

found *megarrhyncha* the most abundant fox sparrow on the islands, with *insularis* a close second. This may be the case in normal years, but as before stated no single individual of the "schistacea group" was met with in 1920. In this connection it is interesting to note the extreme abundance of *sinuosa* on the islands during the time covered by our observations. In no mainland locality with which we are familiar has this race been found in such numbers.

*Sitta carolinensis aculeata* Cassin. Slender-billed Nuthatch. On April 1, 1920, while stalking a flock of crossbills in a dense grove of pines on Santa Cruz Island, a momentary glimpse of a pair of nuthatches of this species was obtained. The female was collected, but the male proved too shy to be secured. Search for the species later in the year in the same area proved futile.

*Sitta canadensis* Linnaeus. Red-breasted Nuthatch. Oddly enough, not one Red-breasted Nuthatch was found on Santa Cruz Island in August, 1922, although the species is common enough in that locality in the spring, and has even been seen excavating what was presumed to be a nest hole (Howell, Pac. Coast Avif. no. 12, 1917, p. 99).

*Hylocichla guttata*, subsps. Of 10 hermit thrushes taken on Santa Catalina in January, 1920, 9 proved to be *Hylocichla guttata nanus* and one *Hylocichla guttata guttata*. By contrast, of 7 birds taken during March, 1920, on Santa Cruz Island, 6 are referable to *guttata* while only one is referable to *nanus*.

*Planesticus migratorius propinquus* (Ridgway). Western Robin. The Western Robin has already been recorded from Santa Catalina by Harry Harris (Condor, xxi, 1919, p. 172). In view of the scarcity of records for this island, it is perhaps pardonable to record an additional adult female, taken at White's Landing, January 24, 1920. On Santa Cruz Island, a flock of about 10 birds, from which a female was collected, was found in the oaks near the main ranch, back of Prisoner's Harbor, March 30, 1920. Mr. Fred Caire, the owner of the island, as well as several residents, stated that robins were present by hundreds during the early winter of that year.

*Pasadena, California, March 26, 1923.*

## ANIMAL AGGREGATIONS: A REQUEST FOR INFORMATION

By W. C. ALLEE

IT IS generally assumed at the present time that the gregarious or social habit in animals is at basis an outgrowth of aggregations resulting from the association of young individuals with one or both parents. In special cases or at critical periods in social evolution, it is assumed that the period of association becomes lengthened and the family comes to react as a unit under many conditions. Some such explanation for the origin of human society is current among sociologists who derive organized society from the family by way of the clan.

Students of social life in insects, especially as it exists in wasps, bees, and ants, usually adopt a similar explanation for the origin of the social habit. Thus Wheeler in his studies on ants and more recently in his review of the social life among insects regards the insect colony as a result of the extension of the natural affiliation of mother and offspring. He regards the bonds that hold mother and daughter together in the initial stages of insect colony formation as identical with those which bind human societies, namely, hunger and affection.

Opposed to this more usual view is the one proposed by Herbert Spencer, which is that colony life arose from the consociation of adult individuals for co-

operative purposes, as among wolves and among various insects which collect under certain circumstances. From these instances, Spencer suggests that in some cases permanent swarms arise and that natural selection will establish such of these groupings as are advantageous. In terms of human society, this view would stress the importance of the gang rather than the family as a preliminary step in the evolution of the social habit. It is important to note that the gang cuts across family lines in its formation.

The formation of such aggregations is widespread in nature. They are frequently brought about by those reactions of animals which tend to bring them into environmental conditions that are favorable for individual preservation. These reactions occur frequently in connection with hibernation or aestivation and are illustrated by the formation of large aggregations of land isopods in protected positions during periods of cold or of drought.

Such congregations also frequently occur when animals are exposed to unusual and perhaps adverse conditions such as develop when animals are brought from nature into the laboratory, as happens, for example, in the cases of may-fly nymphs, brittle starfish, earthworms, frogs, etc. Again they occur when animals become trapped, so to speak, in a given locality by the conditions encountered, as when paramecia are trapped in a region where the water is more acid or when animals negative to light collect in restricted regions of shade.

The association of animals in large groups also frequently occurs during the breeding season. Under these conditions many animals form closely associated clumps or clusters as may be found in studying fresh-water isopods or snakes. Other animals collect in less dense groups, such as schools of fish or herds of deer.

Wheeler expresses the usual attitude toward these consociations when, after describing some instances of aggregation in ants, he dismisses them as either entirely fortuitous instances which would occur wherever ants might be abundant and places of refuge scanty, or as the manifestation of highly developed social proclivities, and not of such proclivities in process of development.

It would seem that observation on bird behavior should furnish much interesting information on this problem since in many species there is periodic formation and disintegration of flocks. Observations on such points as the following are significant: When birds form flocks, are they primarily family affairs? That is to say, do the members of families remain together and thus form the social group which, beginning as a family unit, grows into a flock by the addition of other families which may or may not be close blood relatives? Or, on the other hand, is flock formation comparable with gang formation which disregards family lines? Putting this more specifically one would ask, Are the fall migration flocks formed by the congregation of families or of individuals?

Is it possibly true that both processes are involved in bird behavior in general? If so, are there species of birds which combine both types of flock formation?

Spencer's theory would require that the flock be formed by the coming together of individuals; the more accepted theory would emphasize the importance of the family. The question at hand is, Which of these theories actually holds true in the seasonally recurring development of avian societies?

There is another aspect of the problem of social life similarly in need of

good field observation. It is concerned with the difference in behavior shown by animals when they are members of flocks and when they are alone or relatively isolated. This question has been much discussed with particular reference to problems of mob psychology, but there is still need of observation on the subject, particularly with respect to such highly specialized animals as birds.

In conclusion, I must explain that I am not an ornithologist. My interest in the animal kingdom is so extended that as yet I have been unable to specialize on any one group in making observations. Consequently I request correspondence on either of these points and I should be especially interested to see, summarized in print, the observations of students of bird life which have a bearing on these matters.

*Zoology Building, The University of Chicago, Chicago, Illinois, March 18, 1923.*

## FROM FIELD AND STUDY

**A Note on the Voice of the Ruddy Duck.**—The queried statement, "Voiceless?" in the excellent account of the Ruddy Duck (*Erismatura jamaicensis*) given in Grinnell, Bryant, and Storer's Game Birds of California, suggests that the following may be of interest.

The male in the breeding season has a peculiar and most unducklike note. It is a liquid and faintly explosive sound given at the completion of the characteristic bobbing of the head and neck. Possibly "dook," or "gook," comes as close as it is possible to write it. The sound made by a bubble of marsh gas as it reaches the surface is an almost exactly similar noise. This note is inaudible more than a few yards away.

While I was in a blind one day in the early fall, a female Ruddy and a fully grown juvenile swam past me at only a few feet distance. The young bird was giving at frequent intervals a low but emphatic "quack".—A. J. VAN ROSSEM, *Pasadena, California, March 26, 1923.*

**Black Phoebes and House Finches in Joint Use of a Nest.**—At the time of a visit, May 11-14, 1922, to Oakzanita Lodge resort in the Cuyamaca region of San Diego County, California, there came to the writer's attention a rather surprising state of affairs in avian home-life, with a pair of Black Phoebes (*Sayornis nigricans*) and a pair of House Finches (*Carpodacus mexicanus frontalis*) as principals. The former, whose nest had been built under the projecting roof of an outlying cottage.—proclaimed, by the way, as the "Dove-Cote," where might have been expected only peace and contentment—were experiencing so determined an intrusion on the part of the latter that not only had the nest become a goal of contention, but as a result the phoebes were subjected to intermittent possession and forced to share its use with the finches. Just why the intruders should have disregarded seemingly well-established priority and persistently encroached upon the phoebes' domain has remained an unsolved problem.

Coincident with the finding of the nest, on May 12, the presence of a female finch and absence of the phoebes attracted particular notice, and investigation of its contents disclosed one egg of the finch and two of the phoebe. The logical supposition that the rightful owners had been completely driven away proved erroneous when later in the day the female phoebe was observed on the nest. At an early hour the next morning, however, the finches had already resumed proprietorship, and the phoebes, if in the immediate neighborhood, were not to be seen. During the afternoon the situation was similarly reversed, the male phoebe solicitously flying about while his mate occupied the nest. The morning of the 14th found the phoebes departed and