to govern in direct proportion one's concern for conservation, and so it was that Jepson was a founder and prominent spokesman for the Save-the-Redwoods League and a staunch advocate of forest conservation measures and such other endeavors as the Point Lobos Reserve. All in all, it has been through many channels that the works of Jepson the botanist have become known, not only to his California audience, but to the world at large.

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REVIEWS

The Evolution of Gossypium and the Differentiation of the Cultivated Cottons. By J. B. Hutchinson, R. A. Silow and S. G. Stephens. Oxford University Press. 160 pp. 10 figs. 1947. 15s.

The genus *Gossypium* is of outstanding interest not merely because of the economic importance of cotton, but in respect to the taxonomy, genetic relationships, morphology, and physiology of the plants. To botanists of the Pacific Coast the interest is enhanced by the fact that of approximately 16 truly wild species of this genus, 4 are indigenous to the shores and islands of the Gulf of California.

The scope of the admirable little book under review is indicated by its title and by the titles of the parts: Part 1, The classification of the Genus Gossypium, by Hutchinson; Part 2, The Evolution of the Species of Gossypium, by Hutchinson and Stephens; Part 3, The Differentiation of the True Cottons, by Hutchinson and Silow; and Part 4, The Significance of Gossypium in Evolutionary Studies, by Hutchinson and Stephens. It would be hard to find authors more competent to deal with these matters, all three of them having carried on original research that has advanced, substantially, our knowledge of the subject.

In treating "The Relationships of the Genus," the authors follow Edlin in transferring the tribe Hibisceae, to which *Gossypium* belongs, from the Malvaceae to the Bombacaceae, on the ground that the fruits are capsular (loculicidally dehiscent), not septicidally dehiscent into schizocarps, as in the other tribes of Malvaceae. But this distinction is not absolute because normally in *Bastardia* and occasionally in *Sphaeralcea* and other genera which no one would think of removing from the Malvaceae, the septicidal dehiscence is very imperfect. There seems to be no sharp line of demarkation between the two families and perhaps we should return to the classification of Bentham and Hooker, and regard the Bombacaceae as merely a tribe or subfamily of the Malvaceae.

In the classification of the species, the authors follow, in the main, that which was first outlined by Zaitzev, and later amplified by S. C. Harland, on the basis of cytogenetic studies. Three

main groups are recognized: (1) The approximately 16 wild species, of which all that have been studied cytologically have 13 as the haploid chromosome number. None of them has true lint hairs on the seeds. These species are widely dispersed in tropical and subtropical regions of both the Eastern and Western Hemispheres, with scarcely any overlapping of their ranges. (2) The Asiatic cultivated cottons (*G. herbaceum* and *G. arboreum*), likewise with 13 haploid chromosomes, but producing lint hairs of spinnable length. (3) The American cultivated cottons (*G. hirsutum* and *G. barbadense*), with 26 haploid chromosomes and long lint hairs on the seeds. To the last group belongs *G. tomentosum,* of the Hawaiian Islands, where it is supposed to be endemic, although its affinity to the cultivated American cottons is unquestionable.

The remarkable discovery was made by Skovsted, that the American cultivated cottons possess two sets of chromosomes, 13 larger ones, similar to those of the Old World cultivated cottons, and 13 smaller ones, similar to those of American wild diploid species. This suggested that the American cultivated cottons originated as allopolyploids. Subsequent genetic investigations by Harland and Atteck, Silow, Beasley, and Stephens have strengthened the evidence of such origin, pointing to the Peruvian wild cotton, *G. Raimondii,* or a near relative, as one of the probable ancestors.

The difficulty has been to explain how contact could have been brought about between an Old World and a New World species, since the origin of the American cultivated cottons was, assuredly, pre-Columbian. Harland assumed a southern trans-Pacific land bridge in Cretaceous or early Tertiary times, but apparently insuperable objections to this hypothesis are given in the book under review (pp. 75, 76). The authors (pp. 77–80) prefer the assumption that seeds of an Old World cotton were brought to America and planted there by prehistoric voyagers across the Pacific. Such an explanation cannot be dismissed as impossible, but a third, and in the reviewer's opinion a more plausible hypothesis, has been advanced recently by Stebbins (Ecol. Mon. 17: 155), who points out the significance, in relation to this problem, of the mingling of Asiatic and New World floral elements in Eocene deposits of North America. Although no traces of *Gossypium* have been found, as yet, in such deposits, it is an attractive possibility that a cotton, related to the Old World cultivated diploid species, might have existed in the Western Hemisphere during the Tertiary, in contact with an American diploid species, and that hybridization between them might have produced the ancestors of the American tetraploid cultivated cottons.—Thomas H. Kearney, California Academy of Sciences, San Francisco.

The New World Cypresses. Part I. Taxonomic and Distributional Studies of the New World Cypresses, by Carl B. Wolf. *Part II. Diseases of Cypresses,* by Willis W. Wagener. *Part III.*