raphy will afford ample returns to science, and that the key-note of the inquiry should be the more precise observation of lineamental orientation.

William Herbert Hobbs.
University of Wisconsin,
September 25, 1903.

## *BOTANICAL NOTES.*

### A NEW EDITION OF DETMER'S PRAKTIKUM.

For many years botanists have been acquainted with the very useful little book on plant physiology prepared by Doctor Detmer, of the University of Jena, and intended to be a laboratory handbook under the title of 'Das Kleine Pflanzenphysiologische Praktikum.' This little book has passed through a number of editions, and has been used widely in plant physiological laboratories. The present edition, which bears date of February, 1903, is an enlargement and improvement of the previous editions. It is essentially the same as the earlier editions and is illustrated in the same admirable manner. American botanists can not but envy the German botanists when it is remembered that this book of nearly three hundred pages is sold for a little more than six Marks. It should be even more largely used than its predecessors.

### THE ALGÆ OF NORTHWESTERN AMERICA.

An interesting paper entitled 'The Algæ of Northwestern America' came to hand recently, as one of the University of California publications. It is by Professor W. A. Setchell and N. L. Gardner. It is an attempt at a rather exhaustive account of the algæ of the northwestern coast of North America. It is illustrated with eleven good plates, and altogether is a very excellent paper. The bibliography appears to be quite complete.

The two numbers of Engler's 'Pflanzenreich,' which have recently made their appearance, are devoted to the Orchidaceæ (in part) and the Eriocaulaceæ. The first takes up merely one section of the great family, but this is of interest to us since it includes the lady slippers (of the genus *Cypripedium* and related genera). The treatment is very full, and can not help throwing a great amount of light upon this portion of the orchid family. In passing it may be remarked that Pfitzer, the author, insists upon the spelling *Cypripedilum,* instead of that which is ordinarily followed. The illustrations are excellent. The other number is by Ruhland, and here the treatment is very much like that given by Pfitzer. These successive numbers of Engler's publication indicate that this is to be one of the great publications in botanical literature.

Charles E. Bessey.
University of Nebraska.

## *STUDIES OF THE FOOD VALUE OF FRUIT AT THE UNIVERSITY OF CALIFORNIA.*

According to a bulletin of the U. S. Department of Agriculture Professor M. E. Jaffa has carried on at the University of California, in cooperation with the U. S. Department of Agriculture, a number of investigations which have to do with the food value of fruits and nuts, the special object of this and the earlier work which it continues being to study the value of such foods when they constitute an integral part of the diet.

Nine dietary studies and 31 digestion experiments were made, part of them with persons who had lived for a number of years on a strictly fruit and nut diet, and others with university students who had been accustomed to the ordinary fare. In the majority of the dietary studies and all but one of the digestion experiments fruit and nuts constituted all or almost all of the diet. Thus, in one series of tests the daily ration consisted of apples and bananas, alone or in combination, eaten with walnuts, almonds, Brazil nuts, or pecans. In other experiments different combinations of grapes, pears, figs, walnuts, and other fruits and nuts were eaten with small quantities of milk, cereal breakfast foods, etc., the latter articles being taken simply to give a relish to the experimental dietary combinations, some of which were rather unusual.

In connection with this work the nutritive value of individual fruits and nuts was studied and many data were collected and summarized regarding the composition and

energy value of these materials, an interesting feature of the work being a comparison, on a pecuniary basis, of these and some common foods as sources of protein and energy. In general, it may be said that the chief nutrients in fruit consist of sugars and other carbohydrates and in nuts of protein and fat. In other words, while both fruits and nuts furnish the body with energy, nuts furnish some building material (protein) as well. Some idea of the range may be gained from the fact that at ordinary retail prices in the United States, 10 cents expended for fresh grapes will supply the body with about 830 calories of energy, and in the case of dried apples or apricots will supply about 1,200 calories, as compared with 6,600 calories from 10 cents' worth of wheat flour. In the case of almonds this sum will supply 0.08 pound protein and about 1,100 calories of energy, and in the case of peanuts 0.28 pound protein and about 2,800 calories, while expended for cheese it would provide 0.17 pound protein and about 1,300 calories, and for flour 0.46 pound protein, as well as the large amount of energy noted above.

Although some of the dietaries showed that it is quite possible to obtain the needed protein and energy from a fruitarian diet, the majority of those studied fell below the tentative dietary standards. It is hardly just to ascribe this entirely to the form of diet since the same people might have consumed no larger quantities of nutrients on an ordinary mixed diet. The nutritive value of the fruitarian diet is perhaps most clearly shown in the case of one of these subjects, a university student, who though entirely unaccustomed to such fare gradually changed from an ordinary mixed diet to one of fruits and nuts without apparent loss of strength or health. He was then able for the eight days of the experiment to carry on his usual college duties and for a part of the time also performed heavy physical work on an exclusive fruitarian diet without material loss of weight.

The cost of the fruitarian diet per person per day varied from 18 to 46 cents, values which compare favorably with those found for an ordinary mixed diet.

Although it is undoubtedly advisable to wait until more data have been gathered before making definite statements regarding the digestibility of different fruits and nuts, enough work has been done to show that they are quite thoroughly digested and have a much higher nutritive value than is popularly attributed to them. In view of this it is certainly an error to consider nuts merely as an accessory to an already heavy meal and to regard fruit merely as something of value for its pleasant flavor or for its hygienic or medicinal virtues.

As shown by their composition and digestibility, both fruit and nuts can be favorably compared with other and more common foods. As sources of carbohydrates, fruits at ordinary prices are not expensive; and as sources of protein and fats, nuts at usual prices are reasonable foods.

In the investigations at the University of California the question of the wholesomeness of a long-continued diet of fruit and nuts is not taken up. The agreement of one food or another with any person is frequently more or less a matter of personal idiosyncrasy, but it seems fair to say that those with whom nuts and fruits agree can, if they desire, readily secure a considerable part of their nutritive material from such sources.

## *SCIENTIFIC NOTES AND NEWS.*

THE National Academy of Sciences will hold its autumn meeting in Chicago, beginning on November 17.

IN accordance with the pleasant custom of German universities, Professor E. W. Hilgard of the University of California has received from the University of Heidelberg on the occasion of the fiftieth anniversary of his graduation as doctor of philosophy, October 7th, a new diploma reconferring the title, which in addition to the previous formula, contains a general summary of the scientific work done by him, with the congratulations of the faculty. On the anniversary day Professor Hilgard also received a congratulatory address from his colleagues of the University of California.