. And in that case he deserves good pay for the surrender of his freedom."

It is first pointed out that industries cannot be established without power, and as Ceylon has no coal this power must be hydro-electric. There are indications, however, that some scheme of utilisation of the considerable amount of water power that runs to waste in the hills may soon be put in hand.

Various possible industries are then considered, in which, bearing in mind the above considerations, it is conceivable that success might be attainable. Cement, for example, is considered to have little prospect, inasmuch as Ceylon could not consume the whole output of a factory large enough for proper efficiency. Spinning and weaving, on the other hand, offer good prospects, if the cultivation of cotton can be extended, for there is a large local demand, and the excellent wearing capacity of the cloth made from the short-stapled Indian cotton has already been fully proved.

The possibility of providing the wood used for the making of the vast numbers of chests used for packing tea, rubber, etc., is then considered, and it is thought that, with proper attention to seasoning, Ceylon should be able to supply all her own material, provided that the requirements of the grower of the wood, the maker of the box, and the user of the same, can be properly harmonised—a matter which would fall to the suggested Bureau.

For the encouragement of home industries, such as weaving, silver and brass work, embroidery, and the like, the establishment of a central School of Arts and Handicrafts is recommended.

The question of the fisheries is then dealt with, and it is pointed out that while there is more fish available in the sea than the island requires, it nevertheless imports to the value of about Rs.6,000,000 yearly. It is suggested that a Department of Fisheries be established, in place of the Marine Biological Department so ably carried on by the present Director of the Colombo Museum in addition to his other duties. This new department should attend, among other things, to increasing production, to improvement in methods of curing, to canning (for example, of sardines, which are plentiful), to the manufacture of fish manure and oils, to freshwater fisheries, pearl fisheries, chank, window-pane oyster, and bêche-de-mer fisheries, to encouragement of research, and other things, in all of which there seems to be great opening.

It is further suggested that experiments should be made with such industries as the manufacture of glass, cyanamide, paper, soap, etc.; and the improvement of the mining industry is also considered.

In conclusion, stress is laid upon the necessity for wise action by the State in regard to provision of power, and establishment of the Bureau above mentioned, when it is considered that industries dependent upon forestry and fishing would show the most promise. It is also urged that the youth of Ceylon be given the opportunity, by technical training, etc., of taking part in any future industrial development. The whole report is of a practical and statesmanlike character.

[1] Report of the Industries Commission, Ceylon. (Sessional Paper I of 1922.)

University and Educational Intelligence.

CAMBRIDGE.—The Allen Scholarship has been awarded to J. C. Burkill, Trinity College.

The annual report of the Appointments Board shows a total of 349 men placed in the past year, the highest figure for the past nine years. In view of the prevailing conditions in the industrial and commercial world, this is a satisfactory report. The chief subjects in which men have been placed by the Board are: Educational appointments, 143; administrative appointments in commerce and industry, 65; manufacturing and technical appointments, 47.

OXFORD.—Mr. A. L. Dixon, Fellow and Tutor of Merton College, has been appointed Waynflete Professor of Pure Mathematics in succession to Prof. E. B. Elliott.

THE honorary degree of Doctor of Science has been conferred on Sir Thomas Muir by the University of Cape Town, in recognition of his researches in mathematics and mathematical history. Sir Thomas Muir was Superintendent-General of Education for