SOME DATA ON THE STATUS OF THE SPOONBILL, PLATALEA LEUCORODIA L., IN EUROPE, ESPECIALLY IN THE NETHERLANDS

by

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The steady increase of the human population with all its consequences is an omnipresent threat to the wildlife of the Netherlands, especially to the larger animals who make greater demands on their habitat. That is why preservationists must continuously watch that the living conditions of such species do not drop below a certain level. Besides the various reclamation works and reallotment schemes that have been carried out all over the country, the huge hydraulic-engineering works, known as the "Delta Plan" in the provinces of Zuid-Holland and Zeeland will probably prove to have a really serious effect on the birds that are in the habit of feeding in tidal waters. For these hydraulic works will close off the estuaries of the Rhine and the Meuse, thus bringing an end to the tides which provide not only rich feeding opportunities but also safety (by making the habitat more or less inaccessible to men). Among the birds frequenting these tidal waters the Spoonbill is perhaps the most precious one. Hence, as regards its favourite feeding grounds the prospects for this species — chosen as our "national bird" in 1962 — are rather unfavourable. These prospects, together with the fact that our Spoonbill population has shown a decrease since 1950-1954, lead me to the subject of this paper. Although it is mainly based on literature, the first two chapters contain many of my own observations; I am indebted to Mr. C. van Orden for some recent data on the Zwanenwater and Texel colonies. Furthermore I want to thank Dr. A. C. Perdeck and his staff of the "Vogeltrekstation Foundation" for the kind assistance in providing me with the most recent ringing records, and Prof. K. H. Voous for help with literature.

I. The Netherlands breeding colonies in the 20th century

Although the main course of the Netherlands Spoonbill population is more or less a matter of common knowledge thanks to the publications of Haverschmidt (1935), Van Oordt (1937, 1939, 1954, 1957) and Brouwer et al. (1920-1946), it may be wise to summarize in a few lines the development of this population during the last hundred years.

About 1850 in the moor district of the provinces of Holland and Utrecht there were two large heronries, where the Spoonbills bred together with Cormorants and some heron species: one of these colonies was on the Schollevaarseiland in the inundated Wollefoppenpolder near Nieuwerkerk a/d IJssel, the other was in the Horstermeer between Ankeveen, Vreeland and Kortenhoef. Ornithologists who visited the colonies in the period 1850-1880 reported that the tenant-farmers of these marshes made a vile profit out of the birds, taking their eggs for two months, which was far too long. So it was perhaps fortunate for the birds that both marshes were reclaimed, the Schieland lakes (Schollevaarseiland) in 1874, the Horstermeer in 1883.

It is not known for sure where the birds which were driven away settled down next. Some may have joined the Naardermeer colony, which already existed in 1866 (Van Bemmelen, 1866), but it is likely that the main body found a home elsewhere, probably in the Zwanenwater near Callantsoog, which place is not mentioned in literature before 1892 (H. W. de Graaf's manuscript). I may add here that in 1880 another group of Spoonbills, only a small one of 5 to 25 pairs, lost its breeding habitat too, in this case through the draining of the Grote Vlak on the island of Texel (Drijver, 1957).

In any case at the beginning of this century there were two Spoonbill colonies in the Netherlands: one in the Naardermeer (where about 50 pairs bred at the time) and one in the Zwanenwater where the population amounted to some 200 (or 300) pairs. The last-named colony was visited on 27th July 1898 by Sclater (1899), who, though he did not mention the name of the place, reported that it "was fortunately within a large enclosed area owned by a private individual, and strictly preserved". For the colony in the Naardermeer strict preservation came into force in 1906 when this lake was purchased by the Vereeniging tot Behoud van Natuurmonumenten in Nederland (the Dutch conservation society).

From that year onwards both Spoonbill colonies flourished and in 1933 a third colony was founded in the Muy on the island of Texel, followed in 1954 by a fourth one in the Geul on the same island.

Apart from these settled colonies occasional cases of breeding or attempts to breed became known from at least four other places, viz. one in the

Delta area, one in the IJsselmeer area and two in the Wadden Sea area. It seems that in the part of these breeding attempts young birds were involved.

To illustrate the present distribution of the Spoonbill in our country more clearly, I have — in imitation of the Candlers (1890-1891) and Van Oordt (1957) — mapped the different breeding places and connected feeding grounds as well as the places where non-breeding birds assemble during the breeding season. After the breeding season Spoonbills are to be found in many other shallow waters and tidal flats, but I have not marked these on the map. This restriction is responsible for the differences which are immediately apparent if Van Oordt's map is compared with mine. A short comment on this map (fig. 1) follows here.

1. The Naardermeer covers about 700 hectares; it comprises several sheets of open water (1 to 1.40 m deep), reedbeds and a broad border of mixed forest of willows, alders and birches. The marks of the last attempt at reclamation (1883-1886), which included most of the northern part (north of the Zijpelingskade), are still present in the shape of some straight and deep channels and numerous narrow ditches as demarcation lines. The vicinity of Amsterdam (about 12 km away) is obvious from the traffic: a railway-embankment cuts the lake into two parts, motor highways run parallel on both sides at some 250 to 700 m distance; a new one leading to the future Zuid-Flevoland polder will touch the northern side, passing between the lake and its windmill! Furthermore, airplanes heading for Schiphol airport fly over it regularly. But the Spoonbills whose main feeding grounds are some 20 km away in Waterland do not worry in the least about all the traffic when they fly back and forth to their breeding-place, which is left absolutely untouched. For the fluctuations in the numbers of the breeding pairs and some other details see Chapter II.

2. The Zwanenwater comprises a long-drawn dune valley with two communicating lakes surrounded by overgrown dunes. This private property is about 4 km long and 1½ km broad and is bordered by the North Sea on the west and the Zijpe & Hazepolder on the east, forming a complex of some 600 hectares. Twenty-five years ago the Zwanenwater was still an out-of-the-way place, but during World War II the road along the inner side of the dunes was metalled and a camping site has been established nearby! Another more recent threat is the construction of a nuclear power station (Euratom) barely 1½ km from this important bird sanctuary.

This is our largest colony though the figures given for the years 1925, 1927 and 1928 (ranging from 380 to 450 pairs) were based on estimates

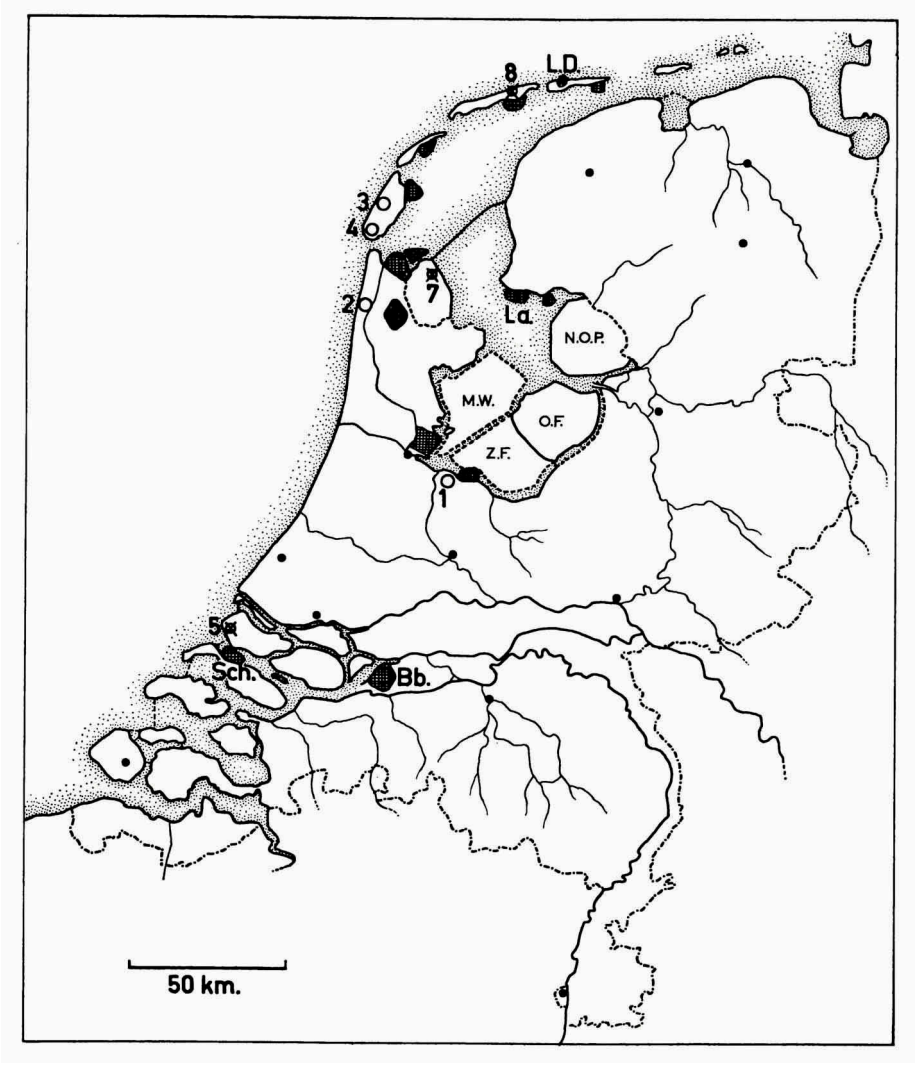

Fig. 1. Map showing the four Spoonbill colonies (nos. 1-4, circles) and connected feeding grounds (shaded areas). Some breeding attempts (nos. 5, 7 and 8) are indicated by a crossed circle. The four places where non-breeding birds regularly stay during May-June, are indicated by: Sch. (Scheelhoek), Bb. (Biesbosch), La. (Laaxum), and L.D. (Lange Duinen), cf. text. The names of the new polders in the IJsselmeer (two of which are still under construction) are: N.O.P., Noord Oost Polder; O.F., Oost-Flevoland; Z.F., Zuid-Flevoland; and M.W., Markerwaard.

and were certainly too high. Between 1930-1946 the numbers fluctuated between 150 and 220 pairs, with the exception of 1934 when there were only 100 nests. The birds are mostly divided up into two or more groups; they are remarkably tame, especially when the young are about 2 or 3 weeks old, as Haverschmidt (1935) has pointed out. Their principal feeding grounds are the tidal flats of the Balgzand and the Breehorn on both sides of the Amsteldiep some 20 to 25 km from the colony. But they also feed in the polder-ditches in the Zijpe & Hazepolder (environment of Oudesluis) east-north-east of Callantsoog. During World War II there was at first little disturbance; on 12th April 1943, however, nearly all the eggs were stolen and in the spring of 1945 the birds were frightened by heavy shooting on Texel where Russian prisoners of war (Georgians) revolted against the Germans. In 1948 quite a number of nearly fledged young were stolen for sale to zoological gardens or private collections of ornamental wildfowl. Most of the stolen birds were, however, recovered by the police and the thieves and receivers were prosecuted.

3. The Muy on Texel is a small and shallow lake of about 6 hectares, the lowest point of a long-drawn dune valley in the centre of a nature reserve of some 800 hectares, administered by the State Forest Department since 1908. This lake is well isolated on the seaward side and on the opposite side there is a dune from which visitors under guidance of a keeper are allowed to watch the birds from a distance of about 200 m (plate XXVI). Around 1909 a small number of Grey Herons settled there and Spoonbills visited the lake repeatedly. But it was only after several unsuccessful attempts during the years 1904, 1910 and 1921-1931 that in 1933 five pairs succeeded in rearing young. From 1934 onwards their number increased rapidly, probably because birds from the Zwanenwater colony shifted to this place, which is only 34 km away. In 1938 there were at least 110 nests and this number was about the average for the next ten years; in the breeding seasons of 1953 and 1954 there were about 150 pairs. In mid-April 1943 all the eggs were taken by some prisoners of war from India, who were encamped on Texel and were keen on eating these eggs. After some discussions with the military authorities and a lecture on bird protection for the offenders, the Spoonbills were left in peace and some 50 pairs bred again and reared their broods.

The main feeding grounds for the birds of this colony are the Eendrachtschorren, the tidal flats north-east of the island, but in all probability they also feed on the Balgzand and the Breehorn as the Grey Herons inhabiting the same breeding place do (Brouwer, 1936). Some Spoonbills feed in the

broader ditches on the inner side of the dikes or in the lowland near Oude Schild, but the latter feeding ground has been spoiled by the reallotment activities.

4. The Geul is a shallow lake, that came into existence after the construction of sanddikes on the sandflats at the southernmost point of Texel when this was separated from the sea some 35 years ago. In 1926 this area (about 400 hectares) was declared a nature reserve, administered by the Staatsbosbeheer (Forest Department). In a couple of years the whole area became a dense reedbed and during World War II a few Grey Herons and Spoonbills attempted to nest, but they were disturbed. In 1953 a solitary nest was built but abandoned; in 1954, however, about five pairs nested and some young were hatched, although the adjacent sandflats were used as a bombing range. Ever since a small group of half a dozen pairs have reared young ones nearly every year in this guarded sanctuary; in 1963 there were 15 nests.

5. The Breede Water forms a part of the "Voorne's Duin" nature reserve (742 hectares), a donation to the Vereeniging tot Behoud van Natuurmonumenten in 1927. This shallow dune lake, covering about 23 hectares, came into existence some 45 years ago (in the same way as the Geul) on the westernmost point of the island of Voorne. There are some small islands in this lake and a vegetation of *Phragmites* which is kept within bounds. In 1934 a few Spoonbills tried to settle: some nests were built and in one of them three eggs were laid. But later on these eggs proved to be infertile (Brouwer et al., 1935; Van 't Sant, 1935). In following years some birds stayed at this lake without breeding, for example in 1936, when seven birds (immature ones among them) were present. In 1961 another attempt at breeding was recorded: some five birds were present; two nests were built, in one of which two eggs, which did not hatch, appeared (Ten Kate, 1963). Their feeding grounds are the tidal flats in the Haringvliet only a few km away.

6. For reasons of preservation I am not authorized to give particulars here about the exact place where in 1959 a breeding attempt occurred in the IJsselmeer area. On this secret place 20 to 25 birds were present, one nest with eggs was seen, but no young were reared. No. 6 is not indicated on the map.

7. In the plantations of Robbenoord in the Wieringermeer polder a pair reared two young ones in 1944. This pair occupied an old heron's nest built in an alder tree some 3 m above the ground (see Van IJzendoorn, 1950, plate VII).

8. The Boschplaat is a large national nature reserve (4,400 hectares) on the island of Terschelling. In former years Spoonbills were regularly seen feeding on the tidal flats along the southern side of the Boschplaat. During high tide these birds rested among the vegetation of some low dunes. Nevertheless, the finding of a nest with eggs on the "Tweede Duintjes" at the end of June 1962 was quite unexpected. Thanks to strict guarding two young ones were reared (Tanis, 1963). In 1963 eight pairs bred at the same place. The habitat of this breeding place is quite different from all the others used by Spoonbills in our country. It is comparable with the situation on the island of Memmert (Germany) where another attempt at breeding was recorded in 1962 (see p. 497).

Summarizing we can say that the total Spoonbill population in the top years 1950-1954 amounted to at least 500 pairs; in the last two years (1962-1963) there were about 380 pairs or some 24% less.

Furthermore I have marked on the map four of the five places where groups of non-breeding Spoonbills like to stay during the breeding season (May-June). They are the following: the Scheelhoek (Sch.) and the Biesbosch (Bb.) in the Delta area; two places in the IJsselmeer area, viz. a small projecting point east of Laaxum (La.) and the place No. 6 above mentioned; in the Wadden Sea area the Lange Duinen (L.D.) on the island Ameland.

A few particulars about each of them follows here.

The Scheelhoek is a sandbank in the Haringvliet barely 10 km south of the Breede Water, covering some 225 hectares, about 140 of which are reedbeds. At low tide it is surrounded by mudflats. It belongs to the Crown Lands and has been administered since 1950 as a bird sanctuary by the Stichting Natuurmonument De Beer. Prior to 1940 as the local airline Rotterdam-Haamstede was still in operation one had a good view of this place from the air, as I know from my own experience, having noted a troop of 20 to 25 Spoonbills on 23rd June 1939. More recent figures for May and June fluctuate between 10 and 100 (Braaksma & Van Leeuwen, 1957). The Scheelhoek is now included in the Delta Plan works and has lost its isolated position, but it is not impossible that the Spoonbills will keep to this place if it is strictly guarded.

In the Biesbosch the tidal mudflats at the south-western tip of the Brabantse Biesbosch are preferred, viz. the Jonge Deen and Boerenplaat and the surroundings of the duck decoy on the Vischplaat. Although the tides will cease here after the Haringvliet is closed off in 1968, it is not impossible that the Spoonbill will find a refuge in the complex of the

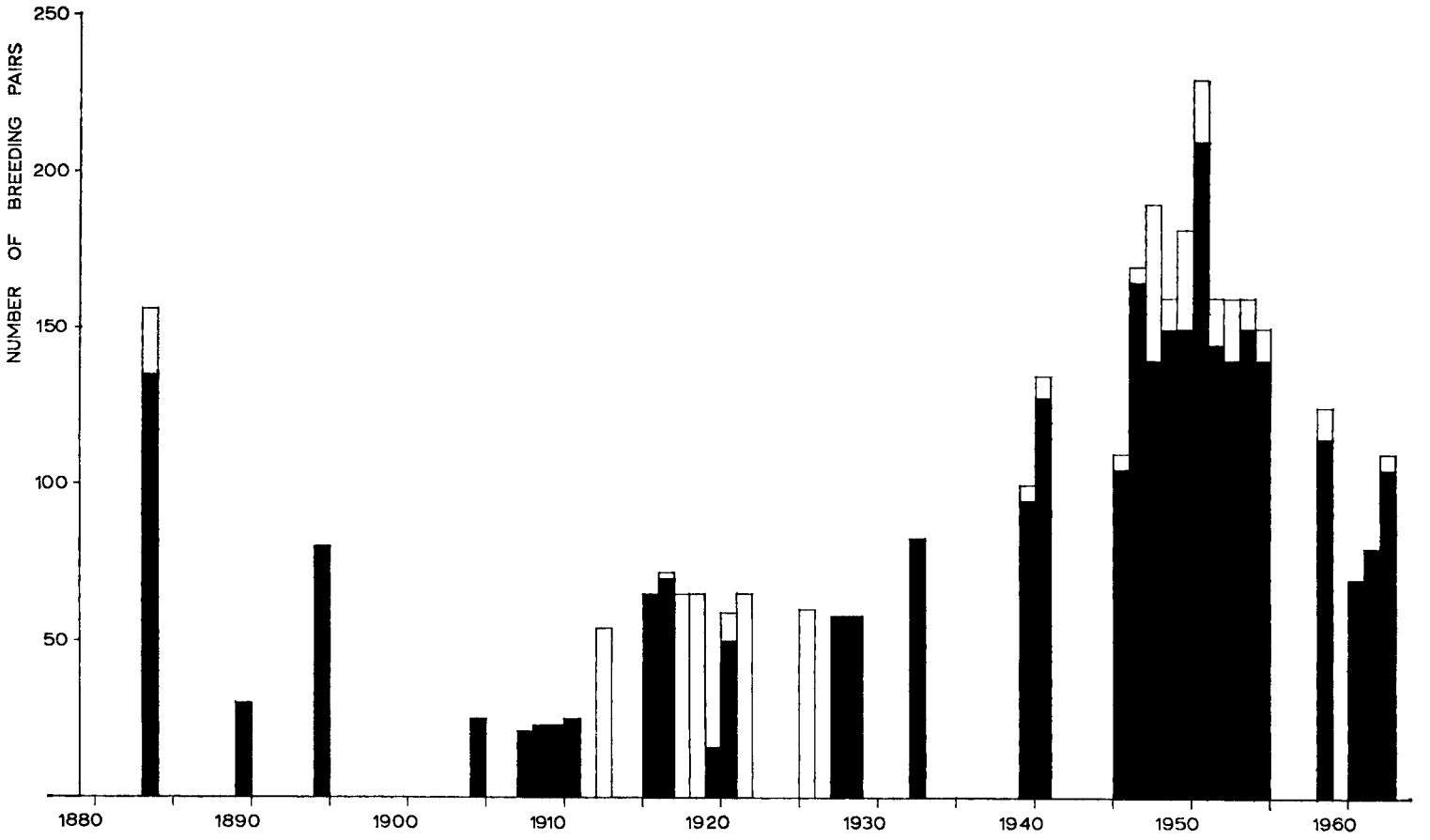

Fig. 2. Diagram showing the fluctuations of the Spoonbill population of the Naardermeer during the period 1884-1963 (black: precise estimates; white: rough estimates).

"De Dood" polder and its surroundings which have been purchased by the Government as a nature reserve. This season (May-June 1963) about fifteen of them frequented the last-named polder as it was flooded during every high tide, one of its dikes having been burst in the preceding winter. See also Verhey (1961).

The small projecting point east of Laaxum was well known to bird-watchers as it afforded shelter to many birds: herons, waders, ducks etc. This place has improved considerably since the Zuider Zee was closed off in 1932. The water level being lowered some 12 cm, a small bay came into existence and later on fairly large reedbeds made this point less accessible. During the period 1934-1941 some eight to thirty Spoonbills frequented this place in May and June; no figures are available from more recent years. This spot could remain a "pied à terre" for Spoonbills for many years to come, which cannot be said for the Lange Duinen on Ameland where the birds have probably been attracted by a small lagoon with a dense reed vegetation. They were seen here in 1951 and later years. But as this lagoon is open to the north-west winds the place will gradually be covered with drift sand.

For the sake of completeness I want to call attention here to the following breeding attempts:

About 1884 late in the season (July) some 20 to 40 Spoonbill pairs tried to settle in the Giethoornse polder, province Overijssel, but this attempt failed because some of the birds were shot by the local fowlers (Drijver, 1927).

In 1906 a breeding case was reported from Eernewoude, province Friesland, where a single clutch was taken by a foreign egg-collector. The details mentioned by Van Balen (1907) and Snouckaert van Schauburg (1908) are rather vague, so that this case should be considered doubtful.

II. Some details concerning the Naardermeer colony with remarks on the number of broods made and on the co-existence with Cormorants

To give a survey of the fortunes of the Spoonbill colony in the Naardermeer I tried to draw a diagram of it. Unfortunately, the figures available were very heterogeneous, as only in a few years the nests were actually counted; in most years the size of the colony was deduced from the number of birds that rose in the air when visitors intentionally made a noise near the breeding place. Furthermore the date of counting is also important because new nests are occasionally made during the breeding season, sometimes a whole group at the same time. So the diagram reproduces the

situation in broad outline only (fig. 2). I would like to comment on it as follows.

1884. — Instead of starting with the year 1906 as Van Oordt did I have chosen 1884, because I would like to give an idea of the period before the lake became a nature reserve and also because it enables me to use an overlooked description by Mr. Alfred Crowley (in Yarrell, 1884-1885) who visited the area during the years when work on the reclamation of the Naardermeer (which was continued from 1883-1886 before being abandoned) was in full swing. Only the southern part remained untouched and here the Spoonbills and Purple Herons held their own. Crowley, who saw the colony on 27th May 1884, noted that some 200 Spoonbills and 50 or 60 Purple Herons were hovering over his head as he came quite close. The Spoonbills' nests contained four eggs or in most cases four young birds, many ready to leave the nest, and several ran off as the visitors approached. But Mr. Crowley had good luck ... after wandering about he found one clutch of only three eggs and one of four, which he managed to blow.

1895-1905. — Steenhuizen (1905) points out that during that decade the number of Spoonbills' nests had decreased from 80 to 25. He stresses the need for stricter preservation, as the keeper of the lake was still allowed to make a profit from these birds by selling the young ones. There was a dealer in Sloterdijk whose aviaries were alongside the railway; in the second half of the summer they always housed a good many young Spoonbills as everybody travelling from Amsterdam to Haarlem could see (Thijsse, 1905). All this was allowed until the Bird Law of 1912 came into force.

1906. — The Naardermeer becomes our first nature reserve; its purchase by the Society was stimulated by the fact that the municipality of Amsterdam intended to make a refuse dump of it. The Spoonbill colony is now at its lowest ebb.

1906-1913. — The size of the colony fluctuates around some 25 nests, but increases to about twice that number in 1913.

1914-1929. — During World War I (in 1916) another increase to about 65 pairs is recorded, which lasts till 1929 (55 to 60 pairs), with the exception of 1920 when only 16 nests are occupied.

1930-1939. — The size of the colony is determined only once during this period: in 1933 there are 83 nests. In 1936 some 28 pairs break away from the main colony and settle down in a new place, viz. in the Jan Hagensbos, a strictly preserved botanical reserve of some 15 hectares (fig. 3, no. 4).

1940-1945. — During World War II the breeding population numbers some 100 to 130 pairs, divided over three colonies: the Middenpol, the

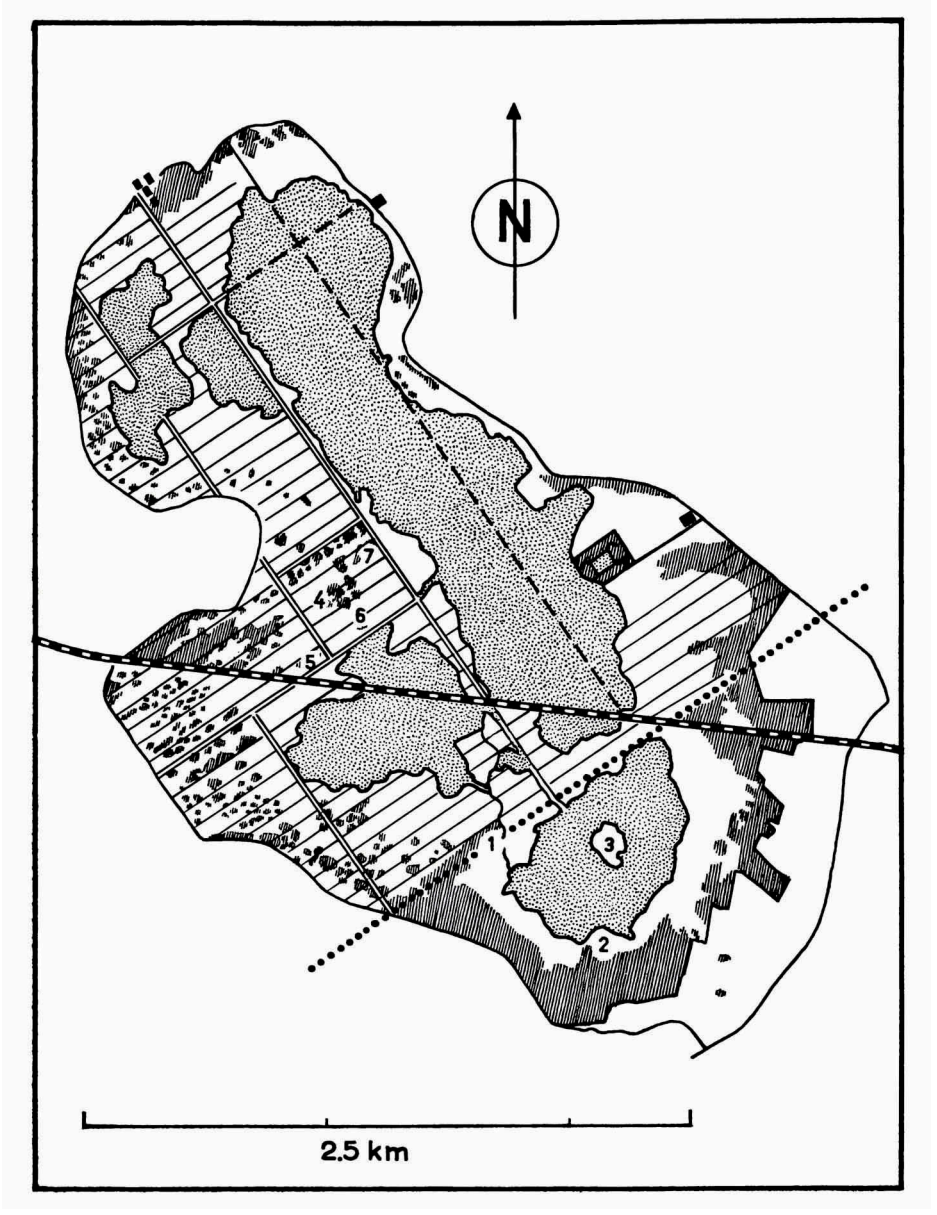

Fig. 3. Map of the Naardermeer with the breeding places used by the Spoonbills: 1, Zijpelings- or Siepeltjeskade (in former years and in 1949); 2, de Punt (in former years, anew in 1948-1953); 3, de Middenpol (till 1945); 4, Jan Hagensbos (1936-1948); 5, West of Jan Hagensbos (a small group in 1946 and 1947 only); 6, Jan Hagensbos (since 1949); and 7, Jan Hagensbos (in 1963). The part of the lake south of the dotted line remained untouched during the reclamation attempts in 1883-1886.

Punt and the Jan Hagensbos. The nests are counted on the ice during winter. In the spring of 1945 the Middenpol colony is shot at from the railway-embankment by German soldiers, after which this breeding place has been abandoned up to the present day.

1946-1955. — This period is characterized by an increase of the population to over 150 pairs and by the settlement of large numbers of Cormorants (to which I return below). The exceptionally high figure for 1951 is due to the discovery in mid-June of a new colony of 54 nests not far from the main one. In 1954 on 17th June an aerial photo is taken of the breeding place (no. 6) in the Jan Hagensbos, showing how the Spoonbills are mixed up with the Cormorants (plate XXVII).

1956-1960. — The colony remains in the same place but the nests are not counted probably because we were obliged to turn our attention to the Cormorants which had to be kept within bounds.

1961-1963. — In 1961 it is found that the number of Spoonbills' nests has decreased to a mere 70, and in 1962 to 64 nests (both April counts). In 1963 the birds start nesting in the old place; after a while, however, the greater part of the population chooses another (quieter) place in the north-eastern corner of the Jan Hagenbos (no. 7). On 4th May the colonies comprise some 40 and 55 nests respectively; in 3 nests of the colony of 40 the young are just hatching, extraordinarily late after the long winter [1]).

Number of broods

In Spoonbill colonies there are often some pairs which start breeding much later than the main body. The difference in time may amount to one or two or even ten weeks. This means in the latter case that when most of the young ones in a colony are already fledged the eggs of these late-breeders are just hatching. The following examples illustrate this.

On 29th July 1950 in a colony with about 150 young birds, 80 % of which could fly, the other 20 % having withdrawn on foot into the reedbeds, I came across one nest with 2 small young in down, 2 or 3 days old. On 24th July 1956 and 5th July 1963 I observed similar cases.

The clutches found by Mr. Crowley, as already mentioned above, belonged to such stragglers, though his visit took place on an earlier date (27th May).

A striking document is the photo made in 1961 by Eric Hosking in the colony at Kisbalaton: this photo shows an adult Spoonbill standing on its nest, in which one egg is visible, while in the background about a dozen young

1) In 1961 there were young ones as early as 11th April, in 1962 not a single young one had hatched on 24th April.

birds some 5 weeks old are walking around (cf. Mountfort, 1962, p. 153, plate XL *d*).

Not only odd pairs but even whole groups may occasionally establish themselves at a late date. This was the case in 1951 when on 17th June I discovered a colony of 54 nests (all containing eggs, 164 in all, 2 outside the nests not included) not far from the main settlement where the young were already 4 to 5 weeks old. Sixteen days later (on 3rd July) most of the nests of this "new" colony were empty and only 11 nests contained a small number of young ones (18 in all plus 1 egg). It is a mystery why these birds gained such poor results.

I should point out here that the new settlements always started late in the season, mostly in June and that in several cases immature birds were involved in these attempts. It is quite understandable that such late-starting pairs and breeding parties were interpreted as birds that made a "second brood". It was so to say a common opinion in the Netherlands ornithological literature of half a century ago that the Spoonbill was double-brooded. I cite here the explanation accompanying Burdet's (1914) stereoscopic photos, running as follows: the first clutch, in April, comprises generally 4 or 5 . . . eggs, the second clutch, in June, has mostly 3 [2]).

Even Heinroth (1931) when he visited the Zwanenwater colony was told that the birds are double-brooded: "Die Nester der leuchtend weissen Vögel stehn auf schlammigem Boden nur wenige Meter voneinander entfernt. Manche Junge waren um diese Zeit schon flugfähig und manche fast flügge. Sie liessen mich dicht herankommen und gingen dann nur ein paar Schritte beiseite. Dazwischen waren frische Gelege, die, wie mir von sachkundiger Seite berichtet wurde, regelmässig von solchen Paaren gemacht werden, die schon früh im Jahre zur Fortpflanzung geschritten waren". I think Heinroth's statement would be right if he had only added the words: "und ihre Brut verloren hatten". For these late-breeding birds are, I think, either adults that have lost their first clutches, or birds which are reaching maturity during summer.

Finally I want to quote here what Archer & Godman (1937) have written about the Somali Spoonbill, *Platalea leucorodia archeri*. They tell us that the main breeding season of this subspecies on the Somali coast is the second half of April and May, but that the species is double-brooded and eggs are

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2) Oudemans (1909) made an interesting observation on 17th June 1908. In a part of the Naardermeer colony which was regularly shown to visitors, he saw four nests together: one containing nearly fledged young ones, one half-grown birds, one newly hatched young and the fourth nest (from which the young were known to have already flown) contained one egg and proved to have been put into use again. In 1908 the first Spoonbills had arrived very early, viz. on 20th February.

laid again between June and August. If one realizes that in the Netherlands the Spoonbill was not protected by law until 1912 and that up to the present this species is regarded in Arab countries — as far as I know — as not a sacred bird but a delicacy, it is easily understood that many (first) broods were lost in the Netherlands before 1912 and still are in Somalia and that many "second" or replacing broods can be expected [3]).

Co-existence with Cormorants

In former centuries Cormorants regularly formed part of the mixed breeding colonies of herons and Spoonbills; this was so in the Zevenhuizensche Bosch, on the Schollevaarseiland and in the Horstermeer. There is a water-colour of the last locality by Willem Roelofs which shows a mixed colony of Spoonbills and Cormorants nesting on the ground, with the Cormorants on some low leafless trees as well. But apart from the picture, Roelofs (1880) also wrote an interesting paper on this colony expressing his surprise that two so different birds could breed so closely together and that the Spoonbills, who are not naturally aggressive, do not apparently fear the greedy Cormorants [4]).

During World War II the Cormorant colonies in our country suffered badly from disturbances: at Wanneperveen many young birds were taken for food and in 1946 this colony even moved into the Grote Otters decoy, but was not allowed to settle; at Lekkerkerk there was disturbance too and the birds of the Brabantse Biesbosch (Keizersdijk) ruined the trees on which they were nesting. As a consequence the birds made attempts at settling in many other places. In 1942 several hundred pairs tried to establish a colony in the Jan Hagensbos (Naardermeer), but as they stole the nesting material from the Purple Herons and it was feared they would disturb the Spoonbills too, it was decided to drive them away. In 1943 they made another attempt,

3) Jourdain (in Witherby et al., 1939) states that the eggs are laid at intervals of several days and that incubation begins before completion of the clutch. Heinroth (1931) estimates the incubation period at some 3½ weeks, but no definite observations were made. The young leave the nest at about 4 weeks, but cannot fly freely till about three weeks later. So we may reckon for egg-laying, incubation and fledging period together at least 12 weeks, which makes it very unlikely that the Spoonbill would normally raise two broods.

4) Roelofs (1822-1897) lived in Brussels, but as he stayed most summers at Kortenhoef this picture must represent the mixed Spoonbill/Cormorant colony in the neighbouring Horstermeer. Thijsse (1939) mistook Roelofs's water-colour for a document of the Naardermeer. It is, however, very unlikely that Roelofs who wrote a paper on the Horstermeer colony, should have painted a similar colony in the Naardermeer. Moreover, there were no Cormorants in the Naardermeer in those years; they were cruelly driven away around 1860 (Thijsse, 1912, p. 41).

but were again driven away. But in 1947 they tried to settle once more and this time a limited number were allowed to breed, because outside the Naardermeer conditions for the Cormorants had become worse: the total number amounted to only one half of the 3,500 pairs that were present in 1940 and 1941.

Meanwhile, it was necessary to limit the Cormorants because all of them seemed to prefer the Naardermeer; the breeding place in the Bakker's decoy at Wanneperveen having lost its attraction since the fishing waters in the eastern part of the IJsselmeer had gradually disappeared as the Noord-Oost polder (1942) and the Oost-Flevoland polder (1957) were drained. But considerations of preservation were not the only ones, the fishing interests also being in question and the fishery-authorities at that time did not allow more than 400 breeding pairs in the surroundings of Naarden. This number was raised to 500 pairs in 1952 and to 600 in 1961 as the steadily shrinking Wanneperveen colony proved to be the only other stronghold of the species in our country, the former colonies in the Delta area (Lekkerkerk, Biesbosch) having completely disappeared.

Looking back over the period 1947-1963, we see that the Spoonbills repeatedly shifted their breeding place: in 1948 the main body left the Jan Hagensbos (no. 4) and settled at the Punt (no. 2), only a small number staying in the old place; in 1949 no. 4 (having been occupied for 13 years) was deserted, the main body preferring to establish a new home between Veertig Morgen and Siepeltjeskade (near no. 1). But later in the season a group returned to the Jan Hagensbos and here they settled in a new place (no. 6). As in those years the Cormorants occupied the northern part of the Jan Hagensbos the abandonment of breeding site no. 4 was obvious. On the other hand the total quiet of the Jan Hagensbos (since 1942 enlarged as far as the railway embankment) continued to attract the Spoonbills. It is difficult to prove, but I am all but convinced that both moves just mentioned occurred when the Cormorants became too numerous in the immediate vicinity of the Spoonbill colony. The move in 1963 from no. 6 to no. 7 I consider as such too. An aerial photo, taken without authorization on 17th June 1954, gives a good idea of how closely both species intermingled in breeding place no. 6. This photo has previously been published in several books for example in Voous (1960) and also in "British Birds" (vol. 48, Dec. 1955, plate 68). Nevertheless I thought it important to reproduce it here once more (plate XXVII).

It is tempting to mention some more details which affect the well-being of the Spoonbill population, viz. the fact that in long winters several birds that have returned early have failed to survive, or the loss of eggs, which

sometimes get outside the nests, etc. But that would be beyond the scope of this paper.

I expect, however, that several readers will regret that so few young birds have been ringed and that up to the present day no thorough investigation into the life-circumstances of the Spoonbill has been made in one of our colonies. I can state here that such an investigation has now been planned, so I suppose it will start in the near future. But I want to stress that the young ones are rather vulnerable. If they are only a few days old one should take care that they are not exposed to fierce sunshine [5]). When they have attained the age of 3 to 4 weeks they leave their nests for the intruders and may get lost, especially in crowded colonies. Or to cite Dragesco (1961 b): "Les Spatules s'occupent avec beaucoup de diligence de leur progéniture, mais se désintéressent complètement du poussin qui s'est écarté de la colonie. La plupart des jeunes qui sont tombés d'un nid, finissent par périr misérablement". This justifies the method of strict preservation and obliges the research-worker to proceed with the utmost caution.

III. The Spoonbill populations in other European countries

For the conservationist it is important to know the status of a bird species throughout its range. This is especially so in the case of the Spoonbill, which is rather an uncommon species with a scattered distribution. It is for this reason that I want to comment here in a few words on the breeding colonies that still exist outside the Netherlands, that is in western and in south-eastern Europe.

Western Europe

Spain. — In this country there is still a small breeding population in the estuary of the Guadalquivir. The first reports on this bird-paradise came from English sportsmen and bird-photographers who were attracted by the multitudes of wildfowl and other birds that concentrated on the shallow lagoons and the wide grassy plains.

It seems that Lodge was the first who saw the Spoonbills nesting on the

5) O. Koenig (1952) has warned us in this respect: "Gefährdung durch Sonnenhitze betrifft fast überhaupt nur Gelege und noch unselbständige Junge von Nesthockern, in erster Linie von Reihern und Löfflern. Werden die Vögel durch irgendwelche äussere Störungen an warmen, sonnigen Tagen von den Horsten gejagt, so sterben Embryonen sowohl wie geschlüpfte Junge oft innerhalb einer knappen Viertelstunde den Hitzetod. Solange die Altvögel an den Horsten stehen, tritt diese Gefahr nicht ein, da sie die Horstmulde immer durch ihren Körperschatten schützen. Löffler brüten ja an sehr heissen Tagen manchmal gar nicht, sondern beschränken sich auf das Abschatten der Eier. Jedwede Begehung von Kolonien sollte daher nur an trüben Tagen, bzw. in den zeitlichen Morgen- oder Abendstunden erfolgen".

lagoon of Santa Olalla in 1899; as the character of this place has changed greatly, the Spoonbills have left it long ago. Chapman (see Farren, 1914) records the finding in 1909 of a colony of 30 to 40 birds, whose nests were crowded together on the mud among bush-like plants of *Salicornia* and *Suaeda* on the open marisma. Beetham (1914) and Farren (1914) stayed in the Coto Doñana in 1911 and 1912 and found about half-a-dozen nests in a mixed heronry and, as these nests were built on the lower branches of tamarisk bushes, they succeeded in taking some beautiful photographs. Mountfort (1958), describing the outcome of three ornithological expeditions to the Coto Doñana (1952, 1956 and 1957), mentioned a small colony just south of Huelva. Valverde stated in his report for the Technical Meeting of the U.I.C.N. at Athens (1958): "...il n'en reste en Espagne comme reproducteurs qu'une douzaine de couples dans une petite lagune de l'Andalousie. Il y a deux ans, elles ont perdu toutes leurs pontes". This lagoon was probably the Laguna de las Madres, which has since been drained for peat digging. But in 1959 two or three pairs were breeding in the Coto Doñana and reared young ones (Valverde, 1960), and in 1960 and 1962 the Spoonbill population on this estate was estimated at 40 pairs (De Vries, 1962). For breeding cases in former years, see Congreve (1943) and Irby (1895).

From other western European countries only a few scattered cases of breeding are known in this century: several from Denmark, a recent one from Germany and a doubtful one from France. To state more precisely:

Denmark. — Here the Spoonbill has been found breeding in northern and western Jutland on a few occasions, even in successive years, but it has not become established as a breeding bird (Jespersen, 1946; Løppenthin, 1948). Holstein (1929) gave an illustrated description of such a breeding case in 1928, when two out of three pairs succeeded in rearing four young ones and Jespersen (1952) contributed two more photographs of a similar event.

Germany. — In 1962 late in the season (20th July) a nest with 3 eggs was found on the island of Memmert, a bird sanctuary between Borkum and Juist. The birds bred for several weeks in vain: the eggs proved to be infertile. So the first breeding case on German territory was unsuccessful. The breeding pair formed part of a small group of Spoonbills (9 birds in all) which stayed in the neighbourhood of the breeding place (Pundt & Ringleben, 1963).

France. — There was perhaps an incidental breeding case in 1946 in the reedbeds in the Loire estuary, but Douaud's observations (1948) over five consecutive summers (1943-1947) are not quite convincing and it was probably only an attempt at breeding.

Perhaps I may add here a few older data: some 300 to 400 years ago Spoonbills still bred in England (Sussex, Middlesex, Kent (?), Norfolk and Suffolk; a map of the breeding places in the latter two counties was given by Gurney, 1921), in France (borders of Britanny and Poitou, mentioned by Belon, 1555) and in Portugal (about 1616 in the marshy ground at Almeirim, opposite Santarem on the river Tagus, see Tait, 1924).

South-eastern Europe

In south-eastern Europe the distribution of the Spoonbill coincides with the area that was covered by the shallow and brackish Sarmatic inland sea, which extended from Vienna eastwards to Tashkent in late Tertiary and Pleistocene times.

The various nationalities and languages combined with the political changes which have taken place in this part of Europe considerably complicated the tracing of the breeding places. The following enumeration is certainly not complete, but it may give at least an impression of the situation. It is based in the first place on Makatsch (1950) and amplified with some earlier and other more recent data from literature. The sequence used in the following corresponds with the figures on the map (fig. 4).

Czechoslovakia. — (1) Since 1949 a few Spoonbills have occasionally bred in the Lednitzer lakes area (Eisgrub) in southern Moravia (Jirsik, 1956; Hanzák, 1958; Kux, 1963).

Austria. — (2) The main part of the Neusiedler See (= Fertö Tava) is Austrian territory, whilst a small southern part belongs to Hungary. This large shallow lake, covering some 30,000 hectares and about 1 m deep, is situated some 40 km SE of Vienna; in recent years it has become more and more a recreation centre. Usually two or three colonies of Spoonbills breed in the extensive reedbeds, some 200 to 250 pairs in all (O. Koenig, 1952). Fluctuations of the waterlevel affected the breeding results in former years (O. Koenig, 1939, 1952; Zimmermann, 1944).

Hungary. — (3) The Kisbalaton is a marsh of about 3.500 hectares with an inner sanctuary of about 970 hectares, situated at the extreme south-western end of Lake Balaton (= Platten See). The latter is, according to Mountfort (1962), the most important recreation centre of the country: instead of unspoilt marshes, there are now holiday camps and hotels every few miles along its (northern) shore. Fortunately its little satellite Kisbalaton has been saved from exploitation and is now a strictly guarded and well-managed sanctuary. The decline of Kisbalaton since 1890 is to be seen on the maps illustrating Schenk's (1918) paper on the past and present breeding

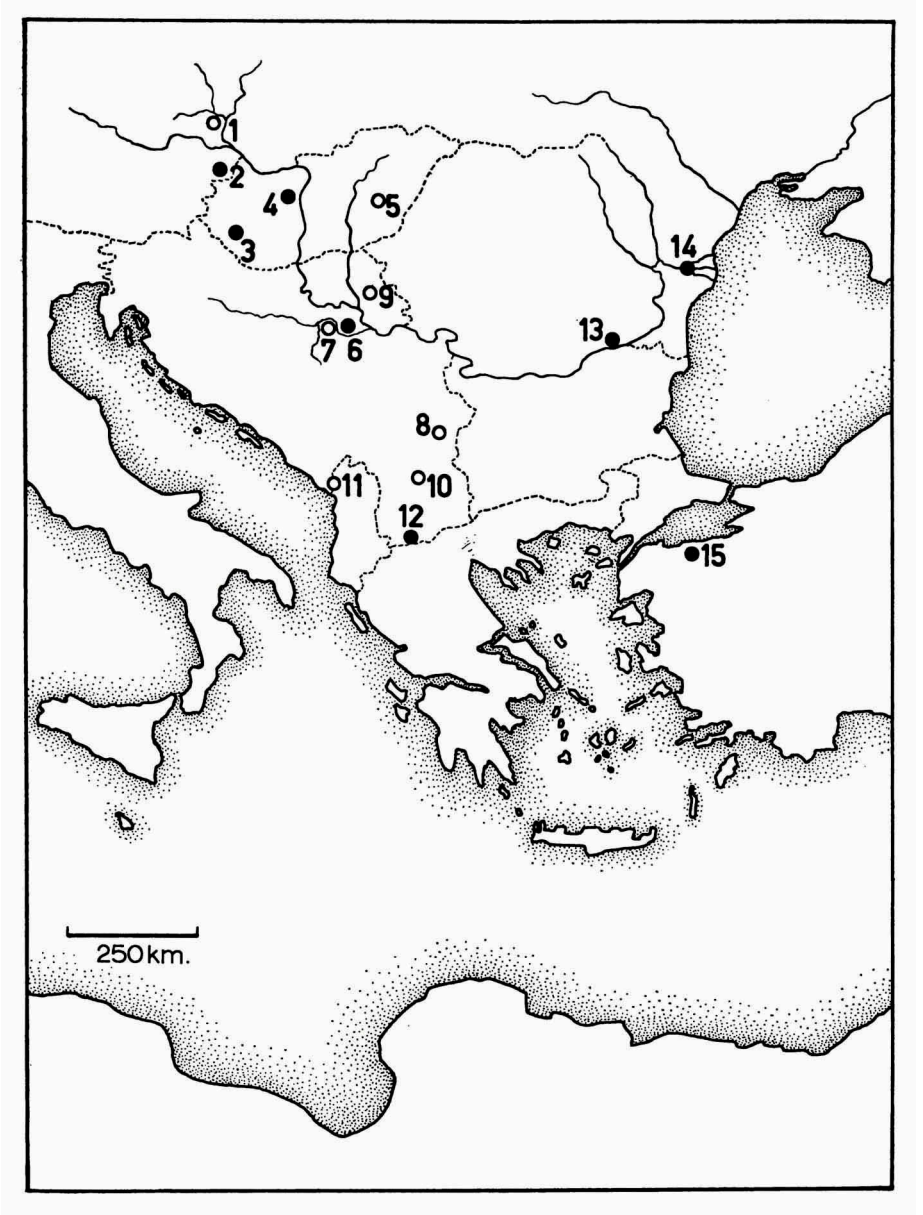

Fig. 4. Spoonbill colonies in south-eastern Europe (black dots: recent data available; circles: occasional breeding or no recent data available). Nos. 1, Lednitzer lakes (Eisgrub); 2, Neusiedler See; 3, Kisbalaton; 4, Lake Velence (Dinnyés); 5, Hortobágy (fishponds); 6, Obedska bara; 7, Mačva; 8, Niš; 9, Banat area (Perlasz); 10, Lake Katlanovo; 11, Lake Scutari; 12, Crna Reka (= Kara Su); 13, Danube, left bank; 14, Danube delta; 15, Lake Manyas (Turkey).

colonies of the Egrets in Hungary. This marsh is chiefly known as a breeding place for the Great White Heron (*Egretta alba* (L.)), but it also houses a fair colony of Spoonbills, whose numbers have fluctuated during the last 40 years between 0 and 120 pairs, with an average of about 50 (fig. 5).

(4) The Dinnyés Marshes, Lake Velence, near Székesfehérvár (= Stuhlweissenburg) about 50 km SSW of Budapest. The breeding of herons in these marshes was first mentioned in 1890; Lindner (1903) visited the spot in 1902 and stated that Spoonbills were breeding there too. According to the figures available the population of this marsh has seldom exceeded 25 pairs since 1930, although in some years (1941, 1948) there were about 60 to 80 pairs, in 1951 even 150 (Szijj, 1951). In 1962 Mountfort was able to ascertain 17 occupied nests.

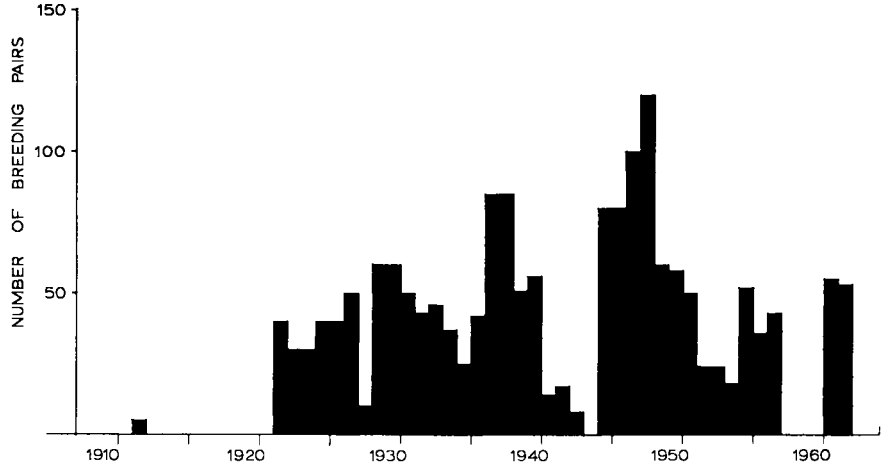

Fig. 5. Diagram showing the fluctuations of the Spoonbill population of the Kisbalaton during the period 1909-1962. No figures are available for 1909-1911, 1913-1921, and 1958-1960. In 1943 no breeding took place.

(5) Fishponds in the Hortobágy. Homonnay (1960) drew attention to a group of some 60 pairs of Spoonbills that had settled in a 50-60 m wide reedbed of fishpond no. 5, where they reared their young. I imagine this was more or less an incidental breeding case, but as it seems that rice-culture is being constantly extended in this area, Spoonbills may perhaps settle down more regularly in these fishponds.

According to Szijj (1951) the total Spoonbill population of Hungary amounted in 1951 to 220 breeding pairs (Lake Velence 150, Kisbalaton 53 and 16 to 19 pairs distributed over 4 or 5 other breeding places).

Yugoslavia. — (6) The "Obedska bara", a former meander of the river Sava near Kupinovo, some 40 km WSW from Belgrade, belonged to Hungary before the First World War. It is one of the classic resorts for marsh birds known from 1835 onwards and was visited in the last century by several distinguished ornithologists, among them J. F. Naumann accompanied by J. S. Petényi in 1835, and W. Eagle Clarke in 1883. Some fifty years ago Schenk (1908) and Rössler (1910) wrote interesting papers on this heronry, in which nine species nested together (six of the heron tribe with Glossy Ibises, Spoonbills and Pygmy Cormorants). The size of this colony was estimated at 12,810 breeding pairs in 1869, 15,000 pairs in 1883, 6,500 pairs in 1902 and 8,000 pairs in 1908. This enormous concentration of herons was only possible because of the presence of vast feeding grounds in the Bara itself, in the "Kupinski Kut", in the "Zivacka bara" and in other marshes in former Serbia. The corresponding figures for the Spoonbills alone, which nested mostly in the reedbeds alongside the heronry, were 300 pairs in 1838, 350 in 1869, 500 in 1902 and 1,000 in 1908 (see Rössler, 1910, p. 229). More recently Steinmetz (1931) investigated this colony; his copious notes show an alarming decrease: he estimated the population in 1930 at 2890 breeding pairs (eight species) and the number of Spoonbills at about 60 pairs. This decrease was chiefly due to the shrinking of the former feeding grounds of which the Bara itself and the "Kupinski Kut" fell off. The reports of Géroudet (1958) and J. F. & M. Terrasse (1961), who visited the "Obedska bara" in 1957 and 1959 respectively, give only few details and no figures. One gain is that the "Obedska bara" itself is now strictly preserved.

There is no recent information concerning (7) the marshes of the Mačva and in the bend of the Danube, but Lintia (1916) recorded that the Spoonbill bred there only occasionally. Nothing new is known of (8), a breeding place in the neighbourhood of Niš; the latter place was mentioned by Stresemann (1920), who examined three birds which were collected there in 1918.

I want to mention here two more breeding places about which sure data from recent years are lacking, i.e.:

(9) the surroundings of Perlasz (Torontál) in the Banat area. Vasvari (1942) mentioned the municipality Ozora in the floodplain of the river Temes (1,200 hectares). Here he visited a wood with a mixed heronry on 26th June 1939 and learned that about 20 breeding pairs of Spoonbills were nesting in reedbeds nearby. Géroudet (1958) reported on the Carska bara and the Perlezka bara (= Feher-tó, south of Nagybecskerek) along the river Bega where he saw about 50 Spoonbills on 20th April 1957, but the birds were not nesting.

(10) Lake Katlanovo near Skopje (= Üsküb). Makatsch (1950) mentioned that in former years there was a colony of 30 to 40 pairs at Lake Ajvatovac, but as this lake had been drained the only suitable habitat for Spoonbills in this region would be Lake Katlanovo.

(11) Lake Scutari, belonging partly to Yugoslavia and partly to Albania, is a big lake. It is 40 km long, 10 to 15 km wide and only a few metres deep. The most important parts of marshland are on Yugoslavian territory (see map in L'Oiseau et R.F.O., vol. 31, p. 118). Von Fuehrer (1934) collected a male Spoonbill here in April 1932 and Makatsch (1950) mentioned this lake as a breeding resort of the species. J. F. & M. Terrasse (1961) visited the north-western corner of the lake (between Vir-Pazar and Plavnica, the "fjord" of Rijeka included) in 1959; they noted four species of herons and many Glossy Ibises, but failed to see Spoonbills.

(12) The marshes on the river Crna Reka (= Kara Su), east of Bitolj (= Monastir). Makatsch (1950) accompanied by Anta Ilić, a local ornithologist, visited these marshes in 1938 and 1939. He wrote that there were two colonies in 1938; the one they visited consisted of about 80 nests. In 1939 there were four colonies with a total population of 200 pairs. Twenty years later, when J. F. & M. Terrasse visited this region, there were still many herons and they spotted Spoonbills too, but, sad to say, bulldozers were everywhere in full action and the whole area, covering some 12,000 to 14,000 hectares, was being destroyed!

Bulgaria. — Although Niethammer (1938) wrote that the Spoonbill bred "in den Donauniederungen Bulgariens", a statement that was apparently copied by Makatsch (1950), neither of them indicated definite breeding places. Mountfort with some companions travelled through Bulgaria in 1960, visited several suitable localities for marsh birds, including Lake Sreburna and the lakes along the Black Sea coast; at the latter lakes they came across a small number of non-breeding Spoonbills (all those examined were immature). So, contrary to Pateff (1950), who said that this species still bred on the Danube, Mountfort & Ferguson-Lees (1961) doubted whether it still does so, though they agreed that there are a few very small colonies on the Rumanian side of the river.

Rumania. — (13) For that reason the last-named colonies are marked on the map (fig. 4) as no. 13 (between Popino and Silistra, but on Rumanian territory).

(14) The Danube delta (Balta). Bernatzik, who explored the Balta in 1929 found there a few small Spoonbill colonies (one comprising just over 10 pairs). Munteanu (1960) got a similar impression of the status of this bird: "Aujourd'hui on ne la trouve plus que dans les marais et le Delta du

Danube, dans un petit nombre de colonies formées seulement de 4 à 8 nids". From the report of Ferguson-Lees & Cramp (1962), who visited the delta for 17 days in May 1961 (in company of Mr. Gheorghe Andone, who has been in charge of scientific and conservation studies in the delta for the past eight years), we get a somewhat different and more favourable impression. They mentioned that Spoonbills were seen in small numbers in most areas; in the big heronry of about 10,000 pairs they visited, the Spoonbills (estimated at 100 pairs) were by far the least numerous, compared with 4,000 to 5,000 Glossy Ibises, 2,500 Night Herons, 2,000 Squacco Herons, 500 to 600 Little Egrets and 1,000 Pygmy Cormorants. There are about twenty mixed heronries in the Delta, though mostly smaller than the one just mentioned.

Greece. — In Greece the Spoonbill is only known as a bird of passage.

Though it was my intention to restrict this enumeration to the colonies of Hungary and the Balkans, I cannot refrain from mentioning here two more papers dealing with this subject, i.e.:

(a) Dementiev & Gladkov's "Systema Avium Rossicarum" (1960), which gives a detailed account of the distribution of the Spoonbill in the U.S.S.R., recording even the long-distance recovery of a nestling ringed in the Volga delta [6]) and shot near Bombay.

(b) Schüz's (1957) paper on the big heronry at Lake Manyas (Turkey), about 15 km south of the Sea of Marmara (no. 15). In this mixed heronry the Spoonbill is the most numerous species with circa 500 pairs, all nesting on huge willows. In 1955 and later years several young Spoonbills have been ringed here, giving very interesting results [7]).

I may add here one single breeding attempt from north-western Africa: a Spoonbill has nested on Lake Fetzara, in the north-eastern corner of Algeria; according to Heim de Balsac & Mayaud (1962), Zedlitz would have mentioned an egg (from an incomplete clutch) obtained here on 9th May by the collector Spatz. This is the only indication for the breeding of the species in north-western Africa.

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6) The Astrakhan Sanctuary (which was established in 1919) houses a pretty large Spoonbill colony; at the end of the breeding season 1938 or 1939 some 710 Spoonbills were counted here. There is a research station attached to this sanctuary (Harber, 1955; Kurockin, 1963).

7) From eight ringed nestlings recovered abroad in their first year two were recorded in Israël, one in Egypt, one in the Sudan, three at the mouth of the Euphrates near Basra and one in the coastal mangroves near Karachi, Pakistan. So the records show that some of these birds travel on a south-eastern route.

IV. Is there any contact between the populations of western and eastern Europe?

Thijsse (1906) wrote a brilliant chapter on the history and the behaviour of the Spoonbill and he also gave a lively description of a visit to their breeding colony in the Naardermeer (Thijsse, 1912). But he was indulging in phantasy when he imagined that our Spoonbills had their winter quarters in the Nile delta and that they connected Amsterdam with Alexandria even more than our White Storks do. At the time Thijsse's writings appeared the bird-marking experiments had not yet been started, so that he can not be blamed for this statement. However, Thijsse was such an authority that his incorrect idea was adopted by later biologists writing on the flora and fauna of the Naardermeer (cf. Van Zinderen Bakker's monograph, 1942, p. 124) and even this year (1963) one of our newspapers mentioned the Nile delta as the winter quarter of our Spoonbills.

In 1935 Tekke gave a review of the ring finds (21 in all) of the Dutch Spoonbills, showing that these birds fly in a south-western direction on their autumn migration, following the coasts of the Channel and the Atlantic as far south as north-western Africa and that there is no distinct indication of a migration route in a south-eastern direction as used by many of the White Storks inhabiting the Netherlands (Haverschmidt, 1949). The only recoveries from localities over 100 km inland are from France; one refers to a 3 or 4-year old bird in June at Lavannes, Dépt. Marne (49° 16′ N 4° 4′ E), the other to one taken in the beginning of August in St. Puy, Dépt. Gers (43° 53′ N 0° 28′ E).

More spectacular, though with several gaps, is the picture of the migration routes of the Spoonbill populations of western and eastern Europe as presented by Schüz & Weigold (1931, map 21), because this picture shows clearly that both populations migrate separately and that they probably have separate winter quarters too. But at the time the research for the abovementioned map was closed (30th June 1930) the winter quarters of the Netherlands Spoonbill population were not yet known, records of ringed birds from the months November to February being still lacking, except for one record of no importance.

More Spoonbills have been ringed in the thirty-three years which have since passed, so I looked through the ringing reports that have been issued up to the present in order to trace in what respect the picture has been changed.

The marking of Spoonbills in the Netherlands has never been practised regularly, but only occasionally in the breeding colony of the Zwanenwater.

In the Naardermeer and the Muy (Texel), which were declared official nature reserves nearly 60 years ago, ringing was not allowed for the safety of the birds as it might cause too much disturbance on the almost inaccessible breeding places. In Hungary (Kisbalaton), however, ringing was done more systematically and the same applies to Austria (Neusiedler See). The following statement of the numbers of nestlings marked in these three countries may give an idea of the situation.

TABLE I

Ringing-place	Years	Numbers ringed	Numbers recovered	Rate of recovery	Remarks
		The Netherlands			
Naardermeer	1909—1910	16	3	19%	marked with rings from Rossitten
Zwanenwater	1912—1941	243	33	13.5%	
„	1955—1962	156	15	10%	
		Hungary			
Obedska bara	1908—1912	48	2	4%	
Kisbalaton	1913—1951	1384	52	3.7%	the Kisbalaton figures include some birds ringed at Dinnyés (Lake Velence)
		Austria			
Neusiedler See	1946—1959	506	17 + x		marked with rings from Radolfzell

The figures in table I are based on the ringing reports from Hungary and the Netherlands (see "References" under R); the ringing results of Austria (on the Neusiedler See, with rings from Radolfzell) have not been published, but Dr. Rudolf Kuhk kindly sent me the records of the nestlings that were marked at this lake and recovered abroad. If we ignore five recoveries from Hungary and Yugoslavia there are twelve left; from this dozen eight birds were reported on the south-western migration route and four on the south-eastern. Specified, of the eight birds on the former route two were found in Calabria, three in Sicily, two in Tunisia and one in the Sahara (ESE of Ouargla, about 29° N 6° 30′ E); of the four birds on the south-eastern route three were found in Greece (Epirus, Arta, and the mouth of the river Vardar), and one in Egypt (El Fajum).

On the accompanying map (fig. 6) 46 records from the Netherlands (only birds from abroad), 50 records from Hungary (only birds found over 250 km from the ringing place) and two records from Austria have been marked. This means that since the preparation of Schüz & Weigold's "Atlas" (1931: map 21; one long-distance find on the island Corvo, Azores

is shown on map 38), the number of recoveries has nearly been quadrupled; among these recoveries the records from Africa rose from one in 1930 to twenty-four in 1963. So it is self-evident that our knowledge of the migration routes and winter quarters of both Spoonbill populations has increased a good deal.

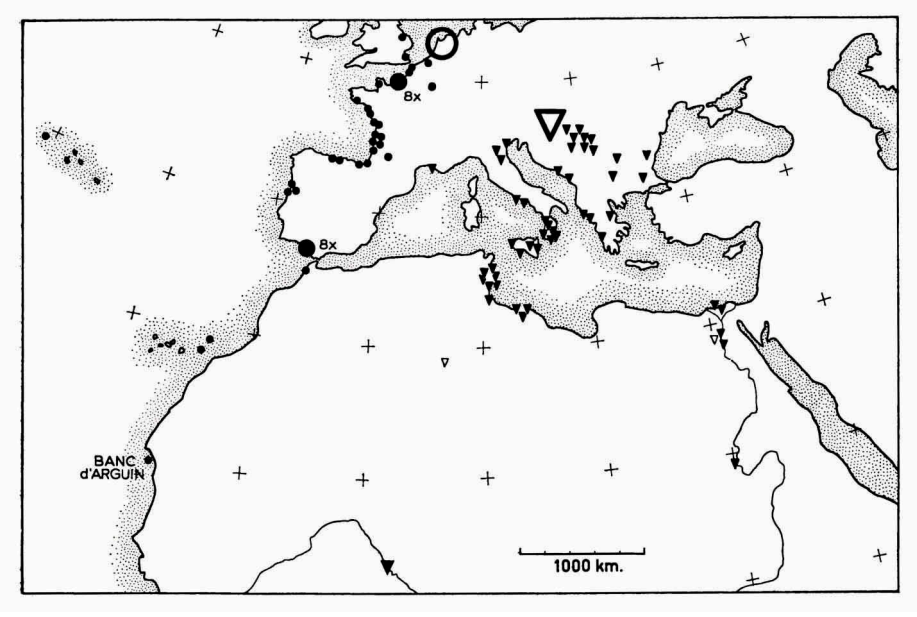

Fig. 6. Recoveries of Spoonbills ringed in the Netherlands (black dots), in Hungary (black triangles), and in Austria (white triangles).

In the meantime our opinion of 1935 about the migration route of the Netherlands Spoonbill population has not changed. This migration route appears as a narrow flight line along the Atlantic coast provided with a number of attractive stages at the estuaries of the various rivers: Somme, Seine, Loire, Gironde, Vouga, Guadalquivir or at tidal flats and marshes near the coast. Not a single record indicates a détour to the Camargue or the lagoons along the Golfe du Lion, although the distance between Arcachon and Béziers is less than 400 km.

Apart from two ringfinds on the Canary Islands in 1931 two more records became known from the coast of the African continent which add considerably to our understanding of the course of the migration route beyond the Straits of Gibraltar. These two records refer to a 5-year old bird shot at Mulei-bu-Selham (Merdja-es-Serga) on the Moroccan coast (over 100 km

north of Rabat) and to a 1-year old bird found in June in a shrivelled state on the Ile Arel, Banc d'Arguin, off the coast of Mauritania, at latitude 19° 50′ north. This is the southernmost record of a bird of the Netherlands population.

More complicated are the migration routes of the Hungarian population: the greater proportion of these birds seems to follow a south-western course and the rest a south-eastern one. Schenk (1922) provided these migration routes with Latin names and he distinguished inter alia a via adriatica-orientalis, tarentica, siciliensis, tunesica-algerica, which crosses the Straits of Otranto near Corfu and seems to be a favourite route for the Kisbalaton Spoonbills to reach their winter quarters along the Tunisian coasts.

Judging from these records I should say that, apart from the Hungarian bird that was found in the Camargue on 19th October [8]), there seems to be a strip of no man's land on the European side of the Mediterranean between longitude 4° W and 8° E and that there is no contact between the Hungarian Spoonbills and those of the Netherlands on their regular migration routes.

But it is not sufficient to rely on ringing records only, so I may state that only solitary vagrants have been observed in most parts of Europe, in Germany chiefly in the north-western part, but also in southern Germany, where on 7th May 1933 by way of exception a group of 18 birds visited the Ismaninger barrage-lake, proceeding the same day. In Switzerland too the species is only exceptionally seen, for example on the lakes of the flat country between the Jura and the Alps (Haller, 1951).

Of extraordinary importance is what Heim de Balsac & Mayaud (1962) have written on the migration of the Spoonbill in north-western Africa; therefore I want to quote them here more or less in full:

"Des Spatules peuvent être vues à peu près toute l'année en Afrique du Nord: Loche spécifiait n'en avoir pas trouvé de nid, et Blanchet se demande si les sujets vus en été nichent. Parmi les sujets qui estivent figurent des immatures: sujet hongrois d'un an repris le 3 août près Tunis.

La migration post-nuptiale a lieu à partir de septembre: hongrois et yougoslave (6) repris à Kairouan, Sousse, Sfax, Gabès et Tripoli, 20 septembre à 20 octobre; hollandais dans le Nord du Rharb, 30 septembre; observations à l'embouchure de la Moulouya 20, 26 septembre, au lac de

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8) In October 1930, when the bird bearing the Hungarian ring was shot, two parties of Spoonbills were seen in the Rhône delta, one at Stes Maries and the other at Esquineau. This was the first observation of the species in the Camargue (Glegg, 1931, 1941 and 1943). Later on Mountfort (1936) saw three birds near Stes Maries on 18-19 May 1935. Very rarely vagrants have been found on Corsica, on the Balearic Islands and in the Ebro delta, cf. respectively Mayaud (1936), Munn (1934) and Bernis (1956).

Mehdia 21 août au 28 novembre (Brosset, Frété).

L'espèce hiverne en nombre appréciable, surtout sur le lac de Tunis et les lagunes de Tunisie (reprises d'autrichiens (2) et hongrois (5) en Tunisie et Libye de décembre à février); mais aussi en Algérie et au Maroc jusqu'au Sous (18 octobre, Meinertzhagen) et même au Banc d'Arguin (un hollandais retrouvé là et 3 sujets bagués aperçus par Roux).

Au printemps ces hivernants partent (nombreux à Larache [9]) en avril, Irby), laissant quelques estivants çà et là (Sous, 29 mai, Lynes; lac de Tunis, Blanchet).

Si l'espèce descend jusqu'au Sud de la Tunisie et au Banc d'Arguin, elle ne paraît guère traverser le Sahara: tout au plus un sujet a-t-il été vu près Sebha (Fezzan) le 5 octobre (Snow et Manning) et un autrichien repris dans le Grand Erg Oriental à 320 km au Sud d'Hassi-Messaoud, le 15 octobre. Par ailleurs l'espèce hiverne de l'Egypte au Soudan qu'elle atteint en remontant le Nil: hongrois repris en Egypte et au Soudan, et près de Niamey (février)".

I think from this long quotation one point is of major importance for us, i.e. the ring-find of that one-year old bird on the Ile Arel (Banc d'Arguin) in combination with Roux's observations of three ringed Spoonbills in the same area. This probably means the solution of the mystery of the location of the Dutch Spoonbill's winter quarters. But let us first see what the recent explorations of the Banc d'Arguin have brought to light.

V. Discovery of a population of Platalea leucorodia, breeding on some islands off Africa's west coast

Until recently ornithologists were of the general opinion that the breeding places of the Western Spoonbill population were confined to the Netherlands and Southern Spain, as indicated by Voous (1960, map 32) [10].

In 1959, however, l'Abbé René de Naurois (1959) made a remarkable discovery during his three short ornithological visits to the islands of the Banc d'Arguin, off the coast of Mauritania, at about latitude 20° N.

This archipelago with its shallow waters, tidal mudflats, salt lagoons and almost inaccessible islands was still a terra incognita from the ornithological point of view. It proved to be the home of some tens of thousands of seabirds belonging to 15 different species: Pelicans, Flamingoes, Cormorants (2 species), Herons (2 species), Spoonbills, Gulls (2 species) and Terns (6 species)!

9) This is El-Araïsch on the coast 120 km South of Tanger.

10) In the English and German editions, however, the Banc d'Arguin is indicated by a red point at latitude 20° N.

Between the beginning of March and the middle of June Naurois visited practically all the islands, mapped the various breeding colonies and made ecological and biological observations.

For convenience Naurois distinguished three groups of islands, viz. from north to south:

(a) a northern group of three islands in the Baie d'Arguin, named Ile Marguérite, Ile de l'Ardent and Ile d'Arguin with 3 or 4 accessory islets without names (latitude about 20° 35′ N), together with the "Ile des Pélicans" in the Baie du Lévrier (latitude 20° 47′ N).

(b) a middle group of three small islands: Ile Kiaone-Ouest, Ile Kiaone-Est and Ile Chickchitt (latitude 20° N).

(c) a southern group around the large Ile Tidra (latitude about 19° 45′ N), composed of some 7 to 10 islands, viz. two larger ones (Ile Tidra and Ile Kiji) and eight smaller ones (Ile Arel, Ile Nairr, Ile Zira, Ile Touffat, Ile Cheddid and 3 nameless ones).

The size and the character of these islands vary a great deal. With the exception of the Ile Tidra (which is nearly 30 km long) the islands are not longer than 8 km, several of them being only a few hundred metres in diameter. Some islands are rocky, rising to some 10 or 15 m above sea level (the Kiaones, Chickchitt and Arel), others possess a sandy soil and are rather flat with a scanty vegetation of halophytes (Nairr, Zira, Touffat and Cheddid).

Inaccessibility from the mainland plays an important role in the welfare of the birds, as the presence of jackals and even hyenas is incompatible with the breeding of seabirds; this is in fact the reason for the absence of bird colonies of any size on the islands Chickchitt, Nairr, Kiji and Tidra, which are separated from the mainland by narrow and shallow channels only.

Furthermore Naurois observed that there were many more birds on the islands of the middle and southern groups than on those of the northern group, which might be due either to a richer marine life in the more southern waters or to a less suitable breeding habitat on the northern islands. He estimated the population of the breeding birds of the whole archipelago (Flamingoes not included) at some 20,000 to 30,000 birds, viz.

1,000 to 2,000 birds in the northern group,
5,000 to 8,000 birds in the middle group and
15,000 to 20,000 birds in the southern group.

Not all the bird species breed in the same season; two of them (*Pelecanus onocrotalus* L. and *Phalacrocorax carbo lucidus* (Lichtenstein)) have their breeding season in the autumn and winter; the other thirteen species breed in spring and summer.

Among these breeding birds — the Flamingo again excluded as its breeding in the area is too irregular — the Royal Tern (*Sterna maxima albididorsalis* Hartert) ranks first together with the African Cormorant (*Phalacrocorax africanus* (J. F. Gmelin)) and the Spoonbill (*Platalea leucorodia*). As regards the latter Naurois ascertained that it was breeding on six of the islands and he estimated the number of breeding pairs at: 80 to 120 on Ile Marguérite, 30 on Ile de l'Ardent, 100 to 130 on Ile Kiaone-Ouest, 800 to 1,400 on Zira, 1,000 to 2,000 on Ile Touffat and a fairly large but unknown number on Cheddid, where the situation was not quite clear. Naurois does not give figures for the total number of breeding Spoonbills, but Dragesco (1961c) states that this number amounts to 2,000 pairs. Elsewhere lower figures are given, fluctuating between 1,250 to 1,850 pairs (Heim de Balsac & Mayaud, 1962, p. 70).

Dragesco (1961a) pointed out that the bird colonies of this archipelago are not of a recent date, they were already there in the 16th century as indicated in an old narrative.

Naurois' discovery brought to light two important facts, viz.:

(a) that until now we have never realized that the Spoonbills living in western Europe (Netherlands and Spain) represent only a part of the total population living on the Atlantic coasts of Europe and north-western Africa.

(b) that the breeding area of the southern representatives is also used as winter quarters by their northern relatives. So that there is a regular contact between our Spoonbills and those of the Banc d'Arguin.

This annual contact is bound to have something to do with the fluctuations observed in the occupation of the Netherlands Spoonbill colonies.

Finally I should like to point out that from the geographical distribution angle these colonies (longitude 16° W) form a remarkable counterpart of the Spoonbill colonies on the Dahlak Islands in the Red Sea (longitude 40° E, latitude 15° to 16° N). The latter colonies were visited by Von Heuglin in 1857, over a century ago; in 1928 Neumann described this Spoonbill as *Platalea leucorodia archeri*; it is slightly smaller than the nominate race. This form also inhabits Fatmah Island off Assab and Saad e' Din Island off Zeila on the Somali coast, where there is a large breeding colony (Archer & Godman, 1937).

VI. Persecution by mankind, destruction of habitats and attempts at preservation

The Spoonbill is a harmless bird that does not interfere with vital human interests. Nevertheless there are two main threats to its survival. These are

the persecution by mankind and the gradual destruction of its breeding habitat and favourite feeding grounds.

The Spoonbill has always represented a certain economic value and so its persecution by man was almost universal. But on the other hand this remarkable bird has always aroused the interest of ornithologists by its peculiar appearance and habits and by its aesthetic performances in flight when it takes wing or alights on the breeding place.

Persecution by mankind

A few details from western European countries about the persecution of the Spoonbill may give an idea of the improving position of this bird.

The Netherlands. — In this country the character of the persecution has changed considerably in the course of three to four centuries.

In the 17th century this bird was reckoned among the "noble game birds", which might only be captured by the hawks of privileged nobility. On the other hand in the famous heronry in the Zevenhuizensche Bosch the young Spoonbills (together with young Cormorants, Grey and Night Herons) were shaken from their nests before they could fly (by using long poles with iron hooks). This was done three times during the breeding season, the young birds being sold in the neighbouring towns. It seems that the young Spoonbills were considered to be prime eating, for they were even shipped to England for the table of King James; the young Cormorants, however, did not appeal to the English consumers (Brouwer, 1954, p. 158).

In the 19th century tastes had changed and instead of the young birds the eggs of the Spoonbill had come into demand. So the tenant-farmers of the marshes made it their job to collect the eggs and this they did so thoroughly (twice a week during May and June), that they nearly killed the goose that laid the golden eggs [11]). Apparently some of these eggs found their way to egg-collectors (cf. Wolley & Newton, 1905-1907, p. 486). Additionally some young birds were caught for the aviaries of amateur aviculturists.

But ever since the Bird Law of 1912, providing complete protection for the Spoonbill, has been properly enforced, persecution has almost completely stopped: the shooting of a Spoonbill is an exception nowadays.

Great Britain. — The British people too have become more protection-

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11) Van Bemmelen (1866) mentioned that in 1851 the Horstermeer colony was estimated at a thousand breeding pairs. This is perhaps an exaggeration, but as in that same year 1,600 Spoonbill eggs were collected in one week in the middle of the breeding season (the eggs being taken every Wednesday and Saturday) a total of 650-750 breeding pairs seems not to be exaggerated.

minded since the last century; the three following pronouncements may prove this.

Sir Thomas Browne (circa 1662) stated: "The Platea or Shovelard, which... formerly built in the Hernery at Claxton and Reedham; now at Trimley in Suffolk. They come in March, and are shot by fowlers, not for their meat, but their handsomeness" (quoted from Yarrell, 1884-1885, p. 238).

Gould (1868) gave a vivid description of the killing on 23rd Oct. 1865 of two Spoonbills, male and female of the year, at Kingsbury Reservoir, Middlesex, by two fowlers and he characterizes the hospitality offered to this bird by his fellow-countrymen as follows: "Once landed, persecution awaits them; every gunner is their enemy, and they are not allowed to rest until the fatal shot terminates their wandering".

Sixty years later Rivière (1930) could make a quite different statement: "Although it is probably close on three hundred years since Spoonbills nested in the county [= Norfolk], their regular presence here each summer, and the immunity from disturbance which they now enjoy, encourages one to hope that one day a pair may again breed, perhaps in the Reedham Heronry as of yore, and that a Norfolk breeding race of these grand birds may be re-established as in the case of the Bittern".

Spain. — The rather low standard of living in rural Spain may have influenced the way in which the inhabitants took every possible profit from their wild life. In this respect the situation in the marismas of the Guadalquivir is vividly described by Abel Chapman (1928), the hunter-naturalist, who passed some forty seasons wildfowling (from 1872 onwards) in this bird-paradise. His statements are not optimistic, but as the situation seems to be turning out better now, I cannot refrain from quoting him:

"On winter evenings in Doñana, we were wont... to hold discussions with our keen-eyed forest-guards — not only on cynegetic schemes and problems, but also on the ways and life-habits of their wild charges, furred and feathered. Many of these valued friends of ours were thoroughly trustworthy witnesses of the wild-life amidst which their years were spent, and true lessons in natural history these palavers often formed...

Up to about twenty years ago [this was written in 1907] flamingoes nested — or attempted to nest — in these marismas every spring, whenever a sufficiency of water warranted their doing so. Yet it is grievous to record that, in our belief, never a single young flamingo has been fledged in all this region! Our veteran keepers — men versed in wildfowl lore — have never known of such an event. Neither Vasquez nor Vergara, on the marismas of Doñana, have ever seen so much as a single young flamingo actually

hatched-out: while Clarita, keeper of the vaster marismas of Las Nuevas outside, though he has seen many young in the nests, asserts positively that, during his fifty-odd years' experience, none have been reared and fledged.

It is a melancholy record: yet the reason is not far to seek. Thus, one spring in the early nineties, from a single *"pajaréra"* [12]) the egg-poachers carried off thirty *arrobas* (750 lb.) of flamingoes' eggs — some being still left behind as the canoes could carry no more! It is the enormous quantities that can thus be gathered at a single spot that induce the professional *"hueveros"* (egg-lifters) of San Lucar ... to ravage the marismas far and wide.

No chance and no quarter is given to beast or bird — fresh eggs or hard-set, it makes no difference! There are those, we were told, who prefer eggs *"empollados"* to *"claros"!* The smaller eggs, such as coots, stilts, terns, red-shanks, etc., sell at a halfpenny: those of gulls, avocets, and the like at a trifle more, while spoonbills command a penny. Flamingoes, of course, represent the *premio gordo,* not only because they are so big, but because, once a colony is discovered, it provides a boat-load for the gathering. These eggs are said to be the worst eating; but then, in hungry Spain, "two will make a dinner for a family"!

Our efforts as "missionaries" among these wild men of the wilderness have proved quite useless. I am not quite sure that we have even driven home a proper sense of shame in the minds of our own keepers! For on one occasion when a company of spoonbills, seventy pairs strong, had settled down to nest at the Algaidilla, close by the shores of Doñana, dear old Vasquez helped himself to every egg, and no spoonbill has ever appeared there since. Yet Vasquez feels no shame! ...

As for the rest, every herdsman in spring carries a *canastro* (basket) at his saddle-bow, to gather every egg he can set eyes on. What chance have the birds?".

Furthermore, egg-collectors and their dealers had their share in the persecution of our bird. I may quote here a few notes to illustrate this assertion. From the "Ootheca Wolleyana", for example, we know that John Wolley's collection contained 77 Spoonbill's eggs, most of them carefully selected from the several hundreds Dr. Frere had in stock. These eggs were bought in Leadenhall Market in the years 1845-1851 and all came from the Netherlands. One typical case: an egg, that was obtained in 1844 from Mr. M., who said he had them from Yarmouth and that they bred there; of course a great lie! Irby (1895) mentions that Spoonbills nested in the marisma in

12) breeding place.

some wet seasons, and also in the Soto Toréro, near Vejer, where sad to relate, a Spaniard in 1873 took upwards of seventy eggs early in May. He took most of these eggs to Gibraltar, to some collectors who were there at that time.

The modern way in egg-collecting (taking complete clutches) was practised by Alexander Koenig (1932), who kept within bounds, and by Makatsch and Ilić, who collected rather thoroughly in Macedonia in 1938-1939; they took together 160 eggs in the Crna Reka marshes for their oological studies; after this acquisition the former's private collection numbered 54 clutches (= 191 eggs).

Finally, inexperienced bird photographers have occasionally disturbed small Spoonbill colonies as is described by Bernatzik (1929).

Destruction of habitats and attempts at preservation

The indirect persecution in the shape of the gradual destruction of its breeding habitat and favourite feeding grounds is equally serious.

It is nearly superfluous to mention here once more the numerous drainage and reclamation schemes which have been realized in the Netherlands or the disastrous result (for the marsh birds) of the regularizations of the rivers Danube, Tisza, Temes etc. in historic Hungary, on which Schenk (1918) wrote such an interesting report. In the past fifteen years reclamation and other deteriorating activities have also been carried out in the estuaries of the Guadalquivir and the Rhône, in the Balkans (Crna Reka!), in North-West Africa (mouth of Wadi Moulouya, Lac Fetzara) and in a good many other places, with the result that the total area of marshes and other wetlands has decreased to such an extent that last year three international organizations for the conservation of nature and the preservation of birds thought it necessary to sound the alarm. These organizations were: the International Union for the Conservation of Nature and its natural Resources (I.U.C.N.), the International Council for the Preservation of Birds (C.I.P.O.) and the International Wildfowl Research Bureau (I.W.R.B.). They jointly organized a special conference, "Projet MAR", at Saintes-Maries-de-la-Mer (Camargue, France), where from 12 to 17 November 1962 over 80 experts from 16 different countries, among them Australia (1), Canada (1), Yugoslavia (2), Morocco (1), Spain (6) and U.S.A. (6), were present to discuss the more than 50 papers sent to the participants beforehand. Some nine recommendations and an urgency-list of European and North African marshes and wetlands that should be secured, were the results.

In the meantime a "World Wildlife Fund" was founded, destined to finance the safeguarding of the last remnants of flora and fauna and their

habitats which are threatened by the "uncontrolled population explosion" of mankind at present. This World Wildlife Fund is supported by the so-called "national appeals", national foundations which have already been formed in Great Britain (autumn 1961), U.S.A. (June 1962) and also in Germany, the Netherlands and Switzerland. The fund acts in close co-operation with the I.U.C.N. and for the future of the West European Spoonbills it is encouraging to learn that both bodies have already obtained important promises concerning vast areas of the marismas in the Guadalquivir estuary (cf. The Wildfowl Trust, 14th Annual Report, 1963, p. 29).

SUMMARY

A description of the Netherlands Spoonbill colonies is given, from which it is clear that on the whole they are thriving. From observations made it is unlikely that the species is double-brooded. Co-existence with Cormorants is possible provided the latter do not become too dominating. An enumeration based on literature of the colonies in Austria, Hungary and the Balkans is added for comparison.

Although a relatively small number of ringing records have been obtained our knowledge of the migration routes has increased a great deal; this holds good for the population of the Netherlands as well as for those of Austria and Hungary. There is no contact between the two populations.

The discovery in 1959 of a large breeding population of *Platalea leucorodia leucorodia* off the coast of Mauritania (latitude about 20° N) was a great surprise. This population more or less forms the counterpart of the Spoonbills (*Platalea leucorodia archeri*) living on the Dahlak Islands in the Red Sea and on the Somali coast (latitudes 16° to 11° N). But the surprise was twofold as the area discovered (Banc d'Arguin) proved to be at the same time the winter quarters of the Netherlands Spoonbills (one ringed bird found and three others with unidentified rings seen).

The greater proportion of the Spoonbills from south-eastern Europe migrate via Calabria and Sicily to Tunisia; the rest fly via Greece to Egypt, where they follow the Nile upstream. About 50% of the birds from Manyas lake (Turkey) migrate in a south-eastern direction to the Euphrates/Tigris delta.

Some remarks are made on the persecution of this bird by mankind in former centuries and on the fact that persecution is gradually changing into preservation; the Latin countries are bringing up the rear.

Biologists are concerned about the disappearance of marshes and wetlands owing to the pressure of the growing human population. To study this problem a special conference (Projet MAR) was organized by I.U.C.N.,

C.I.P.O. and I.W.R.B. in southern France (Nov. 1962). I.U.C.N. in co-operation with the World Wildlife Fund is engaged in securing parts of the marismas in south-western Spain.

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EXPLANATION OF THE PLATES

Plate XXVI

The mixed colony of Grey Herons and Spoonbills in the Muy, Texel, seen from the South-West; the visitors' lookout in the background. Photo G. K. C. van Tienhoven, about 1948.

Plate XXVII

Naardermeer, breeding site no. 6, 17th June 1954. This aerial photo shows two parts of the Spoonbill colony, a third part at the right side is not visible. In the foreground of the original photo (the reproduced ones

being mostly cut off) nearly sixty Spoonbills nests can be seen, but one should not confuse them with the many tussocks of *Carex paniculata*! Here a good many adult birds are seen, with their young still in the nests; a group of nearly fledged young can be distinguished at the left side over the ditch. The disturbance is visible: some 160 Spoonbills (probably mainly adult birds) have taken wing, nearly 130 (adults and young) are still on the ground besides about 60 small young ones; so about 350 Spoonbills are in the picture. The long-drawn pool over the ditch is chiefly a meeting-place for Cormorants (many immatures stay at the colony), although there are some nests on the ground. Photo Aero-carto Holland.