

in the training of teachers, pointed out the impossibility of such students learning hygiene and applying it intelligently unless it was absolutely and strictly based on physiology, and that physiology could not be taught unless students had a preliminary knowledge of physics and chemistry.

Dr. Edkins insisted on the uselessness of teaching hygiene as a collection of health maxims, on the necessity that the teacher should know something of the material, bodily and mental, upon which he had to work, and that no teacher could do justice to the subject of hygiene or to the children taught if his or her qualification were simply rule-of-thumb knowledge and not genuine training in physical science.

Dr. Myers advocated the close coordination of the teaching of psychology and of the physiology of the nervous system and sense organs. Psychology should be included in every scheme of training college approved by the Board, and all psychology taught must have a basis of physiology.

The President of the Board of Education referred to the fact that the teaching of hygiene is universal in schools. He pointed out that the subjects taught in the training colleges were English language, literature and composition, history and geography, elementary mathematics, elementary science, the theory of music, principles of teaching, reading and repetition, drawing, needlework for women, singing and physical training, and that it would be very difficult to force other subjects upon these training colleges without sacrificing some of the subjects which the Board believed were more essential than the higher scientific subjects which the deputation desired to have taught. In conclusion, he informed the deputation that the Board thought that it ought to allow the effect of the Circular to be further realised before any step was taken in connection with it. The Board was not therefore prepared to suspend its operation.

AMERICAN BULLETINS ON AGRICULTURAL SUBJECTS.

THE results of the investigations carried out at the American experiment stations are issued as bulletins, and are sent out broadcast to all who are interested. Perhaps none of the institutions is more prolific than the Bureau of Entomology of the United States Department of Agriculture. In bulletin 97, part iv., Dudley Moulton describes the Californian peach borer (*Sanninoidea opalescens*, Hy. Edw.), which has been a constant menace to fruit-growers in certain districts. The adult moths fly from June to October, but are present in maximum numbers during July and August. The eggs are placed immediately after emerging, and after about two weeks the newly hatched larvæ enter the tree. The protective wash, a mixture of lime and tar oil, must therefore be applied before the middle of June. Carbon disulphide is used to a certain extent as an insecticide, but it has obvious disadvantages in that it is very volatile and combustible. Attempts have from time to time been made to replace it by a less dangerous liquid, and in bulletin 96 Messrs. Chittenden and Popenoe discuss the relative advantages of carbon tetrachloride and carbon disulphide as insecticides. It appears that the tetrachloride is less efficient and far more expensive, so that the problem is not as yet solved.

Bulletin No. 11 of the Michigan Agricultural College Experiment Station contains some experiments by D. G. Shafer, designed to ascertain how contact insecticides kill, a contact insecticide being one that works by enveloping the body in contradistinction to those that must be eaten to become effective. It

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appears that most of the vapours in use diffuse quickly into the insect tissues, and apparently reduce the oxygen absorption. If this conclusion is substantiated it will put the preparation of insecticides on a more scientific basis than has hitherto been possible.

Further observations on a bacterial disease of the pear, known as Hold-over blight, are reported by W. G. Sackett, of the Colorado Agricultural College. It appears that the prevalence of the disease in the arid western climate has been underestimated, and that careful watch will be necessary to prevent further spreading.

The special climatic conditions of New Mexico—rainfall from six inches per annum upwards and a warm climate—necessitate a corresponding degree of specialisation at the agricultural experiment station there. Bulletin No. 78 describes the cacti that occur most commonly, and the uses to which some of them may be put; it is considered that they might be used to a greater extent than they are as stock food. Both spiny and spineless forms have been tried with some measure of success, but the *Opuntia* are by far the most important for this purpose, because of their abundance. The *Cylindropuntias* come next, but they multiply too slowly to be of much value. The advantage of the cactus is, of course, its ability to utilise a scanty and irregular water supply; its disadvantages are that it contains a good deal of saline matter to which animals do not readily become habituated. Methods are suggested by which the live stock can be trained to take more cactus than they do, so as to increase the output of food material from each farm.

NOTEWORTHY WEATHER RECORDS.

AN interesting article on "The High Temperature of the Twelve Months May, 1911, to April, 1912," is published in *Symons's Meteorological Magazine* for May. Dr. Mill points out that for the first time in the Camden Square (N.W. London) record there has been a run of twelve consecutive months in each of which the mean temperature has been above the average of fifty years. In 1911 the month of April was the only one below the average. The mean temperature for the twelve months above quoted was 53.1°, or 3.1° above the average. The nearest approach to this figure for any twelve successive months in the past fifty-four years was 52.8° for the period March, 1868, to February, 1869. The most severe frosts of last winter occurred in the first week of February, but the unusual warmth of the latter part of the month raised the mean temperature 3.6° above the average. March was also very remarkable for its warmth, both the mean temperature, 46.5°, and the mean shade minimum, 40.5°, being the highest on record for March. There were no frosts in the screen.

The same periodical also contains an article on the rainfall of April last. In our issues of May 2 and 9 it was stated that, so far as Greenwich is concerned, so small a monthly amount as 0.02 in. had not occurred in the last 100 years. Referring to the rainfall over the whole of England, Dr. Mill states:—"We may say with confidence that no previous April since the establishment of the British Rainfall Organisation has been so dry." An interesting map which accompanies the article shows that it was an exceptionally wet month in the west of Scotland, while, on the contrary, the east of Scotland had, for the most part, less than an inch of rain. In Ireland the rainfall was little under the average for the month. The map shows very clearly another instance of the frequent divergence of rainfall at opposite parts of the British Isles.