

THE BREEDING OF LESSER AND GREATER FLAMINGOES IN EAST AFRICA

By L. BROWN

During 1953 Lake Hannington, situated 30 miles from Nakuru in the Rift Valley, supported an average population of approximately one million flamingoes of both species. The Lesser Flamingoes, *Phoeniconaias minor*, exceeded the Greater, *Phoenicopterus ruber*, throughout the year by 20 to 1. Observations at intervals between March and December 1953 showed that although about 4,500 nests altogether were built by *P. minor* no successful breeding actually took place at Lake Hannington. A total of five eggs were known to have been laid in a small colony but they were immediately knocked off the nests by their owners or trodden on. Even supposing, however, that all these 4,500 nests had reared young they obviously could not account for the enormous population of Lesser Flamingoes that exists. On Hannington this was estimated at between one and a half and two million by the writer in March 1953 and at two million by M. W. Ridley (in litt.) in July 1953.

Visiting Lake Hannington in June 1954 I found that this enormous population had practically disappeared. There were no more than 30,000 flamingoes on the lake altogether and there was no sign whatever of breeding activity. Following upon the good rains in April and May 1954 in the Rift Valley a considerable number of flamingoes appeared on Lakes Elmenteita and Nakuru (which had been dry in the 1953 drought) but the combined population on these lakes could not possibly account for the numbers which had left Lake Hannington. It was evident, therefore, that the great hordes of Lesser Flamingoes must have gone somewhere else, and it may have been to breed.

In an endeavour to ascertain the facts I made an aerial survey of lakes in Southern Kenya and Northern Tanganyika on 20th and 21st August, 1954. I was accompanied by P. R. O. Bally of the Coryndon Museum. The routes were as follows. On 20th August from Nairobi over Lake Magadi, the west shore of Lake Natron, the Embagai Crater Lake and Lake Manyara to Arusha. On 21st August from Arusha to Lakes Balangida Eidahan and Balangida Lelu near Mount Hanang, thence to Lake Eyasi and from there via Oldeani up the east side of Lake Natron back to Nairobi. The Embagai Crater Lake was visited as a note had appeared in 'Oryx' 2 (1953); 140, that flamingoes had been found breeding in this crater. It was not possible on this aerial survey to visit the Ngorongoro Crater on account of cloud.

The following were the results obtained from this survey.

Lake Magadi. A large number of adults, chiefly Lesser Flamingoes, but no signs of breeding.

Lake Natron. A very large breeding colony was discovered, described in detail in the subsequent paragraphs. There were possibly 500,000 adults of both species, chiefly Lesser, on various parts of the lake.

Lake Manyara. Large numbers of adult Lesser Flamingoes and some Greater but no signs of breeding.

Lake Balangida Eidahan and Balangida Lelu. Completely dry, no flamingoes.

Lake Eyasi. All practically dry except for a few patches of water, totalling several hundred acres in extent, on one of which there were about 4,000 Greater Flamingoes.

Embagai Crater Lake. A line of flamingoes all round the shore but no indication of breeding; the lake did not appear at all suitable since the shores are steeply shelving and not mud. There is another Embagai lake and the one visited, which is high on the Rift wall, may not be the one referred to in the note in 'Oryx'.

Part of the colony on Lake Natron was first viewed on 20th August at the southern end of the lake. There is a large expanse of water here caused by the inflow of stream and springs, which extends up the eastern and western shores in long narrow arms. About the middle there is a large dry tongue of soda-mud. Flying round the edge of this soda flat we saw large numbers of downy young Lesser Flamingoes. One group totalled about 1,000, with several smaller groups of 50 to 100 near them, about 1,500 all told in the water. Several other groups of young were visible on the soda flat itself. We flew in the direction of these herds of young birds for about a mile and there found a number of scattered nests in groups of two or three or even singles spaced widely apart in a manner unlike any flamingo breeding ground previously reported. We thought that the young we had seen must have come from these nests but in the light of later discoveries this may not have been so. The young in the water were accompanied by a few adults but it was evident that they had been largely left to themselves. They were about the size of a fowl and were covered in grey down. As we did not wish to remain long over Lake Natron on 20th August we flew on to Arusha, meaning to return the next day.

On 21st August we flew direct to the spot where we had seen the young birds; their numbers had increased considerably since the day before; the number in the water at the edge of the soda flat was now not less than 3,000. A small group had already attempted to cross the long arm of water running up the east side of the lake, presumably with the intention of reaching freshwater springs under Mount Gelai. The numbers in the water were being augmented rapidly from a string of groups and odd young birds which could be seen trekking across the soda flat from the north. This string extended for possibly two miles, with groups of youngsters along its length, and with isolated herds of young birds walking across the soda by themselves—an amazing sight.

Flying in the direction from whence the string of young birds came, we first passed over the scattered nests seen the day before, and a little further on located a very much larger colony of nests. This colony was roughly triangular, possibly a quarter of a mile long, and could not have contained less than 50,000 nests. It was a compact colony, but like the groups of nests built on Lake Hannington in 1953 it consisted of clumps and lines of nests with bare spaces between, rather than a continuous mass of nests. On Hannington the average density of nests in colonies built in 1953 was 1.4 per square yard, with groups of a density of 4.5 per square yard and bare spaces between; the Natron colonies did not seem quite so dense. All these nests were empty and it was assumed that they were the source of the young birds then trekking across the flats, although other herds of young had obviously gone to the water in other directions since we could see them standing in it.

About half a mile to the west of this great colony was a bay in the salt flat and here we came upon further large colonies at a much earlier stage. Most of these also had hatched young but the chicks varied greatly in size—from the size of a partridge to very small helpless creatures still in the nest. A large number of nests at the western extremity of this colony still contained newly-hatched chicks or eggs. My impression was that there was only one egg in each nest but owing to turbulence over the soda flat it was practically impossible to hold the binoculars still as the aircraft bumped and there may have been two lying close together. The chicks and eggs in the younger colonies were guarded by adults and it was evident that as soon as the young could walk they were taken to water. It was also evident that after a certain age the young were largely abandoned by their parents, since all those trekking across the soda flat were unaccompanied. One would have thought that such youngsters would be helpless against the attacks of birds of prey and this is probably the case for isolated individuals. One herd of chicks, however, over which we flew very low, ran together with their heads towards the centre and burrowed beneath the bodies of their companions, forming themselves into a compact knot in much the same way as a Rugby football scrum. This is presumably a defensive reaction against birds of prey.

At the western extremity of this huge colony of Lesser Flamingoes there were at least two colonies of Greater Flamingoes, each consisting of 50 to 100 pairs, with eggs or very small young. This is the first breeding record for the Greater Flamingo in East Africa. They were easily recognisable from above by the following characteristics :—

(a) larger size; (b) general paler pink colour; (c) the much more brilliant red in the wings when opened. It seemed probable that among the older, now deserted colonies, there had been a certain number of Greater Flamingoes' nests, since among the herds of Lesser Flamingo chicks there were generally some chicks which stood head and shoulders above the others, were clad in a much darker shade of down and looked as though they might be Greater Flamingoes.

There were a number of scavenging birds on the outskirts of this colony; they included several Ruppell's Griffons *Gyps ruppellii*, at least one pair of Tawny Eagles *Aquila rapax*, and a Lappet-faced Vulture *Torgos tracheliotus*. These birds were doubtless subsisting upon the dead or weakened adults and young which could be found scattered about in any colony of this sort. They were sitting very close to the flamingo colonies and their presence did not appear to be resented.

The total number of young, eggs, and occupied nests seen in all these colonies was estimated roughly at between 100,000 and 150,000. This may be an over-estimate owing to the difficulty of making a satisfactory count from a small bumping aircraft moving at 100 m.p.h., but it is based on considerable experience of estimating numbers at Lake Hannington. It is, at any rate, evident that a large part of the breeding flamingoes of East Africa were doing so on Lake Natron in August 1954, though by no means all the adults on the lake were breeding. M. W. Ridley (in litt.) told me that in 1953 he estimated the number of first-year immatures on Lake Hannington and other places as about 150,000 or more in a population of over two million. If this is a regular proportion of first-year young to adults it is likely that Lake Natron is one of the major breeding sites in East Africa, if not the most important.

Other points of interest in regard to this colony are as follow :—

(1) It is evident that the Lesser Flamingo breeds in much the same way as the Greater Flamingo, building a mud mound nest, 6-15 inches high and about 10-12 inches across the top, laying an egg in the depression on the top and hatching it in the normal way. Many eggs are found washed up on the shores of the Rift Valley lakes from time to time, and there were some about the shores of Natron on 4th September 1954, but it is evident that the flamingo does not simply drop its eggs on the shore and leave them to hatch (vide Grant and Mackworth Praed: Birds of Eastern and North Eastern Africa, p. 82, London 1952). These derelict eggs must either be washed off nests or dropped by the birds when visiting springs of fresh water.

(2) This colony would have been invisible from the shores of Lake Natron since it was at least three miles from the nearest shore below Mount Gelai. It would have been possible to walk right round the lake and be unaware of the colony's existence. Local Africans will say that flamingoes simply produce their young in the water. If this site on Lake Natron is regularly used, which seems probable, the first sight Africans would get of the young birds would be when they migrated to the freshwater springs running into the lake (which many of the young birds we saw were about to do). As this does not occur obviously until the young birds are about half grown the supposition that flamingoes produce their young out in the water of the lake would not be unreasonable on the part of a primitive African.

(3) The environment in which the young birds are produced is exceedingly harsh. Nests are doubtless constructed of wet slushy mud on the edge of this soda flat but the half-grown young were able to walk across several miles of solid soda which must have been at a high temperature and which was probably injurious to the skin of any ordinary animal. The concentration of salts in the water at the breeding place must also be great since Lake Natron is shallow everywhere and in large areas the red-brown algae dominate the blue-green which are the normal form in Lake Hannington. Any fresh water which the small young demand must, therefore, be provided by the parents which presumably go to the freshwater springs and collect it. The young are likely to need fresh water since immatures on Lake Hannington show a greater freshwater demand than adults.

(4) Mr. G. H. Swynnerton of the Tanganyika Game Department has kindly forwarded to me a report of flamingoes breeding on Lake Rukwa. This states that according to the local natives the adult birds became flightless when they had young and while helpless were caught in large numbers by Africans and used for food. In the Natron colony I saw no sign that the adults had become flightless and I also feel fairly certain that anybody attempting to run down a flamingo in water and mud would have a very poor chance. However, close acquaintance with a breeding colony is necessary before this point can be clarified.

(5) Egg laying had evidently continued for some time, since the oldest young were not less than 20 days old, and the latest nests still held eggs; laying probably continued for at least a month. I formed the general impression that the earliest nests might have been the scattered small groups, followed by the big triangular colony, and followed, as the water receded, by the other colonies in which small young or eggs were seen. The older nests were completely high and dry, but the newest colonies almost on the water's edge. There were, however, no visible nests in process of construction (such nests have a characteristic black appearance) and there seemed no likelihood of further egg-laying. Within the main colonies there had evidently been synchronisation of egg-laying in groups. There were many such groups or sub-colonies in which the young were all of almost exactly the same stage of development, indicating that 50-200 pairs had laid together on the same day or at least within a day or two.

Subsequent to this flight, on 22nd August, I walked round most of the western shore of Lake Elmenteita. In view of the exceptional numbers of flamingoes on the lake in 1954—more than I have ever seen on Elmenteita at any time since 1946—I thought it possible that there might be some signs of breeding. There were not less than 100,000 adult flamingoes of both species on the Lake, with many *P. ruber* among them, but no sign whatever of breeding and indeed most of the terrain is unsuitable being stony or rocky as opposed to muddy.

On 4th September 1954 I made an unsuccessful attempt to reach the Lake Natron colony on foot. The soda flat was separated from any accessible spot on the shore by a considerable expanse of water and I tried to cross one of these arms of water at a point I had marked from the aircraft as being approximately the narrowest. The water was very shallow overlying a soda crust, and I had nearly reached the far side when I became firmly stuck in the mud, with the result that large chunks of solid soda got inside my gumboots and I sustained severe soda burns of the feet which kept me in bed for three weeks. It is evident, therefore, that this colony will not be accessible without specialised equipment. It remains to be seen whether it is a regular breeding haunt and this will be best established from the air. Aerial photography might possibly be used to make an actual count of nests on another occasion. The birds with eggs or small young did not appear to be unduly disturbed by our aircraft, but birds standing in the water or accompanying herds of large young took wing very readily. It should be possible to avoid desertion of colonies caused by low-flying aircraft (as has apparently been known in the Camargue) if sufficient care is taken. East African flamingoes appear in any event to be much tamer and easier to approach than those of the Camargue.