

some of the largest berries which were difficult to get into the little fellows were cherries.

September 11th (5 weeks later)

We heard the Cedar Waxwings this afternoon, and, looking over in the direction of their calls, we saw two full-grown birds on the top of two tall birches, and three smaller ones on birch-tips a bit lower. Just as we paddled up in our canoe, all five flew up into the air, made a large, graceful circle, and came back to the birches, all five alighting on the top of one birch.

Camp Madeleine Mulford, Montclair Girl Scouts, Stokes State Forest, Branchville, New Jersey.

A NEW NEED IN NATURAL HISTORY

BY GLOVER M. ALLEN

IN recent years the study of natural history has entered upon a new phase, marking an advance in the growth of our knowledge of animals and plants. Half a century ago, museums of natural history, in this country at least, were few, and collections of any size where specimens could be brought together for comparative study were fewer still. But at the present day this is changed. Our larger centers support public exhibitions of excellent character and of local or general scope; some maintain also research collections comprising series of specimens for the more exact study of variation, distribution, and differentiation of species. The result is that such great and historic collections as those at London, Berlin, Paris, Vienna, and elsewhere in the Old World, as well as those at Washington, New York, Chicago, Cambridge, Berkeley, California, and Buenos Aires, Argentina, in the New, have now made it possible for us to arrive at a fair estimate of the living species of the world, so far at least as concerns its birds and mammals. For at the present time there is hardly a corner of the earth's surface left that has not been more or less explored and its fauna and flora collected; so that in these two groups of vertebrates it seems unlikely that we shall in future discover very many more remarkable types, though of course it will be many years before our knowledge is sufficient to settle innumerable details. Nor will the need for study collections grow less, for these are comparable to reference libraries where the student may come with the expectation of

finding a more or less extensive representation of the kinds of animals which he wishes to see; and, with the growth and spread of knowledge, the greater will be the demand for such repositories, accessible to centers of population. But just as the increase of public libraries has tended to lessen the zeal of individuals to form libraries of their own, so the number and magnitude of these collections of specimens tend to discourage the maintenance of large collections by private individuals. Within the last quarter of a century, however, it has become more and more apparent that our wider interest now requires not so much that we collect more specimens as that we find out something more definite concerning the intimate lives of these animals, their normal actions, and their relations to their surroundings, especially to other animals and plants, and to ourselves, in short that we come to know their life-histories, first as species, then as individuals, and the bearing of the facts so obtained on the larger problems of biology. Our failure to know intimately even some of our more familiar species is obviously because the matter is not an easy one. It requires time, patience, and a capacity for observation and inference to pry into the doings of secretive creatures, yet little by little facts are being pieced together and a mass of observations is being accumulated that will eventually serve for the general outline. Such outstanding recent works as Bent's "Life Histories of North American Birds," Phillips's "Natural History of the Ducks," Roosevelt and Heller's "Life Histories of African Game Animals," and Seton's "Lives of Northern Animals" are illustrations of summaries of a general nature, while such others as Gurney's "The Gannet," Wright's "Grizzly Bear," and Shaw's papers on the Columbian Ground Squirrel, exemplify the more particularized sort of intensive work already done in these modern days.

We are beginning to realize how great an upsetting force is human agency, in particular that of the white man with his genius for destruction. He not only alters the face of the land but, by his indiscriminate clearing of forests, draining of lakes, and filling of swamps, has produced great alterations in its flora and fauna, quite apart from the destruction of living things through slaughter on a large scale and the introduction of unaccustomed enemies and diseases. Many species of animals are already gone, others are sadly reduced, while others still have profited by the changes and have increased, sometimes far beyond the bounds of comfort. Many of these changes have come about but slowly and with little or no record of their progress. What would the present-day New

England naturalist give if he might have an accurate picture of the conditions here three hundred years ago! Forbush's wonderful volumes on the habits and history of New England birds show only too clearly how little record we have of birds in Massachusetts even so recently as three generations since. It is evident that a clear record of current conditions must now be kept for the benefit of those who will in future find it useful.

The recognition of a need for still more careful study of habits and life-histories has of late given rise to the establishment of stations in selected localities where research may be carried on under favorable conditions. Outstanding examples are the Roosevelt Wild Life Station in New York State, with its publications now running to a considerable series of bulletins, the Desert Laboratory of Tucson, Arizona, the field station in Prussia maintained by the German Ornithologists' Union, and various biological stations chiefly for the study of marine life. But it is in the Tropics especially that biological stations may be important. For there, where life is more luxuriant, the conditions are correspondingly trying to men of northern blood. Such institutions as the Barro Colorado Laboratory on an island in the Panama Canal and the Atkins Botanical Station in Cuba point the way. With regard to birds in particular, such stations might be of great importance in the study, not only of the resident species, but also of the migrants that pass on their way to and from their summer and winter areas. Records of banded birds will eventually enable us to piece out the migration-routes not only of each species in general but also of the individuals of particular districts. If records could be secured from stations in Panama, Cuba, and Porto Rico of American migrants, we might eventually be able to substantiate present theories of the geographic origin of those birds that migrate to South America by these different routes.

It is with the need of a biological station in eastern Africa especially in mind that these lines are written, for this is a country that is more and more being made the resort of European and American sportsmen and naturalists. European ornithologists have now for many years been active in banding birds, and have successfully mapped out certain routes, enough to show that each species must be studied by itself in order to determine its special migration path and requirements. For the common Stork and the Swallow, many returns are now in hand from both Europe and South Africa, but from much of the intervening country there is little such record.

East Africa has a rich bird-fauna and is still the home of countless numbers of large and small game mammals. Here, before conditions are greatly changed, is the ideal location for a biological station for the study of habits, life-histories, the relations of various animals to disease, and kindred matters concerning this wonderful fauna whose dominance Roosevelt likened to the conditions that must have obtained here in Pleistocene days when elephants, mastodons, horses, camels, tapirs, peccaries, roamed our Eastern States and contended with saber-toothed tigers, giant wolves, and other carnivores for the right to live. Because of its comparatively healthy climate, relative accessibility, the abundance of its fauna, and the fact that it is still largely unchanged, Kenya Colony of British East Africa is an ideal place for such a permanent station, one, too, that might be established with the cooperation or sponsorship of so influential a body as the Zoölogical Society of London, or of the East Africa and Uganda Natural History Society, with headquarters at Nairobi. The site should be chosen to afford ready access to plains, forests, and mountain country, with an abundant supply of good water coming from the perpetual snows of Mt. Kenya. The simple buildings should be of good tropical construction, properly equipped under medical supervision, and with two resident naturalists in charge. Ideally, it should be well endowed, with an income sufficient not only to insure its permanence but also to allow the Station to invite properly qualified persons to come for longer or shorter periods for the study of special matters, paying at least their transportation.

With the expansion of human population in the temperate zones we must of necessity look more and more to the Tropics for many of the needs and luxuries of life. White men must learn to live in the Tropics, to utilize them as a source of food and material supplies; a knowledge of the animal and plant life is an essential of this use. Eastern Africa is a part of the Tropics readily habitable for whites, combining healthy climate with beauty of landscape and abundance of living things. The East African fauna is not only rich but has the appearance of having undergone a long period of development and adjustment, so that a very great number of faunal niches is occupied, allowing many species of related animals to live together without too great interference with one another. Thus, among the antelopes there are plains-livers that may be social, going in herds, or less social species going in small parties, or others that inhabit rocky hills, others still on the bushy hills, and smaller ones yet skulking in grass or reeds. Among birds such

a group as the weavers fills a large variety of similar niches or habitats, beautifully illustrating what Osborn has called "adaptive radiation." These and an infinity of other tempting subjects invite the outdoor naturalist, while from a medical point of view there are many important problems relating to parasitic diseases due to minute organisms with complex life-histories concerning which we need more knowledge.

For one keenly interested in natural history, I can think of no more glorious experience than to awaken with the tropic dawn of an African morning, to sense the fresh earthy tang in the very air, to sniff the faint fragrance of mimosa blossoms, to hear the sprightly voices of unfamiliar birds, and to see spread before him a vision of unspoiled hills and plains dotted here and there with antelope, buffalo, or giraffe. Here lies a strategic point for the establishment of a new research station. Here stands Opportunity knocking at the door!

BIRD-BANDING IN JAPAN

BY FREDERICK C. LINCOLN

ON May 26, 1924, Prince Taka Tsukasa, a member of the Japanese House of Peers, was a visitor at the offices of the Biological Survey in Washington. The Prince was well informed on ornithological matters and expressed much interest in the bird-banding work carried on in the United States and Canada. Full information was given to him, including official bulletins and circulars, and a series of separates of bird-banding papers from the ornithological journals. Upon his return to Japan, the subject was apparently brought to the attention of the Ornithological Society, and as a result this method of investigation was taken up by the Japanese Government and a series of six bands adopted. Three of these are patterned after the flat adjustable band (designated as size "X") that has been used in North America; one is similar to the American size "6," while the remaining two are simple split rings. Besides the customary aluminum, copper is used for sea-birds to insure a longer life to the band. The bands carry, in addition to the serial number, three ideographs identifying their point of origin as the Ministry of Agriculture and Forestry, at Tokyo.

The work is carried on under the direction of Dr. Seinosuke Uchida, Ornithologist to the Department of Animal Industry,