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PROCEEDINGS

OF THE

Royal Zoological Society

OF

New South Wales

FOR THE YEAR
1939-40.

SMITHSONIAN INSTITUTION
SEP 21 1940
NATIONAL MUSEUM

AUGUST 19, 1940.

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ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

(Established 1879.)

Registered under the Companies Act, 1899 (1917).

PATRONS

His Excellency the Governor of New South Wales, The Lord Wakehurst, K.C.M.G.

Sir Philip Woolcott Game, G.B.E., K.C.B., D.S.O.

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Hon. Secretary: T. A. Everitt.

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Chairman: Melbourne Ward, F.R.Z.S.
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ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

The Sixtieth Annual General Meeting of the Society was held at Taronga Zoological Park, Mosman, on Saturday, 20th July, 1940, at 3 p.m. 124 members and visitors were present. The Honorary Secretary, Mr. Tom Iredale, read the

SIXTIETH ANNUAL REPORT.

Membership.—On the 30th June, 1940, the members on the register numbered 535, the ordinary members (including life members) reaching to 329. This is 21 less than last year, but must be regarded as excellent considering the troubled conditions now existing. The Council has decided that members serving their country either here or abroad will remain on the register without payment of subscription for the duration of the conflict. Associate benefactors still number 3; life members 28, honorary members 8, ordinary members 298, honorary associates 3, life associates 21, and associates 174. Members who have passed away during the year number fifteen, while 8 resigned, due to residential and other reasons. Unfortunately the names of 9 members had to be removed, due to the terms of Article 9.

It will be necessary for all members to co-operate this year in maintaining our membership and assist the Society in the continuation of its work.

The Council.—The meetings of the Council have been fairly well attended, the average attendance being 13 and the number of meetings 12. Mr. W. B. Gurney resigned on account of ill health (unfortunately passing away a few weeks later) and Mr. Emil Zeck, also from the Department of Agriculture was, as suggested by Mr. Gurney, elected in his place.

Deaths.—In addition to the death of Mr. W. B. Gurney we have to record with regret the loss of one of our Fellows, Mr. H. J. Carter, after a long and useful life. Mr. Carter was especially interested in Coleoptera, and had contributed articles to our Journal. Otherwise the death roll has been large, Messrs. Louis A. Curtis, a very old member, R. A. Dallen, W. G. Hull, Mrs. E. Leahy, Dr. E. S. Littlejohn, Mr. S. Elliott Napier, Dr. J. I. Parer, Mrs. H. M. Prior, Mr. S. W. Webb, Judge C. A. White, all ordinary members, Mr. L. D. Cameron and Sir Matthew Nathan, Life Associate Members, and Dr. John Macpherson, an Associate Member.

Finances.—These are again in their normal state, but in the coming year, owing to the publication of a Handbook, it will need all the assistance of members to continue the satisfactory condition reported last year.

Publications.—The volume of Proceedings for 1938-39 was issued in August and part 3 of the 9th volume of "The Australian Zoologist" appeared in December.

A Handbook of the Fishes of Australia, by Mr. G. P. Whitley, is in course of preparation, Part I, dealing with the Sharks and Rays, is in the printer's hands and will be issued in the very near future. This will be an excellent publication issued at a very low price, and it is hoped that every member will urge its sale, so that further Handbooks can be issued in succession.

Handbook Fund.—This will be reduced by the cost of the publication of the Fishes Handbook above mentioned, and recommendation of the sale of the Handbook will greatly assist in restoring the fund to its present workable limit.

Fellows.—During the year three fellows were admitted, the well known Victorian naturalist, Mr. Charles Barrett, our President, Mr. Keith A. Hindwood, and Mr. E. Le G. Troughton.

SEP 19 1940

Honours.—It is useful to record that our President, Mr. Keith A. Hindwood, was elected by the American Ornithologists' Union as a Corresponding Fellow, while Mr. A. H. Chisholm was presented with the Victorian Medal.

Sections.—The Sections have continued their valuable work in bringing together the working members of this Society, and also in showing visitors the importance of the work done by the Society. The accounts of the year's work in each Section are published in the Proceedings along with the programmes of the subjects to be discussed at the meetings for the coming year. As the Proceedings are sent to every member it is again hoped that members will make use of the information there included. A new Section, named the General Section, was brought into being for the purpose of entertaining and instructing members who are not specialists but who desire knowledge about nature generally. An open invitation is here extended to all members of the Society to attend this Section as hitherto there has been complaints of the lack of such a Section.

Generally the attendances at the meetings of the Sections have been good, and the programmes better.

Marine Life Exhibition.—This was organised by the Marine Section, and was held in the Art Gallery at Manly, from November 2, 1939, when over 7,000 visitors attended. This success was due to the organiser, Mr. G. P. Whitley, and especially to Mr. and Mrs. Melbourne Ward who, in addition to their splendid exhibit, attended the exhibition daily, explaining the exhibits in an entertaining manner. It is anticipated that the success will lead to similar exhibitions in other districts around Sydney.

Budgerigar Show.—The Budgerigar Section held a very successful Lawn Show at Mr. Hubert Fairfax's residence, Rose Bay, on 27th April, 1940.

Taronga Park Trust.—The Trustees have maintained the facilities for members, and although the Trust is now issuing season tickets, most of our members have continued with us as we provide them with all the sectional meetings above noted.

National Park Cabin.—A sub-committee has been formed to look after the Cabin in National Park, placed at our disposal by the National Park Trust, for the purpose of making and recording observations on the natural life of the Park.

Birds of Lord Howe Island.—Our President, Mr. Keith A. Hindwood, has prepared an exhaustive account of the Birds of Lord Howe Island, which has been published as an extra part of the "Emu". This Society has contributed to the cost of printing, as the part was fully illustrated and somewhat costly to produce.

Faunal Reserves.—Unfortunately the hope expressed last year has not eventuated, through the altered conditions now existing, and the matter must remain in abeyance for some time. Nevertheless, the National Park Trust has inaugurated a small reserve which may prove a useful introduction to the greater scheme originally contemplated, when opportunity offers.

Fauna Conference.—No action having been taken by the State Government, the matter has apparently been abandoned.

State Faunal Advisory Board.—As stated in the last report, the matter of reconstitution of the Board was under consideration by the Chief Secretary. The decision to continue the present Board in its unsatisfactory form was received with great regret by the Council. After prolonged discussion it was decided to discontinue representation by the Society on the Board as its appointed representative and delegate both declined to act.

Mr. G. M. Mathews.—This famous Australian Ornithologist arrived in Australia, and his magnificent library is now housed at Canberra and is being catalogued for the use of Australian ornithologists. Mr.

Mathews accepted an invitation to meet the Council, and leading local Ornithologists were invited to be present at a lunch held at Taronga Park. Later Mr. Mathews attended a meeting of the Ornithological Section, and last month gave before this Section an account of his life work, a short resume of which will appear in the Proceedings.

The Honorary Treasurer, Mr. Phillip Shipway, presented the Balance Sheet. In explanation of the reduction shown in the receipts, as compared with the previous year, he stated that under a new system of bookkeeping subscriptions received during the month of June for the ensuing year were held in suspense, and will be accounted for in the statement for 1940-41.

The Honourable Sir Charles Marr, M.P., moved the adoption of the Annual Report and Balance Sheet. He said that the loss of membership during the year was regrettable, in view of the valuable work the Society was doing. He regretted also the intimation that the Advisory Board had not yet been fully constituted. It was hard to get Governments to move, but if the Society continued to make itself felt their desire in respect to this Board, as well as other matters, would be achieved.

"Any Society endeavouring to protect the fauna and flora of Australia should have Government support," he added. "We are today bemoaning the fact that a lot of our fauna is disappearing. At the same time, there is going on a depletion of beauty spots placed here for man's enjoyment. North Head was an instance of this. There natural beauty had to give place to defence works."

Sir Charles made mention of Dr. J. Foreman, who was sitting alongside him. Dr. Foreman, he said, was the only surviving member present at the formation of the Society, 60 years ago. They were all delighted to have him with them. It was very appropriate that the meeting of the Society should be held in Taronga Park, where the animals were kept in almost natural surroundings. There could be no better situation for zoological gardens in any part of the world. The association between the Society and Taronga Park was particularly valuable.

"Zoology is an ancient science," Sir Charles continued. "It first took definite shape in the mind of Aristotle, over 300 years before the Christian era. He knew over 500 animals, and in his studies he laid the foundations of comparative anatomy and taxonomy. That these foundations were truly laid is shown in the fact that they remained for 15 centuries almost unbuilt on."

Sir Charles concluded with an appeal for greater support for the Society. There would be criticism of its activities. That was not strange, for everyone, from Governments to individuals, were criticised. There were always many people who would lead others to believe that they could do a job much better than those engaged on it. "If you must criticise, let your criticism be constructive, such as will assist those who are now earnestly striving to do a good work for the community", he said.

In seconding the motion, Mr. Aubrey Halloran cited the monkeys in the pit outside as striking exponents of the art of destructive criticism. Any box or other object thrown into the pit was taken to pieces with deliberate care and precision, but he had never known an instance where the disintegrated article was reconstructed!

The six members of Council who retired under Article 22, Messrs. Albert Littlejohn, N. L. Roberts, T. C. Roughley, M. S. R. Sharland, P. Shipway, and E. H. Zeck, were re-elected, there being no other nominations.

On the motion of Mr. Roughley, seconded by Dr. Garnet Halloran, it was resolved to amend Article 9 of the Society's Articles of Association by adding at the end thereof the words "The Council may remit payment of the subscription of any ordinary or associate member on active service, whether at home or abroad".

The President, Mr. Keith A. Hindwood, then delivered his address on "The Sea Birds of Sydney".

BALANCE SHEET AS AT 30th JUNE, 1940.

ACCUMULATED FUNDS.	£ s. d.	£ s. d.	ASSETS.	£ s. d.	£ s. d.
General Account—			**General Account Investments—**		
Working Account—			Office and Lecture room Furniture and equipment at valuation, plus additions	214 7 10	
Balance at 30th June, 1939—Debit ..	40 11 10		Library books, etc., at valuation ..	500 0 0	
Add Excess of Expenditure over Income for the year .	164 7 1				714 7 10
	204 18 11		**Handbook Fund Account Investments—**		
Funds Invested	714 7 10		Australian Consolidated Inscribed Stock (Face Value)	660 0 0	
		509 8 11	Australian Consolidated Treasury Bonds (Face Value)	1,050 0 0	
Handbook Fund Account—			Metropolitan Water, Sewerage and Drainage Board Inscribed Stock (Face Value)	100 0 0	
Working Account—			Metropolitan Water, Sewerage and Drainage Board Debenture (Face Value)	100 0 0	
Balance at 30th June, 1939—Credit .	164 14 4				1,910 0 0
Add Transfer of Invested Funds ..	100 0 0		Including:—		
	264 14 4		Albert Littlejohn Endowment	100 0 0	
Less Excess of Expenditure over Income for the year .	11 19 8		Hume Barbour Endowment	106 0 0	
	252 14 8		Walter & E. Hall Endowment	175 0 0	
Funds Invested	1,910 0 0				
		2,162 14 8	**Cash at Bank and on Hand—**		
			Commonwealth Savings Bank:—		
			General Account	14 13 2	
			Handbook Fund Account	30 12 9	
			Cash on Hand	2 9 10	
					47 15 9
		£2,672 3 7			£2,672 3 7

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 30th JUNE, 1940.

GENERAL ACCOUNT.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Publication "Australian Zoologist", Volume 9, Part 3, and Reprints	204 8 4		By **Subscriptions**— Annual	271 11 0	
,, Publication Annual Report and Proceedings	54 4 2		,, Sales "Australian Zoologist"	15 2 6	
,, Office Rent ..	137 10 0		,, Rent — Subletting Offices .	39 0 0	
,, Office Printing and Stationery	21 18 6		,, Bank Exchange and Postage .	0 8 4	
,, Rent — Post Office Box ..	1 0 0		,, Telephone	9 2 3	
,, Annual Meeting Expenses .	10 1 3		,, Sale of Coloured Plates	4 15 0	
,, Telephone	27 2 1		,, Sundry Receipts	0 3 2	
,, Electricity ..	9 16 3		,, Sale of Badges	2 3 6	
,, Insurance	2 12 0		,, Savings Bank Interest	2 3 8	
,, Company Registration Fee .	1 6 0				344 9 5
,, Sundry Petty Expenses	15 0 0		,, **Donations**:— Albert Littlejohn, Esq. .	14 16 10	
,, Capitation and Affiliation Fees	1 10 6		National Park Cabin Fund	3 5 0	
,, Electrical Repairs	5 16 6		Sundries ..	0 7 6	
,, Expenses — Manly Marine Exhibition ..	14 15 3				18 9 4
,, Purchase of Badges	13 5 0		,, **Balance** — Excess of Expenditure over Receipts for the year		164 7 1
,, Lift Attendance	7 0 0				
		527 5 10			
		£527 5 10			£527 5 10

HANDBOOK FUND ACCOUNT.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Blocks for Whitley's "Fishes"	113 12 9		By Handbook Sales	12 4 5	
			,, Savings Bank Interest	0 15 0	
			,, Interest on Investments	80 11 2	
			,, Profit on Sale of Bonds	8 2 6	
					101 13 1
			,, **Balance** — Excess of Expenditure over Income for the year		11 19 8
		£113 12 9			£113 12 9

Auditor's Report to the Members of the Royal Zoological Society of New South Wales.

I hereby report that I have audited the books and accounts of the Royal Zoological Society of New South Wales for the year ended 30th June, 1940, and have obtained all the information and explanations I have required, and in my opinion, the above Balance Sheet exhibits a true and correct view of the state of the Society's affairs as at 30th June, 1940, according to the best of my information and the explanations given to me and as shown by the books of the Society.

I have examined the register of members and other records which the Society is required to keep by law or by its Articles, and am of opinion that such records have been properly kept.

(Sgd.) ROBT. J. STIFFE, F.C.A. (AUST.),
Hon. Auditor.

Sydney, 17th July, 1940.

K. A. HINDWOOD, President. A. F. BASSET HULL, Vice-President.
PHILLIP SHIPWAY, Honorary Treasurer.

Presidential Address

THE SEA-BIRDS OF SYDNEY.

With Remarks on Certain Specimens from Eastern New South Wales.

By K. A. Hindwood, F.R.Z.S., C.F.A.O.U.

In the preparation of the following remarks on the sea-birds of Sydney and nearby localities I have had in mind the object of providing a reference list of all the species known to have occurred in this area; broadly speaking, some sixty miles north, and a like distance south of Sydney Heads. A brief summary, for the most part, is given of the habits and distribution of each species. Coloured figures, together with known life-histories, plumage descriptions and measurements will be found in "The Birds of Australia", by Gregory M. Mathews; or, in a condenced form, in "A Manual of the Birds of Australia", Vol. I., 1921 by Gregory M. Mathews and Tom Iredale.

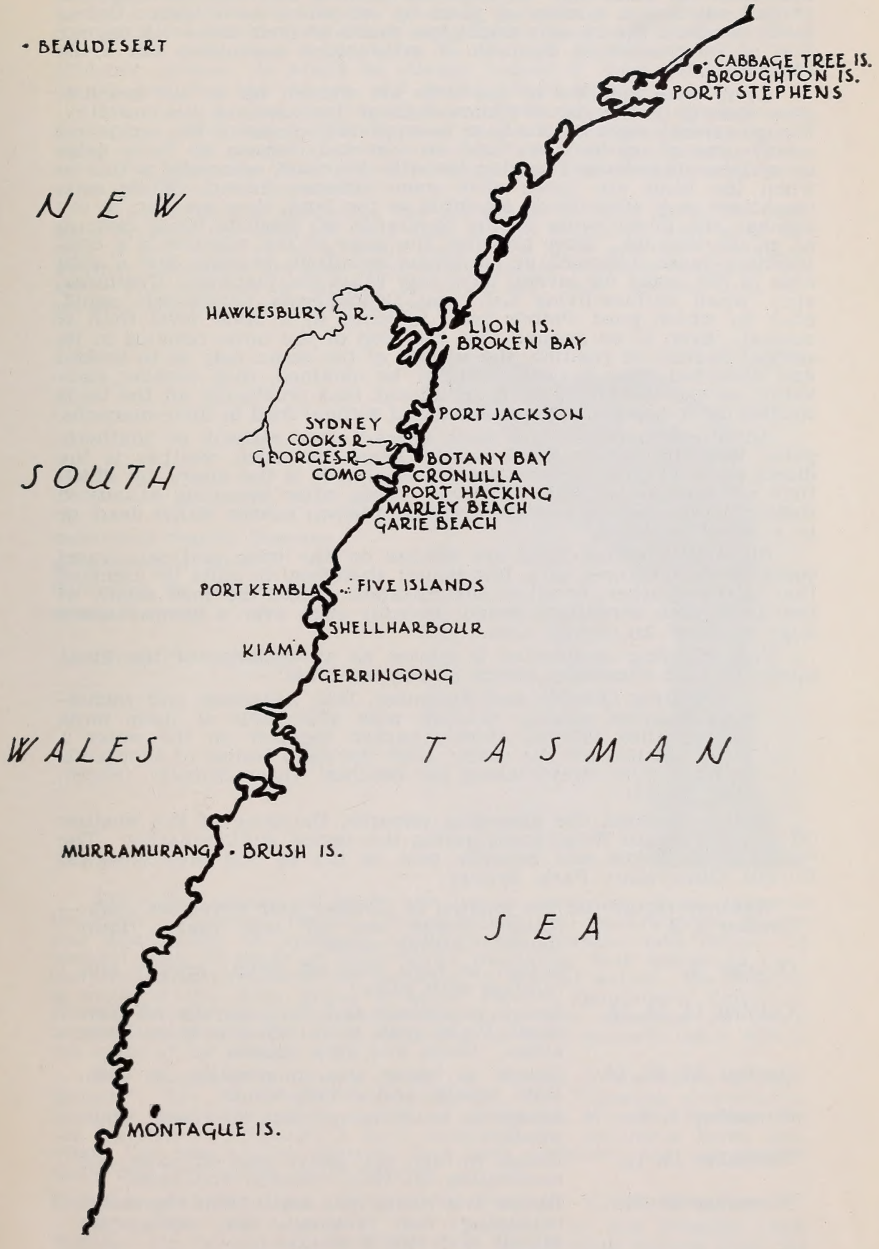
It is hoped that these notes will stimulate the field investigation, as yet almost untouched in Australia, of an interesting and highly specialised group of birds. Quite recently it has been stated, and in all truth, that the sea-bird is as marine as a sea-turtle or a seal; that its relationships to its environment are just as close as those of land-birds; that currents, water temperatures, food supply and a host of other factors govern its life and whereabouts ("Bird Lore", March-April, 1940, p. 157).

Interested field workers need to possess, or have at their disposal, a sea-going boat, with the aid of which a systematic investigation of the movements, numbers and habits generally, of the sea-birds of our coast could be made. Such an investigation would, of course, include the taking of specimens to determine the feeding habits of the various species, and other matters. One of the most successful methods of attracting sea-birds is explained in the following extract from "Bird Islands of Peru", by Robert Cushman Murphy.

> Mr. Rollo H. Beck, a veteran student of marine birds, was collecting for the American Museum of Natural History in Peru; he chartered a coastal sloop under the command of an experienced native Skipper and sailed several days' journey off shore. One quiet grey morning, early in the course of the voyage, Beck remarked that he would like to lower a boat for birds. "But there are no birds here, Senor", said the Skipper, waving an arm around the circle of black water.
>
> Nevertheless, a skiff was sent down, and Captain Charlie manned the oars. For two miles or more he pulled straight ahead, while Beck methodically tossed flecks of oil and grease and scraps of meat in the boats' track. Then they doubled on their course, and to Charlie's amazement the long food-line was soon dotted with dainty sea-sprites which skipped and danced like butterflies along a hedgerow. A series of many sea-birds, among them some rare species, was brought back to the sloop and displayed before the doubting crew.
>
> "But we have never before had such birds in Peru, Senor," insisted the Captain, and his men unanimously agreed.

A local collector, who operated successfully off Sydney Heads many years ago, told me recently that he used to bring the sea-birds around by towing a sheep's liver behind his boat.

The researches carried out by Mr. A. F. Basset Hull, some thirty years ago, brought to light information of the greatest interest to ornithologists. Especially was this so in regard to breeding stations, for most of the Islands lying off the New South Wales coast were visited by Mr. Hull; an undertaking not without the elements of danger. About this time also, 1913-14, a firm of natural history dealers in Sydney employed collectors who obtained, from an area within about twenty miles of Sydney, many interesting specimens most of which eventually reached the cabinets of Mr. Gregory M. Mathews, of England. Unfortunately the war of 1914-18 intervened, collecting was



Rex Iredale del.

suspended and little has been done since to promote the study of the sea-birds of our coast. However, the results then obtained give some indication of what may be expected from a thorough investigation carried out over a number of years by competent naturalists. Unless fairly constant the records would lose much of their value. A regular flow of information is desirable if satisfactory conclusions are to be reached.

Every year numbers of sea-birds are washed up on our beaches, sometimes in thousands. We know little of the causes of this mortality, though several explanations have been offered. Some of the accidental occurrences of sea-birds on land are obviously caused by fierce gales or cyclonic disturbances moving towards the coast, especially is this so when the birds are taken alive some distance inland. While such conditions may often force sea-birds to the land, they are not, in my opinion, the direct cause of the thousands of derelicts being cast up on to the beaches. More probably the state of the weather is a contributing cause inasmuch as boisterous conditions existing over a wide area of the ocean for several days may cause the plankton (Crustacea, etc.), small surface-living fish, and Cephalopods (cuttle-fish, squid, etc.) on which most Petrels feed, to move to a lower level than is normal. Even if we assume that the food of the birds remains in its normal habitat, or position, the surface of the ocean may be so broken and disturbed that it cannot readily be obtained, thus causing starvation among the birds. It is significant that practically all the birds washed up on beaches are emaciated and without food in their stomachs.

Admittedly most of the birds appear after easterly or southerly gales, but this does not necessarily mean that such weather is the direct cause of their deaths, but rather that it is the means by which they are brought to land. In other words, after becoming exhausted they settle on the sea and are eventually blown ashore, either dead, or in a dying condition.

All species of sea-birds are tireless on the wing and can travel considerable distances in a few hours; therefore, it must be assumed that if the weather, or other circumstances, effect the food supply of the birds, such conditions would probably exist over a comparatively large sector of an oceanic area.

The following occurrence is quoted as an instance of the great mortality that sometimes occurs among sea-birds:—

> "During October and November, 1895, fishermen and yachtsmen reported passing through mile after mile of these birds [Short-tailed Petrels] thickly packed together on the water a little distance off the coast; later the dead bodies of thousands of birds were strewn along the beaches" (near Sydney) (North, 1898, p. 115).

Having in mind the preceding remarks, the state of the weather off the New South Wales coast during this period is illuminating. The report given below was recently sent to me by the Meteorological Bureau, Observatory Park, Sydney.

Weather report for the months of October and November, 1895:—

October 1, 2.	Rather rough sea off S.E. coast. Rain squalls. Strong winds.
October 9.	Rough to high seas off coast; squally and raining, with gales.
October 14, 15, 16.	Rough conditions and sea generally off New South Wales coast with high seas in southern areas. Gales and rain squalls.
October 24, 25, 26.	Rough to heavy seas, moderating on 26th. Rain squalls and strong winds.
November 4, 5.	Rough to heavy lumpy seas off coast. High winds.
November 10, 15.	Rough to high and heavy seas off coast, but moderating on 15th. Squalls and gales.
November 20, 21.	Rough and rising seas south from Newcastle, extending into Tasman Sea, with rain squalls and strong winds.
November 24, 25.	Rather rough conditions off east coast of Australia as far north as Sandy Cape, with strong winds and misty rain.

It has also been suggested that an epidemic disease may be the cause of the mortality. Such a theory is, as yet, unsupported by any scientific facts based on **post-mortem** evidence. Moreover, this mortality is not known to occur on the breeding grounds of the birds, despite the countless numbers sometimes congregated in a restricted area, and where the conditions would seem to be ideal for the spread of an epidemic disease. It would be strange indeed if these supposed epidemics occurred only at sea, and during rough weather.

The best months for "beachcombing" seem to be October and November. The lean period appears to be from about December to April, when the majority of birds are at their nesting grounds. However, odd birds may be expected at any time of the year, particularly after prolonged stormy weather.

When collecting specimens the colours of the soft parts, i.e., legs, webs between the toes, bill, and eyes, should be noted; that is, if the bird is still alive or in a fresh state. The date and the prevailing weather conditions are also important, together with the weight of the bird. The beginner is advised to collect all "new" species until experience teaches him what to discard.

Thick-billed Penguin (Eudyptes pachyrhynchus) juv. Gerringong, 60 miles south of Sydney, 2/10/1938.

Photo: K. A. Hindwood.

Fifty-two species of birds are herein recorded; these comprise Penguins (2 species), Petrels (Storm-Petrels and Shearwaters), Prions and Albatrosses (26 species); Gulls, Terns, Noddies and Skuas (14 species), and 10 kinds of other birds (including four species of Cormorants) which frequent the coastline, or coastal waters. No mention is made of the large group of birds, Plovers, Sandpipers, Dotterels, Herons (excepting the Reef-Heron), etc., often observed on ocean beaches, exposed reefs, or in estuaries, as they scarcely come within the scope of the present work.

The classification used is based on "A List of the Birds of Australasia", 1931, by Gregory M. Mathews. The following abbreviation has been used in the text:—A.M.S. = Australian Museum, Sydney. In the majority of instances I have examined the specimens listed and, where the comparative material has been sufficient, the sub-specific name has been added to the species.

Eudyptes pachyrhynchus. Thick-billed Penguin. Crested Penguin.

There are two records of the occurrence of this Penguin near Sydney. On December 5, 1917, Mr. C. F. Raine, while fishing from the rocks near Ettalong Beach (Broken Bay), captured an immature bird. He thus describes the incident:—

I saw what appeared to me to be a Mollymawk, some two

or three hundred yards along the beach, riding the breakers. The bird gave a call resembling the screech of a goose. I answered, giving the same call, and the bird made one dive and came up within ten feet of where I stood. A heavy sea then caught the bird and swept it close to the beach. I then got into the water between the bird and the beach. It made a dive for the open water, but came straight at me and I caught it by the neck. (**in litt.** 2/2/1918).

The bird was a male in immature plumage (skin No. 0.26096, ♂, A.M.S.). The second specimen taken in New South Wales was also

Little Penguin (Eudyptula minor) Sydney Harbour.

Photo: K. A. Hindwood.

an immature male. It was taken alive from the water near Gerringong, some sixty miles south of Sydney, on October 2, 1938 (skin No. 0.37004, ♂, A.M.S.). The Thick-billed Penguin breeds on the Snares, south of New Zealand. The above records are therefore more than 1,200 miles from the breeding locality. The above specimens have been discussed in detail with a review of pertinent literature, by Hindwood (1939, p. 377).

Eudyptula minor novaehollandiae. Fairy Penguin. Little Penguin.

The Little Penguin, the smallest of the Penguins, is quite common along the New South Wales coast. Its peculiar sharp "barking" note may often be heard. The bird swims low in the water and is difficult to locate. This species breeds in Sydney Harbour, Botany Bay, on Lion Island, and along our coastline.

Oceanites oceanicus. Yellow-webbed Storm-Petrel. Wilson's Storm-Petrel.

This species is said to be the most widespread and the commonest of the Storm-Petrels. The breeding range is in the Antarctic regions, the birds wandering northwards during the southern winter. The following records for the New South Wales coast are listed. Two mounted specimens in the Macleay Museum, Sydney. "East coast [sic] of New South Wales" (no other data), a bird taken off Sydney Heads in October, 1913 (Hull, 1916, p. 214) and a skin in the Australian Museum, picked up on Maroubra Beach on October 14, 1929 (skin No. 0.32629, ♂, A.M.S.).

Wedge-tailed Petrel (Thyellodroma pacifica) washed ashore in a dying condition, Bawley Point, South Coast, February 3, 1938.

Photo: K. A. Hindwood.

Specimens from eastern New South Wales have been placed in the sub-species **exasperatus** by Mathews.

Pelagodroma marina dulciae. White-faced Storm-Petrel.

This species is seldom taken on our beaches, though numbers occur offshore, particularly during the summer months (Hull, 1916, p. 214). The nearest breeding locality to Sydney is at the Five Islands off Port Kembla as first recorded by Hull (1911, p. 100). A large nesting colony is situated on Broughton Island, off Port Stephens.

Fregetta tropica. Black-bellied Storm-Petrel.

The Black-bellied Storm-Petrel inhabits southern oceans; the closest breeding place to Sydney appears to be the Auckland Islands, south of New Zealand, where large numbers have also been observed at sea (Oliver, 1930, p. 101). Specimens are rare in collections. The only records for New South Wales are based on four specimens in the Macleay Museum, Sydney; two ♀♀, collected "off east coast of New South Wales, May, 1875", and two mounted specimens, ♂♀, "off east

coast of New South Wales" (no other data, but apparently collected at the same time as the other specimens).

Reinholdia reinholdi.* Fluttering Shearwater.

The Fluttering Shearwater has been recorded in numbers off the New South Wales coast, south of Sydney, but, as yet, no breeding place has been discovered in this area. The species breeds in New Zealand and is present in N.Z. waters throughout the year. Specimens have been collected on beaches near Sydney during the following months:

Young Wedge-tailed Petrel (Thyellodroma pacifica) Broken Bay, Lion Island, April 12, 1935.

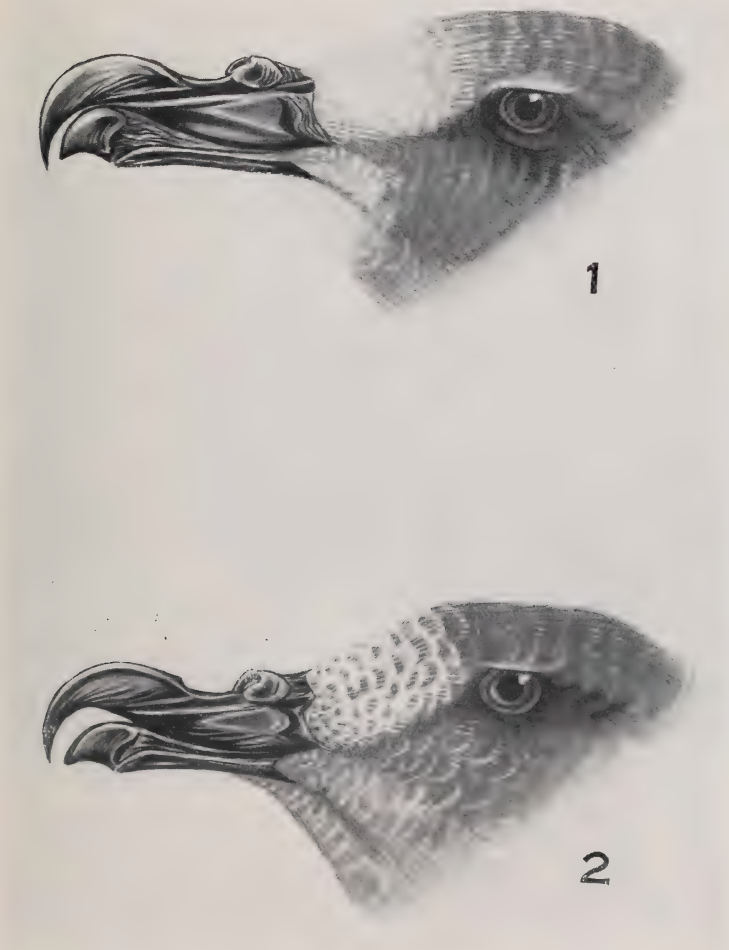
Photo: K. A. Hindwood.

January, February, April, July, September, October and December. All, with one exception, have slender bills and are referable to the sub-species **byroni** (Mathews). The exception is a skin collected by A. J. Marshall on Garie Beach, October 16, 1933. This bird has a comparatively large bill and has been provisionally referred to the sub-species **huttoni** by Serventy (1939, p. 105), who suggested that it may be a stray from the Snares (Southern New Zealand).

*Procellaria [= Reinholdia] gavia, Forster, Descr. Anim. ed. Licht., p. 148, 1844, is now considered indeterminable.

Thyellodroma pacifica royana. Wedge-tailed Petrel.

A colony of these birds nests on Lion Island at the entrance to Broken Bay; this is the nearest breeding locality to Sydney. The species breeds on most of the Islands off the New South Wales coast but is infrequently washed up on the beaches. It is very similar in appearance to the Short-tailed Petrel, but can be distinguished at a glance by its much longer tail.



1. **Grey-faced Petrel (Pterodroma macroptera).**
2. **Brown-headed Petrel (P. melanopus) slightly less than natural size.**

Lilian Medland del.

Hemipuffinus carneipes. Fleshy-footed Petrel.

There is a skin of this species from near Sydney in the Australian Museum (skin No. 0.33550, A.M.S.). It was collected by Mr. H. S. Grant at Warriewood Beach on January 4, 1934. Some years previously specimens were taken on Bondi Beach, but they did not reach the Museum. The nearest breeding locality to Sydney is at Lord Howe Island where the birds occur in large numbers; other breeding stations are on some Islands off the New Zealand coast.

Neonectris griseus. Sooty Petrel. Sombre Petrel.

The Sooty Petrel is the common "Mutton-bird" of New Zealand. Oliver (1930, p. 123) estimates that some 250,000 young birds are taken for food each year by the Maoris. The species bears a strong resemblance to the Short-tailed Petrel, but is larger and has whitish markings on the under-surface of the wings. Several storm-blown specimens have been collected on beaches near Sydney, and a breeding bird, probably a straggler, was taken on Broughton Island on December 29, 1912, by Mr. E. S. Rohu (1914, p. 97).

Neonectris tenuirostris brevicaudus. Short-tailed Petrel.

The Short-tailed Petrel is the familiar "Mutton-bird" of the Bass Strait Islands, where it breeds in countless numbers. Flinders, when exploring with Bass in the vicinity of Three Hummock Island, Bass Strait, observed a flight of these birds on December 9, 1798, which took more than an hour and a half to pass. He estimated that, on a conservative basis, the number of birds totalled at least 100,000,000, but more probably about 150,000,000. Storm-blown birds are often taken on beaches near Sydney. During October and November, 1895, fishermen and yachtsmen reported passing mile after mile of these birds thickly packed together, a little distance off the coast; later the dead bodies of thousands of birds were strewn along the beaches, near Sydney (North, 1898, p. 115).

Procellaria parkinsoni. Black Petrel.

A specimen in the Macleay Museum, Sydney, from near Sydney Heads (collected in May, 1875) is the only record of this species for Australia (1878, p. 21). The Black Petrel breeds on the New Zealand mainland and on associated Islands. It can be distinguished from other dark-coloured Petrels by its uniform dark brown (almost black) plumage, black feet, and stout horn-coloured bill.

Pterodroma macroptera. Grey-faced Petrel. Great-winged Petrel.

This species closely resembles the Brown-headed Petrel in size and general coloration. The accompanying plate illustrates the main differences between the two species; these differences are largely in facial characters. The inner webs of the primaries are greyish-brown in the Grey-faced Petrel, whereas in the Brown-headed Petrel these parts are more or less white. The following specimens are listed from the Sydney area (skin No. 0.32408, ♂, Manly Beach, 10/2/1929, A.M.S.; skin No. 0.32632, ♂, Manly Beach, 15/10/1929, A.M.S.; and skin No. 0.32637, ♂, Cronulla Beach, 16/10/1929, A.M.S.). These three specimens are probably referable to the sub-species **gouldi** which breeds on Islands off the New Zealand coast, though they do not agree exactly with a breeding bird from New Zealand. The differences may be caused through plumage wear.

Pterodroma melanopus. Brown-headed Petrel. "The Bird of Providence."

The Brown-headed Petrel has only once been taken on the New South Wales coast. On April 9, 1934, Gilbert P. Whitley collected a dead bird on Maroubra Beach (skin No. 0.32613, A.M.S.). The nearest breeding locality to Sydney is Lord Howe Island; the specimen in question has a heavier bill than Lord Howe Island birds, indicating that it is probably from another breeding station. The range of the species extends across the Pacific Ocean to as far east as Ducie Island (near Pitcairn Island). The specimens referred to as **"Pterodroma melanopus"**, and the "Bird of Providence" in "The Australian Zoologist" (1929, p. 360; 1930, p. 113), and "The Emu" (1929, p. 291) are actually Grey-faced Petrels. The feathers on the back of this species always have a slaty-grey tinge which is absent in the Grey-faced Petrel.

Pterodroma inexpectata. Mottled Petrel.

An example of this Petrel, collected at Bondi Beach on December 12, 1920, is the only record for New South Wales (skin No. 0.27144, ♀, A.M.S.). The Mottled Petrel breeds on Islands to the south of New Zealand, and ranges north during the southern winter.

Aestrelata lessonii. White-headed Petrel.

The White-headed Petrel occurs in southern oceans; the nearest breeding stations to Sydney are the Bounty, Auckland and Antipodes Islands, south of New Zealand. (Mathews, 1916, p. 54) records a bird

taken at sea near Sydney, and there is a mounted specimen in the Australian Museum collected on Bondi Beach on January 1, 1922 (No. 0.27143, ♀, A.M.S.)). A third specimen is in the Macleay Museum; the following particulars appear on the label: "Richmond River. Blown inland during storms of 23-24 June, 1875".

Macronectes giganteus. Giant Petrel.

Several specimens of the Giant Petrel have been taken near Sydney. The bird, which is the size of an Albatross, is a scavenger; it also captures live birds. Some years ago a collector shot a Wandering Albatross off Sydney Heads; the wounded bird soared for about half a mile and then fell into the sea. Before it could be recovered a Giant Petrel swooped down and devoured most of the stricken bird. The same collector also obtained a white specimen on September 3, 1914 (Hull, 1916, p. 215). The form usually occurring off the New South Wales

White-headed Petrel (Aestrelata lessoni) Bondi Beach, coll. January 1, 1922.
Photo: K. A. Hindwood.

coast is dark brown; white birds inhabit, for the most part, the neighbourhood of the Antarctic ice. The nearest breeding places to New South Wales are on the sub-Antarctic Islands of New Zealand.

Daption capensis. Cape Petrel. Cape Pigeon.

The Cape Petrel is one of the commonest sea-birds in the Antarctic and sub-Antarctic regions, where it breeds. Occasionally birds are taken in sub-tropical seas. The first specimen to be taken on the New South Wales coast was that recorded by Hull (1911, p. 633):—

> At a meeting of the Linnean Society of New South Wales, held on 29th November, 1911, Mr. Basset Hull exhibited, on behalf of Mr. L. Harrison, a skin of the Cape Petrel (**Daption capensis**), which was captured alive at Turimetta Head, Narrabeen, on the 15th October, 1911. The bird was squatting on a ledge of rock above high-water mark, and, though apparently uninjured, seemed incapable of flying. It lived in captivity for nine days, on each of which it was placed in a large bath of water for a couple of

hours and fed upon morsels of fat. The fat was not taken solid but was macerated with the aid of its bill, and the water, with its floating film of fat, greedily taken up. After feeding for about an hour the bird would spend almost another hour in bathing and preening its feathers. This specimen is now in the National Museum, Melbourne. (No. 4881, ♂). A second specimen from New South Wales was collected at Shellharbour, some sixty miles south of Sydney in 1914 (skin No. 0.30242, ♂, A.M.S.).

PRIONS OR WHALE-BIRDS.

Prions are small bluish-grey Petrels with white underparts. The various species cannot be distinguished with any certainty at sea. The main differences are to be found in the bill characters, i.e., length in relation to width, the maxillary lamellae, the shape of the nail of the bill and the presence, or absence, of a distensible sac at the base of the lower mandible. The bill characters are considered so distinct that they have been used as the basis for generic distinctions.

As a group, Prions inhabit sub-Antarctic regions with a breeding range extending to southern New Zealand and South-eastern Australia. Birds occurring on our beaches are stragglers from the winter flocks that roam the southern seas. The species most frequently found near Sydney is the Fairy Prion, which breeds on Islands in Bass Strait, and elsewhere. Five species, one only recently considered as such, have been recorded from near Sydney. The characters of each breeding colony seem to be constant but, as yet, insufficient material from breeding stations does not admit of any very definite conclusions regarding many of the races or sub-species, a number of which have been named from storm-blown birds. The following records from beaches near Sydney are listed.

Pachyptila vittata. Broad-billed Prion.

Two mounted specimens in the Australian Museum (skin No. 0.13552, Long Bay, July, 1904; No. 0.13553, Maroubra, July, 1904) have the following remarks attached. "These birds were found strewn along the beaches in great numbers on July 8th and 10th, 1904".

P. gouldi. Medium-billed Prion.

This form was at one time considered a sub-species of the Broad-billed Prion, but Mathews (1937, p. 118) has recently indicated that it is a full species, at the same time admitting several sub-species. A specimen (skin No. 0.33939, ♂, Collaroy, July, 1935, A.M.S.) falls within this group.

Pseudoprion turtur. Fairy Prion.

The Fairy Prion is the species most constantly found on Sydney beaches. The nearest breeding localities are on Islands in Bass Strait.

Heteroprion belcheri. Thin-billed Prion.

A specimen referable to this species was collected on Maroubra Beach in August, 1908 (skin No. 0.16018, A.M.S.).

H. desolatus. Dove Prion.

There are two specimens of the Dove Prion in the Australian Museum collection (skin No. 0.32634, ♂, Cronulla, October, 1929; No. 0.34883, ♀, Collaroy, 21/5/1936).

Diomedea exulans. Wandering Albatross.

The Wandering Albatross is the largest and one of the most graceful of sea-birds in flight. Contrary to popular belief its wing-span seldom exceeds eleven feet; the weight of its body being about fifteen pounds. In very rough weather, Albatrosses of several species may be seen sheltering in Sydney Harbour. Some years ago a Wandering Albatross was killed when it collided with the chimney of Pointing's butcher shop at Paddington, near Sydney (skin No. 0.32821, ♂, 18/9/1930, A.M.S.). Another bird collided with a ferry-boat in the harbour (skin No. 0.26394, ♂, 6/9/1920, A.M.S.).

Diomedea chionoptera. Snowy Albatross.

Much has been written about the status of this bird. Some authorities (Murphy, 1936, p. 558) consider that the Snowy Albatross represents the final adult plumage phase of the male Wandering Albatross. The matter has been fully discussed, with references to pertinent literature, by Serventy (1935, p. 29). A specimen in the

Australian Museum, taken on Newport Beach in January, 1929, is in the **"chionoptera"** plumage (skin No. 0.32401, ♂, A.M.S.) which is distinguished mainly by having more white on the back and less black, or none at all, on the ends of the tail feathers.

Thalassarche melanophris. Black-browed Albatross, or Mollymawk.

Apparently this species is fairly common off the New South Wales coast; it is often seen in the harbour after stormy weather. The birds mentioned by Hull (1916, p. 215) as having yellow beaks and yellow eyes are no doubt referable to this species. A specimen recently collected off Broken Bay weighed seven pounds (skin No. 0.37510, ♀, 2/6/1940, A.M.S.). The nearest breeding locality to New South Wales is on Campbell Island, south of New Zealand.

T. chrysostoma. Grey-headed Albatross, or Mollymawk.

The only definite record of this species in New South Wales waters appears to be that of a specimen collected at Rose Bay, Sydney Harbour, in April, 1931 (skin No. 0.32885, juv., A.M.S.). The Grey-headed Albatross breeds on Islands in the sub-Antarctic region. The bird referred to by Hull (1916, p. 215) as having a grey head and neck is probably this species.

T. chlororhynchus. Yellow-nosed Albatross, or Mollymawk.

Hull remarks (1916, p. 215) that this species is to be classed as being the most common of the Albatrosses found on the coast of New South Wales, and that it would not be an exaggeration to state that they outnumber the other species by three to one. Several birds were noticed in Sydney Harbour during the first three weeks of August, 1927 (Kinghorn, 1928, p. 281). There are two specimens in the Australian Museum from Botany Bay (skin No. 0.3727, ♂, Botany Heads, ? date; and No. 0.33313, Botany, March, 1933). A third specimen is from near Broken Bay (skin No. 0.37511, ♀, A.M.S., 2/6/1940); the weight of this bird was four and a half pounds. The known breeding places of the typical species are Tristan da Cunha and Gough Island in the Atlantic, and St. Paul Island in the Indian Ocean. Mathews named the form occurring in eastern Australia **bassi**; if this is really a distinct sub-species a breeding place nearer than the above localities is suggested.

Diomedella cauta. White-capped Albatross. Shy Albatross, or Mollymawk.

This is the only Albatross breeding in Australian waters. It nests on Albatross Rock. N.W. Tasmania, and on the Mewstone off the south coast of Tasmania. Several skins in the Australian Museum were taken in Sydney Harbour or on nearby beaches. The specimen listed by North (1898, p. 115). as **Thalassogeron culminata** = **Thalassarche chrysostoma,** Grey-headed Albatross, is actually the White-capped Albatross(skin No. 0.8485, Bare Island, Botany Bay, 23/11/1895, A.M.S.).

TERNS.

Some of the Terns recorded from the Sydney area are not strictly pelagic in the sense that they habitually seek their food from the ocean. Even those species (excepting the Noddy Tern and the Sooty Tern, which are stragglers), that feed in the open sea off our coast are often found in harbours and estuaries. Two species, the Whiskered or Marsh-Tern, and the Gull-billed Tern, frequent marshes and lagoons both near the coast and inland; they are included in this list mainly for comparison with the other species.

Chlidonias leucopareia fluviatilis. Whiskered or Marsh-Tern.

A small graceful Tern which has only been recorded from near Sydney during the months of November, December and January. from the Botany Bay area. It can be recognised by its dark red bill. Apparently the birds seen near Sydney are migrants from inland breeding localities.

Gelochelidon nilotica. Gull-billed Tern.

A straggler to the New South Wales coast from the interior parts of New South Wales where it breeds. There is a specimen in the Australian Museum collected at Como, George's River, on May 19, 1917; it is in winter plumage (skin No. 0.30265, ♂).

Hydroprogne caspia strenua. Caspian Tern.

In the British Museum (Natural History) there is a specimen of

the Caspian Tern from Sydney Harbour (1896, p. 37). North (1913, p. 309) says of this species that "Like many other species once common in the neighbourhood of Sydney, the Caspian Tern no longer frequents Port Jackson, neither has a specimen obtained in the neighbourhood of the Metropolis come officially under my notice during a period of twenty-seven years".

Thalasseus bergii poliocercus. Crested Tern.

The commonest Tern found in Sydney Harbour and along the coast. Birds are to be seen throughout the year but are more numerous during the autumn and winter months. A large nesting colony, situated at the Five Islands off Port Kembla, has been described by Iredale (1928, p. 271). Another breeding area is on Montague Island.

Sterna striata. White-fronted Tern.

The White-fronted Tern is apparently a winter migrant to the Sydney area, probably from breeding stations on Islands off the Tas-

Immature Little Tern (Sternula albifrons) hiding, Cook's River, Botany Bay, January 20, 1940.
Photo: K. A. Hindwood.

manian coast. Hull states (1916, p. 216) that "This bird is only noted for two months of the year, July and August. It is always to be seen diving for its prey close to the rocks. During these months we estimate the total of this species within a range of 20 miles of Sydney would not be more than 150 birds". There are three specimens in the Australian Museum from near Sydney (skin No. 0.18512, ♂, Narrabeen, June, 1876; No. 0.11752, June 9, 1900, found dead in a paddock at Campbelltown some 30 miles south-west of Sydney, after a prolonged easterly gale; and No. 0.33011, ♀, Cronulla Beach, July, 1932). All three specimens are in winter plumage.

Sternula albifrons placens. Little Tern, White-shafted Ternlet, Black-lored Tern.

This is the smallest of the Terns inhabiting the New South Wales coast; it breeds on ocean beaches and on sand-spits in estuaries. Birds near Sydney appear to remain during the breeding season only, arriving in September or October and departing towards the end of February or in March. The only known breeding place in the Sydney area is

situated on a patch of shell strewn sand near the mouth of the Cook's River. Records for the Fairy Tern (**Sternula nereis**) for New South Wales should be taken as referring to the Little Tern. There is no definite evidence of the occurrence of the Fairy Tern along the New South Wales coast; it has a more southern distribution.

Onychoprion fuscatus. Sooty Tern.

The Sooty Tern breeds in large colonies on Islands in the western Pacific and elsewhere. It is an uncommon straggler to the coast of New South Wales, according to North (1898, p. 113), there were several specimens in the Australian Museum obtained in Sydney Harbour. Mathews (1912, p. 113) records and figures a specimen from Long Reef, Narrabeen, collected in May, 1892 A .bird in immature plumage was taken at Queenscliff, near Manly, on February 3, 1934 (skin No. 0.33589, ♀, A.M.S.). The day before this bird was collected Mr. Iredale, who was travelling to Sydney by ferry, heard the unmistakable "wide-awake" call of the species near Middle Head, but he did not see the bird. The nearest breeding locality to Sydney is at Lord Howe Island.

Procelsterna cerulea. Grey Noddy.

The only specimen of the Grey Noddy taken on the New South Wales coast was picked up on Manly Beach on December 24, 1928, as recorded by Iredale (1929, p. 290). Unfortunately the skin (No. 0.32299, A.M.S.) was "Destroyed as useless, 22/4/1936". This species occurs in various parts of the Pacific Ocean. The closest breeding locality to Sydney is at Lord Howe Island, 350 miles to the north-west.

Anous stolidus. Noddy Tern.

The Noddy Tern is widely distributed throughout tropical oceans, but is a rare straggler, probably from Lord Howe Island, to the New South Wales coast. North (1913, p. 337), records a bird taken in Sydney Harbour in April, 1890. This specimen (No. 0.3726, A.M.S.) was mounted and placed on exhibition in the Museum galleries. Later, in 1932, it was sent to the East Sydney Technical College. Such an interesting specimen deserved a better fate. A second record for the New South Wales coast is that of a bird captured on board the S.S. "Bombo", by Captain A. R. Bell, off Kiama, early in March, 1937 (skin No. 0.35536, ♀, A.M.S.). This specimen shows signs of immaturity in its plumage. Kiama is some 56 miles south of Sydney.

Bruchigavia novaehollandiae novaehollandiae. Silver Gull. Sea-Gull.

A common species, frequenting harbours and estuaries and often occurring in large numbers a few miles off the coast. Sea-gulls follow the school fish and apparently, on these occasions, feed on the "bits and pieces" left by the predatory fish attacking these shoals; the birds are largely scavengers. During stormy weather they shelter on lagoons or in paddocks, in thousands. A breeding colony, the closest to Sydney, is situated at the Five Islands, off Port Kembla. Another nesting place is on Montague Island, about 150 miles south of Sydney.

Gabianus pacificus pacificus. Pacific Gull.

It seems that the distribution of this species has changed considerably since North (1898, p. 113) wrote that it was "Common in all the bays and inlets, and along the coast. It may be frequently observed about Sydney Harbour, and on the Parramatta River. Locally known as 'Black-winged Gull', a name which applies only to the fully adult bird". Some eighteen years later, Hull (1916, p. 214) pointed out that some of the records of this species for Sydney Harbour were probably the result of the mistaken identificatio of the Black-browed Mollymawk. Further, he stated, "I have travelled daily from Manly to Sydney for a number of years and have never seen the Pacific Gull on the waters of Port Jackson, nor have I met with it during my numerous trips to the harbours and islands of our coast, from Montague Island to Coff's Harbour".

There are two specimens of the Pacific Gull in the Macleay Museum from Elizabeth Bay, Sydney Harbour; one is an adult male, the other a bird in immature plumage. In the Australian Museum collection there are four specimens from the Sydney area. The species must be considered a rare bird near Sydney. Messrs. Cox and Hamilton (1889, p. 422), recorded the species in large numbers at Beaudesert, near Mudgee, some 150 miles inland. This apparently sporadic occurrence happened about December, 1885.

Catharacta lonnbergi. Southern or Dark Skua.

According to Hull (1916, p. 216) the Southern Skua occurs off the New South Wales coast from May to August. They are known to fishermen as "Sea-hens" or "Sea-hawks". Unlike the other Skuas which obtain their food by harassing other sea-birds, until their victims disgorge their catch, which the Skuas adroitly catch before it falls into the sea, Souther Skuas are largely scavengers. On their breeding grounds they capture large numbers of small Petrels and also feed on carrion; they are very fond of eggs. The closest breeding locality to New South Wales is situated on the southern parts of the south Island of New Zealand, and on Islands to the south. The following specimen is listed (skin No. 0.1005, Sydney Heads, August, 1887, A.M.S.).

Stercorarius parasiticus. Arctic or Parasitic Skua.

The Arctic Skua appears off the New South Wales coast about September or October and leaves again for its breeding grounds in the Arctic and sub-Arctic zones, in February or March. Hull records (1916, p. 216) on the authority of S. E. Rohu, that there would be at this season about twenty of these birds within a twenty miles radius of Sydney. Mathews lists a specimen from Broken Bay, collected on November 11, 1913 (1917, p. 74).

Coprotheres pomarinus. Pomarine Skua.

This species visits the southern oceans during the northern winter; it breeds in northern Siberia and other places along the Arctic circle. The following specimens taken near Sydney, are listed:—Skin No. A.10089, Bondi Beach, April, 1881; No. 035532, ♂, Maroubra Beach, March, 1937, A.M.S., and a specimen from Broken Bay, collected on December 3, 1913 (Mathews, 1917, p. 73).

Demigretta sacra. Reef-Heron.

Usually a bird of solitary habits, frequenting the rocky coastline and securing its food from the flat rock-surfaces exposed by the receding tide. Occasionally birds may be seen in estuaries. Some years ago, December 26, 1931, I was standing on the northern headland of Marley Beach, National Park, shortly after dawn, when approximately twenty-six Reef-Herons were seen flying in a compact flock towards the beach. They circled once, were joined by five more birds, and then departed northwards. The dark slate-grey phase only is found close to Sydney, though the white form is mainly found in more northern parts. The species probably breeds on suitable ledges in the cliffs near Sydney, though I am not aware of any actual breeding records.

Chenopis atrata. Black Swan.

Sometimes seen at sea, but for the most part frequenting the coastal lagoons, and suitable localities inland. Hull (1916, p. 213) noticed large numbers at sea off Tebowrie Head, South Coast, in December, 1915. The Black Swan nests on lagoons and swamps in the Sydney district, mostly during the autumn and winter months.

CORMORANTS.

In New South Wales, Cormorants are more often observed in estuaries and on lagoons and swamps, both near the coast and inland, than along the rocky coastline and islets lying off the coast. Four species have been recorded from the Sydney area; these are:—

Phalacrocorax carbo novaehollandiae. Black Cormorant.

Uncommon.

Mesocarbo sulcirostris.* Little Black Cormorant.

Fairly common.

Hypoleucus varius. Pied Cormorant.

Not commonly observed. North (1911, p. 331) states that this species is an irregular visitor to eastern New South Wales. It occurred in large numbers in the neighbourhood of Sydney from July to October, 1892. The notes on **Phalacrocorax gouldi** = **H. fuscescens** given by Hull (1916, p. 216) refer to **varius.**

*Refer Serventy D.L. "**The Emu**", Vol. xxxviii, 1939, p. 357.

Microcarbo melanoleucus melanoleucus. Little Pied Cormorant.

Quite common near Sydney; frequents bays, estuaries and lagoons, and occasionally seen on the coast. Several pairs nested in trees on a small Islet in one of the Lagoons of Centennial Park, Sydney, during January, 1934. I am not aware of any breeding records, for the other three species, from the Sydney area.

Sulita serrator serrator. Gannet.

A species frequently observed off the coast and sometimes seen in harbours and bays. Gannets live on fish and often plunge into the water from a height of fifty feet or more to secure their prey. A system of sub-cutaneous air-cells, covering almost the whole of the body, has apparently been evolved to withstand the shock sustained when the bird strikes the water. Cat Island, in the Furneaux Group, Bass Strait, is the principal breeding locality in S.E. Australia. A nesting colony is also situated on the Lawrence Rocks, off Portland, southern Victoria.

Leptophaethon lepturus. White-tailed Tropic-bird.

Apparently a rare straggler to the New South Wales coast. The first record is that of a bird, in immature plumage, picked up in a dying condition on the shores of Botany Bay on February 3, 1898. The remains of a second specimen were recovered on Murramurang Beach, near Brush Island, South Coast, on February 2, 1938, and a bird was seen flying over Neutral Bay, a suburb of Sydney, on February 3, 1939, by Norman Chaffer (1939, p. 32). Details of the above specimens, with notes on the distribution of the species, and other remarks, have recently been summarised by Hindwood (1938, p. 12).

Cuncuma leucogaster leucogaster. White-bellied Sea-Eagle.

Several pairs of these handsome birds frequent the coastline within fifty miles of Sydney. They generally nest in tall trees in secluded gullies and, if undisturbed, will return to the same locality each year to breed. They are often seen at sea in search of fish which they seize in their talons.

Pandion haliaetus cristatus. Osprey.

North (1898, p. 90) states that this species is rare near Sydney, and that a few pairs frequent the inlets of the Hawkesbury River, and occasionally Port Hacking. Its habits are similar to those of the White-bellied Sea-Eagle. I know of no recent record of the occurrence of this bird near Sydney, nor have I personally seen it in that locality.

RECORDS REQUIRING CONFIRMATION; AND SPECIES WRONGLY RECORDED.

Puffinus assimilis. Little Shearwater.

Supposed occurrences of this species near Sydney have been proved to refer to the Fluttering Shearwater (**Reinholdia reinholdi**). There is a close superficial resemblance between the two species. The nearest breeding locality of the Little Shearwater to Sydney is at Lord Howe Island. Occasional storm-blown birds may be expected to occur on our beaches.

Thalassoica antarctica. Antarctic Petrel.

Iredale records (1930, p. 113) the skull and sternum of a bird taken near Sydney which is probably of this species. The Antarctic Petrel has not yet been definitely recorded from the New South Wales coast.

Cookilaria leucoptera. White-winged Petrel.

The White-winged Petrel breeds on Cabbage-Tree Island, off Port Stephens. Hull, on the authority of S. E. Rohu, remarks (1916, p. 214) that only two of these birds were noted off Sydney Heads. Some years ago, Mr. Iredale found the decomposed remains of a bird of this species on Manly Beach. Odd storm-blown birds may be expected near Sydney.

Diomedea epomophora. Royal Albatross.

The specimen noted by Hull (1916, p. 215) as this species is actually referable to the Snowy Albatross and is the basis of the sub-species **rohui** of Mathews (1931, p. 66). The Royal Albatross breeds in New Zealand (Taiaroa Head, Otago Harbour), and elsewhere, but has not yet been taken in Australian waters.

Sternula nereis. Fairy Tern.

This species is not known from the New South Wales coast. Supposed occurrences, which have recently been discussed by Sharland (1938, p. 1) undoubtedly refer to the Little Tern (**S. albifrons**). The Fairy Tern occurs in the more southern parts of Australia.

Stercorarius longicaudus. Long-tailed Skua.

There is no authentic record of this species for Australia. Mr. Iredale tells me that he once saw it in Sydney Harbour. It breeds in the Arctic zone and normally migrates to the Northern Pacific and Atlantic Oceans.

Hypoleucus fuscescens. White-breasted Cormorant.

The notes on this species appearing in "The Emu" (1916, p. 216) under the name **Phalacrocorax gouldi** = **Hypoleucus fuscescens** should be taken as referring to the Pied Cormorant (**H. varius**). There is no authentic record of the White-breasted Cormorant occurring in New South Wales. It appears to have a more southern distribution, being found in Tasmania and along the southern coast of Australia.

Frigate-bird (?) species.

Mr. Iredale informs me that towards the end of 1932 he saw a Frigate-bird in Sydney Harbour, but could not identify the species. Both the Greater and the Lesser Frigate-birds have been recorded as stragglers to New Zealand (Oliver, 1930, p. 171), so that storm-blown birds might occur near Sydney occasionally.

The following record is of interest, indicating, as it does, the possibility of the occurrence of a species hitherto unrecorded from Australian waters. In 1878 a specimen of the White Tern (**Leucanous albus**), was shot between Port Jackson (Sydney Harbour) and Lord Howe Island (skin No. 0.18521, A.M.S.). The exact position is not recorded. The White Tern breeds on Norfolk Island and elsewhere in the Pacific.

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The following localities, between Broken Bay and Port Jackson, from north to south, do not appear on the accompanying map, i.e., Newport Beach, Warriewood Beach, Narrabeen Beach, Collaroy Beach, and Manly.

My sincere thanks are accorded to Mr. Tom Iredale, to the Authorities of the Australian Museum, Sydney, and to Mr. A. E. Salter, Curator of the Macleay Museum, University of Sydney, for many courtesies during the preparation of these notes.

Sea-Gulls (Bruchigavia novaehollandiae) in flight.

Photo: K. A. Hindwood.

ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.

OFFICERS FOR 1940-41.

At a meeting of Council, held on 31st July, 1940, the following officers were elected:—

President: Gilbert P. Whitley, F.R.Z.S.

Vice-Presidents: Keith A. Hindwood, C.F.A.O.U., F.R.Z.S., A. F. Basset Hull, M.B.E., F.R.Z.S., Albert Littlejohn, and Noel L. Roberts.

Honorary Secretary: Tom Iredale, F.R.Z.S.

Honorary Treasurer: Phillip Shipway.

Honorary Librarians: Keith A. Hindwood and Michael S. R. Sharland.

Honorary Assistant Secretary: Miss Betty French.

Honorary Auditor: R. J. Stiffe, A.C.A. (Aust.).

REPORTS OF SECTIONS.

AVICULTURAL SECTION.

Annual Report.

It is with pleasure that we are able to report undiminished enthusiasm among the members of the Avicultural Section during the year ending June, 1940. There have been good attendances at all meetings, and the lecturers, one and all, have given valuable and delightful information.

These gentlemen who give so willingly of their knowledge and time, render the members under a deep obligation, more so as they make themselves available time after time. I feel that special mention must be made to the efforts of Dr. Marshall, and Mr. Frank Buckle, who, by showing to the members their beautiful technicolour films of various birds and aviaries, have definitely proved that true Aviculture is a science which eventually will have tremendous economic benefit to mankind.

During the year, the aviaries of several members, and other Aviculturists, were visited by members of the Section. The benefit of this method of studying birds is great, because of the fact that the owners are often able to give information that is overlooked in ordinary discussions. The Section also had the pleasure of a visit by Mr. Murray, of Melbourne, and Mr. Phillips, of Adelaide. These visits, too, are productive of great benefit in the distribution of knowledge.

Several members have expressed the opinion that Aviary Notes taken at each Meeting, and entered in the Minute Book, should be recorded, and distributed to those interested. It is to be hoped that some such arrangement can be made in the near future, as such information which would be of great use, and interest to many people now outside the Society, tends to become more or less obscured in the Minute Book.

Of course the present great conflict going on in the world will probably affect to a great extent the work of Aviculturists in all parts, but there are men, and women, too, who will carry on, under the greatest difficulties, in this, the most interesting, and certainly one of the most ancient of all the hobbies of mankind.

JOHN D. WHALING,
Hon. Secretary.

A. H. BRAIN,
Chairman.

BUDGERIGAR SECTION.

Annual Report, 1939-40.

The Annual Meeting of 1940 of the Budgerigar Section of the Royal Zoological Society brings to a conclusion a very successful and happy year for members of this Section.

The attendances at the Monthly Meetings throughout the year were most satisfactory, and the average attendance was well maintained.

Table Shows conducted throughout the year were a source of considerable interest—the competitive spirit being very keen. The respective wins of competitors were as follows:—Mr. S. Maher, 4 wins; Mr. P. Harvey, 2 wins; Mr. H. Yardley, 2 wins; Mr. M. F. Brennan, 1 win.

The Amateur Judging Competition was again conducted throughout the series. The points in this competition are not to hand for inclusion in this report.

Evidence of the influence of this Section in the improvement and exhibition of the Budgerigar was reflected during the 1939 Showing Season, members of this Section winning the major and most coveted trophies. The A.B.C. Cup, donated by the Australian Budgerigar Council, and competed for at the Hornsby C. & C.B.S. Show, was won by Mr. H. Yardley. The first trophy in the N.S.W. State Council's Young Bird Competition, conducted over nine affiliated societies, was won by Mr. S. Maher. The most beautiful and also most desired of all the Budgerigar trophies—The Sydney Mail Trophy—was won by Mr. R. B. Browne.

This is undoubtedly a very fine achievement for any Society, and congratulations are heartily extended to these fortunate exhibitors.

After a lapse of years, this Section again saw fit to stage a Budgerigar Exhibition. Mr. and Mrs. Hubert Fairfax generously placed at the disposal of the Section their grounds at "Elaine", Edgecliff, for the staging of the Fourth Lawn Show, which was the most successful of any Shows held by the Section to date. The weather on the day of the Show was against a successful effort. Despite this, the entries were a record, and would have been considerably more had the weather been more suitable for the transport of birds.

Mr. and Mrs. Fairfax provided afternoon tea for a large number of exhibitors and visitors, and were suitably thanked for their interest and generosity. Mrs. Fairfax, in her reply, thanked all for their interest in making the Show a success, and again invited the Section to avail themselves of her grounds next year.

On behalf of the Section, I wish to place on record our appreciation of the interest of Mr. and Mrs. H. Fairfax in our activities.

Officers for 1940-41:—President: R. J. Murray. Vice-Chairmen: J. M. J. Marshall and S. Maher. Hon. Secretary: M. F. Brennan. Show Secretary: J. W. Palmer. Committee: R. B. Browne, Mrs. R. B. Browne, McDonald, P. Harvey. Delegates to N.S.W. State Council: R. J. Murray and L. R. Marshall. Delegate to Cage Birds' Federation: R. J. Murray.

M. F. BRENNAN, Hon. Secretary.

GENERAL ZOOLOGY SECTION.

Annual Report, 1939-40.

Last September, at the suggestion of several members of the Society, it was decided to form a new Section under the name of "The General Zoology Section". In its scope, this Section includes the broader aspects of the subject, and also those which are not covered by the other Sections. It is hoped to encourage the interest of undergraduates as potential active ordinary members of the Society.

During the session lectures have been given on the following subjects:—

"Snakes and Snake Venom."—J. R. Kinghorn.
"The Simpson Desert Expedition."—H. O. Fletcher.
"Mosquito Ecology."—A. R. Woodhill.
"Heredity in Man and Animals."—Dr. Kate Pariser.

Symposia have also been held on "Evolution" and "The Origin and Distribution of the Eastern Australian Fauna". It is hoped in future sessions to organise further symposia, discussions and debates on interesting topics.

MELBOURNE WARD, Chairman.
I. M. THOMAS, Hon. Secretary.

MARINE ZOOLOGICAL SECTION.

Fourteenth Annual Report.

Attendance at meetings throughout the year has varied from 13 to 30, the average being 21, which is an advance of 4 over last year's average.

Two field excursions were held—the first to Bottle and Glass rocks on the 16th September, 1939. Not much of outstanding interest was found, but the collecting there was on the whole better than it had been for some time. The second, to Long Reef, had a greater attendance of 20.

A number of instructive lectures have been given as follows:—

1939—

July 3.—"Productivity of the Sea."—By A. C. Simpson.
August 8.—"Problems of the Hake Fisheries."—By I. M. Thomas, M.Sc.
September 4.—"A Naturalist on H.M.A.S. "Moresby."—By Mel. Ward.
October 3.—"Preliminary Survey of Marine Ecology of Long Reef."—By Elizabeth Pope, B.Sc.
November 6.—"Crustacea in Relation to Man."—By A. N. Colefax, B.Sc.

1940—

February 5.—"The Shape of Shells."—By C. F. Laseron.
March 4.—"Travels in Westralia."—By G. P. Whitley.
April 1.—"Variations in the Life History of an Organism."—By Miss V. May, B.Sc.
May 6.—"A Port Jackson Shark."—By A. Jacobs.
June 3.—"Sharks."—By G. P. Whitley.

The most outstanding activity of the Section during the year was the holding of an exhibition of marine life at the Art Gallery, Manly, which was visited by 7,000 persons. It was an excellent display.

The organisation of this was in the hands of Mr. G. P. Whitley. The chief contributors were:—

M. Ward.—Great Barrier Reef Corals, Echinoderms, Beche de mer, Turtles, Lobsters, Crabs, Seastars, Models of Lion, and Lindeman Islands, Clams, etc.

H. S. Mort.—Edible and Foreign Shells.
H. Bernhard.—3,000 Shells—some of fair size.
Miss V. May.—Seaweeds.
Miss J. Allan.—Model of Continental Shelf and Fisheries.
C. F. and J. Laseron.—Sydney Shells.

Australian Museum.—Albatross, Mutton Birds, etc., together with the loan of all the glass cases used in the Exhibition.

Messrs. C. F. and J. Laseron were recommended for a diploma for their achievement in collecting and studying the ecology of minute mollusca in the Sydney district during the last 8 years.

Two members of the Section, Miss A. Vance and Mr. W. E. Smythe, were elected to the Committee to take care of the Society's Cabin at Waterfall.

In conclusion, the officers of the Section wish to express their

thanks to all those who have helped by giving lectures, bringing exhibits and general co-operation.

G. P. WHITLEY,
Chairman.

W. E. SMYTHE,
Hon. Secretary.

ORNITHOLOGICAL SECTION.

Annual Report, 1939-40.

This review of the year's activities contains very little of outstanding interest; the affairs of the Section having moved placidly and according to the arrangements made earlier in the year for lectures and meetings.

Two field days were arranged, and the members attending the outings had an enjoyable and profitable time. Most of the Section's work was confined to meetings and discussions, but individual members continued their work in the field, and no doubt we will hear from them later, when notes have been enlarged upon and all facts and observations collated.

One of our members, Mr. A. Keast, organised a trip to Lion Island, Broken Bay, and those who went along spent an interesting day amongst the birds of the island. We are all grateful to Mr. Keast, who on his own initiative planned the trip and arranged for transport, thus giving our members a chance of exploring a spot rarely visited by bird lovers.

Attendance at Meetings during the year compares favourably with that of past years—an average of 31 being maintained.

The lectures listed below were delivered during the year, and all were of absorbing interest, each covering some phase of natural history. Particular mention must be made of those lectures dealing with the subject of bird life, these lectures being of exceptional interest and delivered by men who are thoroughly acquainted with their subject:—

1939—

July.—K. A. Hindwood: "The Sea Birds of Lord Howe Island."
August.—General discussion of paper, "Cosmopolitan Birds."—By M. S. R. Sharland.
September.—A. J. Tubb: "Banks Island Group, Spencer Gulf, S.A."
October.—J. R. Kinghorn: "In Search of Museums."
November.—Reports on trips made:—J. E. Roberts: Gould League Camp, MacPherson Ranges; M. S. R. Sharland: The Upper Clarence Trip; Messrs. Chaffer, Hindwood and Moore: R.A.O.U. Camp Out, Murrumbidgee River.
December.—Films screened by Messrs. McCoy ("Taronga Park"); Phillips ("Trip through Tasmania"); Stubbs ("Butcher Bird at Home"); and J. E. Roberts ("McPherson Ranges").

1940—

January.—T. Iredale: "Hawks."
February.—N. L. Roberts: "Fraser Island, North Queensland."
March.—J. R. Kinghorn: "Problems of Economic Ornithology."
April.—General Discussion.
May.—Chairman's Address: M. S. R. Sharland: "What I See in Birds."
June.—Gregory M. Mathews: "The Preparation of 'The Birds of Australia.'"

This Section has been fortunate in adding to its membership Dr. D. L. Serventy and Mr. A. J. Tubb, both from other States, keen and eager for pastures new. To date, Mr. Tubb has spoken to the members of the McCoy Society's Survey of the Banks Island Group, Spencer Gulf, while Dr. Serventy has promised to lecture during the coming year on a group of birds that have held his interest for a number of years.

While writing of personalities, it is most opportune to record the visit to this country of the foremost Australian ornithologist, Mr. Gregory M. Mathews, C.B.E. Our visitor needs no introduction to those interested in ornithology, as his work over many years has resulted in

orderliness in the systematic classification of our birds and the clearing up of many obscure and doubtful points.

Owing to the generosity of Mr. Mathews, Australia has been enriched with an ornithological library, an action greatly appreciated and one for which all Australians will be forever grateful.

This year was heralded by the election of Mr. K. A. Hindwood, one of our most active members, to the Presidency of the Society, and to this indefatigable worker a Fellowship was awarded for the work done in past years.

It is gratifying to record that throughout the year the contributions to the "Emu" by members of this Section of the Society were well to the fore, and, as in the past, the articles reveal the keenness and capacity of our members. At this stage, members will be pleased to learn that Mr. Hindwood's paper, "The Birds of Lord Howe Island", has appeared as a special part of the "Emu".

No doubt the outbreak of War has been responsible for the dearth of extensive field trips by individual members, and it is hoped that before long all can resume their every day life with that peace of mind that is necessary for clear thinking and a happy continuance of each one's particular study.

In concluding this report, we desire to thank all of our members and friends who assisted during the year with lectures, specimens, films, and other equipment.

M. S. R. SHARLAND,
Chairman.

T. A. EVERITT,
Hon. Secretary.

SYLLABUS OF SECTIONAL MEETINGS, 1940-41.

Note: When the scheduled date for a meeting falls on a Public Holiday, the meeting is held on the next convenient date.

AVICULTURAL SECTION (Second Monday in the Month).

1940—

July 8.—Members' Night.
August 12.—"Some Birds of Central Australia."—By Roy Cooper.
September 9.—Lecturette.—By A. N. Colefax, B.Sc.
October 14.—Lecturette.—By Frank Buckle.
November 11.—Members' Night.
December 9.—"Birds of New Guinea."—By Charles Camp.

1941—

January 13.—"With the Lyre Birds."—By C. Price-Conigrave.
February 10.—"Taronga Park in Film."—By R. A. Patten.
March 10.—"Acclimatisation of Introduced Birds."—By J. R. Kinghorn, C.M.Z.S.
April 18 (Wednesday).—Lecturette by Professor Priestley. (2nd Monday is Easter Monday.)
May 12.—Lecturette.—By Tom Iredale, F.R.Z.S.
June 9.—Annual Meeting.

BUDGERIGAR SECTION (Third Tuesday in the Month).

1940—

July 16.—Table Show. Type only. Any variety.
August 20.—Table Show. Green. Any variety.
September 17.—Table Show. Blue. Any variety.
October 15.—Table Show. Grey-wing Blue. Any variety. Normal and 50 per cent. body colour.
November 19.—Table Show. Young birds. Rung or unrung.
December 17.—Members' Night.

1941—

January 21.—Table Show. Clear-wing. Any variety.
February 18.—Table Show. Young birds. Ringed, 1940.
March 18.—Table Show. Self-coloured varieties, to include Lutino and Albino.
April 15.—Table Show. Cinnamon-wing varieties.
May 20.—Table Show. Any variety not provided for in Standard of Perfection.
June 17.—Annual Meeting. Table Show. Grey-wing green. Any variety. Normal and 50 per cent. body colour.

GENERAL ZOOLOGY SECTION (Third Monday in the Month).

1940—
July 15.
August 19.
September 16.
October 21.
November 18.
December 16.
1941—
January 20.
February 17.
March 17.
April 21.
May 19.
June 18.—Wednesday.

} Subjects and lecturers to be selected.

MARINE ZOOLOGICAL SECTION (First Monday in the Month).

1940—
July 1.—Exhibition Night.
August 5.—"Body Fluids of Fishes."—By K. Cleland.
September 2.—"Collecting on the South Coast."—By Mel. Ward.
October 8 (Tues.)
November 4.
December 2.
1941—
February 3.
March 3.

} Subjects and lectures to be arranged.

April 7.—"Life in the Depths of the Ocean."—By J. M. Thomas, M.Sc.
May 5.—"Arctic and Antarctic Plankton."—By A. N. Colefax, B.Sc.
June 2.—Annual Meeting. Chairman's Address—by Mel. Ward.

ORNITHOLOGICAL SECTION (Third Friday in the Month).

1940—
July 19.—"Sea Birds."—By Tom Iredale and K. A. Hindwood.
August 16.—"Waders."—By Tom Iredale, F.R.Z.S.
September 20.—General Discussion.
October 18.—"A Neglected Birdman."—By D. Leithhead.
November 15.—Lecturette.—By J. R. Kinghorn, C.M.Z.S.
December 20.—General Discussion.

1941—
January 17.—"Waders and Shore Birds."—By Dr. D. L. Serventy.
February 21.—"The Simpson Desert."—By H. O. Fletcher.
March 21.—"Colour Changes."—By Roy Cooper.
April 18.—General Discussion.
May 16.—"Bird Watching."—By Noel L. Roberts.
June 20.—Annual Meeting. Chairman's Address: "Habits of Birds in Relation to Structure".—By P. A. Gilbert.

THE WORK OF GREGORY MATHEWS, ORNITHOLOGIST.

By Tom Iredale.

It seems best to recognise the visit of this world-famed Australian ornithologist to his native land with a short summary of his life work. Especially as his visit is to hand over to the Commonwealth of Australia —for the use of present and future Australian ornithologists—his immense library of works on birds, including every book with any reference of importance to the study of Australian bird-life.

When a lad at school in this State and afterwards on the land in Queensland, Gregory Mathews was interested in bird life, and at a comparatively early age in manhood the opportunity came for him to issue a series of coloured illustrations of Australian birds. In England he went to the British Museum (Natural History), and there met Dr. Bowdler Sharpe, in charge of the Department of Birds. Dr. Sharpe was the greatest ornithologist of his day and one of the best of any time, having been born with a love of birds, and blessed with a wealth of enthusiasm, as well as ability. Dr. Sharpe took charge of the young Australian and enthusiastically commended his aim and offered to assist him in every way, urging him to prepare first a down-to-date list of the birds, there being no such guide in existence. This was a laborious task as though the young man knew birds he did not know much about their classification. Not daunted by his ignorance, Mathews set to work with dogged Australian pride to master this new problem. Dr. Sharpe assisted him and, in 1908, he had prepared the first of his many Lists, the Handlist issued under the auspices of the Australian Ornithologists' Union. While preparing the Handlist he had discovered really how little, instead of how much, was known about the life histories and distribution of Australian birds. There was only one remedy: a systematic investigation of the bird life by means of new collections, correspondence, and study of literature. He organised collectors, circulated requests for field notes to all the working ornithologists in Australia, and secured all the books bearing upon his study.

The latter part of his task was as difficult as any other as, while many books may be procured for money, there are many others very difficult to secure, although their apparent intrinsic value may be little. The library now at Canberra has taken nearly forty years to build up, and contains many volumes that may not occur in the market in the next forty years. Mathews' aim was to have at his hand every book bearing upon the subject so that any disputable point could be settled instantaneously. Collections coming in had to be determined and allotted to their place and correspondence carefully listed so that the life history of every bird was quickly available.

The preliminaries having been brought into place, Mathews began his herculean task with a time-table of twenty years' work ahead of him. For many years Mathews worked up to sixteen hours a day, only possible through the work being a labour of love. Unexpectedly, before the completion of his first volume, his mentor, Dr. Sharpe, died, and Mathews had to continue single-handed. Soon after, it was my good fortune to become associated with Mathews, and I assisted him in the continuation of his gigantic work. It may be here stated that the Birds of Australia is printed in large quarto size and runs into twelve volumes, averaging nearly 500 pages each, a total of nearly 6,000 pages and nearly six hundred colcured plates. In addition, a Check List and a Biblography were added, and then the Birds of Lord Howe and Norfolk Islands, and a final Supplement, making a total of about 7,000 pages.

During the preparation of this work, Mathews got together a huge collection of birds and examined all the other important collections in Europe and America, as well as those in Australia, in private hands as well as those in Museums. It is well known that figures impress more than words, so it may be recorded that Mathews has examined over 100,000 bird skins from Australia, and be it remembered that most of these were examined, not once or twice, but twenty and more times. It was his custom whenever a collection came in to examine the specimens in conjunction with the series already in hand, and then

GREGORY M. MATHEWS, 1940.
Photograph by Keith A. Hindwood.

with those in the British Museum and at the Rothschild Museum, Tring, so that errors were reduced to the absolute minimum as far as personal ability could permit.

In touch personally and by correspondence with all the leading ornithologists of the world, every debatable question was freely discussed and only the truth was desired. It was the elimination of personal prejudice that caused more disputes than any other, and, strange to relate, after thirty years of increased knowledge personal prejudice has cropped up again in a recent publication. How it was annulled in Britain can be seen in the fact that Mathews was elected as a member of a Committee formed to settle matters of dispute in

connection with British birds. The young Australian had mastered his subject so thoroughly that he was given place among the law-givers of the most conservative British Ornithologists' Union, the first and probably the only Australian to receive such an unexampled honour. When the British and American Ornithologists' Unions decided to issue a Systema Avium, that should be authoritative throughout the world, Mathews was elected to represent Australia and due to his unexampled enthusiasm his volume was the first to be issued. The MS of the Systema Avium was submitted to the leading ornithologists of Europe, America, Asia, Africa and Australia, and the comments discussed, and then the printed copy again resubmitted before publication. Recently some workers, ignorant of these conditions, have suggested that this work was merely a personal opinion given by Mathews.

Having now finished his work, prepared for the ornithologists of Australia as a reliable working basis, Mathews has crowned his life work by the gift of the Library, whereby all his statements can be checked by future Australians. As to the extent of the collections worked upon, Mathews gave a list at his talk to the Ornithological Section, and it was almost terrifying. It read like a chapter in "Numbers", Rogers in North-west Australia, Tunney in South-west Australia, Dahl in Northern Territory, Kemp and Meek in North Queensland, McLennan in North Queensland and Northern Territory, and so on and so on, it would take a page merely to write the names down. Suffice to say that every portion of every State in Australia was represented. It should be unnecessary to point out that in the preparation of the Birds of Australia there was no opportunity for easy work. When a bird was to be dealt with, the whole family had to be examined very thoroughly, so that the plumage changes could be understood. Then a fine male, a fine female and a young one had to be selected for description, and then this series had to be figured. While the illustration was being prepared the variations in the series had to be criticised to find out whether they were due to age, season or geographical distribution. In the last-mentioned case, the names had all to be scrutinised to see if any supposed synonym were available and, if none, a new name had to be proposed. As Mathews was the pioneer in the study of subspecies of Australian birds discussions have arisen, but all workers to-day recognise the great value of his work, and in the future it will be even better understood.

Mathews, like many Australians, is most modest about the quality he might boast of, and in his talk everyone noted how he gave all the credit to his helpers, omitting all mention of his own great enthusiasm that fired all the helpers to do their best. He suggested that Sharpe was responsible for his success, but the man himself has surely showed that he owes little to anyone, and as this is not an obituary notice, I may be allowed to conclude with, "Long live Gregory Mathews!", with the sure knowledge that when it becomes his time to pass on he will rest happy in the assurance that he will continue to live by his works always in the memory of present and future Australians.

NATIONAL PARK CABIN.

A committee, representatives of different Sections, has been appointed to control the Society's Cabin in National Park and to stimulate interest in its function as a zoological research station. At the first meeting of the Committee, in June, Mr. D. Leithhead was elected chairman, and Mr. M. S. R. Sharland, secretary. The secretary reported that hitherto the Ornithological Section had exercised nominal control over the Cabin on behalf of the Society, and his object in convening the Committee was to widen the scope of this control by inviting representatives of other Sections to share the responsibility, and at the same time to arouse more interest among members in maintaining the Cabin in good condition. Some much needed repairs have since been carried out. There is, however, still much to do, and the Committee is hopeful that it will have the help of the National Park Trust in this matter. The Cabin has again proved popular during the last year, chiefly among bird-observers, who have used it as their headquarters in field studies.

NOTES ON CERTAIN LIZARDS.

By G. Longley.

Further notes on the Pink Tongued Skinks (**Hemisphaeriodon gerrardii**).

The young Pink Tongued Skinks which were born on December 27th, 1937, had been placed in a glass-covered vivarium in the garden. During the hot weather one of the glass panes was removed, and one containing finely perforated zinc substituted, and also the greater portion of the glass in the other panes was screened from the direct rays of the sun. The whole brood of seventeen was well and intact until the winter of 1939, when one succumbed to the cold. Another died from some unknown cause on 11/11/1939. During the ensuing summer I sent two pairs to Taronga Park Zoo, and also gave a pair to Mr. W. Turner, of Sydney. The rest of the brood are at present hibernating, and as far as I know quite healthy.

Sunday, 31st December, 1939.—I found a newly-born **H. gerrardii** dead in the water-trough in the glass vivarium. This young one had part of the yolk attached. I also discovered ten other young ones alive. Several were weak and undersized. These young ones were all placed in a small glass-covered vivarium, and fed upon chopped snails. However, six of the weaklings died, but the remaining five made progress.

January 14th, 1940.—Looking into the glass vivarium, I found five more very healthy young Skinks, one of which had shed its tail, but all the rest were perfect specimens, and very lively. These were duly placed in the small vivarium with the other five young ones, which were born December 31st, 1939.

Those born on 31/12/1939 were the broods of two females born in my vivarium December 27th, 1937, and those born January 14th, 1940, were a brood of a third female, also born December 27th, 1937.

The eleven young which survived are well and thriving. Some have grown to eleven inches in length, the shortest perfect specimen being eight inches. The tail-less one has grown a new caudal appendage, but shorter than the original. The change in colour of mouth and tongue, etc., is the same as previously described, so those details need not be repeated. As before, some of the same brood grow more rapidly than others. Sloughing is also very frequent, as these Skinks have been under artificial heat since the 6th April, 1940.

A record of temperatures kept throughout the colder months shows the lowest readings to be:—

June 23rd, 1939.—7.45 a.m., 41°F.
June 10th, 1940.—8 a.m., 40°F.
June 11th, 1940.—8.30 a.m., 40°F.

The thermometer is hung about 6 inches off the ground in the glass vivarium.

The Leaf-tailed Gecko (**Gymnodactylus spyrurus**).

A Leaf-tailed Gecko came into my possession on November 10th, 1939. It had arrived as a stowaway in a log from the far North Coast. This lizard was 8½ inches long, the upper surface being a beautiful mixture of brown and grey, which colours sometimes change to a misty green, due to the action of light or emotion, or both. The limbs are long, as are also the digits, which are armed with extremely sharp claws. The tail is very broad and tapers to a moderately fine point. The eyes are prominent, pupil elliptical and the iris green. The gape of the jaws is very wide and the neck narrow. The ventral surface is cream. In captivity the food consists of moths, smooth caterpillars,

isopods (slaters), also the native wingless cockroach (**Panesthia laevicollis**), and I was surprised to see the Gecko eat the flying cockroach (**Blatta americana**). All food is swallowed whole. Certain insects, however, it refused to touch—one of which is the vine moth (**Agarista glycinea**). This was rejected, both in larval and imago forms. Other brightly coloured moths were also refused.

This Gecko shares with most others the peculiar habit of being able to lick its eyes. It also licks the undersurfaces of its hind limbs

The Leaf-tailed Gecko (Gymnodactylus spyurus). Viewed from above.

From photograph by Miss Ella McFadyen.

and tail in a very cat-like manner. It laps water with the tongue in the same way as a number of other lizards.

When seizing its prey this Gecko leaps forward with great rapidity in such a manner as to resemble the "strike" of certain snakes.

The photograph is kindly lent by Miss E. McFadyen.

Leaf-tailed Gecko. Side-view.

From photograph by Miss Ella McFadyen.

The Broad-tailed Gecko (**Gymnodactylus platurus**).

I have at present three Broad-tailed Geckos. The first arrived on December 5th, 1939, and the other two a few weeks later. They average about 5 inches in length. The tail is extremely broad and tapers to a long, fine point, doubtless causing some people to believe that Geckos "sting" with their tails, which is of course ridiculous. The usual colour is a dark grey, but at times they are a light stone colour, finely spotted with dark brown. The ventral surface is pale fawn. The eyes are prominent, irides grey, pupils elliptical. The feet have five well-formed digits, terminating in sharp claws, but there are no adhesive pads on the toes as in some Geckos.

Food consists of certain moths—isopods ("slaters"), blowflies, caterpillars, and native cockroaches (**Panesthia laevicollis**). I have not seen them eat beetles, and small members of the Carabidae which I have offered them have been refused. They are extremely active in the pursuit of their prey, and it is very interesting to see them eating cockroaches, as if this insect is seized by the tail it is gradually worked round often with a few shakes by the Gecko's jaws until the insect's head is pointing down the gullet when it is swallowed with relish.

This Gecko often sheds its tail when attacked or mishandled. Another tail soon grows, but the scalation is finer and the point not so tapering.

These and other Geckos are often attacked by small red mites, which, however, do not seem to cause the host much inconvenience unless they are numerous. Moreover, they may usually be removed by a pair of fine forceps or a camel's hair brush.

I am indebted to Mr. J. R. Kinghorn for the identification of these reptiles, and to Mr. Keith C. McKeown, who identified the insects.

The Broad-tailed Gecko (Gymnodactylus platurus). A striking example of assimilation to environment. From a photograph by Keith A. Hindwood.

The "Shingle Back" Lizard (**Trachysaurus rugosus**).

The first pair of these lizards to come into my possession were received from Mr. W. Turner, as were also subsequent specimens. They were placed in the same vivarium as the Blue Tongued Lizards, and shared the same food such as snails, chopped, raw or cooked meat, fruit, consisting of apples, bananas, plums, grapes, etc., also sultana raisins. Besides these foods they will take milk and raw eggs. Beetles, particularly the chafers and certain caterpillars, are greatly relished, also "cut worms".

These lizards do not appear to be as hardy as the Blue Tongue, and for some time I experienced considerable difficulty in getting them to live through the Sydney winter. The locality where they are housed is not subject to frost during the cold months, and they have plenty of access to shade during the hot weather. The trouble seems to arise from the reptiles lying out in weak sunshine during winter, refusing to hibernate, and not taking any food. In consequence of this habit they develop cold in the eyes and lung trouble, which usually proves fatal. I have also noticed that those lizards which possess a thin and poorly developed tail in place of the usual fat and "stumpy" one succumb quickly during cold conditions. Any of these lizards which I have received during the spring and which had thin tails generally only lived a few weeks. As a result of these failures, I decided to try a different method of housing for the winter, and so built a glass-topped vivarium the glass being protected by a wire frame. The bottom of this vivarium is sunk into the ground for about 6 inches and covered with plenty of loam, bark, etc., into which the reptiles are able to burrow. Drinking water is always kept in this vivarium, and on mild sunny days a small dish of sweetened milk is placed inside. This method has proved successful, and I now have three "Shingle Backs", which I received in the spring of 1937.

The Shingle Back Lizard (Trachysaurus rugosus).

From a photograph by Keith A. Hindwood.

One day when I had some of these lizards on the lawn I noticed them cropping Dandelion flowers, and since then these flowers have been fed to them regularly, and apparently enjoyed in hot weather. I have not seen them eat the leaves.

Like most other Skinks, the "Shingle Back" responds to kindness and will readily take food from the hand.

Below are particulars of the length of time I have had these lizards:—

No.		Received.	Died.	
1.	♂.	8/10/35	26/12/35	
1.	♀.	8/10/35	26/6/36	Same consignment.
1.	♂.	31/1/36	24/7/36	As pair received,
1.	♂.	31/7/36	20/9/36	31/7/1936.
1.	♀.	31/7/36	3/2/38	
1.	♀.	7/8/36	31/8/37	
Young.		6 in. long.	Grew to 12¼ in.	
1.	♂.	21/10/36	15/10/37	This one was black above.
1.	♂.	2/6/37	13/8/37	Brown above. Black and white below. Still living.
1.	♂.	1/9/37		
1.	♀.	1/9/37	19/9/37	Same colour. Very poor tail.
1.	♀.	6/10/37	Both have good tails and are still living.	
1.	♂.	20/10/37		
1.	♀.	1/8/38	21/9/38	Small specimen. Yellow and olive above.
1.	♂.	1/8/38	1/11/38	Larger. Colour ditto.
			Both had very thin tails and were in poor condition.	

These observations seem to indicate that a certain amount of reserve energy is stored in the tail for the period of comparative inertia.

GLAUCUS, A MYSTERY OF THE SEA.

By Tom Iredale.

Glaucus, the Sea God, was represented as with a long beard, dishevelled hair, shaggy eyebrows and the tail of a fish, but the quaint little sea-swimming creature which bears his name is a beautiful blue-black and silver slug. Perhaps the fringes on the arms suggested the name, but no reason was given at its nomination. About 1763, Du Pont described a Marine Insect which had been found floating on the surface of the sea about Jamaica. A year or two later another worker denied that the animal was an insect, and declared it to be the baby stage of the Angel Shark!

The correct location was assigned to it by J. R. Forster, whose comment was published by his son, G. Forster, in his "Voyage Round the World" (Cook's "Second Voyage"), published in 1777, as follows:—"p. 49: Animals belonging to the class of **mollusca,** one of which, of a blue colour, in shape like a snail, with four arms, divided into many branches, was named **glaucus atlanticus".** This account initiated a series of observations, as the little creatures were commonly met with by the naturalists on board the sailing vessels of scientific expeditions. During the vessel's becalming in the Tropics, the collection and study of the peculiar pelagic greatly interested the naturalists, and beautiful paintings from life were made of this little slug. Although Forster's short description, as given above, mentions four arms, he meant four on each side, as shown in his detailed description and figure later published. When Gmelin, the great compiler, issued his Systema Naturae he classified and named Du Pont's Marine Insect as **Doris radiata.** Apparently the next naturalist after Foster was Lamartiniere, a member of the ill-fated La Perouse expedition, whose observations were issued in 1798. A different animal (slightly) from that of Forster or Du Pont was figured from the Bashee or Bachi Islands, north of the Philippine Group. Simultaneously, Bory de St. Vincent described another form from the West African islands, and a little later Peron added yet another figure. Cuvier also published another painting, and the poor systematist, unable to reconcile these paintings, concluded that they must be poor representations of one variable species. Therefore, Lamarck cited all the figures, and gave to the medley, a new name, **Glaucus forsteri.** At the same time, Blainville examined a preserved (!) specimen in the British Museum, and regarded it as a new genus, **Laniogerus,** quite an excusable mistake, as it was a bulbous mass without any frills. It is very unfortunate that these exquisite morsels defy preservation, as upon approaching dissolution (in the literal sense) they cast off all their elegant papillae and somehow get blown up until they are almost unrecognisable. The sea-faring naturalists, Eschscholtz, Lesson, Quoy and Gaimard, Orbigny and Bennett, all delighted in the living animals, and each determined that the variation was specific, Quoy and Gaimard, after their conclusion, painting three different creatures, revoking, after they had returned and discussed the matter with the indoor workers.

At last, in 1867, the group was monographed by a stay-at-home anatomist, Bergh, and he found for the outdoor naturalists, separating two main groups, and at least seven species. Again, more indoor work made him reconsider, and he later reduced the number. After many years' study of these pelagic animals, the truth seems to be that they are as localised as any other marine animal that is devoid of long-swimming faculty, and that many species occur in the waters of the world. Thus, if specimens from any locality whence paintings have been made, be studied afresh, they will be found to agree.

Two very distinct animals are found on the Sydney beaches, sometimes in numbers, and one of them agrees with one of Bergh's groups, the other generally with the second. Therefore we can allow that, at least, a species of **Glaucus,** and a species of **Glaucilla** live off these coasts. Prof. W. J. Dakin, conducting plankton investigations, has met with these in the plankton nets, and photographed the living animals. From these photographs my colleague, Mr. G. P. Whitley, has made sketches which show clearly the differences between the two. As specific names those given by Bergh to South Pacific specimens are tentatively used, though it is almost certain the local forms will be found to differ when close comparison can be made.

In the larger form, **Glaucus lineatus** Bergh, the body is slender, about five times its breadth, with three pairs of arms, each adorned at the end with a bunch of longer slender papillae, the longest in each series being about equal. The long arms have over twenty papillae, increasing from inside to centre; the second pair with almost as many similar in form, while the third has about a dozen papillae, the middle two or three very long: the tail long.

The smaller species, **Glaucilla briareus** Bergh, has the body short and stout, the length being only about three times its breadth. The three pairs of arms are adorned with short thick papillae, the length decreasing in each pair of arms, the third very short. The long arms have about sixteen short, rather conical papillae, the second almost the same number but notably shorter, the third pair scarcely extending from the body. The scheme of coloration appears to differ, the **Glaucus** being darker with a whitish patch on the papillae, while the **Glaucilla** is paler and the papillae are dark tipped with a white and then dark band, the dark patch corresponding to the light one in **Glaucus.**

The general coloration of the dorsal surface is pale bluish white, the ventral surface being the blue, black and silver one, but as the animal swims upside down as easily as the other way, the highly colored surface has been commonly regarded as the upper and is the one figured. The little animals are sea snails, belong to the Nudibranch series of the Mollusca, but their origin is not known and they are allotted a family to themselves. This has been placed next to that of the Eolids, a group of crawling Nudibranchs whose dorsal surfaces are ornamented with elegant papillae, but it has been shown that the Eolid papillae and those of **Glaucus** are essentially different.

REVIEW.

Sharks!!!

The Fishes of Australia. Part I. Australian Zoological Handbook, published by the Royal Zoological Society of New South Wales. Price, 7/6.

The first part of a projected series of Handbooks dealing with the Fishes of Australia is now on sale. It is a handsome book of 280 pages Imperial octavo, printed on art paper and with over 300 illustrations, and has been prepared by Mr. G. P. Whitley, F.R.Z.S. This part is complete in itself and can be purchased without any liability for purchase of the other parts. These Handbooks are provided for the use of laymen and scientists alike, dealing with the subject popularly, but with the accuracy demanded by the scientific worker, at an inexpensive price. As a layman I welcome this first part which, dealing with Sharks, Rays and suchlike, is the most comprehensive work on this subject ever attempted. Its contents are encyclopaedic and everyone will find much of interest whatever his viewpoint may be. The scientist can peruse and study (criticise if he be able which I doubt) with profit, the literary student will also uncover gems unexpected under such a title, the artist will be pleased with the numerous illustrations, while even the anatomist will meet with novel dissections of merit. Moreover, all the shark tragedies are catalogued and the shark industry is described in detail, while figures of the curious teeth and quaint egg cases are given.

TOM IREDALE.

LIST OF MEMBERS.

As on August 12, 1940.

Note.—Unless otherwise specified, members are residents of the State of New South Wales.

Members will oblige by notifying the Honorary Secretary of any change of address.

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