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**PROCEEDINGS**  
OF THE  
**Royal Zoological  
Society**  
OF  
**New South Wales**

FOR THE YEAR  
1944-45



**Price 1/-.**

(Free to all Members and Associates.)

AUGUST 31, 1945

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ROYAL ZOOLOGICAL SOCIETY OF NEW  
SOUTH WALES

(Established 1879.)

Registered under the Companies Act, 1899 (1917).

**PATRONS:**

The Right Honourable Sir John Greig Latham, G.C.M.G.  
Sir Philip Woolcott Game, G.B.E., K.C.B., D.S.O.

**COUNCIL, 1944-45.**

**President:** Frank Marshall, C.M.G., D.D.S.

**Vice-Presidents:** Albert Sherbourne Le Souef, C.M.Z.S., Garnet Halloran, B.Sc., M.D., F.R.A.C.S., F.R.C.S. (Syd.), Edward John Lees Hallstrom, and Emil Herman Zeck.

**Honorary Secretary:** A. F. Basset Hull, M.B.E.

**Honorary Treasurer:** Phillip Shipway.

**Honorary Editors:** A. F. Basset Hull and Tom Iredale, F's.R.Z.S.

**Honorary Librarian:** Keith A. Hindwood, C.F.A.O.U.

**Members:** Neville W. Cayley, F.R.Z.S., Aubrey Halloran, B.A., LL.B., Charles F. Laseron, Keith Collingwood McKeown, F.R.Z.S., Noel Lee Roberts, Theodore Cleveland Roughley, B.Sc., F.R.Z.S., Ellis Le Geyt Troughton, F.R.Z.S., and Gilbert P. Whitley, F.R.Z.S.

**Assistant Honorary Secretary:** Miss Betty French.

**Honorary Auditor:** Robert J. Stiffe, F.C.A. (Aust.).

**OFFICERS OF SECTIONS:**

**Avicultural Section.**

**Chairman:** A. H. Brain.

**Hon. Secretary:** E. H. Hernfield.

**Budgerigar Section.**

**Chairman:** H. Yardley.

**Hon. Secretary:** T. J. McSwiggan (Acting).

**Marine Zoological Section.**

**Chairman:** Mrs. L. H. Woolacott.

**Hon. Secretary:** Miss E. Butters.

**Ornithological Section.**

**Chairman:** J. E. Roberts.

**Hon. Secretary:** A. R. McGill.



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**IMPORTANT ANNOUNCEMENT**

**Please see page 52 for details of an important  
announcement**

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# ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

The Sixty-fifth Annual Meeting was held at Taronga Zoological Park, Mosman, on Saturday, 28th July, 1945, at 3 p.m. One hundred and seventy-two members and visitors were present. The Honorary Secretary (Mr. Basset Hull) read the

## SIXTY-FIFTH ANNUAL REPORT.

**Membership.**—On 30th June, 1945, the members of all classes on the Register numbered 589, and included 1 benefactor, 3 associate benefactors, 7 honorary members, 33 life members, 334 ordinary members, 22 life associates, 3 honorary associates, and 186 associates. Eight members died during the year, four resigned, and the names of 10 were removed from the Register in terms of Article 9. The net gain for the year is 50 members and associates, as compared with a gain of 56 during the previous year; both being very satisfactory records.

**The Council.**—Eleven meetings of the Council were held, the average attendance being 10.9. Mr. Whitley was absent in Western Australia for the greater part of the year, investigating for the Council for Scientific and Industrial Research. Mr. Troughton was engaged in research work with the Scientific Investigation Section of the Army for some months, and both of these members were granted leave of absence. Mr. Gregory M. Mathews tendered his resignation in view of his approaching departure for England, and it was accepted as from 30th June.

**Deaths.**—Dr. Charles Anderson, former Director of the Australian Museum, who died in October, 1944, rendered valued services in connection with obtaining consent of his trustees to publication of papers by his staff in "The Australian Zoologist." Sir James Barrett, an associate of many years' standing, died in April, 1945, and Dr. Consett Davis, also an associate, died in an aeroplane crash in New Guinea, in December, 1944. He was a scientist of exceptional versatility, and his death at an early age is greatly to be deplored.

**Honorary Member.**—In recognition of his valued services in presenting to the Society the manuscript of his "Australian Insects," Mr. Keith Collingwood McKeown was elected an honorary member.

**Finances.**—The balance sheet shows that the Society has satisfactorily improved its position. An amount of £200 was transferred from the General Account to the Publication Fund, in accordance with the Rules.

**Publications.**—The "Proceedings" for 1943-4 was issued on 31st August, 1944, and Part I of Volume 11 of "The Australian Zoologist" was published on 11th June, 1945. The difficulties which confronted us in relation to the second edition of Mr. McKeown's "Australian Insects" persisted as regards binding; our binders procured sufficient cloth with great difficulty, only to have it stolen by burglars. Another supply was obtained, and delivery commenced on 1st May, 1945; 1,300 copies have so far been delivered, all of which are sold or ordered. In view of the demand for this work, paper has been procured (again with difficulty) and printing of about 5,000 copies is proceeding. Of Mr. Whitley's "Fishes of Australia. Part I. Sharks and Rays," very few remain, and it is hoped that circumstances will admit of the printing of a second edition, together with Part II, which Mr. Whitley has been working on for some time. Matters in connection with the proposed handbook on "Australian Birds" have not progressed any further, owing to difficulties in connection with the illustrations.

**Kosciusko State Park.**—Considerable activity has characterised the Society's association with the Trustees of the Park. A Committee of members of this and the associated kindred Societies was formed, and

joint meetings of this Committee and the Trust have been held. The principal subjects for consideration have been: (a) Location of the proposed Primitive Area, (b) Biological Survey, and (c) Protection of geological, botanical or other interesting features.

**Birds and Animals Protection Acts.**—At the request of the Chief Secretary, representatives of this Society were appointed to act in consultation with this Department on proposed amendments of these Acts. Dr. Garnet Halloran, Messrs. Hallstrom, Roberts and Cayley were appointed to represent the Society, and meetings have been held during which the proposed amendments were discussed.

**Membership Increase.**—The number of members entitled to free admission to Taronga Park is limited to 350 under existing arrangements with the Park Trustees. Steps are being taken to arrange a conference with the Trust with a view to amalgamation of the Society's and the Trust's subscribers, so as to secure uniformity in the privileges conferred.

**Sections.**—Attendances at sectional meetings have improved, and considerable enthusiasm has been evinced in carrying out the work of each. A further effort to establish a mammalogical section has been suggested, but the poor response to last year's effort has caused Council to ask that all those interested in the subject should communicate with the honorary secretary, and state their willingness to attend meetings if such a section is established.

**Building Fund.**—Council considered that it was time to take steps to secure a suitable building in which to house the Society, and such kindred institutions as might desire to co-operate.

To that end a Building Fund has been established, and it rests with members, associates and their friends to bring our objective to a successful issue.

In the first instance, donations will be acceptable, and in the event of a substantial amount being subscribed, debentures will be issued to an amount sufficient, with the donations, to secure a suitable building. It may be pointed out that, during the past 23 years, the Society has paid a total of £3,240 in rent for the rooms occupied in Bull's Chambers.

The delegate to the Treasurer has consented to the issue of debentures to the amount of £6,000, bearing interest at 5%. Already several token donations have been received, and more promised; while subscriptions to the debentures, which will be limited to members and associates, already exceed £1,500.

The Honorary Treasurer (Mr. Phillip Shipway) presented the balance sheet. (See page 5.)

The Hon. Clive R. Evatt, K.C., M.L.A. (Acting Chief Secretary and Minister for National Emergency Services), moving the adoption of the annual report and balance sheet, congratulated the Society on the increase in membership during the past two years, as revealed in the report. He regarded this as an indication that the Society was extending its horizons, and as evidence of increasing interest in the important tasks to which the Society had set its hand.

Mr. Evatt stressed the need to maintain a due regard for animal and tree life. There was no more tragic chapter in Australian history than that which recorded the needless destruction of animals and trees. The time to call a halt had long since passed.

There were people who would cut down trees so as to get the last possible shilling out of the soil. This greed had created a terrifying problem for Australia, as was shown last year when clouds of red dust from the West filled the Sydney air and were carried out to sea, and even as far as New Zealand. The colour was appropriate, for it represented the life-blood of Australia. We must do something at once to prevent soil erosion. We must preserve our remaining forests, the Minister said.

The Minister referred to the Birds and Animals Protection Act.

"This Act," he said, "is, as its name implies, for the protection of wild life, yet the applications made under it are for the destruction of birds and animals. It is difficult to administer the Act, because of frequent applications claiming that unless a number of animals are destroyed, farmers' crops will disappear, and the available grass be devoured, to the detriment of the sheep.

"We are insisting on most searching reports on all applications for permits. Applications are usually received during the winter months when high prices are paid for skins."

Mr. Evatt quoted the following extracts from police reports:—

1. Report by the Mudgee police on an application: "As the area under cultivation is small, other means could be used to keep the kangaroos out of it, such as high netting. The applicant does not rely on the crops grown for his livelihood, as his property is only suitable for grazing purposes. It would appear that a permit would have been more necessary when feed was scarce than at present, but it has been noticed that applications for permits are invariably received during the winter, when good prices are being received for skins."

2. From Brewarrina: "There may be a few kangaroos on the property, but from my experience over the past two months I would say that they are doing little damage to the grass and herbage at the present time. The applicant has a grown-up son who prefers shooting kangaroos to doing any class of labouring work, and it is my opinion the permit is required for the express purpose of allowing the son to make money by the sale of skins."

3. From Scone: "There is less than 50 acres of cultivation on the property, and, in view of the abundance of natural feed in the locality it can definitely be stated that the damage to crops by kangaroos and wallaroos, so far as this holding is concerned, is very slight indeed."

4. From Delegate: "I am not satisfied that there are kangaroos in the numbers as claimed by the applicant. During recent weeks I have been on part of the applicant's property and did not see any kangaroos; further, the application is being made at a time when the skins are bringing their best price."

5. From Uralla: "The corn crop has now been garnered, and at this time of the season there would be little or nothing growing to be destroyed by such animals as possums."

The Minister said: "Last year the taking of a quarter of a million skins of kangaroos, wallabies and other animals was recorded at police stations. Possibly, if it included animals killed but not reported, the total would be about half a million. If this went on, these animals, like the koala, will be almost exterminated."

Mr. Evatt said he was establishing at Kurnell a koala sanctuary. A dozen of these delightful little animals would be sent there.

He paid a tribute to Mr. T. C. Roughley, a member of the Society, for his book, "Wonders of the Great Barrier Reef." The Government was sending Mr. Roughley to America to lecture on marvels of the Reef. He would be a scientific ambassador, and his lectures might well induce many Americans to visit us.

Mr. Evatt forecast heavier penalties for persons guilty of cruelty to animals. Legislation to enable magistrates to inflict heavier punishment was contemplated.

He recalled that as Minister for Education he had founded the Junior R.S.P.C.A. He hoped that it was inculcating in our young citizens an affection for animals and in this way developing citizenship.

He had received unpleasant reports about riding schools and the ill-treatment of horses there, indicating that some persons exploited their horses and had no proper regard for feeding or care. It might be necessary to license riding schools.

"I note with pleasure your determination to find a home for the

Society. Whilst not in a position to pledge the Government, I shall do what I can to assist you in this praiseworthy effort to acquire your own building."

Mr. Evatt expressed his appreciation of the splendid service rendered by the Honorary Secretary (Mr. A. F. Basset Hull) whose life for 35 years, he said, had been interwoven with the work of the Society. "When one thought of the Society, one thought of Mr. Basset Hull, and when one thought of Mr. Basset Hull, one thought of the Society," concluded the Minister.

The motion was seconded by Mr. E. H. Zeck, and carried.

Mr. Aubrey Halloran, on behalf of the Society, moved a vote of thanks to Mr. Evatt. He said:—

"We wish to express our thanks to the Hon. Mr. Clive Evatt for the address he has given this afternoon.

"No Minister of the Crown has rendered greater service to the Royal Zoological Society of New South Wales than Mr. Evatt by his sympathy, addresses to the public, and help in a practical way.

"His speeches for years past, calling on fellow Australians to preserve their birds and animals and their forests, will soon find expression in Acts of Parliament.

"We appreciate his remarks concerning our Honorary Secretary (Mr. Basset Hull) who for 35 years has been the mainstay of the Society.

"We hope Mr. Evatt will long be spared to continue the good work he is doing, and I have much pleasure in proposing a hearty vote of thanks to him."

The motion was seconded by Mr. T. C. Roughley, who referred to the obvious sincerity of the Minister in his desire to carry out the administrative work of his Department in respect of the protection of our fauna and flora.

The motion was carried with acclamation.

Five members of Council, who retired under Article 22, were re-elected, viz.: Messrs. Neville W. Cayley, Keith A. Hindwood, Tom Iredale, Ellis L. Troughton and Gilbert P. Whitley. Mr. Keith Collingwood McKeown was elected to fill the vacancy caused by the resignation of Mr. Gregory M. Mathews.

The President delivered his address. (See page 7.) A vote of thanks for the address was moved by Mr. Hull and seconded by Dr. Marshall.

Mr. Alfred E. Stephen moved that the members present authorise the Council to call an International Conference for the purpose of obtaining world-wide co-operation in the care of the wild animals and birds of every country.

He spoke at some length in support of the motion, the subject of which had been referred to in the President's address.

There being no opposition, the President declared the motion carried, and thanked members present for their support.

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#### OFFICERS FOR THE YEAR 1945-6.

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President: Dr. Frank Marshall, C.M.G., D.D.S.

Vice-presidents: Dr. Garnet Halloran, Messrs. Albert Sherbourne Le Souef, C.M.Z.S., E. J. L. Hallstrom, and Emil Herman Zeck.

Honorary Secretary: Mr. A. F. Basset Hull.

Honorary Treasurer: Mr. Phillip Shipway.

Honorary Editors: Messrs. A. F. Basset Hull and Tom Iredale.

Honorary Assistant-secretary: Miss Betty French.

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

**ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.  
REVENUE ACCOUNT FOR YEAR ENDED 30th JUNE, 1945.**

**GENERAL ACCOUNT.**

	£	s.	d.	£	s.	d.	£	s.	d.	
To Office Rent ..	300	0	0				By Subscriptions ..	403	0	6
" Office Printing and Stationery ..	12	14	6				" Rent — Sub- letting Office ..	172	0	0
" Telephone ..	27	12	9				" Bank Exchange, etc. . . . .	7	5	10
" Electricity ..	7	14	9				" Telephone Col- lections . . . . .	8	5	9
" Affiliation Fees	1	11	6				" Sale of Badges	4	6	
" Expenses — Annual Meeting	9	7	6				" Interest on Bank Account	2	11	8
" Insurance Premiums . . . .	7	15	0				593	8	3	
" Donations . . .	1	9	0				" Deficit — Excess of Expenditure over Revenue for the year ended 30th June, 1945 . . .			
" Gratuities . . .	9	0	0							
" Rent — Post Office Box . . . .	1	0	0							
" Postages, Tele- grams and Ex- change . . . . .	19	5	5							
" Library Books and Maps . . . .	2	4	0							
" Office Repairs .		9	6							
" Taronga Park— Excess Members	10	10	0							
" Life Passes . . .		6	0							
				410	19	11				
" Amount Trans- ferred to Pub- lications Fund .				200	0	0				
				£ 610	19	11				
							£ 610	19	11	

**PUBLICATIONS FUND.**

	£	s.	d.	£	s.	d.	£	s.	d.	
To Publication of " Australian Zoologist" and " Proceedings," in- cluding Postages	171	10	1				By Sales "Austra- lian Zoologist"	26	18	5
" Expenses on Ac- count of Pub- lication of Hand- books . . . . .	576	5	5				" Sales of Hand- books . . . . .	398	3	7
				747	15	6	" Sales — "Pro- ceedings" . . . .	2	0	
							" Interest — Sav- ings Bank . . . .	1	14	0
							" Interest — In- vestments . . . .	49	12	3
							" Profit on Sale of Common- wealth Treasury Bonds . . . . .	9	17	6
							" Donation . . . .	2	2	0
							488	10	3	
							" Government Grant—Depart- ment of Edu- cation . . . . .	50	0	0
							" Transfer from General Ac- count . . . . .	200	0	0
							738	10	3	
							" Deficit — Excess of Expenditure over Revenue for year ended 30th June, 1945			
				£ 747	15	6				
							9	5	3	
							£ 747	15	6	



**ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.**  
**BALANCE SHEET AS AT 30th JUNE, 1945.**

ACCUMULATED FUNDS.				ASSETS.					
		£	s.	d.			£	s.	d.
<p><b>Balance at 30th June, 1944 ..</b> 3,384 1 6</p> <p><b>Deduct: Deficit, Excess of Expenditure over Revenue for year:—</b></p> <p>General Account, £ 17/11/8: Publications Fund, £ 9/5/3</p> <p style="text-align: right; margin-right: 20px;">26 16 11</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">3,357 4 7</p> <p style="text-align: center;"><b>BUILDING FUND.</b></p> <p>Donations during year ended 30th June, 1945 ..</p> <p style="text-align: right; margin-right: 20px;">137 7 0</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">£ 3,494 11 7</p>	<p><b>Furniture and Equipment, Etc.—</b></p> <p>Office and Lecture Room Furniture and Equipment at valuation, plus additions .. ..</p> <p style="text-align: right; margin-right: 20px;">240 4 3</p> <p>Library Books, etc., at valuation ..</p> <p style="text-align: right; margin-right: 20px;">500 0 0</p> <p>"Parrot" Paintings, at valuation .. ..</p> <p style="text-align: right; margin-right: 20px;">500 0 0</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">1,240 4 3</p> <p><b>Investments (at face value.—</b></p> <p>Australian Commonwealth.—</p> <p>Inscribed stock .. ..</p> <p style="text-align: right; margin-right: 20px;">1,010 0 0</p> <p>Treasury Bonds .. ..</p> <p style="text-align: right; margin-right: 20px;">650 0 0</p> <p>Metropolitan Water, Sewerage and Drainage Board:—</p> <p>Inscribed Stock .. ..</p> <p style="text-align: right; margin-right: 20px;">100 0 0</p> <p>Debentures .. ..</p> <p style="text-align: right; margin-right: 20px;">100 0 0</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">1,860 0 0</p> <p><b>Cash at Bank.—</b></p> <p>Commonwealth Savings Bank.—</p> <p>General Account ..</p> <p style="text-align: right; margin-right: 20px;">5 15 2</p> <p>Publications Fund .. ..</p> <p style="text-align: right; margin-right: 20px;">251 5 2</p> <p>Building Fund Account .. ..</p> <p style="text-align: right; margin-right: 20px;">137 7 0</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">394 7 4</p> <hr style="width: 100%;"/> <p style="text-align: right; margin-right: 20px;">£ 3,494 11 7</p>								

**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, 1945, 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, 1945, 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, 24th July, 1945.

A. S. LE SOUEF, President.

E. J. L. HALLSTROM, Vice-president.

PHILLIP SHIPWAY, Hon. Treasurer.

# PRESIDENTIAL ADDRESS

## THE FUTURE OF THE WILD ANIMALS OF THE WORLD.

By A. S. Le Souef.

We have in the Australian wild fauna a wonderful heritage, something which has taken hundreds of millions of years to reach its present stage of beauty, symmetry and perfection. It forms a distinct part of the world's economy and adds considerably to the interest of the countryside and in many instances to the well-being of human interests.

When we review the rapidly changing conditions that have marked the past one hundred and fifty years we see that the wild things have been ruthlessly decimated. Unless we now recognise their precarious position, and take adequate steps to save those remaining, we are likely to lose many species that can never be replaced. This would be a tragedy. We owe it to posterity to take care that this does not happen. We must ensure that future generations are able to see the truly marvellous products of evolution.

It is true that during the greater part of last century very little protection was given to the wild animals and birds, as they were so numerous. Advancing civilisation, however, has changed this outlook. Many countries have recognised the danger in which their fauna is placed, and have taken steps to afford them protection; nevertheless, some factors vital to their well-being are beyond the control of the present laws, and the people generally do not recognise their responsibility in the matter. It is therefore necessary to review the whole situation in the light of what has happened in the past and what is likely to eventuate in the future.

We have seen during the past three hundred years, but more especially the last century, a rapid advance in colonisation, during which several countries, notably America, Africa, Australia and the Pacific Islands, have been occupied and put to intensive commercial use. This has radically altered the world's economy and brought about far-reaching changes in the position of the wild animals and birds. It means that cultivation and domestic animals have taken much of the space occupied by the original fauna. In addition, there has been an immense increase in manufactures and facilities for travel, which has given cheap and effective firearms to anybody who wants them, as well as the ability to reach the country districts and indulge in shooting with ease and safety. This has enabled the age-old instinct to kill things to be put into effect with disastrous results upon the wild beings.

The expansion of commercial interests is, of course, all in order and just as it should be, but we must realise that it is going to continue in ever-increasing intensity, and that it will radically alter the balance of nature the world over. This has already caused trouble in pastoral and agricultural pursuits and the upset of the natural processes of nature must increase unless every relevant factor pertaining to the wild life is thoroughly investigated and what is useful carefully preserved.

At the present rate of progress there will soon be no room for anything that is not of economic value. Human interests will naturally dominate everything. The great change of which we who have lived a full life are so conscious really portends the close of one epoch in the stage of the world's affairs and the opening of another. From the point of view of those interested in the wild life it really means the ending of the age of mammals and the extending of the age of man. It is on this basis that we must survey the future. The late Professor Henry Fairfield Osborn drew attention to this some years ago.

When we check up individual members of the animal kingdom we find that in all countries some species have recently become extinct and that others are on the verge of becoming so. Just to give a few

examples, it can be mentioned that the last remaining Quagga died in the London Zoo some years ago. The only remaining White Tailed Gnus and Mountain Zebras, both beautiful and distinct species of their respective families, live on sufferance on farms in South Africa. The Report of the Preservation Committee on game in Bengal (1943) states: "Until very recently all three species of Asiatic Rhinoceros were found in Bengal, but now are reduced to a single species (The Bengal Rhinoceros) . . ." while the Great Indian Rhinoceros (*R. unicornis*) once common along the foothills of the Himalayas, is now only found in a few places in Nepal, Northern Bengal and Assam, and is alarmingly rare everywhere." It is pointed out that in many parts of India, where it was once common, the tiger is surviving, but that is all, and stating that it is the spread of cultivation that has caused this animal to diminish.

Captain Pitman, in "A Game Warden Takes Stock," lists as vanishing species Gorillas, Chimpanzees, White Rhinoceros, Giraffe and the Uganda Kob. He further states: "The game situation generally calls for little adverse comment. On the whole, the wild animals are holding their own, though it must be admitted with regret that the extension of settlement is annually denuding fresh areas of their interesting mammalian life." He mentions the menace to wild game caused by the possession by numbers of African soldiers of .303 rifles with an almost unlimited supply of Service ammunition. When an American expedition went to Africa a few years ago to procure specimens of the Giant Eland and other antelope for the Museum of Natural History in New York, they had the utmost difficulty in finding what they required.

We know that the beautiful Sea Otter, which lives in the semi-arctic regions off Alaska, has been almost exterminated. Dr. Henry Fairfield Osborn, President of the New York Zoological Society, states (May, 1945): "Both the White Mountain Goat and the Big Horn Sheep are in a precarious position in this country. There are limited scattered colonies of both, but it is difficult to say how long they will survive," and further states: "The whole situation (of our wild game) is reasonably satisfactory, and if public interest can be maintained at its present level and if the national and State parks, together with the national forests, continue to be protected, again by public opinion, over the long future ahead, it seems reasonable to assure that at the end of this century, for example, we shall still have a fairly good wild life situation in this country, although some of the more tender species referred to may perhaps have become extinct."

In Australia we miss the pretty Bridle Nail-tailed Kangaroo, Grey's and the Parma Wallaby, together with Gaimard's Rat Kangaroo, Gunn's Bandicoot and other species of marsupials, some of which are apparently extinct. Among the birds we find that an *Atricornis* has vanished while the Paradise and the Golden Shoulder Parrots are very rare, and the last remaining specimens may easily disappear.

The world list of animals that are in danger of extermination could be greatly extended.

The question of preserving the most interesting and valuable of the world's fauna is by no means simple, as so many factors are involved.

We must look ahead to the next one hundred and fifty years and try to gauge the trend of settlement, commercial interests and public opinion during that period.

The occupation of all lands that can be put to economic use can be anticipated. The spread of cheap firearms and traps and their extensive use by the more irresponsible and native populations must be taken into account. The exploitation of animals and birds for commercial purposes will take place wherever it is permitted, coupled with an ever-increasing demand for them for exhibition. The breeding of fur animals on farms, now a well-organized business, will be increased. We must expect a lessening appreciation of the wild things for their own sake as this tends to be undermined by purely human interests.

The present laws seem to be ineffective to meet the changing

situation; moreover, it is one thing to make regulations and another to have them obeyed, as the average person pays little attention to prohibitions that conflict with personal interests. Instances of this are often brought under notice. For example, when a game reserve was made, many years ago, in South Africa, the local land-holders foregathered and rode through the area shooting everything that came within range. Rhinoceros in Northern Bengal were extensively poached and their numbers seriously diminished by organised bands of hunters who sold the horns at high prices for medicinal purposes in China. This sort of thing is most difficult, and in some cases impossible, to control in outlying districts and moreover, the preservation of such animals may not agree with local public sentiment.

Individually, we often see a total disregard for the game laws by those who are responsible for their enforcement. For instance, several years ago when out collecting, in another State, with the local sergeant of police and a half-caste aboriginal, a gun was carried in case a rabbit got up; however, we flushed a hen Bustard with a chick at foot. The sergeant quickly handed the weapon to his companion who shot the bird and gave it and the gun to the representative of the law. The aboriginals are not bound by game regulations, so technically all was in order. On another occasion I was collecting, under permit, some nestling egrets for exhibition purposes. The local sergeant kindly drove me out to the swamp in his car. On returning it was necessary to stop at a street intersection and put a mat over some Magpie Geese, a comparatively rare bird in that State and which was nesting, so that they would not be seen by the constable on traffic duty, as it would never do to have the head of the Service arrested by one of his staff. I admit having transgressed the law on occasions when opportunity occurred to secure specimens for which no permit had been issued.

Results of the present changing conditions are seen on all sides. The Game and Fisheries Preservation Committee of Bengal gives an instance (Report for 1943): "Only thirty years ago Mr. G. U. Yule visited the plains on the Brahmaputra, near the Garo Hills, and found them swarming with large game such as Rhinoceros, Buffalo, Deer of several kinds. In the winter of 1939, when this district was again visited by an observer, a very different picture was presented as practically all these things had entirely vanished. A beat in the jungle and careful watch on an animal drinking-place revealed one doe Barking Deer and a few Jungle Fowl."

Twenty-five years ago the Burraborang Valley was full of wild animals and birds. The wonderful Lyre-birds were in every gully. Wonga and Bronzewing Pigeons were plentiful. Rock Wallabies were on the hills and the Great Grey Kangaroos and smaller game in the forests. To-day, as far as wild life is concerned, the place is a wilderness.

Such examples represent the position in many parts of the world. They indicate the unseen but progressive decimation that is ever going on.

There is fortunately another side to the picture as we see increasing signs that the public is learning to appreciate the denizens of the wild, and many of our animals and birds are protected by sentiment. Thus Wapiti Deer, Moose and Bison are carefully preserved in America, and so are many of the smaller things which nobody would dream of killing. We look after the Koala and people are sensible to the economic value and beauty of the Lyre-birds, Magpie Larks, Kookaburras, Blue Wrens, Robins, Harmonious Thrushes and other birds. This change in outlook is largely the result of education, which, if greatly extended, would have a very marked effect on the fauna. Our Society should try and get the Government to include lessons on the subject in the school curriculum. We might prepare a text-book on this important part of our wild life economy.

Keeping these things in mind, we see that a great deal more has got to be done about the matter than is at present enacted. As far as Australia is concerned, it seems as if the whole system of fauna protection needs recasting. We cannot do much in this direction until we get a zoological survey of the whole country, including the adjacent

islands. This should frequently be checked by an authoritative observer.

The question of a zoological survey has often been raised, but never organised. It is probably safe to say that it never will be carried out until put on a commercial basis.

The first step towards this objective is to put a sales tax on all furred skins. The proceeds of this tax would go a long way towards meeting the cost of the survey. Skins of Kangaroos, Wallaroos, Wallabies, etc., are constantly being sold, so are the pelts of rabbits and foxes.

The second step towards this project is to have the care of our fauna put under the Department for Internal Affairs. The Commonwealth is the only authority that can properly co-ordinate such important work.

The third item would be to have breeding establishments to rear such animals and birds as might be required for zoological purposes both at home and abroad. There is a great and growing demand for our fauna and prices could be regulated so as to make the animal farms paying concerns. By this means many species threatened with extinction in the immediate future would be preserved and spread over the world. The Zoological Society of New York has already taken the initiative in this work by collecting and distributing what remained of the Giant Tortoises on Galapagos. Those which Taronga Park received many years ago are doing very well.

An important section of this work would be an establishment designed and maintained to breed the Birds of Paradise, Fruit Pigeons, Lories, Cassowaries and Tree Kangaroos that are native to New Guinea. There food and labour are cheap and there would be a great call for the birds and animals at high prices.

It seems to be equally necessary to have wild animals and bird farms in other parts of the world, as it appears to be only a matter of time when most of the native things will be crowded out of their environment. The animals of Africa, South America, Borneo and other places will be needed for exhibition in many centres of population. Zoological Institutions, where the animals and birds are kept under natural conditions, are a great feature of public interest and help to keep the growing generation in touch with the diverse and marvellous products of evolution.

The present method of collecting the larger wild animals is cruel, uneconomic and wasteful in the extreme. For instance, if a Rhinoceros, Hippopotamus, Chimpanzee or Orangoutan is required, it is necessary to kill the mother and take the young, and even then only a proportion of those so caught survives. There should be no need for this, as it is just as easy to breed an animal worth a hundred pounds as a bullock worth ten.

Before closing I would like to make some reference to the position of some of our animals in Australia.

At present each State has charge of its own fauna and enacts such protective laws as it considers necessary. These enactments, however, are largely founded on past conditions and do not seem sufficient to meet changing conditions. All animals and birds except those mentioned in a special schedule are nominally protected. If, however, any species, in the absence of natural enemies, becomes too numerous, an open season is proclaimed, during the period of which the residents of that district can destroy all the unprotected animals they can find. The danger of this method is that killing may not be confined to a special kind and a species that is rare may be killed off with those that are common.

In the absence of a zoological survey we have no means of checking up the numbers of any species that is becoming scarce. For instance, the Brush-tailed and Yellow Footed Rock Wallabies have not been seen for years, with the exception of the little group of the former at Jenolan Caves. All we know for certain is that they have disappeared from their former haunts, but how many, if any, exist in the more remote parts is quite uncertain.



The existence of many of our animals and birds is seriously jeopardised by the introduced Pig, Fox, Rabbit, Black Rat and Mouse. These animals are far ahead of our marsupials and native rodents in their stage in evolution, and consequently they must occupy their heritage wherever they come into competition. This competition exists almost everywhere on the mainland with the exception of the far north, where conditions do not suit the fox and rabbit. The wild pig, however, thrives best in the tropics where it is menacing the existence of the Cassowary by destroying its eggs. This is probably also the case in New Guinea.

The only means of saving our threatened species is to place them on special purpose farms or on islands off the coast.

A matter needing special attention is the preservation of the balance of life in the forests. Timber is becoming an increasing necessity, as so many uses are being found for it. One serious result of allowing Possums to be killed for their fur is the great increase that has taken place in the parasitic mistletoe. In the absence of the animals, which feed on the ripe fruits, this arboreal plant is spreading unchecked and causing great damage in many localities. We must also recognise the value of the Black Cockatoo and other birds in keeping the trees free from the larvae of boring beetles and moths. The Cockatoos which nest in old hollow trees must be allowed adequate breeding places. The absence of the Bandicoot in many districts is allowing the cockchafer beetle to increase and this causes the defoliation of certain species of eucalyptus.

There are some rare and strikingly beautiful parrots and other birds on the islands of the Pacific. These islands are under the Governments of Britain, Australia, New Zealand, America and France. It seems to be very necessary to have a survey made of the fauna and adequate steps taken to have it preserved, as it is very likely that these lands will be intensively cultivated in the near future. Some of the most lovely birds in the world are found there and it would be a tragedy if any were lost.

What we really want in order to stabilise the safety of the wild animals of the world is an international conference. There are many far-reaching problems to be considered, which only whole-hearted co-operation between the various countries can solve. Nothing less could meet the crisis which confronts the fauna of the world. We face something which is unique in history, and which must have the backing of the Governments of each country concerned to preserve our threatened wild life heritage.

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#### HARRY BURRELL.

By this name alone was Henry James Burrell known throughout the world and by his wide circle of acquaintances which included many scientific workers. His death on 29th July, 1945, at the age of seventy-two, has brought to the close a rather remarkable career as far as his contributions to science are concerned. His wit always amused his friends, as it was spontaneous, and it is believed that it was earlier his profession, but for the last forty years he was more interested in natural history, especially as a photographer. Apparently he took up the natural history side of photography and his series of animal studies came in useful when he became associated with A. S. Le Souef in the production of a publication, entitled, "The Wild Animals of Australasia," to which E. le G. Troughton contributed the section dealing with Bats. However, Burrell had become interested in the Platypus, and a book dealing solely with this interesting archaic mammal was the result. This book dealt with the history as well as the field life, the latter being based on Burrell's own studies of twenty years, and became the basis of all the more recent work on this interesting mammal form. It is in connection with this monotreme that Burrell's name will live in scientific circles. He was awarded the O.B.E. and made a Fellow of the R.Z.S. for this research. Some fifteen years ago while engaged in this study he was stricken down with paralysis and though he completely recovered his interest had died out, and recently he gave his very fine series of photographs of Australian mammals to the Australian Museum, Sydney.—T.I.

## REPORTS OF SECTIONS

### AVICULTURAL SECTION.

#### Annual Report.

In presenting the report for the year ending 30th June, 1945, I am able to say that the Section, though somewhat depleted in attendances, is still able to function, and that there is every hope of maintaining a nucleus of members on which to build when the troubled times through which we are passing come to a close.

The past year has been marked by a lack of lecturers, many of whom have given their services in the past but have been unable to cope with the pressure of work which has fallen upon them since the war started. This is understandable, and the Section again wishes to extend to all those kind persons who have helped in the past, its sincere thanks, and hopes that in the future we will be able to avail ourselves of their services.

The Section has, during the past year, become affiliated with the Cage Bird Federation and has already benefited by its membership of that body by being kept informed, and being able to enter into the discussions relative to certain aspects of the proposed alteration and re-drafting of the Birds and Animals Protection Act.

Through the year some of our members have had successes with their breeding of Australian and Foreign Finches, and a very notable contribution was given to us by Mr. Lear in his observation of the almost unknown Ground Parrot, which has been regarded in some quarters as almost extinct. This necessitated Mr. Lear putting in a lot of time and travelling long distances to observe the bird.

The members of this Section are able to pride themselves on the fact that the general type of aviary is improving, and a visit to some of the back-yards of members will reveal a wealth of ideas and some very fine examples of "aviary art" and some fine expressions of the individual art of building a home for the birds.

JOHN E. SIMONS, Acting Hon. Secretary.

A. H. BRAIN, Chairman.

### BUDGERIGAR SECTION.

#### Annual Report.

Throughout the last twelve months, despite the war and drought, scarcity of seed and long hours of labour, the Budgerigar Section has increased its membership, thus showing that man can still turn to the cult of the Budgerigar to help lessen the prevailing tension.

**Attendance at Meetings.**—We have attracted an increased number of members to our meetings throughout the year, having an average attendance representing a slight increase on 1944 with its total of 186 and average attendance of 16. The year just ended doubled the 1943 totals.

**New Members.**—The welcome addition of 10 new members of calibre and experience is a tower of strength to the Section.

**Lectures.**—Following is a list of subjects dealt with by various lecturers during the year, in their order:—

"Lantern Lecture on the Bird Life, Past and Present, of Lord Howe Island" . . . . .	Mr. T. Iredale.
"Lantern Lecture on the Birds of Central Australia" . . . . .	Mr. Roy Cooper.
"Control of Vermin in Aviaries" . . . . .	Mr. E. H. Zeck.
"Colour Breeding in Budgerigars" . . . . .	Mr. R. B. Browne.
"Clear-wing Budgerigars" . . . . .	Mr. R. B. Browne.
"Reptiles—Live Specimens" . . . . .	Mr. G. Longley.
"Birds of Paradise" . . . . .	Mr. T. Iredale.

The Budgerigar Section owes a debt of gratitude to these gentlemen, and takes this opportunity of thanking them for their courtesy.

**Table Shows for Type.**—The Section held two shows, at which many excellent birds were displayed. A notable feature of the two shows was that the outstanding bird on each occasion was exhibited by a new member, viz., Mr. Charles Hill's Grey-wing Blue and Mr. Swinfield's Cinnamon-wing Sky.

**Ninth Annual Lawn Show.**—Held at "Elaine," home of Mr. and Mrs. J. Hubert Fairfax, and officially opened by Col. Alfred Spain, V.D.

Entries for the Show totalled 123 birds of outstanding quality.

Mr. Harley Yardley won the coveted "Sydney Mail Trophy" outright, becoming the owner of this excellent trophy. Mr. Yardley deserves not only our praise but the praise of the whole Budgerigar world for the high standard he has achieved.

Another achievement of merit was the winning of the "Best Young Bird" by our new member, Mr. J. L. Vance, of whom more is going to be heard.

Mrs. Fairfax and Mrs. Nigel Smith expressed their appreciation to all concerned who assisted in donating the sum of £28 to the Red Cross.

The Budgerigar Section is greatly indebted to Mr. and Mrs. Fairfax for enabling them to have their show in such beautiful surroundings.

We also wish to express our thanks to Mr. Charles Hill, Show Secretary, Mr. R. B. Browne, Assistant Show Secretary, and Messrs. Murray, Scheers, De Chateaubourg, Mills, Vance, Buckle and Maher, who worked so hard to make the show a success.

T. P. LYNN, Hon. Secretary.

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## MARINE SECTION.

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### Annual Report.

The Marine Section has had a very successful year.

Many most instructive and interesting lectures have been given including lantern lectures, covering a wide range of subjects.

The attendance has been most satisfactory, indicating an enthusiasm which augurs well for this Section.

Many new members have joined during the year, a pleasing feature being the enthusiasm displayed by the younger generation. In addition, some of the older members who have been with the Services are beginning to return, and this opportunity is taken to welcome them back to the fold.

Apart from marine subjects, the interests of the Section are fairly catholic, and on several occasions, live lizards and snakes have been exhibited.

Of the purely marine subjects, Conchology has proved the most popular, and every meeting has seen exhibits of interesting and beautiful shells, mostly from the east coast of Australia. Many specimens have been exchanged or given, identifications made, and advice given to newcomers as to how and where to collect.

Plans for the future include the acquisition of a cabinet, in which it is proposed to house a type collection of New South Wales shells, which will be available at the rooms of the Society for reference by all members.

For the purchase of this cabinet, Mr. Mel Ward has kindly donated £5, the Council of the Society has voted a similar sum, and donations of smaller sums are in hand.

In addition to the monthly lectures, six further meetings each year have been arranged, for the purpose of mutual help and study

and for the exchange of specimens and information. Only one meeting of this kind has so far been held, but the attendance and enthusiasm was so great that further meetings will probably be monthly instead of every two months as at present.

Several excursions have been held during the year, notably to Long Reef, Bottle & Glass Rocks and Bradley's Head, and good collecting was had on each occasion.

The committee wishes to thank all those who have contributed to make the year such a successful one.

The following is a list of the meetings held during the year, and the subject matter of the lectures given. For the forthcoming year, lectures have yet to be arranged, and will be advertised as usual in the "Sydney Morning Herald" on the Saturday preceding the meeting.

1944.—

- 3rd July.—"Old Museums," Mr. Tom Iredale.
- 7th August.—"Man's Insect Enemies," Mr. Musgrave.
- 4th September.—"Camouflage by Man and Nature," Mr. Kinghorn.
- 2nd October.—"Our Seaweeds," Miss Valerie May.
- 6th November.—"Marine Life of Port Jackson," Mr. Laseron.
- 4th December.—"Snakes," Mr. Longley.

1945.—

- 5th February.—"Sugar," Mr. Isaacs.
- 5th March.—"Crabs," Mr. M. Ward.
- 3rd April.—"Cunjevoy," Miss Pope.
- 7th May.—"A Trip in the Upper Reaches of the Shoalhaven," Mr. Helsham.
- 4th June.—"The Formation of the Coast of Australia," Miss Thornleigh.

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## ORNITHOLOGICAL SECTION.

### Annual Report.

It is pleasing to report the continued interest amongst members of this Section. Monthly meetings have been held regularly, and the average attendance of 27 shows a slight upward improvement compared with that of the past few years.

The following is a brief summary of meetings held and lectures delivered: 21st July, 1944, "Similarities Between the Birds of Australia and New Guinea," by J. A. Tubb; 18th August, Colour Films of Nesting Sea-birds, screened by Cpl. Axel Poignant; 15th September, "Extinct Birds," by Tom Iredale; 20th October, Bird-calls, by Alex Walker and Film-slides screened by K. A. Hindwood; 17th November, Illustrated Talk on "Bird Ecology," by P. A. Gilbert; 15th December, Film-slides of Birds in the possession of the Society screened; 19th January, 1945, "Topographical Features of New South Wales and Victoria," by Flt.-Lieut. D. Leithhead; 16th February, "Economic Ornithology," by J. R. Kinghorn; 17th March, Colour Films of Birds, screened by Norman Chaffer; 20th April, "Bird Behaviour," by G. R. Gannon; 18th May, "Australian Quail-like Birds," by N. W. Cayley; 15th June, "Birds Referred to by the Classical Poets," by J. E. Roberts.

The thanks of the Section are extended to the various lecturers for their support and interesting addresses.

Amongst those welcomed by the Chairman during the year were some interstate visitors and Service personnel on leave, including Miss Irvine (Vic.), Cpl. Jack Waterhouse, Mr. A. H. Chisholm (Vic.), Lieut. T. Everitt and Mr. and Mrs. G. H. Barker (Qld.).

An invitation was extended to the Section to be represented in an advisory capacity, on the recently-formed "Fauna Investigation Committee," consisting of appointed members from the Department of Agriculture, Australian Museum and Chief Secretary's Department. A delegate was elected to put forward the views of the Society.

No organised field-outings were arranged during the year, but observations reported at each meeting contained many items of

interest and depicted the individual enthusiasm of many of the members. An endeavour will be made this year to reorganise field-study, although the absence of suitable field-glasses, requisitioned during the early part of the war, is a difficulty that may be hard to overcome.

On the evening of 28th June, 1945, members of the Section, together with representatives of various kindred Societies, made a pilgrimage to the Memorial Tablet in St. James' Church, Sydney, to commemorate the centenary of the tragic death of John Gilbert, the noted ornithologist and explorer. Suitable remarks were made by Rev. E. J. Davidson and representatives of the Societies in attendance, and wreaths of wild flowers placed on the memorial.

The following were elected officers for 1945-1946:—

Chairman: J. E. Roberts (re-elected).

Secretary: A. R. McGill (re-elected).

ARNOLD R. MCGILL, Section Hon. Secretary.

### NEW RULE.

Under the powers conferred by Article 40 of the Society's Articles of Association, Council has made the following:—

#### RULE NO. 3A.

#### Building Fund.

(a) A Building Fund is established for the purpose of purchasing a building, or a site and the erection of a building, designed to accommodate the Society, its members and associates, and such other kindred institutions as may desire to occupy such part of the premises as may be available.

(b) The Building Fund shall consist of:—

- (i) Such sums as are expressly donated to the Fund.
- (ii) Any amounts that may be raised by the issue and sale of Debentures secured upon the income and property of the Society.
- (iii) The interest derived from any investment of the Fund.
- (iv) Such sums as may from time to time be transferred from the annual income.

#### BUILDING FUND.

The following donations have been paid:—

	£	s.	d.		£	s.	d.
E. J. L. Hallstrom . . . . .	255	0	0	K. A. Hindwood . . . . .	2	2	0
Leo Weingott . . . . .	100	0	0	Dr. Marshall . . . . .	2	2	0
A. F. B. Hull . . . . .	25	0	0	A. S. Le Souef . . . . .	2	2	0
Wal. Turner . . . . .	10	0	0	F. G. Pursell . . . . .	2	2	0
Mr. Done . . . . .	10	0	0	Oswald Turner . . . . .	2	0	0
Mrs. Done . . . . .	10	0	0	W. J. Drummond . . . . .	1	2	0
Mrs. Baxter . . . . .	10	0	0	W. Andrews . . . . .	1	0	0
C. Asprey . . . . .	10	0	0	P. Shipway . . . . .	2	2	0
Anonymous . . . . .	10	0	0	A. B. Higgs . . . . .	1	1	0
Mr. and Mrs. Cayley . . . . .	10	0	0	Dr. Forbes . . . . .	1	1	0
Miss E. Allan . . . . .	5	0	0	A. E. Williams . . . . .	1	1	0
H. Yardlev . . . . .	5	0	0	E. H. Zeck . . . . .	1	1	0
Norman Chaffer . . . . .	5	0	0	H. B. Brown . . . . .	1	1	0
C. F. Laseron . . . . .	2	2	0	Dr. McCulloch . . . . .	1	0	0
G. P. Whitley . . . . .	2	2	0	T. C. Roughley . . . . .	2	2	0
E. J. Bryce . . . . .	2	2	0				
					£489	6	0

Other donations promised:—

	£	s.	d.		£	s.	d.
A. Littlejohn . . . . .	100	0	0	L. J. Jones . . . . .	2	0	0
G. A. Johnson . . . . .	5	0	0	A. Whiteley . . . . .	1	0	0
G. H. Hardy . . . . .	3	0	0				
					£111	0	0

Members have notified their willingness to subscribe a total of £2,310 to debentures if issued.



## SYLLABUS OF SECTIONAL MEETINGS, 1945-46.

**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).

1945—

August 13.  
September 10.  
October 8.  
November 12.  
December 10.

Owing to war conditions no set Syllabus has been drawn up for 1945-46, but speakers' names will be published in the Bird column of "The Sydney Morning Herald" on the Saturday previous to the meeting night.

1946—

January 14.  
February 11.  
March 11.  
April 8.  
May 13.—Lecturette.  
June 10.—Annual Meeting and Members' Night.

### BUDGERIGAR SECTION (Third Tuesday in the Month).

1945—

August 21.  
September 18.  
October 16.  
November 20.  
December 18.

Owing to war conditions no set Syllabus has been drawn up for 1945-46, but speakers' names will be published in the Bird column of "The Sydney Morning Herald" on the Saturday previous to the meeting night.

1946—

January 15.  
February 19.  
March 19.  
April 16.  
May 14.  
June 18.

### MARINE ZOOLOGICAL SECTION (First Monday in the Month).

1945—

August 6.  
September 3.  
October 2 (Tuesday).  
November 5.  
December 3.—Exhibition Night and Supper.

Subject to be selected. Advertised in "The Sydney Morning Herald" on the Saturday preceding the meeting.

1946—

February 4.  
March 4.  
April 3 (Tuesday).  
May 6.  
June 3.—Annual Meeting.

Subject to be selected. Advertised in "The Sydney Morning Herald" on the Saturday preceding the meeting.

### ORNITHOLOGICAL SECTION (Third Friday in the Month).

1945—

July 20.—General Discussion: Subject—"Robins."  
August 17.—"Bits About Bikes, Buggies and Birds," by Jack Jones.  
September 21.—Selected Address, by Tom Iredale.  
October 19.—"Life in the Markham and Ramu Valleys," by Major H. Burgh.  
November 16.—Movie Films of Birds, screened by N. Griffiths (Public Relations Officer of the Rural Bank).  
December 21.—"Duties of Ornithologists With Regard to the Breeding of Rare Birds," by A. S. Le Souef.

1946—

January 18.—"Australian Finch-like Birds," by N. W. Cayley.  
February 15.—"In Quest of Birds," by Roy P. Cooper.  
March 15.—Colour Films of Birds, screened by Norman Chaffer.  
April 19.—Selected Address, by J. R. Kinghorn.  
May 17.—"Birds Scenes That Have Vanished," by P. A. Gilbert.  
June 21.—Annual Meeting; Chairman's Address, by J. E. Roberts.

## ROYALTY VISITS THE LYREBIRD.

The Duke and Duchess of Gloucester recently tramped through rough sandstone country to see a lyrebird on its nest. The expedition, which was quite informal, was arranged by Mr. A. H. Chisholm, press liaison officer to the Governor-General, and a well-known ornithologist. The party walked along a bush track in the upper reaches of Middle Harbour, down a steep hillside and across a pleasant creek to a secluded gully; here the female lyrebird had built her home on a rocky ledge. She was not unduly disturbed by the presence of humans and an excellent view of her was obtained when she left the nest. The large egg, purplish-brown with darker blotches, was examined and the habits of lyrebirds discussed. It was explained to Their Excellencies that the hen bird alone incubates the single egg and attends to the nestling. The male bird, being what may be termed a "club man," spends much of his time displaying on specially prepared "dancing" mounds, small clearings in the forest, and indulging in his wonderful mimicry: he rarely comes near the nest.

The nesting of the lyrebirds takes place during the coldest months of the year. The nest takes about a month to build and the period of incubation is approximately six weeks. Near Sydney most eggs hatch towards the end of July, or early in August.

The female will leave the egg, sometimes for several hours, to feed, being under the necessity of foraging for herself as she receives no assistance from her mate. When this happens the egg becomes quite cold. Such a condition no doubt slows down the process of incubation, but it has no apparent effect on the ultimate emergence of the chick from the egg. The young bird stays in the nest for a period of from four to six weeks, sometimes longer, depending largely on the situation of the nest. Nests are occasionally built off the ground in trees in which case the young bird remains at home longer than when in a nest on the ground.

Lyrebirds feed entirely on the ground, raking over the damp earth and humus for insects of all kinds with their powerful legs and claws. The male alone possess the beautiful tail which is spread over his back like a fan (not in an upright position as is commonly depicted) in display.

It is gratifying to know that lyrebirds still nest within a few miles of Sydney at such places as Roseville, Lindfield and Gordon, and throughout the watershed of Middle Harbour. They are not in great numbers, largely because suitable habitats are restricted in those parts.

Their Royal Highnesses were also shown the nest of a rock warbler, or cave-bird, in the dark recess of a cave. This unique bird, which is about the size of a sparrow and of various shades of brown and russet, was seen hopping about the sandstone nearby. It is highly specialised in its nesting habits and is found only within an area of about 100 miles of Sydney. The nest is suspended by spiders' webs from a ledge in the roof of a cave, or some similar situation.

Frogmouths (mopokes), Kookaburras, and numerous smaller birds were seen, and many of the beautiful flowering shrubs of the sandstone were examined and admired.

The Duke and Duchess were accompanied by Mr. A. H. Chisholm, Mr. Norman Chaffer, and Mr. K. A. Hindwood, President of the Royal Australasian Ornithologists' Union. Later, Mr. Chaffer, a leading nature photographer, attended Admiralty House and showed colour films of birds, flowers and other outdoor Australian subjects, mainly relating to the region near Sydney. The above three naturalists are members of the Royal Zoological Society of New South Wales, and the Society is pleased and honoured that its members were able to show Their Royal Highnesses some of the beauty and interest to be found in unspoiled bushland, even though only a few miles from the most populous city in Australia.

The excursion took place on Saturday, July 21, 1945.

## THE FARMER AND THE NATIVE FAUNA.

By E. O. Edwards.

Following on Mr. Le Souef's Presidential address and his timely warning of the dangers of destruction of our wild life, I am taking the opportunity of making some suggestions from a farmer's viewpoint. With over 25 years' experience in the country from the War-rumbungle Mountains into Queensland, and now back to the outer suburbs of Sydney, my experience is that the progressive farmer is well aware of the trouble ahead but far from educated in Zoology, Entomology or Ornithology.

I am of the opinion that the vast majority of farmers are not favourable to the destruction of wild life and that in many cases the killing of Kangaroos, Wallabies, Possums, etc., is due to poor returns for primary produce, and the need to supplement the income. I think the position might be summed up as follows:—

1. The sub-division of land into areas too small to make a reasonable living. This results in the selectors, especially when starting off in rural pursuits with financial obligations heavy, looking for a means to supplement their income, and the sale of skins is an easy way out.

2. The income on the smaller farms is usually too small to pay anything like a reasonable amount to the members of the growing family as pocket money, and, after all, they are entitled to take the girl from next door to the pictures. The sale of skins will bring in the required finance, and the younger generation open their bank accounts at the expense of our wild life.

In the above two cases we cannot altogether blame the farmers. The root of the trouble is bad Government administration.

On the other side we have the professional shooters. They are not farmers, usually coming from country towns, and are the cause of most of our troubles. Again, we have the lazy farmer who finds that the murder of animals is much easier than a day's work on his farm; but I do think that the worst culprits are the professional men from the country towns who spend the week-ends out shooting for "sport." I have no hesitation in saying that I know of bank managers guilty of visiting their clients' properties on shooting expeditions and putting those clients in an unenviable position, as it is not always tactful to upset the bank manager. This does not condemn all bank managers, but I do think it should be made clear that a big percentage of the destruction does come from country towns, and there is absolutely no excuse for business men in a country town to destroy our wild life.

Most farmers, even those interested, are deplorably ignorant of all branches of Natural History. Why? Because they have never had any chance of being educated on the subject in an elementary way.

Here is an example. My nephew, who was doing agriculture at Glenfield High School and staying with me at the time, while poring over his homework one night made this remark: "Uncle, you must have been clever when you were young." I denied it and asked him why. He presented me with a large sheet of entomological definitions, many of which the practical entomologist would not use. These had to be learnt by a youth of 14. Result: a dislike for this "highbrow stuff."

We need simple, practical education on all sections of wild life minus any unnecessary technical terms. Call a life history a life history, never mind about metamorphosis. If the child shows special interest in Natural History he or she will acquire technical terms later on.

Here is another example only a few weeks old:—

A pair of Black-shouldered Kites had been about the district for some time. I found a local poultry farmer crouched behind his shed, gun in hand. On asking him what he was after he said that a hawk (indicating the Kite on a distant tree) was after his fowls (he had no chickens at the time). I asked him if he really expected a bird that size to be able to pick up a fowl and fly off with it. He looked a bit surprised, and replied that it had come down near the fowl-yards and frightened the fowls. When I explained that the bird was obviously after mice, about which he had been complaining for their

ravages on his poultry feed, he became interested and soon realised the position.

My suggestions are that to protect our wild life we must educate our farmers as to their value, but that education must come from practical men. There is a growing antagonism to University students without practical experience, and not without good reason. Efficient farmers must be practical men to succeed and they will not listen to some young man with degrees fresh from the University with often no knowledge of country conditions, though possibly highly versed in science.

Means of getting the farmers interested should be through their own papers, such as "The Farmer and Settler," etc., or more so through such magazines as "Wild Life," but it will need tactful work. I mention that because one speaker at the annual meeting was rather inclined to down all farmers for destroying wild life, which is very wrong.

Trusting the remarks will be of some value and concluding with the opinion that unless there is prompt action in preserving our wild life the upset in the balance of nature will, in years to come, present a problem as great as soil erosion.

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### FOREST DESTRUCTION AND WILDLIFE.

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The following editorial by the President of the New York Zoological Society, appeared in a recent issue of "Animal Kingdom," the organ of the Society. We reprint it as a valuable contribution to the study of conservation dealt with in our President's address.

"Truth seems hard to come by. Rarely does it shine out like a beacon on a mountain-top—usually it is a will-o'-the-wisp in a lower valley.

As a case in point, has the public got the facts concerning the destruction of the forests which are essential, not only for wildlife preservation, but also for balanced and adequate water supply and the needs of many basic industries? The air is filled with propaganda or, shall we say, with inspired or prejudiced information, in the form of magazine articles, as well as motion picture films, prepared and sponsored by representatives of the commercial lumber interests. This material gains widespread circulation, is read or seen by large sections of the public that are led to conclude that all is well with our forests.

The facts concerning the forest situation are clearly presented in the last annual report of the Chief of the United States Forest Service. This report indicates that the rate of destruction, even making allowance for war demands, is far greater than the rate of replenishment and that the situation in regard to forest depletion is rapidly becoming more acute. Do these facts receive widespread circulation? Is the public as a whole informed regarding them? Not really. The potent machinery of propaganda is generally used by special groups seeking special purposes.

Occasionally the beacon flashes out—some Government official makes a statement that draws general attention, or an authoritative article appears such as the recent one by William Vogt, Chief of the Conservation Section of the Pan American Union, telling of conditions in Central and South America, where, in many republics, the velocity of destruction is even greater than it is in the United States. It reminds one in a way of the oncoming of war in Europe. Many people knew it was inevitable, but no concerted action was taken to prevent it.

There are innumerable agencies, governmental and private, that have the facts and realise the seriousness of the situation, but whose efforts in the matter of getting the truth over to the public are not co-ordinated and therefore not fully effective. These conservation forces naturally have their own varying objectives and could not be expected to forfeit anything of their own individualities. Nevertheless, there is one issue in which they should all join together, namely, informing the public concerning the crisis of the forests. This can be accomplished by the establishment of a central agency specialised in the technique of disseminating facts. The situation cannot be saved unless supported by organised public opinion. The Zoological Society is vitally interested because the present trend is a threat of the first magnitude to wildlife.—FAIRFIELD OSBORN."

## NOTES ON THE LACE MONITOR (*VARANUS VARIUS*).

By G. Longley.

Some young specimens of this Monitor having come into my possession in a rather unusual manner, I thought that the following notes might be of interest.

On 17th October, 1944, I received a telephone message from Miss E. McFadyen asking if I would tender Mr. N. L. Roberts (ex-president of this Society) some advice upon the rearing and feeding of a young Monitor popularly known as a "goanna." I replied that I would call at his office, and upon my arrival Mr. Roberts produced a parcel which he had received from Rockhampton, Queensland, accompanied by a letter of advice, stating that the parcel contained three reptiles'



—Photograph by Ella McFadyen.

eggs, which had been found in a termites' nest high up in a tree. Mr. Roberts said that as there were scratching noises, and other sounds of movement proceeding from the parcel, he would be pleased if I would open it; which I did, and then, turning to him, I asked: "I believe you said there were three reptiles' eggs?" He replied, "Yes." I continued: "Well, all three have hatched. Here are three young Monitors (*Varanus varius*)."

This caused a mild sensation with the office staff, and after Miss McFadyen, Mr. Roberts and myself had all fondled and admired the youngsters, I produced a tape measure. After a little difficulty, as



they would persist in winding their tails up in the form of a spiral, we got an average measurement of 11 inches.

The colouring of these young lizards was exquisite. The pattern being something as follows:—

The upper surface of the head is spotted with blue and black marks fading to lavender in the nuchal region. Between the nostrils and the eyes are broad bands of black alternating with narrower ones of pale yellow. The whole of the dorsal surface has narrow transverse bands of black, interspersed with grey; these grey spaces have a series of transverse yellow spots, the largest being in the centre, and diminishing on the flanks. These markings are carried for half the length of the tail, the other half bearing broad alternating black and yellow bands. The colour of the tip of the tail being black. The limbs have alternating black and yellow bands or stripes. There are a few blue spots in the elbow region of the fore-limbs. The digits are black and yellow. The throat is sulphur yellow, and the under or ventral surface is creamy to grey in colour.

The eye has a rather large round pupil, and a narrow yellow iris. There is an upper and a lower eyelid, and also, like a great many other lizards, a rictitating membrane is present. The tongue is deeply bifurcated.



—Photograph by Ella McFadyen.

I took charge of these lizards upon Mr. Roberts' suggestion of my becoming their foster-parent.

Upon my arrival home the young Monitors were placed in a small heated vivarium, as the nights were still rather cold at this time of the year. Fresh drinking water was provided, but for the first two or three days they ate **nothing**, which is not unusual for newly-hatched, or newly-born lizards. In a few days they commenced to feed on a little yolk of egg, and also small pieces of raw or cooked meat. The artificial heat was discontinued when the weather grew warmer, and later they were placed in an outside vivarium with a glass top and side, protected by fine wire. There was also a darkened sleeping compartment. They have grown; but not rapidly. They were measured to-day, 5th June, 1945. The measurements being: 16½ inches, 17½ inches, 18½ inches.

Strange to say, the one which when hatched appeared to be the weakest of the brood is now the largest and most robust.

They are gentle and may be easily handled.

This species attains a length of six feet or more.

## LIMPETS OF NEW SOUTH WALES.

By Miss G. Thornley.

### HISTORY.

(1) The common shells of the world were the first to be named and arranged in the Linnean system. Lamarck later proposed important amendments to the general system of conchology, most of which are in use to-day. Both worked chiefly from dead shells and often grouped shells on quite superficial likenesses.

(2) Travellers and scientists and explorers, such as Linnaeus himself, Banks, etc., all interested themselves in foreign shells, but some did not always get their data correct. If a ship called at both Tahiti and Tasmania, they were very apt to put all their conchological finds into one box, and rely on memory later on. Errors naturally arose and much overlapping.

Shells were ascribed to wrong localities, some were named again and again by later travellers who rediscovered them, sometimes species were confused with a different form from a different place; other shells were overlooked completely.

There were no conchologists living here on the spot, and later, when there were, they inherited a tangled maze of information, hidden in old books, rare research papers, and English and Continental museums.

Limpets were particularly badly treated, because most of them are littoral in habit, and very often collected by travellers. Our shells were named by Blainville, and Quoy and Gaimard of Paris Museum; by Angas and other English workers; and the types were not available for comparison when local workers began to multiply.

Rev. Tenison-Woods, in Tasmania, did outstanding work in this field. He and others did the best they could, but left the field still in hopeless confusion when they passed on.

Mr. Hedley, of our own museum, saw that only comparison of our shells with the types would clear up the anomalies existing. He therefore visited every collection in Europe containing Australian shells, and had drawings and descriptions published. This was a step in the right direction, but Hedley had a very wide field with which to deal, and made no special study of Limpets.

Mr. Tom Iredale undertook this work while at the British Museum, commissioning Mr. Roy Bell to make a wide collection at Twofold Bay, and in Victoria, and by arranging these, and comparing them with British Museum types, etc., was able definitely to settle many of the most vexing points.

Hedley's list, however, was published in 1917 and did not have the benefit of this new information. There are nine Limpets in the list, whereas now there are 16 named forms (counting varieties) and four unnamed. Mr. Iredale's findings were not published till 1925, and he confirmed them then by extensive field studies round and about Sydney.

Some of the difficulties, however, still remain, and many vexing problems, and there is urgent need for more work along the following lines:—

- (1) Study of radular characteristics of rare specimens, if and when they become available, and determining of varietal forms of some common species by the same means.
- (2) Study in the field, of location and habitat, to confirm earlier observations.
- (3) Collections of large series both alive and from shell sand, and separation to determine geographical distribution and variation. A few interesting facts emerge in this way.
- (4) If any means can be devised to make it effective, a study of the breeding habits of the Limpet would settle many doubtful points.

- (5) Some further classification is necessary. As I said, there are at least four unnamed forms, and one named form is not on even the amended list. But further data has to come to hand before Mr. Iredale can do very much about these.

I have tried to study location and habitat problems, and to collect series for study and determination. I think this hobby has added a little to the sum of knowledge of this subject. I have found several new forms.

I first became interested when I started collecting, and observed the infinite variety of pattern, which makes these shells so beautiful and so bewildering. Curiosity, they say, is the mother of all evil, but it leads to enterprises of some value, too. I just wanted to find out all I could about them.

#### WHAT IS A LIMPET?

A Limpet is a saucer-shaped shell, with a colour pattern inside, and with or without ribbing outside. It has no grooves or slits at the sides, nor any holes near the apex, the shape is regular, the apex is central or towards one end. Most Limpets are found on the rocks between the low and high tide mark, but some are below low water in the shallows, and one form prefers mud-flats. There are many similar forms. It is not a Limpet if it is pure white both within and without. It is not a Limpet if it has a slit or groove or hole in it. It is not a Limpet if it has the edge curved-inward, like *Haliotis*, or if it is irregular, like *Gadina* or *Siphonaria*. It is not a Limpet if it has a pattern of crossed ridges, minutely cross-barred on the outside, like *Emarginula*, or *Phenacolepas*. Some of these shells are close relations, others are only superficially like them.

#### HOW CAN WE DIFFERENTIATE BETWEEN ONE SPECIES OF LIMPET AND ANOTHER?

(1) From the shell. Get your eye in and learn to recognise pattern, colour and ribbing. The ribbing is a constant feature, the pattern and colour, while variable, only vary within certain fixed limits.

(2) From the location. Each species definitely prefers a certain environment and no other. Thus, if you know the situation of the shell, you can identify it with ease.

(3) From the radula. This absolutely establishes relationships among the Limpet family, but from the difficulty of using it, cannot be used very often.

(4) From its grouping. Learn to distinguish characteristics of each genus, e.g., *Patelloida*, ribs project beyond edge (sometimes), very shiny, china-like within; *Notoacmea*, smooth and thin shell, often translucent; *Radiacmea*, small white ribs.

#### ECOLOGICAL VARIATION.

I said that each species has only a very limited range in situation. Thus *petterdi* always likes the vertical surfaces of rocks near high tide. I have never found it anywhere else. *Submarmorata* likes flat rocks at half tide and down to low water. Here we meet variation. The specimens at half tide are much darker than those at low water. At half tide they are brown with darker spots, at low water they are cream with brown spots, and have a star-like shape, and there is another variation, probably from below low water, which is light brown, without spots at all.

*C. tramoserica*, which is found everywhere between high and low water, on any sort of rock, varies enormously, but I found that patterns tend to vary with its situation, those in one spot being generally alike. Thus, at Angourie I found a silver-grey *tramoserica* under rocks near dead low tide, with no other colour at all. And on the upper surfaces of the same rocks I found the typical golden form, while up near high tide I found they had the red, orange and black ribbing more marked.

Thus also, you will find the most strongly ribbed forms, such as *Patellanax squamifera*, live in places which receive the full buffeting of the waves; *Chapmani*, too, develops two forms, one flatter and less star-like under coralline growth, the other, less protected, is high

and very prominently indented at the edge. The same thing occurs in *alticostata*. All protected Limpets will be less worn, flatter, smoother ribbed, less prominently indented at the edge. When they attach themselves to another shell, as *mixta* and *insignis* do, they tend to grow very conical.

#### GEOGRAPHICAL DISTRIBUTION.

This phase of our subject needs a great deal more attention. First, a close study of Limpets shows that in some cases there are marked local variations from the norm. Thus, at one place I found that every adult *tramoserica* had a bright brown edge. These variations are sometimes due to disease, sometimes to local conditions, and no doubt may occasionally be mutations that are breeding true. Again, if something that the shell requires is absent the shell may be absent too. If there are no vertical rocks near high tide, *petterdi* is absent also. At some places all the shells are eroded badly. This is generally due either to the softness of the rocks, or to the pounding of the waves at that place.

Local geology has an interesting influence on the shells. The shells on Sydney sandstone are soft and erode easily, those on shale are stronger, while those on basalt or quartzite are very tough in texture. Up at Keppell Bay, where soft shale is next to quartzite and dykes of basalt, one shell even had two different patterns and colour schemes, one always found on basalt, and the other always on claystones.

Examination of specimens from other States reveals the fact that typical forms are found over a wide stretch of coast, making varietal forms every few hundred miles. Limpets do not have a free-swimming larval stage, therefore they can only travel along a coast. So every country, even every island, has its own typical forms, so distinct at times that they are recognisable at a glance. Along our own coasts the range of most Limpets is limited. *Petterdi* is found right from Tasmania to Queensland, *tramoserica* and *squamifera* from South Australia all the way to Queensland, but most of our other shells are variations of southern forms. The *marmorata* group is interesting. In Tasmania we have *marmorata*, in N.S.W. *submarmorata*, in Queensland two variations of *saccharina*, and an unnamed form, all similarly shaped and spotted. Tenison-Woods, in his 1873 paper, said that all were the same shell, but later research does not confirm this.

Again, there is the *flammea* series, the true *crucis* (*flammea* or *irradiata*) in Western Australia, *scabrilirata* in the southern States, *flammea diminuta* in N.S.W. and an unnamed variation at Keppell Bay.

*Insignis* is found in Tasmania, *insignis cavilla* in N.S.W.

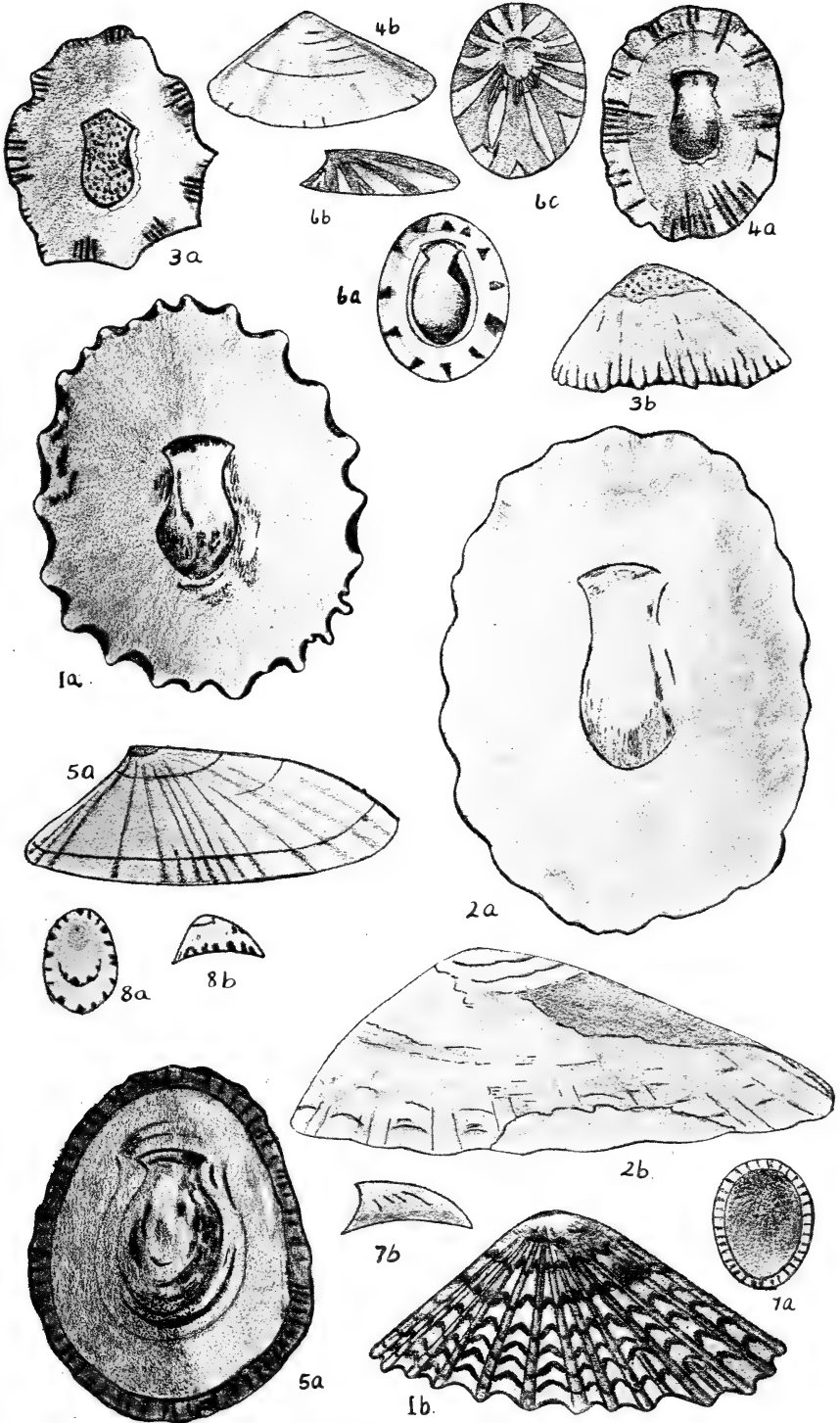
There are large series grouped round *squamifera* and *tramoserica*, all the way round the South, West and East of Australia.

#### BREEDING PROBLEMS.

How do Limpets breed? Each individual has first a masculine, then a feminine stage, but cannot fertilise itself. Very soon after hatching the young attaches itself to a convenient rock, and thereafter leads a strictly sedentary life. Though I have found that some species will move out of the sun on a hot day into the shade, most of them move very little in a lifetime. Thus a Limpet only travels the distance the egg can drift before it can hatch. That is one reason why their range is limited; another reason is that they die quickly when taken from their habitat, so a current would take only dead shells to a new place.

Can related forms interbreed and thus produce an infinite number of mongrel forms? It is unlikely. The radula does not vary with the pattern. Are all variations purely individual? Does some trick of the chromosomes and genes fix each colour and line of the pattern? Or do the patterns depend entirely upon environment? If the variations are individual, by what laws are they governed? Maybe Mendelian principles apply to Limpets just as they do to human beings. Problems of breeding seem to be basically the same for all living creatures.

Now, here is an interesting thought: if mutations from a particular form have occurred, both forms could live side by side, and each breed true, varying only slightly from the other, and yet not be recognised



Limpets of New South Wales.

—G. Thornley, del.

even as sub-varieties. That is why further radular determination would be advisable.

Why can't breeding problems be studied by breeding Limpets? Aquarium conditions cannot be stabilised sufficiently. Salt-water aquaria are difficult to maintain, unless they get the ebb and flow from the ocean, and though you can keep Limpets in an enclosure, you can't make a net fine enough to keep the eggs of other species out.

#### OUR N.S.W. LIMPETS.

This naming business is rather like a cross-word puzzle, but not quite so easy. It reminds me of the trouble astronomers had to name the Asteroids. As more and more were discovered the names of minor Greek and Roman deities ran out, then they gave them city names, and finally the Asteroids were discovered in such hordes that they started to number them.

Research workers do not all agree, and later work of one adds to the earlier findings of another. Still, the shells are there down at the beach, whatever name we call them by. The following list contains the latest nomenclature and division I can find.

In the plate the numbering is the same as that below, (a) being the interior, and (b) the exterior view.

#### FAMILY PATELLOIDIDAE.

1. *Patelloida alticostata* Angas, subspecies *antelia* Iredale. (480 on Hedley's list). Size: 14 mm. by 11 mm.

Seven main ribs, with one or two intermediate ones, about 21 in all. Black, basket-like lines connect ribs, forming a pattern on the back. Inside, porcellanous, blue or white, with irregular brown or black body marks. It is sometimes star-like, with a black edge.

It is found at dead low water, among weeds.

2. *Patelloida alticostata* Angas, subspecies *complanata* Iredale. Size: 14 mm. by 11 mm.

Ribs obsolete, often absent, back often covered with white coralline growth, inside porcellanous, pattern and colour more indeterminate, and less regular, edge smoother.

Habitat: Below low-water mark. I have taken it in depths of one to two feet at dead low tide. It likes sheltered positions.

3. *Patelloida submarmorata* Pilsbry. Size: 14 mm. by 11 mm.

It begins with seven main ribs, adds more up to 33, narrow, small and black. But the average specimen has obsolescent ribs, and is much eroded. Inside brown or cream, body mark outlined in white, sepia marks at edge, and sepia spots inside body mark. It has three variations: At half tide on flat rocks it is brown with sepia spots; at low tide and below it is cream or white with brown spots; and there is a rarer, more regular form, which is brown and sepia without any spots.

Habitat: Always on flat upper surfaces of rocks, between half and low tide.

4. *Notoacmea mixta* Reeve, subspecies *mimula* Iredale. (481 on list). Size: 14 mm. by 11 mm.

Ribs obsolescent, almost smooth, somewhat eroded, greenish-grey back. Inside cream with brown lines at edge irregularly placed. Even edge.

Habitat: On rocks and dead shells in mangrove zone, and mud-flats.

5. *Notoacmea petterdi* Tenison-Woods. (483.) Size: 23 mm. by 12 mm.

Ribs obsolescent (though specimens are sometimes found with narrow sharp ridges) almost smooth, somewhat eroded, greyish back. Inside brown body mark, bluish or brown; black, or black and brown checked edge.

Habitat: Always on vertical rocks near high tide.

6. *Notoacmea flammea* Quoy & Gaimard, subspecies *diminuta* Iredale. Size: 10 mm. by 8 mm.

Smooth, regularly oval, apex towards one end, cream and brown radiating lines inside and out, translucent, flat, sometimes a white china-like line between body mark and edge in adult. 6c gives another view of the inside, showing the extreme variability of the pattern.

Habitat: Have found it under stones at low water, and on sides and top of stones higher up. It is not common. I found it in Taylor's Bay, Port Jackson. It does not live anywhere where a strong tide beats on the rocks, but prefers sheltered bays.

7. *Notoacmea subundulata* Angas. (484.) Very rare. Size: 8 mm. by 6 mm.

Light brown, sharply conical, apex towards one end, lined faintly on back. Greenish-blue and shiny within, with sepia and brown checked edge, sometimes entirely brown within.

Habitat: It has been dredged in shallow water at Eden.

8. *Notoacmea* (unnamed). Size: 6 mm. by 4 mm.

White, translucent, with reddish-brown marks inside and out at edge and round shell. Apex towards one end, conical. It is probably a variety of *subundulata*.

Habitat: Unknown. It was found by myself at Kurnell in shell sand.

I also have another shell, found at Terrigal, which is probably a *Notoacmea*, and resembles *flammea*, of which it may be another variety.

9. *Actinoleuca calamus* Crosse & Fischer. Size: 10 mm. by 5 mm. Very rare.

Close ridges, uniformly dark grey or black, apex towards one end, shell oval and very narrow, even edge, shining blue within, regular black body mark.

Habitat: I have found the only three of these taken in N.S.W. One was found at Kurnell and two at Terrigal. They have more colour than the Tasmanian shell, which is uniformly white. In shell sand. They have not yet been found alive.

10. *Actinoleuca* (unnamed), probably a variation of *calamus*. Size: 8 mm. by 5 mm.

Bleached looking, close light brown ribs, tiny, sharply conical, apex central, frail, light brown lines somewhat irregular inside at edge, spotted round centre.

Habitat: Dredged in shallow water at Eden. Very rare.

11. *Radiacmea mufria* Hedley. (482 on Hedley's list.) Size: 5 mm. by 3 mm.

It is narrow, tiny and high, white ridged, with red lines inside and out.

Habitat: It is found in Galeolarian worm tubes. 11c is the end view.

At Kurnell and several other places I have found specimens which begin with a typical *mufria* at the top, and widen quickly into a typical *insignis* at the base. This leads me to believe that *mufria* is only a variation of *insignis*. A view of such a specimen is given in 11d.

12. *Radiacmea insignis* Menke, subspecies *cavilla* Iredale. Size: a, b, 10 mm. by 6 mm.; c, d, 14 mm. by 10 mm.

There are, I am sure, two variations of this. Both are illustrated. 12a, b, is greenish-brown outside with black or brown cross, ribs obsolescent, very conical, inside brown with dark cross always plainly marked, sometimes a white V at centre. It is always found on other shells, such as *Turbo*, near low water.

12c, d, is very variable, and may be more than one variety. *Mufria* is probably a close relation or variety of it. Always has close irregular white ribs on back, with an even edge. Marking inside is a brown cross; just a brown body mark; brown body mark with a white V; brown lines at edge; or red lines at edge. May be flat or sharply

conical. Apex towards one end. Body mark is sometimes double or triple, one line within the other.

Habitat: Always on flat rocks, right at low tide.

13. *Asteracmea illibrata* Verco, subspecies *mellita* Iredale. (487.) Uncommon. Size: 5 mm. by 4 mm.

This is the tiniest of our Limpets. It is mauve to lilac, very smooth and regular, shining within, with white line at edge. Sometimes it is yellow or rose rayed outside, and in large specimens has a checked edge in yellow and lilac shades inside. Body mark is faint or absent.

Habitat: It was dredged by Verco in South Australia, and is found in shell sand in this State. Cpl. John Laseron tells me that he has found it alive in wet sand under rocks at dead low water. It may be that it adheres to the under-side of rocks, and drops off when the rock is disturbed. He got his specimens by screening the wet sand.

#### FAMILY PATELLIDAE.

14. *Patellanax chapmani* Tenison-woods, subspecies *perplexa* Pilsbry. (485.)

This is also commonly called *octoradiata*. Size: 27 mm. by 12 mm.

Both species and its variety are found here. *Chapmani* is not figured. It has eight ribs with a red line down each, white interior, but it is not star-like, but oval, and somewhat irregular. *Perplexa* is commoner, eight-ribbed, each projecting. It is white within, without a mark ever, and has a red line down each rib on the exterior. An uncommon variation has seven instead of eight ribs.

Habitat: It lives below low water under bryozoa growth, or weeds. Very hard to find, but common as dead shells.

15. *Patellanax squamifera* Reeve. (486.) Size: 40 mm. by 27 mm. The illustration is reduced in size. It is one of our largest Limpets.

There are at present four shells bearing this name, grouped on quite superficial likenesses, though some are undoubtedly related. Each will be dealt with in turn.

The true *squamifera* has a thick heavy shell, strong ribs, each ridge scaled or beaded, 13 primary ribs on the young shell, 30 to 40 ribs on the adult, white, sometimes tinged with black. Inside china-like, cream, with blue and brown irregular splotches. Body mark is seldom distinct, sometimes tinged with pink or orange, blue or brown.

Habitat: Lives at low tide in very exposed places, where the waves beat continually upon it. Prefers vertical surfaces. The more exposed the place, the more sharply conical it becomes, and the heavier the ribs.

16. *Patellanax squamifera* Reeve (southern form). Size: 27 mm. by 23 mm.

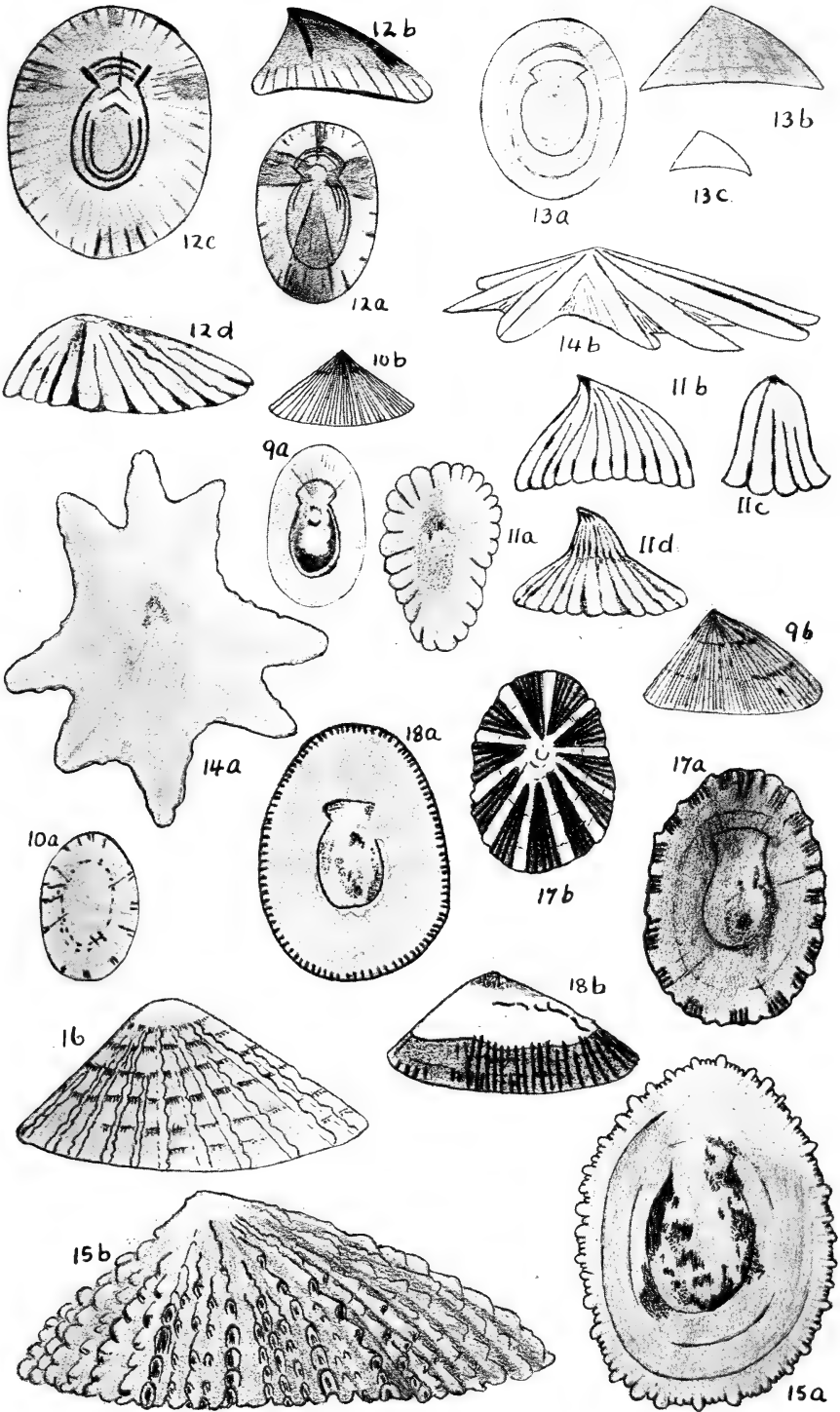
This form, taken by me at Long Bay (Malabar) is very like the southern shell which is called *squamifera* in South Australia. It is white within, without a mark, edge only slightly indented. The outside is white or cream, with slight ridges, wavy but not beaded, and has brown rings round the shell. It is of a somewhat different shape from *squamifera* proper.

17. *Patellanax ustulata* Reeve. Young form (11 mm. by 8 mm.) figured.

Adults grow much larger. It is a Victorian species, which has come into this State, and is closely related to *squamifera*, with which it has been confused in the past. It is somewhat smaller, smoother, black ridges in adult, even edge, blue inside, tiny black lines in groups of five, round edge. The young has 11 white ridges with black ridges in between, and this readily distinguishes it from *squamifera*, which begins usually with 13 white ridges, and no black ones. The adult closely resembles *squamifera* at times, but the edge is sometimes touched with orange, and rays of that colour sometimes appear on the back. Translucent rays can be seen even in the adult, which is not nearly such a heavy shell as *squamifera*. Also it sometimes has a continuous black edge.

Habitat: At Terrigal I found it on vertical rocks a few feet above





Limpets of New South Wales.

—G. Thornley, del.

low water in sheltered situations. *Squamifera* was found on the same rocks in exposed places.

18. (Unnamed). Probably related to *ustulata*. Size: 14 mm. by 10 mm. Very rare.

Black ridges on back, no white ridges at all, smaller and more oval than *ustulata*. Blue within, with minute black lines at edge. Thin shell.

Habitat: It was found at Pussy Cat Bay, 1893, and Coogee, 1895, in rock pools. It was not found since till I took a specimen at Kurnell in shell sand.

19. (Unnamed). Has been confused with *squamifera*. Size: 28 mm. by 20 mm.

This is not figured, as it could be easily recognised from a description. It is flatter, more elongated than *squamifera*, very regular edge, pink radiating lines within from centre to edge. Colours milky pink and cream. No body mark, but a yellow or orange blot at centre. Ridges are obsolete, and hidden by coralline growth. It is slightly beaded at the edge outside. It is similar to the New Zealand shell *lacunosa* to which it has a marked resemblance. It may prove to be no relation to *squamifera* at all.

Habitat: I found it alive in a rock pool at dead low tide at Gerringong, down the South Coast, but have taken specimens in sand since in other places. It is always covered with coralline growth.

20. *Cellana tramoserica* Sowerly. (488.) Size: Up to 2½ inches in length.

This is not figured, as it is easily recognisable and the commonest Limpet we have. It is very variable, large, red, orange and black radiating ridges, close together, even edge, golden, orange, black and silver within, very variable pattern. It is usually a shining gold, with black dashes radiating towards the edge.

Habitat: It is found everywhere between tides.

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## FRESHWATER CROCODILE IN CAPTIVITY.

By E. Worrell.

On the 10th January, 1945, Mr. J. Matthews, of Katherine, presented me with a pair of young *Crocodilus johnsoni* which he obtained from the Katherine River, Northern Territory, on the 2nd December, 1944. During the month which he kept them, Mr. Matthews offered the crocodiles grasshoppers, beetles and geckoes of various genera, but although quite lively on receipt, their physical condition was definitely not all that was to be desired. The following are my notes from personal observations . . .

Receiving information beforehand of Mr. Matthews' intention of presenting me with the pair of crocodiles, I prepared a receptacle which was to constitute their living quarters. A medium-sized iron tank was obtained, into which well-washed river sand was placed to a depth under one inch. (Well mixed with the sand was a quantity of fine gravel, as specimens of all ages which were dissected and X-rayed contained within the stomach gravel and pebbles—doubtless as a digestive aid.) In the centre of the tank a large rock was deposited, hollowed beneath to permit entry of the reptiles' bodies should they desire darkness. The tank was then filled with water to a depth of about six inches, leaving the rock protruding two or three inches above the water. The entire tank occupied a position which enabled it to be exposed to one hour's morning sunlight daily.

Turning *Crocodilus johnsoni* into their tank without receiving nips from their hissing, snapping jaws almost developed into a problem within itself, but eventually the feat was accomplished without casualties on either side.

The largest, a male, measured 11 inches, of which the head comprised  $1\frac{1}{2}$  inches. The other, also a male, was slightly shorter. (When Mr. Matthews first captured them they barely measured six inches in length, and as the navel seams were opened to almost one-fourth of an inch when the bodies were distended, he surmised that the incubation had taken place during the last week of November.) Both explored their new home with unrestrained vigour and commenced fighting viciously almost immediately. Several peculiarities of the crocodilia were quite evident from the beginning; as they submerged the valvular nostrils situated on a mound on the top of the snout closed, also the flaps over the diagonal auricular slits, and a transparent lid slid from the anterior to the posterior of each eye, affording unrestricted vision when the organs were immersed. Remaining submerged for ten-minute periods appeared to be accomplished without difficulty and when breaking water the nostrils and eyes only were visible, and occasionally the tail, while the body hung almost vertical.



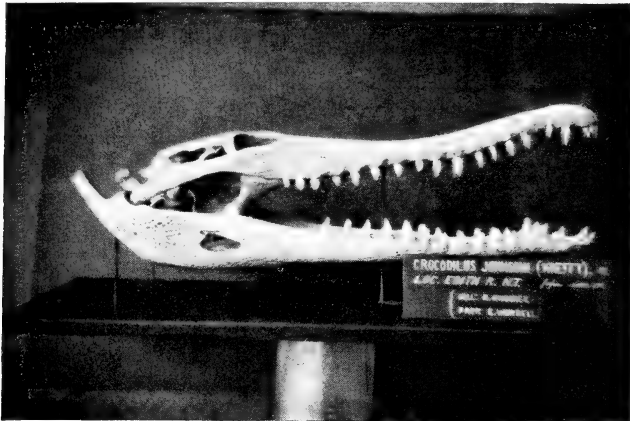
The tail and hind-limbs were used in casual swimming while the fore-limbs were occasionally pressed against the body, but the tail only was used when swimming at any noticeable speed. Five digits without webbing were attached to the fore-limbs and the two outside toes without claws. Four more or less elongated digits on the hind-limbs were strongly webbed with one outside clawless. These webbed feet maintained a steady tread as the reptiles surfaced.

On the following day the larger crocodile swallowed two small frogs, hindquarters first, and on the fifth day the emaciated smaller one began feeding. Experiment with various types of food has convinced me that a staple diet of frogs and tadpoles supplemented with shrimps will conform to their natural requirements. Often, the hindquarters only of larger frogs were swallowed. Meat was refused; living food must always be offered.

Besides hissing, during which the musk glands on the chin protrude, crocodiles are capable of producing another sound commonly known as "bellowing." On the surface this sound, which resembles to a certain extent in the youngsters the sharp whimper of a tiny pup, is emitted through the open jaws or nostrils, but when submerged the sound may issue into the back of the throat or the cavity of the chest, as although

there is little noticeable decrease in volume, no air bubbles whatsoever are apparent.

At present in their tropical atmosphere the crocodiles are thriving and a plentiful food supply being available has filled their physique to



normal healthy proportions. If a steady temperature of approximately 90° F. could be maintained with suitable artificial humidity, I have no doubt that crocodiles could be accommodated in captivity in the temperate zones.

### THE ORANGE-NAPED WHIPSNAKE.

By E. Worrell.

On the morning of the 21st February, 1944, I was considerably elated to obtain alive from the rocky cliffs of Emery Point, Darwin, an Orange-naped Whipsnake (*Pseudelaps christeanus*), 13½ inches in length.

The long head, rather distinct from neck, was black—the neck likewise—a broad pinkish-orange band crossed the nape slightly overlapping the posterior of the parietals (the scales on the nape were lightly tipped with brown). The body, slender and depressed, was a reddish-brown on the dorsal surface, fading to greenish tinged olive sides, each scale posteriorly edged with chocolate, displaying a network appearance. The internal organs could be faintly discerned through the white transparent ventral plates.

I kept this snake (of which I believe only four or five specimens had previously been known to science) under observation for almost two months, during which it refused all food, although I offered small frogs and lizards, also insects.

It proved to be of mild disposition, and only after continuous provocation would assume a belligerent attitude. The full striking stance was to raise the anterior third of the body from the ground and double the neck. All its energy would be concentrated on one strike, at the termination of which the body would fall clumsily outstretched to the ground. A further attempt to bite was rare, the tiny snake usually allowing itself to be handled without resistance. Forced bites on my fingers produced no irritating or otherwise ill effects, presumably owing to the smallness of the venom apparatus.

When placed in the open, the Whipsnake almost invariably sought cover beneath rocks in preference to bark or rotted timber.

On the 18th March, the anterior half of the skin was cast, and

the remainder two days later. Additional food was offered, this being refused, and death came by accident on 17th April.

During July the same year I visited Sydney and Mr. Kinghorn confirmed the identity and asked if I could manage to acquire another specimen or a series for the Museum.

On my return to the Northern Territory I secured another specimen, over 16 inches in length, from Katherine, on the 1st November, 1944. This I preserved and presented to the Australian Museum, along with other specimens from the North.

**Scalation.**—Small rostral broader than deep, barely visible from above; nasal entire, does not contact preocular; frontal somewhat acute posteriorly, twice as broad and slightly longer than supraoculars; six upper and eight lower labials.

Scale 17 rows; ventrals up to 196; anal divided; subcaudals up to 50, paired.

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#### NOTES ON BURTON'S LEGLESS LIZARD (*LIALIS BURTONIS*).

By **G. Longley.**

I have made a few not altogether successful attempts to keep this reptile in the vivarium, as most specimens only lived a few months. Better results were obtained when Mr. E. Worrell brought me specimens from the Northern Territory of Australia.



—Photograph by Ella McFadyen.

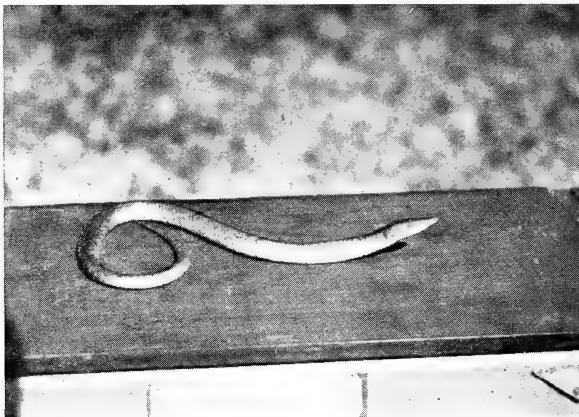
**Burton's Lizard.**

These, a male and female, were of a light biscuit colour above, fading to almost white towards the ventral surface, which was chocolate brown, lighter towards the centre. The side of the head has a dark brown stripe commencing at the nostrils, and extending to beyond the ear opening; below this is a broad whitish band which extends beyond the head and merges with the lighter colour bordering the darker ventral surface.

Mr. Worrell told me that he obtained the larger specimen, which is ♀ and 15 inches in length, from Darwin. The male, which is rather smaller, he collected from Warrigata, N.T.; where it caused something of a sensation when it appeared in a trench full of soldiers, they, of course, mistaking it for a small snake, and were apprehensive in consequence. These two lizards were received on 17/7/44, and placed in a heated vivarium containing leaves, bark, etc., also a shallow dish of fresh water.

Later I received a male of a reddish-brown colour, collected by Mr. K. Hindwood in the Lane Cove district, on 21/9/45.

Mr. J. R. Kinghorn gave me another small male, 11 inches in length, of a light slate colour, from Ryde, N.S.W.



—Photograph by Ella McFadyen.

**Burton's Lizard.**

Isopods (slaters), various insects, and their larvae were placed in the vivarium as food for the reptiles, but their favourite diet consisted of the small skinks, three or four inches in length, so common in the undergrowth. When approaching its prey, *Lialis burtonis* strikes in much the same manner as a snake, killing its victim by a bite on the head or shoulder region, turning it in its jaws until the head of the prey is pointing down the gullet, and swallowing it whole. These lizards did not kill other lizards unless they are hungry, and I have known small skinks to be in the vivarium for several days without being interfered with in any way.

Burton's Lizards sloughed at varying intervals, the slough being almost perfect if the reptile was in good condition.

The male from Warrigata, N.T., died on 3rd March, 1945.

The other three inmates of the vivarium are alive and well (11th June, 1945).

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**SAVE THE TREES—CONSERVE OUR FORESTS.**

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The Forestry Advisory Council of New South Wales has issued an appeal to all tree-lovers to join in a campaign designed to inspire a general tree-consciousness, together with forestry practice, erosion, soil and water conservation, bush-fire prevention, and other problems of paramount importance.

It is planned to enrol various groups, associations with kindred aims, individual members, governmental bodies, and community interests to further the above objects. The subscription for life members is fixed at £5/5/-, and for associate members 5/- per annum.

The Royal Zoological Society of New South Wales has expressed sympathy with the proposed campaign, and recommends its members who feel interested to become subscribers.

Subscriptions may be forwarded to: Mr. F. T. Berman, Organiser, Forestry Advisory Council of N.S.W., 55 William Street, Roseville.

THE ESTABLISHMENT OF SALINATOR FRAGILIS LAMARCK  
AND SALINATOR SOLIDA VON MARTENS AS TWO  
DISTINCT SPECIES IN AUSTRALIA.

By Mrs. Lee Woolcott.

During the last two or three years, when collecting in the mangrove areas and muddy backwaters of New South Wales, I have made considerable collections of *Salinators*, and noticed that in several places I collected what appeared to be two distinct species. Sirius Cove, Port Jackson, was the first spot at which I found a *Salinator* of a delicate, globose kind. The specimens were small, and it was presumed that they were merely juveniles. On collecting at Middle Harbour and North Harbour, Port Jackson, I noticed a solid shell in all stages and sizes, and side by side with it, small and medium sized snells of a more delicate nature. I gathered a series of both, and after removing their opercula became convinced that there were two definite species, the opercula being completely different. Last year, during a short holiday at Narooma, on the South Coast, New South Wales, large and beautiful specimens of the frail type were collected, and so I was able to compare both shells in a complete range of size.

Hedley (1900, p. 511-12) proposed the new generic name *Salinator* to indicate the group typified by *Ampullaria fragilis* Lamarck. The New South Wales Molluscan List to date shows only one species of the genus *Salinator*, under which undoubtedly, two species will have to be included, as the observations above have shown, and research into literature has proved.

Lamarck (1822, p. 179) named *Ampullaria fragilis*, a small species deposited in the Paris Museum and collected by Peron, whose collections were confused through the death of collectors, and no locality was therefore given. The species was described as very thin, transparent, and greyish-horn colour. Later Quoy and Gaimard (1833, p. 201) described and figured (pl. 15, fig. 10-16) as *Ampullaria fragilis* Lamarck, specimens collected by them, and gave figures of two varieties. Of these, figures 13 and 14 conform to Lamarck's *fragilis* (which, however, Quoy and Gaimard regard as a variety of *fragilis*), whilst the species they regard as the true *fragilis* (fig. 10) does not conform to Lamarck's description of *fragilis*, or with Delessert's later figures of Lamarck's species (1841, pl. 31, fig. 4a, b c).

Later, Schacko, being interested in radula, found two different kinds amongst some Australian shells, and gave them to von Martens to name. Martens recognised two distinct species of shells, and gave an excellent account correctly determining the Lamarckian *fragilis*, and named the other species *solida*, but again only Australia was given as a locality. Schacko gives a full account of the radulae of these two species in his paper (1878, p. 1-9), and includes von Martens's description of *Amphibola solida*. The excellent comparison given by Schacko, not only of the radulae but also of the structure of the two shells, immediately shows the existence of the two distinct species. One is a solid, globose-conical form with dark red, zigzag, interrupted markings, and the other, a fragile, dilated-globose species with dark bands.

Previously Potiez and Michaud (1838, p. 288) had complicated matters when they described the collection at Douai, as confusion existed over the localities and they were all labelled New Zealand. They, however, recognised two species of these shells, one as *Ampullaria fragilis* (pl. xxviii, figs. 15-16) which is Quoy and Gaimard's "variety," and the other, a smaller, smoother form, which they named *Ampullaria quoyana* (pl. xxviii, figs. 17-18). Schacko rightly pointed out Quoy and Gaimard's fig. 10 more correctly belongs to von Martens's *solida*, and their figs. 13 and 14 to Lamarck's *fragilis*.

In the above descriptions, however, the opercula were neglected, except by Quoy and Gaimard, who gave a figure of an operculum but gave no indication as to which variety it belonged. From the present observations, where live specimens have been found, with opercula, it has been discovered that the opercula form a most striking and constant characteristic of the two species, differing in structure, colouring and size.

The characters of the two species of *Salinator* found in Australia are compared below:—

*Salinator fragilis* Lamarck, 1822.

**Shell** frail, broad, inflated, fairly transparent, globose, umbilicated.

**Spire** small. **Height** of shell approximately 5 times that of spire.

**Sutures** deeply impressed.

**Aperture** large, roundly expanded, outer lip thin, inner columellar lip attingent to body wall for greater part of length, making umbilical cavity appear wide.

**Texture** delicate, growth striae conspicuous but irregular.

**Colour** creamy fawn with brown concentric bands; young forms often uniform gold-brown.

**Operculum** very thin, papery, pale horn colour, large, completely filling aperture. Paucispiral. Spire flat, no conspicuous spiral articulation on inner face.

**Measurements (fig. specimen):**  
**Height**, 16 mm. **Width**, 16 mm.

**Distribution:** New South Wales, Queensland, Victoria, South Australia, Western Australia, Tasmania.

*Salinator solida* von Martens, 1878.

**Shell**, conical-globose, solid, opaque, umbilicated.

**Spire** elongated. **Height** of shell  $3\frac{1}{2}$  times that of spire.

**Sutures** impressed, whorls faintly angulated.

**Aperture** fairly small, rounded, with lip thickening towards base. **Inner columellar lip** appressed to body whorl, making umbilical cavity small.

**Texture** strong, growth striae rather regular.

**Colour** greyish-cream with close set longitudinal bands of broken rust-coloured zigzag markings.

**Operculum** thick, strong, dark red-brown in colour. Much smaller than *fragilis*. On inner face a very conspicuous projecting spiral rib or articulation, which is present in all specimens.

**Measurements (fig. specimen):**  
**Height**, 15 mm. **Width**, 11 mm.

**Distribution:** New South Wales, Queensland, Victoria, South Australia, Tasmania, Western Australia (?).

**Remarks.**—The species *Ampullaria quoyana* Pot. & Mich. is undoubtedly a synonym of *fragilis* Lamarck, possibly a young form, as immature specimens of *fragilis* examined are difficult to distinguish from the illustration and description of *quoyana*. Some of the specimens of *solida* and *fragilis* from other States exhibit slight variations from the typical New South Wales specimens, but the fundamental characters remain the same. The variation when present, is possibly an environmental factor.

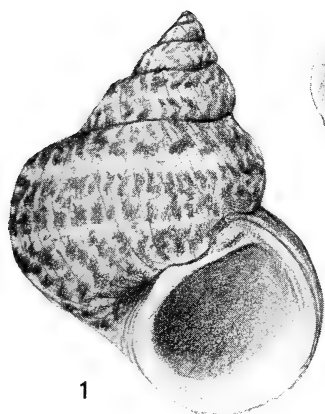
In New South Wales, I have found *solida* both in true salt mangrove habitats as well as in brackish to almost fresh water. On the other hand, I have found *fragilis* only where fresh water in some degree is present, and not in true mangrove mud swamps. *Salinator solida* is much more prevalent than *Salinator fragilis*, and can be found on the edge of nearly all mangrove and salty backwater areas.

To Miss Joyce Allan, of the Australian Museum, I wish to express my gratitude and thanks for her encouragement and assistance with this paper, and, in particular, for the preparation of the accompanying plate of illustrations. Also Mr. T. Iredale, for his help in taxonomic matters.

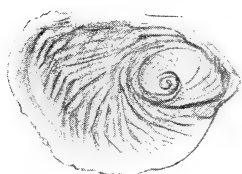
#### REFERENCES.

- Hedley, 1900, P.L.S.N.S.W., pt. 3, p. 511-12.  
Delessert, 1841, Rec. Coq. non. fig. par Lamarck, pl. 31, fig. 4a, b, c.  
Lamarck, 1822, Hist. Nat. des Animaux sans Vertebres, Tom. vi., pt. 2, pp. 179-180.  
Potiez and Michaud, 1838, Cat. Moll. et Coq. du Mus. de Douai, p. 288, pl. xxviii., figs. 15-16.  
Quoy and Gaimard, 1833, Astrolabe, Zool. ii., p. 201, pl. 15, figs. 10-16.  
Schacko, 1878, Die Zungenb. der Gattung Amphibola-Jahrb. der Deutsch. Malakolog. Gesell., pp. 1-9, t., i., figs. 1-4.





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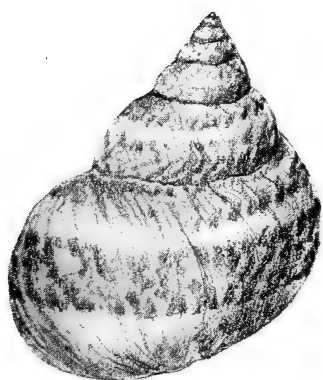
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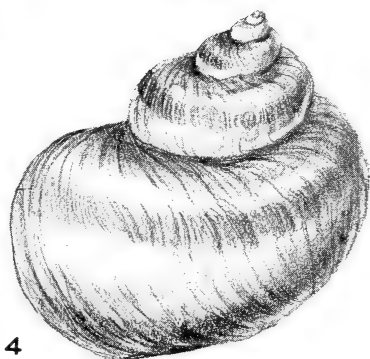
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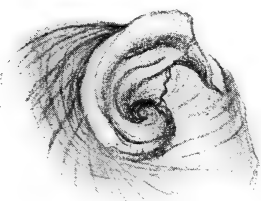
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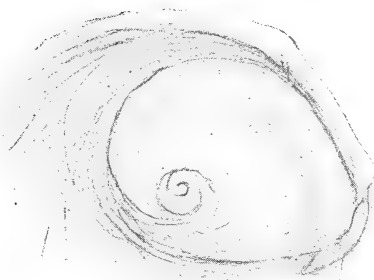


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*Joyce Allan*

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10

*Sallnator solida* and *S. fragilis*.

### EXPLANATION OF PLATE III.

- Figure 1: Front view of *Salinator solida* von Martens. Enlarged.  
" 2: Back view of same specimen, in natural position resting on base.  
" 3: Front view of *Salinator fragilis* Lamarck. Same magnification.  
" 4: Back view of same specimen, resting on base.  
" 5: Inner face of operculum of same specimen of *Salinator fragilis*. Enlarged.  
" 6: Outer face of same operculum. Same magnification.  
" 7: Inner face of operculum of same specimen of *Salinator solida*. Same magnification as that of *fragilis*.  
" 8: Outer face of same operculum.  
" 9: Inner apex of operculum of *S. solida*. Considerably enlarged, showing projecting spiral rib.  
" 10: Inner apex of operculum of *S. fragilis*. Considerably enlarged, showing lack of spiral projection.
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### GENETICAL ANALYSIS OF THE YELLOWFACE BLUE BUDGERIGAR.

By T. J. McSwiggan.

#### DESCRIPTION:

Immature: Pale yellow face. Markings similar to wildtype green, but yellow ground colour paler. Body colour, blue, varying in extension and depth according to the genetic constitution of parent birds.

Mature: Bright yellow face. Markings similar to wildtype green. Body colour in all forms shows marked reversion towards wildtype green. Usually green suffused more or less with blue.

The normal green or wildtype budgerigar is too well known to need description, other than to remark that the green body colour of the nestling differs very little from the adult specimen. In all other mutations from the wildtype with the exception of the yellowface blue, the plumage of the matured bird can also be determined with certainty from its appearance as a nestling. If a bird is an olive, normal blue (whiteface) or yellow in the nest it will retain that colour on reaching maturity, but in the case of the yellowface blue, the plumage of the young undergoes a change so marked and abnormal in the budgerigar as to make this mutation an excellent subject for experiment and observation.

#### EARLY RECORDS.

There have been other recorded instances of the appearance of a yellowface blue. Dr. Karl Russ, in his book, "The Budgerigar" (page 119) relates: "In the course of the summer of 1881, Mr. Kessels, of Uccle (Holland) bred another blue budgerigar, a female which was blue all over its body. Head and tail, however, were yellow. There are also blue budgerigars which still show a clear yellow, particularly at the head." It is interesting to note the first normal blue budgerigar (whiteface) is recorded as having been bred in 1881 by Mr. Limbosch, also of Uccle.

In 1933, a pair of whites or "silvers" with yellow heads were exhibited at the R.A.S. Show in Sydney, and many aviarists will, no doubt, remember them. Most of us were novice breeders at the time, but it is regrettable the more experienced did not seek to obtain and propagate these specimens.

My own stock birds of the yellowface variety, and those in the aviaries in Australia at present are, indirectly, the product of the variety which appeared in England about 1935. The modern mutation is, as far as we know, altogether separate and distinct from the others, and

there is evidence to support the theory of it being a reverse mutation between normal blue and wildtype green.

#### REVERSE MUTATIONS.

Reverse mutations are not altogether unknown. Denys Weston, F.Z.S., in an editorial note to the second edition of his book, "The Budgerigar in Captivity," instances the fact of normal marked young birds produced by his greywings. Commenting on such an unusual occurrence, Dr. Hans Duncker, Budgerigar Bulletin 22, September, 1932, makes the following reference. "We know a parallel case with the drosophila fly which is the subject that has been most thoroughly examined genetically. In the wild form this fly has dark red eyes. By mutation of the factors which control eye colour, a lightening of the colour has been observed in various stages through coral, blood, cherry, apricot, cosin, ivory, tinged, buff, and ecru up to white. Instead of three or four stages of the breaking up of the factors we have therefore 11. And yet it has also happened that from a mating of two individuals which belong to a lower grade colour young have been produced with dark coloured eyes, even the natural type. We call such a case a 'back mutation,' and it has been shown that the back mutating forms breed exactly as if a mutation had never taken place in their predecessors."

This is also true of the yellowface blue budgerigar insofar as it breeds as a separate and distinct entity, and is proved from the results of experimental matings, but it is not suggested, however, as in the case of Mr. Denys Weston's greywings, or in the parallel case of the drosophila fly, that the mating of yellowface blue to yellowface blue will produce normal or wildtype green budgerigars. In its present mutant form—midway between blue and green—if bred solely within its own mutation, the yellowface blue does produce progeny which tend to revert to green, and this tendency is so well known to breeders that they continually outcross to the deepest blue with the object of retaining and advancing blue to the ultimate exclusion of green.

#### GENETICAL ANALYSIS.

Wildtype green, Yellowface blue, Normal blue (Whiteface).

From genetical analysis it can be said that wildtype or normal green possesses the characteristics of its mutant allelomorphs of yellow and blue. Blue plumage colour is the result of a mutation occurring in a single gene, the effect of which is to suppress the development of the yellow ground colour in the bird, hence in the normal blue (whiteface) there has occurred total exclusion of yellow, whereas in the yellowface blue only partial suppression.

As regards the yellowface blue we can come to the conclusion that to the normal green, and the normal blue it stands in the relationship of a multiple allelomorph, and the order of dominance is wildtype green, yellowface, and normal blue. If the wildtype be mated to either mutant the resultant progeny will be all green, and if yellowface be mated to normal blue, all yellowface young will be produced, the progeny themselves reproducing on the Mendelian principle. Using the customary genetic symbols, + = wildtype, yf = yellowface blue, and b = blue, the matings are represented as follows:—

##### 1.—WILDTYPE GREEN TO NORMAL BLUE:

$$\begin{array}{rcccl}
 + & & b & & \\
 \hline
 + & \times & b & & P_1 \\
 \hline
 + & & + & & \\
 \hline
 b & \times & b & & F_1 \\
 \hline
 + & + & b & b & \\
 \hline
 + & b & + & b & F_2
 \end{array}$$

## 2.—WILDTYPE GREEN TO YELLOWFACE BLUE:

$$\begin{array}{rcc} + & \times & \frac{yf}{yf} \\ \frac{-}{+} & & \\ & & P_1 \\ \\ + & \times & + \\ \frac{-}{yf} & & \frac{-}{yf} \\ & & F_1 \\ \\ + & + & \frac{yf}{+} \frac{yf}{yf} \\ \frac{-}{+} & \frac{-}{yf} & \\ & & F_2 \end{array}$$

## 3.—YELLOWFACE BLUE TO NORMAL BLUE:

$$\begin{array}{rcc} \frac{yf}{yf} & \times & \frac{b}{b} \\ & & P_1 \\ \\ \frac{yf}{b} & \times & \frac{yf}{b} \\ & & F_1 \\ \\ \frac{yf}{yf} & \frac{yf}{bf} & \frac{b}{yf} \frac{b}{b} \\ & & F_2 \end{array}$$

So far we have considered the results of crosses between wildtype green, yellowface and normal blue, and it is now proposed to discuss the more complicated matings.

### YELLOWFACE WITH VIOLET AND GREY.

The genetic constitution of the violet is as yet not determined, but from experience we have observed that it affects every shade of colour (by increasing intensity) with the exception of grey; so it is possible to have a violet form of sky blue, cobalt, mauve, or even green. In appearance the violet is a colour between cobalt and mauve, and it has an intermediate inheritance somewhat similar to cobalt.

From the mating of clearwing violet to yellowface clearwing cobalt the yellowface progeny showed more resistance to reversion to wildtype green, and the best specimens retained about 50% of violet at maturity. In their immature feather, of course, some showed full violet body colour, with pale yellow wings and head.

Grey is dominant to all blue colours, and owing to its singular influence on wildtype green, it seemed to have the requisite characteristics to check the tendency to reversion on the part of the yellowface blue.

The young yellowface clearwing greys produced were, when they left the nest, most striking in appearance—yellowface, cream coloured wings, and soft grey toning in body colour. However, when they matured the colour had reverted to that typical of clearwing olive.

### YELLOWFACE WITH OPALINE, CINNAMON, AND ALBINO.

Opaline, Cinnamon and Albino are localised on the X chromosome. They are, therefore, sex-linked genes with a crisscross inheritance, and together with wildtype form an allelomorph series.

The opaline form is always a brighter colour than its wildtype allelomorph, and body colour tends to invade other areas, particularly suffusing the wings and mantle. In contradistinction to the opaline, cinnamon is a pastel shade, and, of course, albino blue, pure white. We can have a cinnamon, opaline, or cinnamon-opaline compound form of every variety of budgerigar, and an albino form of all varieties, including cinnamon and opaline.

From the mating of a cinnamon cock to a yellowface hen we obtain yellowface, heterozygous or "split" cinnamon cocks, and cinnamon yellowface hens. Young cinnamon yellowface birds when they leave

the nest exhibit pale blue plumage on the body, and pastel shade of green on the back. At maturity the body colour reverts to a pastel shade of green. These birds are frequently referred to as a new variety—so-called “pastels.”

Opaline has the same crisscross inheritance as cinnamon. Invariably the young opaline yellowface birds stimulate the most sanguine hopes of the breeder that he has at last attained the goal of breeding a budgerigar with full blue body and yellowface, but, like the colour, the hopes fade somewhat when the birds reach maturity. However, the opaline violet form of yellowface does appear to show the greatest resistance to wildtype green, but this should be viewed in its proper perspective. Breeders are prone to think, when they produce an opaline yellowface violet, that considerable progress has been made, but an examination of normal yellowface violets obtained from a backcross will reveal the exact state of affairs. It has to be remembered when a gene mutates, a new form is established, and thereafter has its own particular inheritance. The opaline, although a more brilliant form, can neither influence, nor be influenced, by the normal or any other variety. If this were not so, then the converse would be equally true; i.e., the mating of yellowface to cinnamon (and fallow) would have to be regarded as a retrograde step because these mutants are a pale form, but we know when the cinnamon yellowface is backcrossed to normal blue, the normal yellowface birds have not had the amount of blue colouring decreased, neither is it increased by virtue of having been mated to opaline. The breeder has not advanced anything by the experiment—he has merely obtained a new form of what had already existed.

Albinism in the blue budgerigar acts as a white cloak, and the hereditary genetic colour system, although obscure, is faithfully transmitted from generation to generation.

Experiments with albino to yellowface included backcross, incross, and outcross, and the yellowface progeny from all matings were typical of the peculiar inheritance of the variety. The young albino yellowface hens when they had left the nest exhibited pale lutino coloured wings, and back. Colouration of the body was white somewhat resembling albino parent. When matured, the body colour had reverted to a pale lutino. Yellowface clearwings of the matings were, as expected, identical in colour with the progeny obtained from other clearwing matings.

#### YELLOWFACE TO PIED.

Our knowledge of the Pied budgerigar is still very limited, but we know that it is dominant over all other colours, including wildtype green. The gene or factor responsible introduces patches of bright yellow in greens and pure white in blues. Distribution of these patches is erratic and variable; some blue birds, for instance, display a few white feathers on one wing, others partial white on both wings, and the more striking specimens show both wings practically white, in addition to a white bar across the breast. Similar distribution takes place in the greens, yellow patches appearing in place of white.

Yellowface pied progeny from the matings of yellowface to pied showed the characteristic inheritance of both mutants—blue coloured body and yellowface, bright yellow patches on the wings. On reaching maturity body colour reverted to green suffused with blue.

An examination of all results obtained from experimental breeding of the yellowface enables us to summarise the following facts:—

- (a) The colour of the nestling changes from blue to a colour midway between blue and green as adult plumage is assumed, showing marked reversion from blue to wildtype green.
- (b) Yellowface is dominant to all other varieties except wildtype green.
- (c) Its particular inheritance in all forms is transmitted in accord with the Mendelian principle.

We thus conclude that the yellowface variety of budgerigar is an established reverse mutation of the blue gene, with an hereditary colour system midway between blue and green, and varying according to genetic constitution.

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

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### IMPORTANT NOTICE.

#### Building Fund.

The following additional donations have been received:—

E. J. L. Hallstrom . . . . .	£100 (total £355)
Albert Littlejohn . . . . .	100
E. J. Gadsden . . . . .	1
	—
	£201
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#### Our First Endowment Member.

In recognition of his valuable services to the Society in contributing a total sum of £1,000 to the Society's Funds, Council has conferred the title of "Endowment Member" upon Mr. Edward John Lees Hallstrom, of Willoughby.

Mr. Roy Cooper has been elected a member of Council vice Mr. E. J. Bryce, resigned.







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