

peculiarly rich in talus and burn successions. Within a radius of five miles are found more than twenty distinct plant formations. In 1903, stations were established at Manitou at 1,900 m., and on the top of Mount Garfield at 3,800 m., and automatic records were obtained throughout the growing season for the three zones, foothill, subalpine and alpine. During the present season, these stations are to be equipped with thermographs, psychographs and automatic photometers, while water-content determinations will be made at stated intervals. A small cabin has been acquired at Minnehaha, and it is intended to convert this into a laboratory ultimately. It is the purpose of the alpine laboratory to carry on investigations under field conditions alone, and the building will be equipped only with such books, microscopes and other instruments as are necessary to field experiment.

The general phytogeographical survey of the Colorado mountains, which was begun in 1896, has been carried out along new lines in vegetational research, and is now nearly completed. The structural characteristics of the mountain formations have already been indicated in a series of formation herbaria, entitled 'Herbaria Formationum Coloradensium,' issued in 1902, while the methods of research employed have just been published in a paper, 'The Development and Structure of Vegetation.' A large number of permanent and denuded quadrats have been established for the experimental study of invasion and competition, and considerable work in experimental ecology has been initiated by changing habitats and transferring species to diverse habitats. Special problems in succession and adaptation are under investigation by advanced students, and the results will appear during the coming year.

The facilities of the laboratory are at the disposal of botanists and students desiring to do advanced work or to carry on investigation, upon the payment of a nominal fee. Good accommodations may be secured at reasonable rates in the mountain hotels at Minnehaha and Halfway. Minnehaha is reached from Manitou by the trains of the Cog railway, over which commutation tickets may be ob-

tained at reduced rates. Detailed information will be furnished upon application to Dr. Frederic E. Clements, The University of Nebraska, Lincoln, Nebraska.

THE CULTIVATION OF COTTON IN THE WEST INDIES.

It is satisfactory to report that the experimental cultivation of cotton in the West Indies has proved a success, and that the industry is now established on a commercial basis. Plantations exist in Barbados, St. Lucia, St. Vincent, Montserrat, Antigua, St. Kitts, Trinidad, and the smaller islands, while plots have also been started in Jamaica and British Guiana. The total area estimated to be under cultivation is 4,000 acres. During the season just ended Barbados alone shipped, up to March 31, 244 bales and two bags of cotton, weighing 61,000lb., and the gins have been busy since. The Imperial Department of Agriculture, which has the work in hand, has orders from planters for Sea Island seed sufficient to plant 7,000 acres, and as this quantity has been paid for the presumption is that it will be used. In Jamaica, where the pioneer work is being carried out by the Board of Agriculture, enough seed has been disposed of to plant 500 acres. A number of Syrians, who are acquainted with cotton-growing in Egypt, are engaged in the cultivation there. Central factories for ginning and pressing the cotton have been erected in the various islands, and a cotton gin expert from the Sea Islands has just completed four months' work on the machines, all of which are now in perfect working order. He states that the factory in St. Vincent is the best-arranged and best equipped he has ever seen. A nine-hours' run of the six gins yielded 3,800lb. of lint; in Barbados, where the methods and appliances are not so scientifically complete, a similar run gave from 1,500lb. to 1,600lb. There are a few private ginneries, but the majority are government undertakings carried on under the direction of the Imperial Department of Agriculture. The cotton is ginned, baled and shipped for the planters for 3c. per lb. of lint; seed cotton is also purchased at the rate of 4c. per lb., which is

equivalent to payment at the rate of about 11d. per lb. for the lint in the Liverpool market. The prices obtained for the Sea Island cotton have been highly satisfactory. One recent consignment from Barbados was valued at from 16d. to 17d. per lb., another averaged just under 15d., the highest price being 16½d., and the lowest 13d. Prices current exhibited in Barbados at the same time showed that Sea Island cotton was being quoted in Savannah at from 10d. to 12½d., but this was evidently the price for common lint, as the last crop on the Sea Islands brought from 30c. to 35c.—this, of course, representing the result of 30 odd years of careful selection and cultivation. The figures given are sufficient to indicate that West Indian cotton, grown from Sea Island seed, is capable of yielding a return quite equal to the finest product of America. It is calculated that, the yield of lint being assumed to be 204lb. per acre—the average in America—and the total cost of placing it in the Liverpool market 7d. per lb. for cotton fetching 12d. per lb., the net profit would be at the rate of £5 2s. per acre. Labor is cheaper in the West Indies than in the Southern States; the cotton gin expert referred to was amazed at the low value of the labor in Barbados.

Sir Daniel Morris, the head of the Imperial Department of Agriculture, is of opinion that the only cotton that should be grown in the West Indies is the Sea Island variety, which, it is well known, is a native of these islands. Other varieties are therefore being eliminated. Some planters favor the Upland, and even the indigenous varieties which are still found growing wild, but it will undoubtedly prove more advantageous to devote attention only to the highly cultivated long-staple Sea Island cotton. The area throughout the world suitable for the growth of Upland is unlimited; that able to produce Sea Island is strictly limited. The latter fetches double the price of any other cotton, and like Blue Mountain coffee, will remain unaffected by future fluctuations of the market. A sample of the native cotton of Jamaica has been sent to England and pronounced very fine, being valued at 14d. per lb. It is a cotton which appears to resist

insect pests, and many think that a first-class variety might be evolved from it. The experiments in the island, however, are being made with Sea Island seed, and it will probably be found wiser to begin where the Sea Island planters have left off than to engage in experiments which may not prove successful.

Many difficulties have naturally been encountered in establishing the industry, owing largely to the inexperience and ignorance of the growers, the most formidable being the attack of the cotton worm. Remedies were not at hand, and loss was sustained, but the planters are now forearmed, and they believe themselves able to cope with any similar emergency. Every assistance is rendered to growers by the Imperial Agricultural Department, which has published and circulated an extensive literature on the subject. One of Sir Daniel Morris's latest ideas is to send the officers of the department to the various islands to deliver popular lectures on the industry with magic-lantern illustrations. He recommends, however, that only capable planters should go in for cotton-growing at present, and advises those who wish to come out to the West Indies to embark on planting on a large scale, to pay a visit first to St. Vincent, and study the conditions and opportunities there. Great credit is due to him for his indefatigable efforts to promote the industry during the past four years. West Indian planters are not very ready to strike out on new lines, and, but for the steady persistence and influence of the department, aided by practical assistance from the British Cotton Growers' Association and West Indian Committee, it is doubtful whether the present important results would have been achieved.

DECENNIAL PUBLICATIONS OF THE UNIVERSITY OF CHICAGO.

MOST of the eighteen volumes originally planned as decennial publications of the University of Chicago have been issued. The University Press announces the following as among the volumes that may be expected shortly:

Lectures on the Calculus of Variations. By
OSKAR BOLZA.