ness men but as a reference work in schools and colleges.

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BOTANICAL NOTES

GENERAL NOTES

One of the most interesting of the popular bulletins issued by the United States Department of Agriculture is that on "The Basket Willow" (Farmers' Bulletin 34) prepared by W. F. Hubbard, of the Forest Service. It appears that the growing of basket willows was introduced into the United States about sixty years ago by German immigrants who settled in New York and Pennsylvania. It has now extended south and west and is rapidly spreading over the non-arid regions of the far west. Three species are commonly grown for this purpose, viz., *Salix amygdalina, S. purpurea* and *S. pruinosa acutifolia,* and in the bulletin the peculiarities of each are given. How to plant, how to prune and care for the young trees, how to cut and peel the rods, and finally how to prepare them for the market are described in a most interesting manner. Every botanist who is interested in the economic aspects of his science will find this pamphlet worth reading.

Botanists of an ecological turn of mind will find in A. W. Sampson's paper on "The Revegetation of Over-grazed Range Areas" (Circular 158, U. S. Forest Service) an example of how ecology may have some intensely practical applications. In the Wallowa National Forest in northeastern Oregon the sheep owners overgrazed the land, and it became necessary to study the problem of the restoration of the pastures to their original condition. At first this would seem to be an agricultural problem, but its solution called for "an expert in plant ecology (Mr. Sampson) and in the last analysis the problem becomes an ecological one. The paper is commended to ecologists for careful study.

Another agricultural bulletin of high botanical interest is L. H. Smith's on "The Effect of Selection upon Certain Physical Characters of the Corn Plant" (Bull. 132, Ill. Expt. Station) in which are given the results of experiments in breeding corn (maize) with reference to (1) the height of the stalk, and (2) the declination of the ear from the stalk. By starting with a particular variety of corn and breeeding in opposite directions in the fifth generation the average heights of the ears on the stalks are three feet apart. In part this is due to the increased height of the whole plant on one hand, and the decreased height on the other, but it is due still more to the appearance of the ears from higher or lower internodes. Thus the average number of internodes below the high-eared corn was $8\frac{1}{2}$, while the average for the low-eared corn was $6\frac{1}{2}$, and this was reduced to a little more than $4\frac{1}{2}$ in the last generation. Apparently one may breed the ears down to the ground, or up out of reach.

Here may be mentioned W. T. Macoun's "List of Herbaceous Perennials Tested in the Arboretum and Botanic Garden of the Central Experimental Farm at Ottawa, Canada," which contains an astonishingly large number of species (over 2,100), when one thinks of how far north they were grown.

Under the title "The Distribution of Woody Plants in the Pikes Peak Region" Professor E. C. Schneider enumerates 115 species, giving altitudes, distribution and descriptive notes. It is printed in the Colorado College Publication (Vol. XII., Science Series). Fifteeen conifers are enumerated, five poplars, fourteen willows, six oaks, etc.

Much more ecological in nature is Professor Ramaley's "Studies in Lake and Streamside Vegetation" (*Univ. Colo. Studies,* Vol. VI.), which deals with the plants of Redrock Lake near Ward, Colo., at an altitude of over 10,000 feet above sea-level. It is, we are told, the first of a series of similar papers. It is beautifully illustrated by many half-tone reproductions of photographs.

That the botanists of Colorado are active is shown by the foregoing, and also by the following titles of recent papers in the *University of Colorado Studies* (Vol. VI.): "Botanical Opportunity in Colorado," by Professor Ramaley; "Studies in Mesa and Foothill Vegetation" (including the "Distribution of Conifers (4 species only) on the Mesas," by

W. W. Robbins and G. S. Dodds, and "Distribution of Deciduous Trees and Shrubs on the Mesas," by W. W. Robbins); and "Bibliography and History of Colorado Botany," by Edith M. Allison. Under the last title several hundred papers are enumerated bearing more or less upon Colorado botany.

Somewhat out of the ordinary is Professor De Loach's bulletin entitled "The Mendelian and De Vriesian Laws Applied to Cotton Breeding" (Bull. 83, Georgia Experiment Station). It is a plea for the application of scientific principles to the breeding of the cotton plant, with illustrations from his own work, and will repay careful reading.

The Report of the State Forester of Wisconsin for 1907 and 1908 contains much interesting, and some encouraging matter for the lover of forests. Especially pleasing is the "half-tone" frontispiece which shows a thrifty growth of young pines which if protected will eventually restock the land with a forest covering.

Not strictly botanical, but worthy of examination, is the Second Biennial Report of the Wyoming State Board of Horticulture, of which the well-known botanist, Professor Aven Nelson, is the secretary. The eastern reader will be astonished at the photographs of fine trees and fruits grown in this new mountain state.

RECENT SYSTEMATIC PAPERS

Another local manual of botany has appeared, this time in a region where such a thing is much needed. Professor J. R. Watson, of the University of New Mexico, has issued as one of the bulletins of the university (No. 49) a pamphlet of a little more than a hundred pages consisting of a "Manual of the More Common Flowering Plants Growing without Cultivation in Bernalillo County, New Mexico." In his preface the author says that it "has grown out of the need of a key to the local plants to place in the hands of his students. None of the manuals published cover this region satisfactorily." Thus finding no systematic manual, he very properly went to work and made one. That is the right spirit for the teacher, and Professor Watson is to be commended for undertaking the work. And we say this in spite of the poor printing and the numerous typographical errors in the pamphlet. One who has had no experience with the small printing establishments to be found away from the large cities has no conception of the impossibility of faultless typography under such circumstances. So we overlook the *form* of the little manual, and see in it a worthy effort of the author to supply a usable book for his pupils. We should like to see more teachers willing to incur the labor necessary to provide as useful a book as this.

H. Leveille's "Monographie du Genre Onothera," begun some years ago, has reached its third part and includes species from No. 38 to 54, *i. e.*, those of the "groups" *Godetia, Clarkia* and *Boisduvalia.*

Recent numbers of the "Leaflets of Philippine Botany" issued at irregular intervals by A. D. E. Elmer, of Manila, include articles 23 (November 23, 1908) to 29 (February 15, 1909). The titles are "Synopsis of *Rubus*" (classifying and describing the sixteen species and one variety which occur on the island), "Threescore of New Plants," "The Genus *Itea*" (containing two Philippine species), "A Fascicle of South Negros Figs" (34 species, of which 5 are new), "Gesneraceæ from the Cuernos Mountains," "New Philippine Zingiberaceæ" and "A Score of New Plants." These "leaflets" constitute an interesting little journal of systematic botany.

A NEW LAKESIDE LABORATORY

A very pretty prospectus announces the establishment of the "Lakeside Laboratory" of the State University of Iowa at Okoboji, Iowa, by the alumni of that institution. The location is on a bay on the westerly side of Okoboji Lake, in the extreme northern part of central Iowa, at the highest elevation above the sea of any place in the state. The session covers ten weeks, divided into two terms, the first from June 21 to July 31, and the second from August 2 to August 28. In botany three courses are offered in the first term, namely: (1) mycology, by Professor Macbride; (2)

biology of aquatic plants, by Professor Wylie; (3) the nature of plants, by Professor Wylie. Opportunities are afforded, also, for research work in botany under the direction of the two professors named. In the second term, work is offered in field ecology and plant taxonomy by Professor Shimek. Courses in geology, zoology and nature study also are offered by competent instructors. The management of this summer-school work is in charge of the director of university extension at Iowa City.

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SPECIAL ARTICLES

SEX AND ITS RELATION TO THE BARRING FACTOR IN POULTRY

W. J. Spillman[1] has suggested that the barring factor and sex in poultry are correlated in such a way that the female is always heterozygous in respect to sex and also barring when present. The male, on the other hand, is always homozygous in respect to sex and may be either homozygous or heterozygous in respect to barring. I have recently performed the following experiments, which bear directly on this point and confirm his theoretical deductions.

Experiment 1.—A Buff Rock male (non-barred) bred to Barred Rock females give, in F_1, barred males and non-barred (blacks or buff) females.

Experiment 2.—A Barred Rock male bred to Buff Rock females (non-barred) or a Rhode Island Red female (non-barred) gives in F_1, all barred birds in both sexes.

Experiment 3.—A Buff Rock male bred to F_1 females (non-barred) from experiment 1 gives, in F_2, chicks which do not show the down pattern characteristic of chicks from barred parents, thus indicating an entire absence of barring in F_2.

These experiments may be formulated thus: Using B = barring factor, b = its absence; F = the female sex factor, f = its absence or the male sex factor. Assume that B and F can not occur in the same gamete (Spillman). Then,

Experiment 1 becomes $bf \cdot bf \times Bf \cdot bF = Bf \cdot bf + bf \cdot bF$.

Experiment 2 becomes $Bf \cdot Bf \times bf \cdot bF = Bf \cdot bf + Bf \cdot bF$.

Experiment 3 becomes $bf \cdot bf \times bf \cdot bF = bf \cdot bf + bf \cdot bF$.

Other crosses giving similar results are:

Experiment 4.—A White Rock male (carrying barring as a cryptomere) mated with Brown Leghorn females gives in F_1 both sexes barred.

Experiment 5.—The reciprocal cross, viz., a Brown Leghorn male mated with White Rock females gives black chicks and chicks having a down pattern like that of Barred Rock chicks. These chicks, however, are yet too young to enable a determination of their sex.

Experiment 6.—A White Rock male (carrying barring) bred to Buff Rock females gives, in F_1, both sexes barred.

Experiment 7.—From the reciprocal cross I have only two birds as yet, both barred males.

Experiment 8.—One of the F_1 barred males from experiment 7 mated with a Buff Rock female gives, in F_2, barred and non-barred chicks, which are still too young to permit of their sex being determined.

While my results appear to confirm Spillman's suggestion, I wish to point out that experiment 3, rather than experiment 2, 4, 6 or 8, furnishes us the true test of his suggestion, for the reason that the presence of the F factor may simply prevent the B factor from becoming visible under certain conditions. In some experiments, at any rate, I find that the presence of the F factor operates to modify barring, making it appear obscure and blurred as compared with males from the same parents. On the other hand, we may refer this obscuring of barring to some other cause, perhaps the heterozygous nature of the female.

The details of these experiments are reserved for a later paper.

H. D. Goodale

Since the above note went to Science some F_2 chicks in experiment 3, have reached the

[1] *Am. Nat.*, Vol. XLII., No. 50, 1908.