

published under the above title.<sup>1</sup> It treats of nature as seen in a little valley in the Catskills and of farm life in a rather remote spot. While birds do not figure very largely the chapters will hold the interest of all who love the outdoors.—W. S.

**Mailliard's 'Birds of Golden Gate Park.'**—This serviceable little booklet<sup>2</sup> has been prepared by Mr. Mailliard for the benefit of bird lovers and those who might become bird lovers, who frequent Golden Gate Park, San Francisco, and who have expressed a desire for a local guide to the bird life of this area.

The work is, we think, admirably adapted to its purpose and will be of service to all who would know the birds of the San Francisco region. On each left hand page are drawings of several birds with brief descriptions based on field characters—the bird in the bush rather than the bird in the hand—while on the opposite pages are brief accounts of striking habits or characteristics of the species figured, their time of occurrence, relative abundance and habitat. The species are arranged in several sections—birds of the lakes, birds of the high trees, birds of the air, birds of the ground, etc.

The little book is published and sold by the California Academy of Sciences, at the museum in the Park.—W. S.

**A Theoretical Discussion of the History of Bird Migration, by Mayr and Meise.**<sup>3</sup>—Recent literature on bird migration has been very largely descriptive, or such theory as has been introduced, so mixed with descriptive matter as to lose clarity or balance. Hence the present paper which confines itself to the theory of migration, using as evidence facts already established and for the most part familiar, is well worth careful study and discussion. It concerns itself with the historical-zoogeographic and evolutionary origins and development of migration, without considering the biological factors which control it in,—or how it is accomplished by, the individual bird.

The paper consists of two parts. First there is a general review of the subject. Migration can only be understood from its historical aspect; each year's migration is an unfolding of habits which have their origin in the history of the respective species, not a new enterprise. Migration is always correlated with seasonal change, which renders regions favorable for avian occupancy at one part of the year unfavorable at another; hence, birds of

<sup>1</sup> *The Little Hill Farm or Cruisings in Old Schoharie.* By John Van Schaick, Jr. Universalist Publishing House, 176 Newbury Street, Boston, Mass. (1930). Pp. 1-179.

<sup>2</sup> *Handbook of the Birds of Golden Gate Park, San Francisco.* By Joseph Mailliard, Curator Emeritus Department of Ornithology, California Academy of Sciences (Special Publication) San Francisco. Published by the Academy. 1930. Pp. 1-84.

<sup>3</sup> *Theoretisches zur Geschichte des Vogelzuges.* Von Ernst Mayr und Wilhelm Meise. *Der Vogelzug*, I, 1930, Heft. 4, pp. 149 to 172.

the seasonless tropics are to all intents and purposes permanent residents. Conversely where birds find favorable habitats for part of the year only there will of necessity be migration. Migration is sometimes loosely thought of as a phenomenon due to the glacial period, but it must have existed long before. Even when an equable climate covered the poles there must have been an annual migration away from the arctic night, unless the arctic day was birdless, which is unthinkable. Species, of which there are many examples, wherein the more northerly nesting individuals are migratory, and the more southerly resident, those of intermediate latitudes moving only irregularly, or in severe winters (*Strichvögel* in German), may be studied to advantage for what they suggest as to the purpose and origin of migration.

In considering an invasion of the north by ice during the Glacial Period the authors believe that in the main the birds of high latitudes died out as their territory became uninhabitable, rather than that any considerable shift of the actual population to the south occurred. This is consistent with the point of view elsewhere mentioned or implied in the paper, that shifts in a bird's abundance or range are referable to expansion here and contraction there rather than to population movements. This may (or may not) be the correct solution of a familiar problem, which is as yet by no means settled. They do not mention and perhaps would not entertain the possibility of unglaciated areas in the north free from ice during a glacial period with a summer bird population which retreated in winter south of the ice, flying over glaciated areas. Nor do we find developed the concept of zonal bands of climate, arctic at the actual ice front, then sub-arctic, boreal, temperate; narrow to be sure like the zonal bands on a mountain, but as on a mountain each with its appropriate birds,—slowly moving south as the ice advanced, moving north and expanding again as the ice retreated. They have minimized the glacial period as an historical factor traceable in bird migration as it exists today. Nevertheless one cannot but agree that there never was an abnormal concentration of birds south of the ice during the glacial period, which on account of such concentration expanded more rapidly as the ice retreated than any normal bird population will expand given new and favorable territory. Not the glacial period, but a favorable alternating with an unfavorable season in higher latitudes is the cause of migration. At the height of glaciation most of the north temperate bird population (the Palaearctic avifauna is especially referred to in this paper) must have been almost resident in a comparatively narrow area south of the ice; and the history of our present migration is essentially postglacial.

To recapitulate, in a year-round favorable environment the bird is resident in its breeding range; migration is a direct result of changing seasons or conditions, and as such existed, just as seasons did, before the glacial period; in the glacial period our birds were confined to a comparatively small area and little migratory; migration in its present form developed postglacially, the retreat of the ice opening broad areas for invasion by natural expansion of the bird population, and much of the new territory

being habitable for only a part of the year; many factors and circumstances have since influenced these primary facts so that now the migration of almost every species is developed in ways peculiar to itself.

This brings us to the second part of this paper, an hypothesis as to how migration routes developed, lengthened and attained their present form. First came the invasion little by little but eventually to its farthest limit, of postglacially available breeding territory not suitable for winter occupancy. Retreat of the breeding population from this new territory in winter would congest the more or less original permanent resident range so that pioneers would push its southern limit southward. Either the entire population must shift south, the more southerly breeders evacuating territory occupied by birds from the north, or the northern migrants pass over residents, to occupy territory beyond them. As a matter of fact each condition has been demonstrated to exist today in certain cases. The primitive migration route, supposed to follow the line of original invasion, more or less direct or circuitous, must have been altered in many cases, alterations tending to make it more direct. A condition wherein summer and winter ranges overlap is presumed to be primitive. Environmental and economic conditions which tend to extend the summer range in one direction (to the north), the winter range in the other (to the south) are discussed, but not considered adequate to account for the evolutionary tendency which seems to have been active in thus lengthening the migration route, at both ends, so that the winter range is frequently in part, or in whole, removed beyond any faunal area where the species has affinities. It is suggested that the migration-urge once started, has tended to increase, as an evolutionary behavior rectegradation, causing the bird to swing annually pendulum-wise over an ever increasing course. The original home of the species, where it was at one time resident, may then lie neither in the present breeding or wintering areas, but at some intermediate point. As has been said, environmental influences are discussed in connection with the theory advanced, yet it may be that their influence has not been given full credit, either as a factor to, in some cases, turn migration from a direct course, or to produce it southward as a balance to its northward extension. Take for instance the case of the American Golden Plover, perhaps diverted eastward to the coast of Labrador in fall by the berry-crop, with winter range established in high latitudes of the southern hemisphere where winter conditions parallel those of the bird's summer home.—J. T. N.

#### Shorter Papers.

**Berlepsch, Hans Freiherr von.**—Twenty-second Review of Bird Conservation at Burg Seebach. [In German.]

**Bowen, W. Wedgewood.**—The South African Forms of *Saxicola torquata*. (*Proc. Acad. Nat. Sci. Phila.*, LXX XIII, pp. 7-9, February, 1931.)—Six races recognized of which *S. t. stonei* (p. 8) from Angola is described as new.