

## ROOSTING SPARROWS (*PASSER DOMESTICUS*) KILLED BY RAINSTORM, HAWKE'S BAY, NEW ZEALAND

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On 3 February 1967, following a night of high wind and heavy rain, many dead birds were found below the oak trees where they roost, in Civic Square, Hastings. Of 1357 dead sparrows (Table 1), 1285 were collected on 3 February and 72 on the seven succeeding days, although none seemed fresh enough to have died since 4 February. Most of the birds were moulting.

TABLE 1  
DEAD BIRDS FROM CIVIC SQUARE, HASTINGS

	Adult Male	Adult Female	Juvenile	Total
House Sparrow ( <i>Passer domesticus</i> )	668	482	207	1,357
Starling ( <i>Sturnus vulgaris</i> )		2	7	9
Goldfinch ( <i>Carduelis carduelis</i> )		2	1	3
Indian Myna ( <i>Acridotheres tristis</i> )			4	0
			0	4

Photographs of the roost showed 14,389 sparrows on 2 July, 1967. Since some birds were obscured a minimum total of 14,500 is estimated. Numbers using the roost would have changed since February but the mortality would still be of the order of 10%, a sizeable proportion of the annual mortality.

The age and sex composition of the dead birds is of interest. Adult female and juvenile sparrows are difficult to distinguish. As the plumage was wet, juveniles were separated by their soft elastic skulls, soft expanded bill corners, reduced or absent underarm down, and small bills. When two observers sorted separate samples of the birds found on the first day the following results were obtained.

	Adult Male	Adult female	Juvenile	Number
Observer 1	49.3%	39.4%	11.4%	686
Observer 2	47.7%	33.8%	18.4%	488

The adult female:juvenile ratios recorded by the two observers differed significantly ( $p = 0.001$  in a chi-square test), but there was no difference between the adult male:juvenile + female ratios ( $p = 0.5 - 0.7$ ). This suggests that some juveniles and/or females were wrongly classified.

In spite of this, the sex and age ratios of sparrows found dead agreed well with those of birds caught by mist nets over the same period at the D.S.I.R. Orchard, Havelock North,  $2\frac{1}{2}$  miles from Civic Square (Table 1,  $p = 0.6 - 0.7$  in a chi-square test). Consequently the low proportion of juvenile to adult dead sparrows appears to be

a true reflection of the proportion living at that time. Table 2 also shows that the percentage of juveniles was higher in 1966 than in 1967 ( $p < 0.005$  in a chi-square test on both net and trap captures).

TABLE 2

## SEX &amp; AGE RATIOS OF SPARROWS, 15 JANUARY - 15 FEBRUARY

	Mist Net		D.S.I.R. Orchard		Trap	Dead below roost
	1966	1967	1966	1967		
Adult male %	35	48	4	21	49	49
Adult female %	18	32	14	22	36	36
Juvenile %	47	20	82	57	15	15
Total Number	17	25	51	135	1,357	1,357

The 1966 percentage (47% juveniles in mist nets) is nearer what might be expected from the usual annual replacement rate in small passerines overseas (Lack, 1954, Table 21).

Weather records are available from a station only 100 yards from Civic Square. These are taken at 9 a.m. and give the wind velocity then, and the maximum and minimum temperatures, and rainfall, for the previous 24 hours. On 3 February there were high winds, heavy rain and abnormally low temperatures (Figure 1). Low temperatures also occurred on 21 February, 2 March, 13 March, and 22 March, but were not so extreme, nor were they associated with strong wind or heavy rain. Continuous records show that the wind changed to SSW at 3 p.m. on 2 February. The rain began at 5 p.m. but heavy rain (40-50 points/hr) and strong wind (frequent gusts of 30-35 knots) did not come until 3-7 a.m. It was in this period, too, that temperatures reached their minimum.

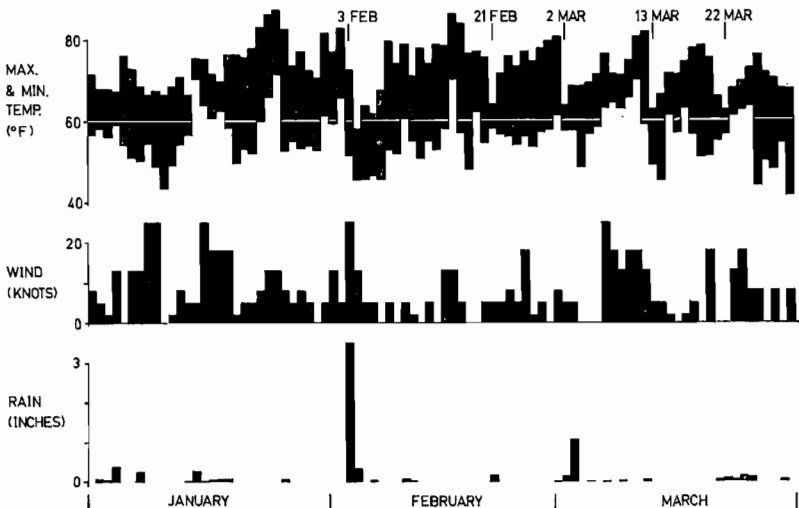


Figure 1 — Weather recorded at the Hastings Fire Station, 9 a.m., January to March, 1967 (see text)

Thus the birds went to roost in moderate winds and steady rain — the more extreme conditions coming after dark. Though Civic Square was searched throughout the period 10 February - 30 March only one other bird was found dead — an adult male sparrow on 16 February. It seems clear that the unseasonable weather brought by cyclone "Diana" was responsible for this unusual bird mortality, which may have been widespread in Hawkes Bay. Three sparrows were found below a small roost in Havelock North on 4 February; and five adult and five juvenile Rooks (*Corvus frugilegus*) were found dead below trees at Bridge Pa on 11 February, and at least 20 others at Otane on 4 February (R. E. R. Porter and T. P. G. Purchas, *pers. comm.*). Probably the mortality was general and the species that roost communally were merely easier to find. Other contributing factors could include the moult and perhaps the poor season (as evidenced by fewer juvenile sparrows than at the same time in 1966).

#### ACKNOWLEDGEMENTS

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#### REFERENCE

LACK, D., 1954: The Natural Regulation of Animal Numbers. Oxford.



### SHORT NOTE

#### SEX RATIO OF THE BLACKBIRD (*Turdus merula*) IN CHRISTCHURCH BOTANIC GARDENS

The authors carried out two independent studies in the Christchurch Botanic Gardens during the winter of 1967. Tasker's study involved 180 separate counts of adult Blackbirds on the Archery Lawn, an area of 2.7 acres. Lumping all counts gave 1628 observations comprising 907 males and 728 females, a ratio of 1.22:1.00. East's study involved a series of transects, counting all birds within an area of 14.6 acres on each transect. Lumping the data from all transects gives 768 male Blackbirds and 632 females, a ratio of 1.21:1.00. Thus the two studies independently showed a ratio of approximately 6:5, much closer to unity than the ratio of approximately 2:1 obtained by Gurr (1954) for the Blackbird in New Zealand.

The tameness of birds in the Botanic Gardens makes it a particularly suitable area for determining the sex ratio. Each observer sampled an area in which all the birds present could be seen. Since the ratio of 6:5 is based on over 3000 observations it is likely to be very close to the actual sex ratio in the Gardens, indicating a slight excess of males. In birds the sex ratio is normally about equal in the young but there is often a small excess of males among the adults (Lack, 1954). Gurr's figures were based mainly on birds shot and seen from the road, a method which would tend to give a biased ratio in favour of the more conspicuous males.

#### REFERENCES

GURR, L., 1954: A study of the blackbird, *Turdus merula* in New Zealand. *Ibis* 96: 225-61.  
LACK, D., 1954: The natural regulation of animal numbers. Clarendon Press, Oxford.

— R. EAST  
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