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Some Observations on Natural Mass Mortality of House Sparrows.—Storms with high winds, rain, hail, and electrical discharge, are climatic variables capable of killing large numbers of animals in a short time. House Sparrows, *Passer domesticus*, are subject to injuries by storms, and especially after they flock and begin roosting in trees and other partly exposed places they may be subject to heavy local mortality from storms. The observations reported here concern two storms in the past three years that killed many sparrows in eastern Kansas.

On August 6, 1964, a violent nocturnal hailstorm occurred over Lawrence, Douglas County, Kansas; the hailstones were perhaps one-half inch in diameter, and these killed large numbers (several hundreds) of House Sparrows in roosts in trees and other exposed sites. A small sample of 34 individuals (Table 1) was collected from one site and autopsies were made on the specimens. Both adults and juveniles and males and females were present in the sample, and the departures from a 1:1 ratio for either category are not enough for us to suppose that the birds at the roost were not simply a normal group of postbreeding sparrows.

Some of the birds showed conspicuous evidence of damage from being hit by hail, and in each instance their skulls were involved. There was fracture of bone, evident intracranial bleeding, or both. This was especially clear-cut in the adult sample, in which only 3 specimens showed no evidence of having been physically damaged. In the juveniles about half showed no signs of injury (see Table 2).

On August 16, 1966, a severe nocturnal windstorm cut through parts of Topeka, Shawnee County, Kansas. Many sparrows, perhaps running into the thousands, were killed at their roosts in several places in Topeka, and three lots were collected by Prof. E. R. Hall and made available to the author. The birds totaled 605 (Table 1), and of these 153 were prepared as skeletal specimens; these were also examined carefully for various physical qualities, such as apparent cause of death, gonadal condition, fat deposits, and the like. All the birds showed some physical damage, and the 153 examined in detail each had one or more puncture wounds. These could have been made by the birds having been heavily buffeted by wind against sharp twigs of the roosting trees. Note that every bird was damaged in some way, in distinction to those from the Lawrence hail-kill.

General discussion.—Such instances of mass mortality in House Sparrows can occur mainly after the birds have flocked in late summer and early fall. The probability of finding such a kill clearly increases after flocking, but this is not the same as saying

TABLE 1. HOUSE SPARROWS KILLED BY HAIL AND WIND STORMS

	Males		Females		Sex?		Total N
	N	%	N	%	N	%	N
Topeka, 1966							
Adults	331	60.9	212	39.1	0	0	543
Juveniles	32	51.6	28	45.1	2	3.3	62
Lawrence, 1964							
Adults	7	—	7	—	0	—	14
Juveniles	4	—	16	—	0	—	20

TABLE 2. EVIDENT INJURIES OF SPARROWS ACCORDING TO AGE AND SEX
IN THE LAWRENCE HAIL KILL.

	Evident Damage	No Damage
Males		
Adults	5	2
Juveniles	3	1
Females		
Adults	6	1
Juveniles	8	8
Total Sample		
Adults	11	3
Juveniles	11	9

that the probability of death from storms increases for sparrows that have flocked. Some of the necessary information on these points is yet to be collected, but it is not likely that the presence or absence of other birds will affect the chances of one bird in a storm; the basic set of events seems generally unrelated to density.

Yet, the act of aggregating in the fall has some unexpected effects on population structure in these midcontinent birds. The storms that occur in the American midwest in the summer are considerably more violent than those occurring in the northern European haunts of the ancestral American House Sparrows. It is likely that more sparrows die each year as a result of storms in the American midwest than in the English midlands (and presumably fewer die from other agencies in America than in England). If sparrows are spaced out as in the breeding season, a few will be affected by most of the storms that occur; a constant, low-level mortality might be expected from such occurrences. If sparrows are aggregated as in the postbreeding period, most storms will not affect them, but those that do will kill many birds. It is germane to note that English House Sparrows evolved essentially without reference to such selective agents.

Instances of mass mortality change many aspects of local population structure in a short time; most conspicuous are the changes in dispersion with attendant modifications of density. Other associated changes may also occur, and probably dispersal and gene flow will be affected. Such a range of changes is not characteristic of population structure of ancestral sparrows, and this must be one of the major environmental differences facing the sparrows brought to North America from England. Good studies of the population biology of the House Sparrow in the American midwest are badly needed.

It is suggestive to note that the adults and juveniles killed by hail have different proportions of the subsamples showing evident physical damage. That is, most of the adults show evidence of actually having been hurt and nearly half the juveniles show no such evidence. This perhaps may be interpreted as due to the toughness of older birds—it may take a heavy blow to cause fatal injury, and such a heavy blow may well leave conspicuous traces. Conversely, young birds (and some were only a few weeks old) may be subject to fatal injury from a relatively light blow, such as might not leave an evident trace.

The sex ratios in the Topeka sample support knowledge already available on sex ratios in House Sparrows. For the juveniles, with a very small sample, the ratio is essentially 1:1, males to females. The adult samples are more reliable in size however, and the ratio of roughly 3:2, males to females, is a significant departure from a 1:1 ratio. Causes for this departure are not evident in the sample itself or in the general situation in which the birds were killed, but it is worth noting that more males than females were in the sample, and this situation is found time after time, wherever House Sparrows are found. It is also characteristic of many monogamous bird species.—R. F. JOHNSTON, *Museum of Natural History, The University of Kansas, Lawrence, 66044, 24 May 1967.*

Birds of Europe. A collection of color plates from the lithographs of John Gould; text by A. Rutgers. 1966. London, Methuen and Co., Ltd. (distributed in the U. S. by Barnes and Noble, Inc., New York), 322 pp., 160 color plates. Price, \$15.00.— This volume reproduces in color 160 of the lithographed plates of paintings that originally appeared in John Gould's *Birds of Europe* (1832–1837) and *Birds of Great Britain* (1862–1873). In the present volume each illustration is accompanied by a 250 word discussion which usually includes a superficial physical description, and notes on habitat and distribution, behavior, migration, nests, eggs, feeding habits, and the like. The text adds a sense of utility, although it is necessarily shallow and of limited usefulness to ornithologists. The nomenclature of families as presented in the table of contents does not always reflect the most recent opinion (e.g., vultures, *Aegypiidae*; spoonbills and ibises, *Plataleidae*).

Since the major contribution of the present *Birds of Europe* is the reproduction of the artistic works in Gould's two books, a major deficiency is that there is no preface or introduction that offers the reader information on John Gould and on the significance of his contributions to 19th Century ornithology. Thus, to those not familiar with his work, the present volume is little more than a well-illustrated "picture book." John Gould (1804–1881), an English naturalist and self-taught artist, wrote and illustrated a considerable number of ornithological works in his lifetime (Sharpe, R. B. 1893, *An analytical index to the works of the late John Gould, F. R. S.* London, Henry Sotheran and Co.). His wife, also an artist, did most of the lithographs from his paintings for *Century of Birds from the Himalayas* (1832), *Birds of Europe*, *Birds of Australia* (1840–1848), and other early works. Although Gould designed all of the paintings, much of the actual painting was probably done by his able assistants under his close direction. In addition to the geographically oriented works mentioned above, some of Gould's most outstanding achievements are the monographs on the Ramphastidae, Caprimulgidae, Trogonidae, Trochilidae, Pittidae, Odontophorinae (American partridges), and Macropodidae (kangaroos). The extensive collections of birds gathered in preparation for many of Gould's works, especially collections of Australian birds, were quite valuable in their time.

The lithographs of the paintings, and presumably the paintings themselves, are more diagnostically and technically illustrative than creatively artistic. The views show a portion of the habitat and frequently show the birds with characteristic food items or at the nest. Usually both sexes are shown, and frequently young are depicted. The poses, which show plumage patterns, sometimes seem rather stilted, but are not overly dramatic as in paintings of J. J. Audubon.

In the review copy the color registry is excellent and the paper is of high quality. Typographical errors are few, except for a few glaring errors such as the headings on pages 254 and 321. A few of the plates are, to this reviewer, of sterling quality; for example, the House Sparrows at the nest (p. 320) make *Passer domesticus* almost likeable. It is pleasing to know that the works of one of ornithology's most historically renowned artists are being made available once again.—DENNIS M. POWER.

NOTES AND NEWS

Dr. Charles A. Ely has assumed editorship of the *K.O.S. Newsletter*. All contributors, indeed, all who wish to contribute, should send their material to Dr. Ely for processing and publication. His address is as in the membership roster: Department of Zoology, Fort Hays State College, Hays, Kansas, 67602.

A new book, *Attracting Birds: from the prairies to the Atlantic*, by Verne E. Davison (Crowell, New York), will be of interest to almost all K.O.S. members. There are sections dealing with food preferences of birds of many kinds, feeders, nests and birdhouses, how to attract birds by providing appropriate foods, nesting sites, food plants, and plant cover, and an alphabetic list of plants and other foods and how birds use them. Mr. Davison seems to have had much more experience in this general field than anyone else, and looks to be the ultimate referee for some time to come.

Another new book is *The Psychology of Birds*, by Harold E. Burtt. This is a very

good introduction to animal behavior using birds as the chief points of reference. It is hard to see how the book could have been more simply written, and Dr. Burtt must be warmly commended for doing that most difficult thing, writing simply about complicated matters; it is an elegant book.—R. F. J.

Members not wishing to keep a back file of the *K.O.S. Bulletin* may want to make their files available to schools and colleges by sending the back numbers to the Editor. Numbers donated in this fashion will be made parts of back runs that are sent to schools when they decide to get an entire set of the *Bulletin*. This will represent a modest financial saving for some schools, and will possibly allow us to send originals rather than expensive copies of certain numbers now exhausted.

The Annual Meeting for 1968 will be held at the Museum of Natural History, The University of Kansas, Lawrence, in close association with the annual meeting of the Kansas Academy of Science, also meeting at The University of Kansas. Plans presently call for the K.O.S. to have its morning papers session vacated so as to participate in the symposia of the K.A.S. that will be held on Saturday morning, 4 May; the normal afternoon papers session will proceed as usual, as will the annual banquet the evening of 4 May, and the field trips on Sunday morning, 5 May. This will be our 20th annual meeting, and the Centennial meeting for the K.A.S., so something special may be expected by all members of both societies.

Kansas Ornithological Society

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