

dress on Liberal Culture and Professional Education, in the course of which he justified the recent action of the University in offering the B. A. degree in place of the degrees of Bachelor of Philosophy, Science and Law. He held that liberal culture does not come alone from the study of classics. "If it be said that the action of Cornell University destroys the conception of liberal culture, I reply that, far from destroying the conception, it enlarges and revivifies it and brings it into living relation with all the intellectual and æsthetic elements of our modern complex civilization. It is folly to suppose that some parts of human knowledge are liberalizing, and others neutral or negative; or that some institutions yield culture, and others merely science."

DISCUSSION AND CORRESPONDENCE.

THE APPLICATION OF SEX TERMS TO PLANTS.

TO THE EDITOR OF SCIENCE: If I do not mistake Prof. Bailey's meaning in his article 'On the untechnical terminology of the sex-relation in plants' (SCIENCE, N. S. III., 825), he advocates a use of the terms male and female in semi-popular language which he acknowledges to be in reality incorrect, since he accepts as true the present view of the morphology of the members involved. It should be remembered that this usage arose when the morphology of the stamen and pistil was not understood, and when the ovule in the pistil was really believed to be an egg within an ovary and the pollen grain in the anther, the sperm within a spermary. The question to be discussed is "Shall this usage be continued in 'common' language?"

It may be conceded at once that it is of no practical importance to a horticulturist (whose interests Prof. Bailey clearly has at heart) whether he is taught to apply sex terms to flowers and their members or not. Seed time and harvest will not fail because he does not know the plants he deals with. But suppose a student whom Prof. Bailey has inspired with a desire for more extended study goes to another teacher for a course in morphology. He has been taught to call a stamen a 'male organ.' He is given a staminate flower of a pine. He is permitted to call its members stamens, and

in their 'maleness' his professor of horticulture has led him to believe. Very good. He is then given a shoot of *Equisetum*, bearing what the Manual is pleased to call a 'fertile spike.' He discovers its close resemblance to the former specimen, and perhaps thinks to call it a 'male flower' and its members 'male organs.' But as he studies the life history and seeks to discover the 'function of paternity,' in some unaccountable way the maleness vanishes, and instead he finds an organ exhibiting at the same time both 'maleness' and 'femaleness'—discharging at the same moment 'the function of paternity' and 'the function of maternity'—quite as truly, at least, as the stamens 'discharge the paternal relation.'

Will Prof. Bailey hold that the stamen-like sporophylls of *Equisetum* should, therefore, 'in the broad sense of common language,' be called hemaphrodite organs? If so, what will he say to the sporophyll of *Botrychium* or *Onoclea*, whose spores produce a bisexual plant? By what sex term will he designate untechnically the office of such sporophylls? I do not take him here beyond the plants with which the florist deals and about which he may rightly demand instruction. Surely, in this day, Prof. Bailey would not desire to perpetuate, even among amateurs, the fiction that between the ferns and the flowering plants there is a great gulf fixed? Yet the loose use of language which he advocates would seem to require an affirmative answer. Into what hopeless confusion this would plunge the poor student, only he can imagine who has seen the difficulty with which one eradicates from his thought and language the misleading analogies which he has merely acquired accidentally. How much more difficulty would they give were they inculcated by a trusted teacher!

Although Prof. Bailey enunciates briefly in his introduction the doctrine of the alternation of the sexual and non-sexual phases in plants, he seems to have failed to grasp its significance when he writes: "Surely the prothallus is no more sexual than a stamen or a leaf." The essential character of the sexual phase is that it produces gametangia, *i. e.*, sexual organs, in which the sex cells are differentiated. The essential character of the non-sexual phase is that

it produces sporangia, *i. e.*, non-sexual organs, in which spores are differentiated. All that morphologists ask of Prof. Bailey is that he use the same criterion with plants as with animals, applying, by a common grammatical figure, sex terms to the organs that produce sex cells, and to the plants that carry the sex organs. It is for this reason that it is proper to call a bull a male animal and a cow a female animal. But if the embryo produced by the union of their sex cells grew into an animal 1,000,000 times the size of the bull or the cow, and one of its giant cells formed within itself a bull and another within itself a cow, we should certainly not be justified in applying sex terms either to the monster or to any of its organs.

When Prof. Bailey asks to have the figurative use of the sex terms *extended so as to obscure the distinction between the sexual and non-sexual phases of the plant*, he asks us to return to a confusion from which botanical language has been happily delivered, and from which it is the duty of botanists to deliver 'common language.' This deliverance can be brought about simply by using untechnical terms already coined and by avoiding the use of sex terms for a purely vegetative organism. 'Staminate flowers' and 'pistillate flowers' are phrases quite as untechnical as 'male flowers' and 'female flowers,' and they have the advantage of avoiding the perpetuation of obsolete ideas.

Were the question merely one of morphological consistency it would be of comparatively little moment. But it is a question of clearness or confusion of ideas. If the mental eye, as it looks upon plants, be not single, the whole mind will be full of darkness; and if the morphological light that is in the student be darkness, how great is that darkness! To advocate one set of ideas for common language and another for technical is to advocate a return to that chaos of which the professional botanist himself was scarcely conscious until the light of the doctrine of the alternation of generations broke forth. In its light it behooves us to order our use of language that applied botany will be helped toward a clearer view of plant life.

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SCIENTIFIC LITERATURE.

Antropometria Militare. By DR. RIDOLFO LIVI. Parte I. Text and Atlas. Roma. 190+ 419 pp; 23 plates.

The first part of Dr. Livi's great work on the anthropometry of Italy has recently been issued by the Director of the Italian Army Medical Journal. The work ranks easily among the most important contributions to anthropology. The fact that in past years Dr. Livi has contributed some of the most fundamental results of his extended and careful investigations to the *Archivio per l'antropologia e la etnologia* and presented others that are not less interesting to the Roman Anthropological Society and to the Eleventh International Medical Congress (Rome, 1894) has made the complete presentation of his data only the more eagerly expected. The present part contains the purely anthropological results of his investigations, while the second part will be taken up by hygienic and in a more general way sociological statistics.

The investigations are based on measurements and observations upon men born in the years 1859-63 and enlisted in the Italian army. The anthropometrical data that were collected are the following: Stature, circumference of chest, weight, length and breadth of head. Besides these a number of descriptive features were observed: Color of eyes and hair, complexion, character of teeth, form of forehead, of nose, of mouth, chin and face. These data have been worked up in the following detailed tables:

For each military district (Mandamento):

1. The frequency of statures in groups of from 5 to 5 cm.
2. The frequency of the various colors of the hair and of the eyes and that of the pure blonde and of the pure dark type.
3. The average cephalic index and its distribution in groups from 5 to 5%.

For the larger districts (Circondario) the preceding data are summarized and the following are added:

1. The relation between stature and color of hair.
2. The relation between stature and color of the eyes.
3. The relation between color of hair and color of eyes.