

THE PELICAN IN SOUTH AUSTRALIA

With special reference to the Coorong Islands

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INTRODUCTION

During the last eighteen months there has been considerable interest in the status of the Australian Pelican (*Pelecanus conspicillatus*)—sometimes called the Spectacled Pelican—in South Australia.

This interest has been directed towards ensuring that the species shall continue to be a regular breeding form within the boundaries of the State. As a result of recent representations, the islands in the Coorong, one of its main breeding places, have been declared a prohibited area and the birds have been made a fully protected species—a status the species has enjoyed for some time in all other Australian States.

Concern for the well-being of the species, especially during the breeding season, has existed for many years. Numerous references to this prevailing concern are to be found in the writings of many authors today, and the time is ripe to provide a review, or outline, of what is known of the history and status of the Pelican in South Australia.

OCCURRENCE AND DISTRIBUTION

The species is confined to the Australian region and can be observed on most larger

waters both adjacent to the coast and inland. It also visits New Guinea and has been recorded as a straggler to New Zealand.

Gould (1), in the year 1865, stated "It is abundant in all rivers and inlets of the sea both in Tasmania and on the continent of Australia. . . . In Australia it is common on the Hunter as well as in Spencer's and St. Vincent's Gulfs . . . and on all lakes of sufficient magnitude to afford it a supply of food. . . . So numerous is it on these inland waters that Captain Sturt states that the channel of a river from 70-80 yards broad was literally covered with Pelicans; and that they were in such numbers on the Darling as to be quite dazzling to the eye."

Its favourite haunts in South Australia are the shallow waters of the Murray river system and the Coorong. In good seasons they have been reported in large numbers on the flooded river systems of the north-east of the State. Stuart (2) reported seeing a "large flock" on Newcastle Water, just beyond the South Australian border, on May 23, 1861; and Howitt (3), later in the same year, mentions finding a Pelican at Lake

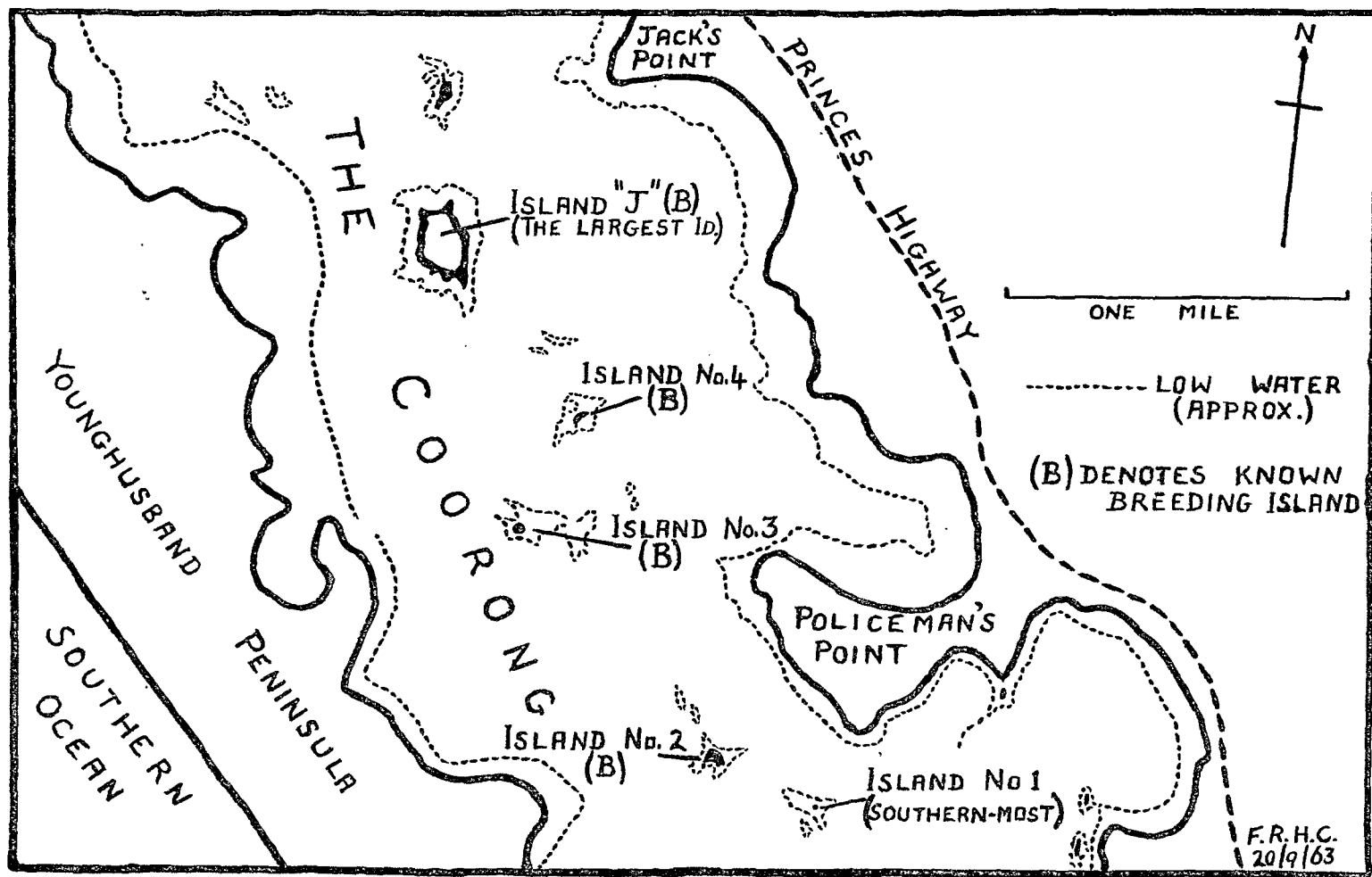


Fig. I.—The Pelican Islands, Coorong, South Australia.

Hope just choked by attempting to swallow a perch about a foot long, the tail of the fish protruding from its mouth. The party, of which Howitt was a member, saw large numbers of Pelicans and other waterbirds at Lake Hope at this time (September, 1861).

It would be difficult to estimate the true abundance of the species in South Australia at present. The large size of the birds draws attention to their presence and the bulk of the local population probably frequents waters adjacent to roadways and in districts where interested observers are most numerous. The Princes Highway, which extends south-easterly from Adelaide, fronts Lake Albert for several miles and follows the inner shoreline of the Coorong for perhaps 40 miles. Here, from the vicinity of Salt Creek, the so-called Pelican Islands may be seen in the Coorong. During the breeding season, congregations of the birds can be seen from the roadway. Again, flocks of Pelicans can be seen from the highway which passes through Blanchetown, on the River Murray, where the first of the river locks is situated. Pelicans gather at this place to catch food in the disturbed waters at the lock. Many reports of large numbers of Pelicans at the present time are probably exaggerated. Observers should always endeavour to make counts of birds seen.

It is the opinion of most ornithologists that Pelicans are fewer in numbers than when Sturt made his voyage down the River Murray in 1830, as quoted by Gould (1).

Of course, since that time great changes in the natural environment of the species have occurred. Some of these are as follow:

(a) with an average fall of two inches per mile over its lower and middle course, the River Murray originally formed large areas of shallows adjacent to its main channel. There has been extensive reclamation of these swamplands for various agricultural purposes;

(b) a deep channel has been maintained in the river by the installation of six locks along its middle and lower reaches;

(c) the series of barrages between the mainland and several islands close to the mouth of the river has transformed Lakes Alexandrina and Albert into areas of permanent and deep freshwater;

(d) extensive drainage of the Lower South-East has brought about a considerable reduction in the number and extent of

inland lakes and swamps in this district; it has also increased the salinity of the Coorong, which no longer receives its natural complement of fresh water from the adjacent mainland;

(e) the River Murray has been stocked with exotic fish, with probable harmful effects on the native fish populations; and

(f) there has been a steady, or perhaps increasing depredation of the Pelican by Man.

It seems certain that the total effect of these changes, perhaps in conjunction with others not generally recognised, has led to a decline in the number of pelicans in these parts. However, by safeguarding the birds at breeding time, it is hoped that recent downward trends will be halted.

A marked decline in the numbers of pelicans had been noted more than sixty years ago. Mellor (18) stated that in contrast with the vast hordes seen on the Coorong in the 1870's, twenty years later they were in small numbers only. Mellor, in his capacity as honorary secretary of the South Australian Ornithological Association, wrote to the Adelaide newspaper "*The Register*" in the year 1903. In his letter, he drew attention to moves afoot to remove the existing partial protection of the birds and the possible introduction of payments of a bounty for their heads. He went on to say "Some years ago, when these birds were numerous and nested on Kangaroo Island and elsewhere, they were placed on the unprotected list; but, owing to their becoming less in later years, they were removed to the partially protected list to save them being totally exterminated, as they are year by year getting fewer. . ." To date, this downward trend has not been arrested, in the opinion of many interested observers.

Little is known of westward movements of the pelicans, but it is probable that they are restricted to the coastal districts. In the east, movements might take place over a wide area, extending into eastern Australia.

The origin of the pelicans which visit the flooded areas in the North-East in favourable seasons is doubtful, but it is generally believed that they follow the rivers entering this State from Western Queensland. Any link between these birds and those of the south could well be an indirect one, and their appearance in large numbers might not affect the southern populations.

This year (1963) reports of great congregations on flooded Cooper's Creek in the north have coincided with the appearance of some of the largest flocks seen in the south on the Coorong for several years.

Obviously, there is a need for a better understanding of the movements and occurrence of the species, and an Australia-wide banding project to this end should be inaugurated. It is suggested that different coloured bands could be used for each breeding colony so that individuals could be readily spotted by interested observers.

BREEDING

Various species of pelicans throughout the world differ in their breeding requirements. Some are known to choose nesting sites in trees, at times at a considerable height from the ground. The Australian Pelican, however, has been recorded only as a ground nester. Its nest consists of a depression in the ground, which is usually lined with varying amounts of material such as sticks, herbage and the feathers and skeletal remains of dead members of its own and perhaps other species. Clutches vary from one to three eggs, two being the most usual. The eggs are chalky white when laid but often become soiled and stained. Serventy and Whittell (4) give an average size of 92.7 x 55.7 mm. for six eggs from Shark Bay, Western Australia.

Pelicans are known to breed on a number of islands around Australia as well as on certain inland lakes and waterways in each State. At the time of settlement in South Australia, the species nested regularly at two places in the south:

(a) an island in Pelican Lagoon, Kangaroo Island; (breeding ceased towards the end of the nineteenth century—there is an egg in the South Australian Museum collected in 1890; and

(b) Pelican Islands, situated in the Coorong, between Woods Well and Salt Creek. The species still breeds here.

In northern South Australia, adjacent to the Queensland and Northern Territory borders, pelicans breed in a number of places, following the flooding of vast areas of lowlands by the large river systems of the Diamantina and Cooper, which succeed in carrying flood waters the length of their courses from time to time, during wet periods.

One such area is Goyder's Lagoon, situated on the Diamantina River about 150 miles north-east of Lake Eyre. Here in July, 1930, Dr. A. M. Morgan (12) noted a colony of birds, with young pelicans just about to fly. L. R. Reese (15) also mentions breeding activity at the same place in August, 1933. Further reports (13) by the last-named refer to nesting on Lake Goolangirrie in April, 1931. Neither Morgan nor Reese give any indication of the actual numbers of birds seen.

Breeding has also been reported from the far South-West of New South Wales. G. L. Lansell (8) described a nesting colony seen at Moulamein in the southern Riverina. He observed 150 nests which contained either eggs or newly hatched young. Lansell stated that breeding followed "above average" rainfall in the district for the year 1939.

Dr. W. Macgillivray (7) gives an account of the conditions necessary for and the incidence of pelicans breeding along the River Darling and its tributaries. He describes the nesting colonies on Menindie and Cawndilla lakes during the floods of the year 1921, when he estimated the number of birds present to be between fifty and one hundred thousand at Cawndilla.

GOORONG AND ISLANDS

The Coorong is an arm or inlet of the sea, having its opening in Lake Alexandrina, not far from the mouth of the River Murray, and extending therefrom in a south-easterly direction for a distance of perhaps 90 miles. This vast stretch of saltwater, from one to three miles wide at different places, is separated from the sea by the Younghusband Peninsula. The Peninsula is composed of a series of sand dunes, up to 100 feet high, and is partly vegetated; in width it varies from about one half to two miles. Access to it can be gained from the south where it joins the mainland, north of Kingston. In the north the Peninsula meets the Murray mouth.

The Coorong "lake" which covers an area of probably more than 50 square miles, is generally shallower than it may appear and seldom exceeds a depth greater than 12 feet. Its bed consists of sand or mud. However, towards the mainland, there are extensive reefs and shelves of limestone, which become most evident at low water.

Among the numerous islands in the Coorong are the so-called Pelican Islands, six in number, and consisting mainly of residual limestone in the form of rocky spits, caps and escarpments.

The tops of the larger islands are partly covered with aeolian sands of varying depth and in places forming slopes that merge into well-washed sandy beaches.

The height of the islands above high water level varies from less than one foot for the southernmost island, to over 20 feet for the largest. Vegetation consists mainly of salt tolerant species of annuals and small perennials. The bigger islands support, in addition, some larger herbs, notably the introduced African Boxthorn (*Lycium ferocissimum*). Those parts of the islands used by the pelicans during the breeding season become partly denuded.

The extent of the islands varies considerably according to seasonal rise and fall of the water. When the Coorong is full, the southernmost of the Pelican Islands is reduced to a few square feet in area. Island No. 3, likewise, becomes much reduced in size by inundation of the broad sandy beaches which are visible at low water level. The majority of the islands are between one half and two acres; the largest is about 12 acres.

The average seasonal variation in water level is about four feet and sometimes as much as six feet. Daily tidal movements of the Coorong waters are not noticeable at least in this area.

BREEDING OF THE PELICANS

Various accounts and records of the breeding of the pelicans on the Coorong islands are contained in the Minutes of the South Australian Ornithological Association, "*The South Australian Ornithologist*" and "*The Emu*." Much of this information is based on single visits during any one breeding season, so that comparative data on seasonal fluctuations, changes in populations, number of broods, duration of breeding season in any one season, mortality and the effects of human incursions is for the most part not available. Consequently, in reconstructing the history of the birds on these islands it has not been possible to give more than an incomplete outline of events through the years.

It is not always possible to be certain of the island or islands to which respective

authors refer. Some have distinguished the islands by numbers, without explanation. Numbering may start from and include those islands beyond the "Pelican group"; in other cases the numbers are within the group. It is unfortunate that the islands have not been officially named. Indeed, available maps from the Department of Lands do not accurately define them.

Breeding on the Coorong seems to be confined to a period between June and March, although egg-laying varies considerably from season to season and also within any one season. It is of interest to note that in Western Australia egg-laying takes place in autumn (4).

Young birds "about the size of a domestic pigeon" were seen by Mr. R. F. Brown on August 4, 1963. This would suggest that eggs were first laid in late June, although the incubation period is not recorded.

J. Sutton (11) inspected the islands from October 11 to 17, 1929, and noted some 200 nests containing eggs and a nest with a newly hatched chick. Again, Sutton (14) reported eggs and half-grown young from 5 to 15 October, 1932.

W. B. Hitchcock (16) on January 19, 1937, observed eggs and young. Some of the latter were sufficiently advanced to seek safety by taking to the water and swimming.

The writer visited the islands on September 11, 1953, when there was no evidence of breeding. Very few pelicans were present in the area.

A feature of the variation in breeding times is that there appears to be a tendency for the birds to gather into groups, egg laying in each group being made simultaneously. There may be more than one such groups on any one of the larger islands.

A visit by the writer to Island No. 2 opposite Policeman's Point on October 8, 1950, where about three hundred nests were in use, showed two such distinct groups, both of similar size. The first group was situated on the level limestone cap of the island. Here most nests contained young, some well advanced, others contained eggs. The second group was situated on the gently sloping eastern side of the island just below and beyond the first group and between it and the shore. Here most nests contained eggs, though there were some recently hatched young and there were a number of

nests where it appeared laying was about to begin.

This observation corresponds with one made on the same island by Messrs. H. T. Condon and S. E. Terrill, fifteen years earlier on September 5, 1935 (17).

Hitchcock's (16) observations on January 19, 1937, indicate three main groups on the largest of the Pelican Islands. Again each was characterised by a different stage of development of the brood. However, unlike Island No. 2, here the most advanced group was near the shore-line and the two subsequent colonies progressively higher up on the island. Condon and Terrill (17) also noted that: "There were clear indications of three main nesting sites of Pelicans" on this island on September 5, 1935.

It is likely that the most suitable sites are used by those that come into breeding condition first and that later breeding birds are obliged to use progressively less favourable sites.

This variation in the time of breeding within a season raises the question as to whether Pelicans will attempt breeding a second time in a season following the destruction of their eggs and young. If so, does the stage of incubation at the time of destruction have any bearing on this?

If the answers were known perhaps we could better determine just how serious the raids of the past have been on Pelican numbers. These questions can be illustrated with a review of the 1962-63 breeding season:

August 26, 1962. Island No. 2 had about one hundred and thirty nests and two hundred eggs and Island three had twenty nine nests and fifty nine eggs.

September 23, 1962. All eggs had been stamped on or kicked from the nests.

December 23, 1962. Island No. 3 had more than fifty occupied nests in which many of the eggs had just hatched or were in the process of hatching. Island No. 2 had about two hundred nests with eggs.

January 13, 1963. About one hundred young were seen on Island No. 3. A few were large enough to take to the water. Island No. 2 was deserted. Some disaster, natural or otherwise, for a second time in the season, had caused breeding cessation.

It is not known whether the broods observed on December 23, 1962, were first or renewed attempts to breed, or some combi-

nation of the two. To date this can not be answered satisfactorily, because the frequency of breeding is not known. Possibly, there is not even an annual nesting by the species, which would assist in explaining the considerable variation in the numbers of birds seen during different years.

In the 1962-3 season, less than one quarter of the birds was present compared with the current season, when it has been estimated that about 3,500 individuals were seen by the writer, in company with Messrs. R. M. Gibbs and G. Clark, on September 9, 1963. How this number compares with earlier observations is uncertain. The last large influx of water into the Coorong occurred in the year 1956 and coincided with the flooding of the River Murray. Perhaps breeding in the south is triggered by high water and/or fresh water, as in the arid interior.

It is not known whether pelicans always return to the same place to breed, but this might well be so. Alternatively, they may favour other localities in some seasons.

INTERFERENCE

Pelicans, wherever they exist, have probably experienced some degree of hostility from Man. South Australia, in this regard, is no exception. Quite possibly, the enmity springs from the piratical habits of rogue birds at fish-nets. However, almost since the beginnings of European settlement in this State, the pelicans have experienced the outrages of vandals far in excess of the normal retribution which might be expected for their transgressions.

The periodic raids on the Coorong islands have had the effect of considerably reducing the number of young reared in a season. In some instances this may have been intended by the raiders.

The earliest recorded massacres are those of the 1870's, which are still spoken of. There may have been earlier ones but I have no evidence of this. The raids have continued right up to the present. The frequency of the attacks throughout this period can only be guessed at, but it is of interest to note that they have come to be referred to as "the annual raids." The occasional mention of successful breeding in early records may imply that raids did not occur in that season.

Condon (9) in 1939 states: "Many times during the last ten or twelve years the pe-

licans on the islands of the Coorong, South Australia, have been subjected to marauding parties, which have clubbed the young ones to death or trampled them down with heavy sea-boots. The culprits are difficult to apprehend; moreover informants are always unwilling to state their evidence openly."

The methods employed to prevent successful breeding include damaging eggs and dislodging them from their nests as well as slaughtering young birds.

On October 10, 1958, the writer together with Messrs. D. Kraehenbuehl, B. Glover, R. M. Gibbs, R. Schodde and R. Savage visited the Pelican Islands. On Island No. 2 what Mr. Kraehenbuehl had observed as an active colony a fortnight earlier was now deserted. More than one hundred nests which had contained eggs on the earlier visit now contained the broken shells. Each egg had a jagged hole in its side that could have been made by Ravens (*Corvus coronoides*) or Silver Gulls (*Larus novae-hollandiae*).

The damage could have been quickly and efficiently done by a person with a pointed stick. If this was the case the method would have the added advantage of being difficult to interpret.

Again the damage could have been caused by scavengers through human agency, as there was a well-made, and from evidence well-used duck-shooter's hide on the island. Shooters occupying the hide could have kept the pelicans away for the time necessary to invite scavengers to the scene in sufficient numbers to do the observed damage. The hide was dismantled by the visiting party.

Five islands to the north of Island No. 2 were also visited. None showed signs of recent breeding activities.

Condon and Terrill (17) in 1935 noted the much decomposed bodies of about four hundred and seventy pelicans. The evidence did not indicate as to whether the deaths were due to some natural disaster or due directly or indirectly to Man.

The early records and Minutes of the South Australian Ornithological Association show that the payment of a bounty on the scalps of several species, including Pelicans, occurred for a time. The following early Minutes throw some interesting light on this matter.

March 13, 1903. Captain S. A. White said that many people in the Lake Albert and Lake Alexandrina area were under the

impression that the Government was paying scalp money for pelicans.

May 1, 1903. A letter from the Commissioner of Crown Lands was read. It denied Government payment of the scalp money.

November 6, 1903. Attention was drawn to the action of the Government in proposing to pay scalp money for pelicans and gulls, and the honorary secretary reported having written to the Commissioner of Crown Lands.

Further reference to scalp-taking was made by White (6) in 1911:—"Some scoundrels," he said, "allowed the whole rookery on Pelican Island to hatch, to the extent of two thousand birds. The rookery has now been swept away because somebody has secured the heads of two thousand fledglings."

Again in 1918 White (10) records a head hunting raid of "some years ago." He says that the payment was one penny per head.

Man's interference with breeding pelicans has not been limited to acts of violence and reprisal. The presence of humans near a colony can prevent parent birds from giving their broods normal attention. Such visits, if prolonged, can lead to the death of embryos and young birds.

There is a newspaper account, published in the year 1937, which tells of a visit to the Coorong the previous year by one J. O. Beeby. It is said that the visit "concluded with a grand spectacular climax. After lying hidden and observant for a long time, by a sudden movement we spread panic through the whole large and timid population." (23).

The adult pelicans are wary and will leave their nests and the islands when alarmed by an approaching visitor. A cautious approach will bring about a quiet and orderly retreat by the birds. In the case of panic, many eggs will be dislodged and broken and young birds may be trampled upon. The danger from this is most frequent on calm days, when more effort by the parent birds is required to become airborne.

At certain stages of brooding, the adult birds appear to be very tame and it is possible to drift a small craft to within one hundred yards of the sitting birds without causing noticeable alarm.

It is feared that in future years, untimely visits by thoughtless tourists and the possible introduction of water sports in the region of

the islands might threaten the welfare of the species.

ACTIVITIES OF THE SOUTH AUSTRALIAN ORNITHOLOGICAL ASSOCIATION

Within four years of its inauguration in 1899 the South Australian Ornithological Association was actively involved in endeavouring to give Pelicans reasonable protection in South Australia. Records tell of deputations and letters to Government Departments and their officials on this matter.

The Association's most noteworthy move was the securing of a lease of the Coorong Islands between Woods Well and Salt Creek. This lease was granted for the purpose of protecting the bird life on the islands and was gained through the initiative of J. W. Mellor (20).

The lease of the islands was superseded in 1919 by the granting of an *annual licence* to occupy certain islands in the Coorong for the fee of one shilling per annum (22).

This licence, number 662, was held continuously by the Association until 1962, when it was cancelled. The South Australian State Government then declared the islands prohibited areas. This action followed widespread newspaper publicity of egg destruction in September, 1962.

During its fifty years of "tenancy" of the islands, the Association has used a number of aids to assist in the protection of the breeding birds.

Notice boards were erected on and near these islands during the early years by the Government and by Captain White on behalf of the South Australian Ornithological Association (21), (19). Arrangements were in hand for re-erection of notices in 1962 (25).

Several residents of the Coorong district have acted as Custodians of the islands for at least between the years 1911 to 1919. These custodians were appointed by the Government on the recommendation of the Association (19). Records indicate that there was little interference with the breeding Pelicans during that period.

The most important function of the holding of the islands appears to be that it prevented any tenancy from being granted that would have adversely affected breeding.

In 1911 the South Australian Ornithological Association received a request to rent the islands from the Association for grazing purposes. The request was rejected (20).

In 1931 the Director of Lands informed the South Australian Ornithological Association of an application for permission to remove guano from the islands. The Association resolved to permit the applicant to remove guano from one island only, between March 1, and June 30, under payment of a royalty to the Government. This decision was made even though at the time members of the Association felt that the birds might leave the disturbed nesting places. That this decision was made during the "depression years," might explain a policy which would be unacceptable today (24). Records do not show whether any attempts were made to remove this guano.

The chances of commercial interests occupying the islands in the future seem remote now that the Government has declared them prohibited areas and placed them under the control of the Department of Fisheries and Game.

Under this new control, measures to prevent deliberate interference as well as seemingly harmless incursions on the islands should be more effective. But it may be necessary to restrict entry to the immediate surrounding waters.

There is much to be learned about the habits and movements of the Pelican in Australia. When assured breeding on the Coorong is once again evident it is to be hoped that local ornithologists will be able to direct their attention towards a detailed study of the species, especially during the breeding season.

REFERENCES

- (1) Gould, J. 1865. Handbook of Birds of Australia.
 - (2) Stuart, J.McD. 1865. Journal for years 1858-62.
 - (3) Howitt, W. 1863. History of Discovery in Australia, etc. Vol. 2.
 - (4) Serventy, D. L. and H. M. Whittell. 1960. Birds of Western Australia.
 - (5) *Emu*, 3, 1903, page 195.
 - (6) White, S.A. 1911. *Emu*: 10: 344.
 - (7) Macgillivray, W. 1923. *Ibid.* 22: 162.
 - (8) Lansell, G. L. 1940. *Ibid.* 39: 303.
 - (9) Condon, H. T. 1941. *Ibid.* 41: 92.
 - (10) White, S.A. 1918. *South Austr. Ornith.* 3: 200.
 - (11) Sutton, J. 1930. *Ibid.* 10: 189.
 - (12) Morgan, A. M. 1930. *Ibid.* 10: 264.
 - (13) L. R. Reese. 1931. *Ibid.* 11: 70.
 - (14) Sutton, J. 1933. *Ibid.* 12: 19.
 - (15) Reese, L. R. 1933. *Ibid.* 12: 130.
 - (16) Hitchcock, W. B. 1937. *Ibid.* 14: 65.
- (Continued at foot of next page).

REFERENCES (continued).

- (17) Condon, H. T. and S. E. Terrill. 1948.
Ibid. 19: 7.
- (18) Minutes, S.A. Ornithological Association,
1910—July 6.
- (19) Minutes, S.A. Ornithological Association.
1911—September 8.
- (20) Minutes, S.A. Ornithological Association.
1911—December 22.
- (21) Minutes, S.A. Ornithological Association.
1918—April 5.
- (22) Minutes, S.A. Ornithological Association.
1919—April 25.
1919—May 30.
- (23) Minutes, S.A. Ornithological Association.
1937—April 30.
- (24) Minutes, S.A. Ornithological Association.
1931—January 30.
- (25) Minutes, S.A. Ornithological Association.
1962—September 28.