long; corolla ochroleucous, about 15 mm. long, the banner moderately arched; fruit leathery, nearly straight when young but at maturity the dorsal suture concave and the ventral suture convex making the pod recurved, 25–40 mm. long and 3–4 mm. wide, sulcate on the dorsal suture, the cross section obcordate and without an internal septum; stipe 7–10 mm. long, exceeding the calyx; seeds about 10 to 15 in each pod, reniform.

Type. Northwest of Spruce Tree House, Mesa Verde National Park, Colorado, 6800 feet, May 26, 1925, *Hazel M. Schmoll & Deric Nusbaum 1555* (Rocky Mountain Herbarium no. 105889, flowers, no. 105888, fruit). Cotype. Among junipers, Mesa Verde National Park, Colorado, May 12, 1925, *A. Nelson 10420* (Rocky Mountain Herbarium).

The relationships of this species are not clear, but it appears to have the most in common with the Section *Racemosa* as defined by Rydberg. The recurved pod also suggests *Astragalus recurvus* Greene in the Section *Atrata,* but the large flowers, long stipe, and coarse nature of the plants are not in keeping with that group.

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Literature Cited

1. Beath, O. A., C. S. Gilbert, and H. F. Eppson. Am. Jour. Bot. 26: 257–269, 296–315. 1939.
2. Trelease, Sam F., and Helen M. Trelease. *Loc. cit.* 25: 372–380. 1938.

REVIEWS

Experimental Studies on the Nature of Species. II. Plant Evolution through Amphiploidy and Autoploidy, with Examples from the Madiinae. By Jens Clausen, David D. Keck, William M. Hiesey. Carnegie Institution of Washington Publ. 564: viii + 174. 1945.

Part two of "Experimental studies on the nature of species" consists of well-documented discussions of the role of amphiploidy and autoploidy in the reticulate type of evolution that characterizes groups at or below the taxonomic level of genera and species. The documentation is chiefly of data resulting from the experimental synthesis of amphiploids. After cytogenetic investigation their interpretation follows biosystematic principles. Many experimental polyploids developed by others are reviewed and interpreted along the biosystematic pattern. The term "autoploidy" is restricted to "the multiplication of genomes within one ecospecies," while "amphiploidy" involves the addition of the genomes of two distinct species.

The authors point to the organization of living things being in a sort of equilibrium between genetic and ecologic processes. "The natural species consists of individuals whose genes are in internal balance so that a harmonious physiologic and morphologic development is assured generation after generation." The

individuals of wild species not only are balanced internally, but are in harmony with their natural environment.

A classification of hybrid auto- and amphiploids is presented based upon circumstances of origin which determine certain observable results involving such features as the loss or preservation of parental genomes, and the complete, partial, or absence of inter-genomal pairing. Plotted against these differentiae is the degree of sterility or fertility of the undoubled F_1. The fully fertile F_1 is regarded as resulting from an intra-ecospecific cross and is known only in autoploids. Where partial sterility results the cross is regarded as inter-ecospecific, and where complete sterility results, the cross is regarded as inter-cenospecific. These latter cases apply to amphiploids.

Although the reticulate nature of evolutionary relationship in the lower taxonomic categories is granted, your reviewer prefers to keep an open mind on the significance of interfertility and sterility, used in a categorical sense, to delimit or merge taxonomic entities. There is much to be learned about the nature and causes of sterility and fertility. This leads him to question the merging of the hexaploid *Madia citrogracilis* and the hexaploid *M. gracilis* on the circumstantial evidence of gene interchange in spite of the difference in origin of the two. Likewise, he maintains an open mind on the meaning of the apparent discrepancies in the classification of the grasses discussed by these authors until we can be sure that speciation in the monocotyledons follows precisely the same cytogenetic patterns as it does in dicotyledons.

The work goes a long ways toward clarifying the problems of amphiploidy and autoploidy and it is of the usual excellence of these authors.—Herbert L. Mason.

Flora of Illinois. By George Neville Jones. The University Press, Notre Dame, Indiana. Pp. 317, 1 map. 1945. $4.00.

To an already impressive list of excellent guides to the flora of limited regions of North America, Dr. Jones now adds the "Flora of Illinois," a volume deserving the whole-hearted commendation of amateur and professional botanists. The work consists of carefully constructed keys to the families, genera, and species of plants in the state of Illinois. There are no descriptions, no illustrations, and indications of range beyond state boundaries are omitted. There is no list of proposed new species, new names, or new combinations, but one finds on page 178 a new combination in *Rhus*. There is a short discussion of the flora and vegetation by regions at the beginning, and a lengthy bibliography at the end. The section of the latter dealing with taxonomic monographs and revisions, although incomplete, is perhaps the most useful bibliography of this kind which has appeared in connection with any North American flora.

The key to the families (adapted from an earlier attempt by