

entirely with North American migrants, the change in title is scarcely a happy one.

The figures have been "brightened up" by the addition of a portrait of the bird in question. This certainly makes for emphasis and decoration, but there is a resultant tendency for some of the figures to become more crowded and less lucid than they were when Wells Cooke first presented them around the turn of the century.

While no one would quarrel with the principle of keeping the salient facts of bird migration before the public, the methods employed in this instance seem scarcely above reproach. The new title, decorative cover, modernized figures, large print and 200 per cent increase in price all imply a thoroughly revised and up-to-date treatment of this subject, something which this circular certainly is not.

At the time of going to press we have received a photographic reduction of this work with hard covers, published by Doubleday at \$1.25.

W. W. H. GUNN

CYTOLOGICAL AND EMBRYOLOGICAL STUDIES IN THE AMPHI-APOMICTIC *ARABIS HOLBOELLII* COMPLEX

By TYGE BÖCHER. *Det Kongelige Danske Videnskabernes Selskab. Biologiske Skrifter. Vol. 6, No. 7 (1951) pp. 1-59. Dan. Kr. 9.00.*

Holbøll's rock-cress, *Arabis Holboellii* Hornem., is a highly polymorphic American-Greenlandic species which has long presented many problems to taxonomists. The present discontinuous distribution suggests that the species is a survivor of North American glaciation.

It is now most abundant in western North America (Alaska-California) but it is also found about the Great Lakes, on the Gulf of St. Lawrence, and the coasts of Greenland. Western North America is the present centre of variation of the species and, in the author's opinion, is the probable centre of origin. The basic haploid chromosome number is 7; diploid races occur in both America and Greenland, triploid races in Greenland only, and tetraploid and hexaploid races in America only.

In the present study collections of the varieties *typica* and *retrofracta* from Greenland and from Alaska respectively were examined cytologically. Meiotic behaviour and pollen development were studied in detail, and observations on embryology and seed sterility were also made. Diploid and triploid plants of the var. *typica* and diploids of var. *retrofracta* were found. In some diploids the pollen meiosis was regular, in others an apomeiotic development resulted in the formation of pollen with the unreduced chromosome number. Usually the triploids were apomeiotic. Frequently the embryo-sac also followed an apomeiotic development; in such cases the unreduced pollen germinated but fertilization did not follow. It is of interest to note that *Arabis Holboellii* is the only species of the Cruciferae for which apomixis has been reported.

Böcher's work is a contribution to an understanding of the complex taxonomic problems of this species. Further cytotoxic study, particularly of the American forms, would be very desirable and would probably be highly rewarding to our understanding of such evolutionary problems.

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