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

FOR THE YEAR
1943-44



Price 1/-.
(Free to all Members and Associates.)

AUGUST 31, 1944

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ROYAL ZOOLOGICAL SOCIETY OF NEW
SOUTH WALES

(Established 1879.)

Registered under the Companies Act, 1899 (1917).

PATRONS:

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

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

COUNCIL, 1943-44.

President: Albert Sherbourne Le Souef, C.M.Z.S.

Vice-Presidents: Garnet Halloran, B.Sc., M.D., F.R.A.C.S., F.R.C.S.
(Syd.), Edward John Lees Hallstrom, Noel Lee Roberts, 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.

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Aubrey Halloran, B.A., LL.B., Charles F. Laseron, Frank Marshall,
C.M.G., D.D.S., Gregory Macalister Mathews, C.B.E., 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.).

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Avicultural Section.

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Hon. Secretary: John E. Simons (Acting).

Budgerigar Section.

Chairman: H. Yardley.

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

Marine Zoological Section.

Chairman: Mrs. L. H. Woolcott.

Hon. Secretary: Miss E. Butters.

Ornithological Section.

Chairman: J. E. Roberts.

Hon. Secretary: A. R. McGill.



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ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES

The Sixty-fourth Annual Meeting was held at Taronga Zoological Park, Mosman, on Saturday, 22nd July, 1944, at 3 p.m. 150 members and visitors were present. The President, Mr. Noel L. Roberts, read the

SIXTY-FOURTH ANNUAL REPORT.

Membership.—On the 30th June, 1944, the members of all classes on the Register numbered 539, and included 1 benefactor, 3 associate benefactors, 7 honorary members, 29 life members, 301 ordinary members, 3 honorary associates, 20 life associates, and 155 associates. Seven members died during the year, one resigned, and the names of 13 members or associates were removed from the Register in terms of Article 9. The net gain for the year is 56 members and associates, a very satisfactory record.

The Council.—Twelve meetings of the Council were held, the average attendance being 10.5. Mr. Laseron was on leave on active service for the greater part of the year, and Mr. Whitley, who was investigating for the Council for Scientific and Industrial Research, was also on leave. Owing to other duties preventing him from regular attendances at meetings, Mr. Albert Littlejohn resigned as from June 30th. Council regrets the loss of Mr. Littlejohn's valuable advice and counsel.

Deaths.—Dr. E. A. D'Ombra, who was a member of Council from 1917 to 1931, and was subsequently elected an honorary member of the Society, died on 23rd June, 1944. He was a keen ornithologist, and rendered valuable service to the Society. Sir Archibald Howie, Mr. E. E. Gostelow, and John Hawley, ordinary members, and Mr. Palmer, associate, died during the year.

Honorary Member.—Miss Joyce K. Allan has been elected an honorary member in recognition of her valuable services to the Society and to Australian zoology. Her graphic illustrations of shells and other subjects have for many years adorned the Society's publications.

Finances.—The balance sheet shows that the Society has maintained its satisfactory position. Certain expenditure has been incurred in preparation of further publications, the benefit of which will be shown in next and future years.

Publications.—The "Proceedings" for 1942-43 was issued on 25th August, 1943, and Part 3 of Volume 10 of "The Australian Zoologist" was published on 10th May, 1944, completing that volume. There was a strong demand for K. C. McKeown's "Australian Insects," sold out during the previous year, and strenuous efforts have been made to produce a reprint of the work. Permission to reprint was readily obtained, but extreme difficulty faced us in procuring suitable paper, and in getting the work set up. These difficulties have been overcome, except that the quantity of paper procurable is not sufficient to print more than three-fourths of the first edition. Binding is now the last "hurdle" to be negotiated, but it is hoped that even this will be overcome, and that the reprint will be ready for issue before Christmas. Owing to the increased cost of paper and printing, the price of the work will have to be increased. G. P. Whitley's "Fishes of Australia, Part I, Sharks and Rays," is still in good demand. The proposed book on "Australian Birds" has to await the procurement of permission to print, paper on which to print it, and cloth to bind it.

Kosciusko State Park.—The magnificent gesture on the part of the State Government in setting apart an area of 1,140,000 acres in the

snow country as a Park attracted the attention of Council, and steps were taken in the interest of the native fauna. The proposal to let the area, except 9,000 acres specially reserved, on snow lease or permissive occupancy appeared somewhat incompatible with the principle of a State Park. Other Institutions were asked for their views, and the Linnean Society of N.S.W., the Rangers' League, the Wild Life Preservation Society of N.S.W., the Naturalists' Society of N.S.W., and the National Parks and Primitive Areas Council gave us their support and advice. We communicated with the Premier (the Hon. W. J. McKell), and a Committee was appointed to receive and discuss our views. We expressed a hope that the specially reserved area could be increased to not less than one-tenth of the whole; we suggested that the burning-off conditions attached to the leases were inimical to the survival of birds and ground fauna, and that a representative of the scientific institutions interested might be appointed one of the trustees of the Park. The Act empowering the establishment of the Park contains a provision for the reservation of a primitive area of not more than one-tenth of the area. Our president, Mr. Noel L. Roberts, has been appointed a trustee of the Park. The Society is deeply indebted to the Premier for his action in the matter.

Macquarie Marshes.—The proposal to grant leases over these swampy areas, the breeding place of numerous wading birds, came under notice of Council, and representations in favour of conservation were made to the Premier. It is gratifying to have to report that the conditions attached to the leases were made strongly in favour of the native fauna. Burning-off and cutting of live or dead timber is prohibited, and the sheltered breeding places of Ibis, Spoonbill, Heron, and other useful insectivorous birds are afforded protection.

Uniform Control of Fauna.—Further correspondence on this subject was directed to the Prime Minister and the Federal Attorney-General (Dr. Evatt), but no action has been taken in the direction suggested by the Society.

Sanctuary for Australian Fauna at Canberra.—The Society's offer to prepare plans and make suggestions regarding the establishment of a purely Australian Zoological Park at Canberra has been formally acknowledged by the Prime Minister, but no definite action has been taken in relation to what was put forward as a preparation for post-war activities.

Sir Joseph Banks Memorial.—The Society's representative on the Committee appointed to recommend a form of memorial (Mr. E. J. L. Hallstrom) has reported progress, and press reports indicate that the publication of the Banks Journal will be supported by the Government, a substantial grant being added to the fund in hand.

Koalas on Quail Island, Victoria.—Press reports of starvation of Koalas on this Island caused the Society to make inquiries on the subject. So many conflicting reports were obtained that it was decided to leave the matter to the supporters of conservation in Victoria.

Cabin at National Park.—This "institution" for bird observers, made available by courtesy of the Trustees of the Park, has passed through a series of raids by casual thieves who have taken much of the Society's furniture and equipment, the locks, and occasionally the weatherboards and windows being wrenched off. As a result, it has been decided to abandon what was left of the building, and to store the remainder of the furniture at Audley, pending the construction of a more substantial building after the war is over.

Sections.—Attendances at the four established Sections have been satisfactory, considering existing conditions. An effort was made to establish an additional Section to study the mammals of Australia. 120 members, considered as being possibly interested in the subject, were invited to an inaugural meeting, but as only 12 (ten per cent.) attended, Council decided to abandon the project.

The Honorary Treasurer, Mr. Phillip Shipway, presented the balance sheet. (See page 4.)

Five members of Council, who retired under Article 22, were re-elected, viz.: Messrs. Aubrey Halloran, E. J. L. Hallstrom, A. F. Basset Hull, Charles F. Laseron, and Gregory M. Mathews. Dr. Frank Marshall

was elected to fill the vacancy caused by the resignation of Mr. Albert Littlejohn.

The Honourable Clive R. Evatt, M.L.A., moved the adoption of the Annual Report and Balance Sheet. He expressed his pleasure at being present as representing the Premier, Mr. W. J. McKell, and the State Government, and congratulated the Society upon its successful operations in the face of the present disturbed state of affairs. He felt some trepidation when receiving the invitation to attend, not knowing what he might be called upon to meet. Not being a zoologist or in any way scientific, he thought he might be out of place at such a gathering, but he had always taken an interest in many matters dear to the hearts of zoologists and the Society itself. He had attended the presentation to the Society of a series of Mr. Cayley's paintings of Australian Cockatoos and Parrots, made by a member who was then anonymous. He was also happy to announce the restoration of the Government subsidy to the Society, which he hoped was continuing to be paid, and that an increase in the amount might be granted in the future, but application in this direction would have to be made to another Minister than himself. He had taken a strong position in regard to pigeon-shooting in support of the Royal Society for the Prevention of Cruelty to Animals, and was glad that an end had been put to this practice. He was greatly interested in the proposed memorial to Sir Joseph Banks, and paid a tribute to Mr. Hallstrom, the Society's representative on the Banks Memorial Committee, who had personally contributed £500 to the fund, which the State Government was also subsidising to the extent of £2,000, in order to perpetuate the memory of Sir Joseph Banks. He referred briefly to the establishment of the Kosciusko State Park, the appointment of the Society's President to the Park Trust, and hoped that great work would be done by the Trustees. This country, he said, cannot be too careful to see that our birds, animals, and flowers are protected for the enjoyment and instruction of our people. When Minister for Education he had always impressed upon children their duty to respect and preserve both native animals and trees. It had been his privilege to set up in Public Schools the Junior R.S.P.C.A., the membership of which had recently been reported to him as comprising 27,000 boys and girls. He suggested that junior organisations might be established in connection with the Society as a means of building up the character of the coming citizens. He concluded by expressing a hope that before the members met again in twelve months' time victory and world peace will be secured.

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. Clive Evatt for restoring the annual Government Grant to the Society.

While it was not a large amount, it was a token of the goodwill and appreciation of the Government for the work the Society is doing.

He said that Mr. Evatt's visits to the Society at their rooms and discussing various matters with the members of the various branches showed his keen interest and stimulated the members in their important work.

The motion was carried with acclamation.

The President delivered his address. (See page 6.) A vote of thanks for the address was moved by Mr. Hallstrom, and carried.

OFFICERS FOR THE YEAR, 1944-45.

President: Mr. Albert Sherbourne Le Souef, C.M.Z.S.

Vice-Presidents: Dr. Garnet Halloran, Messrs. E. J. L. Hallstrom, Noel L. Roberts, and E. H. Zeck.

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

Honorary Treasurer: Mr. Phillip Shipway.

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

Honorary Librarian: Mr. Keith A. Hindwood.

Honorary Assistant Secretary: Miss Betty French.

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

ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.
BALANCE SHEET AS AT 30th JUNE, 1944.

ACCUMULATED FUNDS.				ASSETS.					
		£	s.	d.			£	s.	d.
Balance at 30th June, 1943 ..		3,456		12 10	Furniture and Equipment, Etc.—				
Add Surplus General Account Excess of Revenue over Expenditure for year.		20		19 2	Office and Lecture Room Furniture and Equipment at valuation, plus additions ...	275		4 3	
		3,477		12 0	Library Books, etc., at valuation ..	500			
Deduct Deficit Publication A/c Excess of Expenditure over Revenue for year ...		93		10 6	"Parrot" Paintings, at valuation ..	500			
		3,384		1 6	Investments (at face value).—				1,275 4 3
					Australian Commonwealth—				
					Inscribed Stock	1,010			
					Treasury Bonds ...	750			
					Metropolitan Water, Sewerage and Drainage Board.—				
					Inscribed Stock	100			
					Debentures ..	100			
									1,960 0 0
					Cash at Bank and on Hand.—				
					Commonwealth Savings Bank.—				
					General Account ...	44		14 9	
					Publication Account ...	102		10 2	
					Cash on Hand	1		12 4	
									148 17 3
		£3,384		1 6					£3,384 1 6

Auditor's Report to the Members of 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, 1944, 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, 1944, 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.),

Sydney, 14th July, 1944.

Hon. Auditor.

NOEL L. ROBERTS, President.

GARNET HALLORAN, Vice-President.

PHILLIP SHIPWAY, Hon. Treasurer.

**ROYAL ZOOLOGICAL SOCIETY OF NEW SOUTH WALES.
REVENUE ACCOUNT FOR YEAR ENDED 30th JUNE, 1944.**

GENERAL ACCOUNT.

	£	s.	d.	£	s.	d.
To Office Rent	300	0	0			
„ Office Printing and Stationery	37	7	2			
„ Telephone	26	5	0			
„ Electricity	7	19	3			
„ Affiliation Fee	0	10	6			
„ Expenses Annual Meeting	8	3	9			
„ Registrar General's Fees		10	0			
„ Insurance Premiums	7	15	0			
„ Lift Attendance and Gratuities	8	10	0			
„ Rent—Post Office Box	1	0	0			
„ Office Repairs	5	14	6			
„ Postages, Telegrams & Exchange	19	5	3			
				423	0	5
„ Excess of Revenue over Expenditure for year ended 30th June, 1944				20	19	2
				£ 443	19	7
						£ 443 19 7

PUBLICATION ACCOUNT.

	£	s.	d.	£	s.	d.
To Publication of "Australian Zoologist" and Proceedings, including Postages	204	5	10			
„ Expenses on Account of Publication of Hand Books	125	19	0			
				330	4	10
				£ 330	4	10
By Sales "Australian Zoologist"	21	11	0			
„ Sales of Hand Books	78	17	7			
„ Refund Sales Tax	14	13	3			
„ Interest—Savings Bank	2	2	8			
„ Interest on Investments	69	9	10			
				186	14	4
„ Government Grant — Department of Education	50	0	0			
				236	14	4
„ Excess of Expenditure over Revenue for year ended 30th June, 1944						
						93 10 6
				£ 330	4	10
						£ 330 4 10

PRESIDENTIAL ADDRESS

THE STUDY OF BIRD BEHAVIOUR.

With Special Reference to Injury-Feigning.

By N. L. Roberts.

In his book, "Mechanistic Biology and Animal Behaviour," Professor T. H. Savory quotes this statement by the novelist, Dale Collins: "It would be very difficult to write a novel with the worm as hero and to get within his walls of pink skin to learn what passed there." That is an original way of stating the fundamental and insuperable difficulty which confronts every student of animal behaviour. In the very nature of things, absolute knowledge of the animal mind is unattainable. But if it be true, as the great explorer Nansen affirmed, that man "wants to know," and when he ceases to do so he is "no longer man," it is equally true that when he cannot know, he wants to speculate—to hazard an opinion. Because every kind of animal, including man, is itself and no other, animal psychology can never escape the limits imposed by opinions, although there are psychologists who believe behaviour will be explained ultimately in purely physical terms, and whose faith has been expressed perhaps in these words of Sir P. Chalmers Mitchell: "If we scrutinise our generalisations and do not extend them to a class of facts from which they were not derived, if we do not endow abstractions with an independent reality, we shall find no logical ground to infer the existence of any but physical events in the world of living things."

I propose, in this address, to refer to birds as "living things," and to give reasons for my opinions that their behaviour cannot be explained adequately as a total of physico-chemical factors. Proof, in a scientific sense, that it is, or is not, such a total, is impossible. But there is great interest, I think, in formulating and considering evidence for a point of view, for this involves a study of those daily acts in which a bird expresses itself and which are of supreme interest, whatever theory we may hold about their motivating force. Obviously, observations of bird behaviour are very important, for they provide the basis—the raw material—of the psychologist's theories. The systematists's task, in great part, has been accomplished. But there is almost limitless scope for accurate, objective records of the behaviour of even our commonest birds at various seasons and under varying conditions. Even actions that seem insignificant in themselves may provide a clue to some larger problem. Russell (1) puts this truth very aptly: "I would strongly emphasise the value of recording as fully and accurately as possible, not only what appear to be exceptional cases of animal 'intelligence,' but, what is even more important, the normal everyday activities of animals, especially in a wild state. Here is a field where the amateur naturalist and the sportsman can help." What animals do constitutes their "behaviour," so that we can all be psychologists in the sense of recording carefully what we observe and thus making it possible for theories to be developed or changed.

THE LIVING ANIMAL.

I suppose no maxim is better known to animal psychologists than one enunciated by Lloyd Morgan (2): "We should not regard any instance of animal behaviour as the outcome of higher mental processes if it can adequately be interpreted as the outcome of mental processes which stand lower in the order of mental development." It seems a safe and simple guide until we ponder the word "adequately." And as the interpretation of this word must be left to the individual, it is easy to understand how numerous and conflicting theories of animal behaviour can arise and be defended vigorously and conscientiously by their exponents. Perhaps the commonest term the psychologist uses is "instinct." Yet even this word conveys widely different meanings to different persons. On the one hand, Friedmann (3) says: "Our present concept of instinctive behaviour does not involve any feeling, any desire,

any pleasure-pain principle in the animal." On the other hand, Loeser (4) declares that "in any given situation every creature helps itself as well as it can under the aegis of the 'pleasure principle.'" Loeser's theory that all so-called instinctive actions can be explained "adequately" in terms of a "pleasure principle" seems an extreme reaction from the mechanistic concept. It is difficult, for example, to accept a statement such as this: "Uniform types of nests, by which certain species can at once be recognised, are nothing but the result of uniform conditions." Loeser concedes that the choice of the site and materials and the type of construction vary according, not only to external physical conditions, but also to "the psychological qualities of the species," and surely these qualities, with their innate behaviour patterns, determine primarily the type of nest that will be built. If fifty magpie-larks in a given district build fifty mud nests their uniformity of behaviour cannot be explained simply by stating that mud is available and that they get more "pleasure" in building with mud than other materials. The type of nest is specific enough to justify the use of the term "instinctive." There must be an inborn urge to build in that particular way. On the other hand, the term "instinctive" should not exclude the building of some other type of nest if conditions are changed and the normal materials are unavailable. It is this capacity of the individual bird to alter its behaviour which, I think, the mechanists fail to explain satisfactorily. Friedmann states that instinct, as a concept, covers "a vast blot of ignorance on our psychic map, as we know it only in its perfected state and not in any developmental phase. An animal either has an instinct or it does not; it never has it partly developed. An instinct, to be of use, has to be complete." Friedmann then goes on to say that emotions are similar to instincts and are "probably an outgrowth from them." But every instinct must have had a beginning and could have been perfected only through the successive experiences of individual birds comprising generations of the species. It seems reasonable to believe it could have developed only through satisfying desires along specialised lines, so that the satisfaction of these desires is now expressed in well defined grooves of reaction. I do not see how instincts could have originated and developed if they did not involve "any feeling, any desire, any pleasure-pain principle in the animal." Nor do I think it can be established that emotions are outgrowths from instincts. Could it not be argued with equal force that emotions provided the basis on which instincts developed? Fear is an emotion. Friedmann points out that a study of nestling birds seems to indicate that fear has to be "acquired" and that birds "are not necessarily born with a fully formed sense of fear"—that in many small birds the sense of fear does not develop until the fourth or fifth day after hatching. It is one thing, however, to say that birds are not born with a sense of fear "fully developed," and quite another to say that fear has to be "acquired." A baby is not born with a fully developed sex instinct, but it does not have to be "acquired" in the sense that it might later acquire a technique for controlling a motor car or aeroplane. Friedmann cites the fact that birds show remarkably little fear in some regions where they have no enemies. But does this prove that fear is acquired? Such birds can soon be intimidated, so that the emotion of fear may be regarded as already latent in the bird's psychic nature. Migration and nest-building are quoted as instances of purely instinctive, non-emotional activities. But how can this be proved? Even if a bird in its winter home has no anticipatory feeling regarding migration, it is possible that the act itself may be accompanied by an emotional feeling. Instinct need not exclude emotion, which can be actualised simultaneously with a physical response to a given stimulus. I venture these opinions because it seems to me we can hardly do justice to the significance of instinctive actions unless we stress the time factor in their development, the permanence of that element of variability which made such development possible, and the possibility that they arose in the first place as responses to feelings or emotions.

Wood Jones (5) wrote recently a little book called "Habit and Heritage," in which he submits a strong case in proof of the inheritance of "acquired characters." And if there is a case for the acquisition of some physical characteristic over a long period of time, surely the development of instincts involves the transmission of psychic pro-

pensities and the possibility of new developments due to the adaptive capacity of the "variable factor" in the animal's mental endowment.

The plasticity of instinct has been well expressed by Alverdes (6), who states that "no instinctive action ever runs its course altogether automatically and mechanically, but always contains in addition to its fixed and unchanging components a variable element more or less adapted to the particular situation." Alverdes continues: "Every act, A, is, therefore, at one and the same time a function of a constant, C, and a variable, V; expressed as a formula this becomes $A=f(C, V)$. The constant is the instinctive element in the actions of men and animals; the variable, on the other hand, is the element which produces in some cases an appropriate: in others an unforeseeable response to a situation." It is this fact of variability, or plasticity, which makes animals, including birds, so interesting as "units" of life. And the truth we must not lose sight of is that this factor is always present in the bird's psychic nature, though often concealed. Thus, while the instincts of birds have been fixed over countless centuries in certain well defined behaviour reactions that have biological value, there is a sense in which they can still become "more perfect" if changed conditions demand it. In some degree, every bird is a "machine," controlled by internal and external physical factors. But it is also a conscious organism with a capacity for making adjustments. As Henri Bergson says: "Wherever anything lives, there is, open somewhere, a register in which time is being inscribed." The mechanist, of course, can assert that the variable factor is implicit in the genes and that a bird's behaviour, even when it acts adaptively—or "intelligently," as some would say—can still be explained in purely physical terms. I admit this is so, but, in my opinion, the explanation is not "adequate." You can observe a bird behave, say, in the presence of danger. You can be fascinated by its perfectly co-ordinated, purposive, and varied sequence of actions; you can note its varying expressions of fear, anxiety, anger, and you can say that all these things, integrated into one whole of behaviour, are simply the sum of physical organs and chemical substances. There are mechanists who say this even of human activities. But the bird is a living creature, able to respond to its environment and the immediate situation, and, although its behaviour requires physical organs, glandular secretions and the inheritance factors represented in the genes, I do not think it can be explained "adequately" without an integrating and directive life force which is more than the sum of the physical parts and comes to a focus in the "mind" of the bird. It is this which gives a real meaning to behaviour and makes the bird an "individual," as well as an epitome of the race, capable of adding something new to its inheritance. Purely physical properties cannot perceive and respond to the complex situations which may arise in the course of a bird's experiences. Moreover—and I think the fact is significant—two birds of the same species may react differently to the same stimulus. A simple example can be quoted from an account, recorded in "Wild Life," by P. A. Bourke, of the discovery of two nests of the Spotted Nightjar (*Eurostodopus guttatus*). Mr. Bourke flushed two different birds. The first "rose on noiseless wings, to settle twenty yards or so away, and 'freeze' with head down and tail up, in which position she was nothing but a piece of broken, sun-dappled branch." The second bird "alighted only a few yards away, turned towards me, opened her capacious mouth, elevated her white-spotted wings, and grunted." Is it reasonable to suppose that the marked difference in the behaviour of these two nightjars can be expressed purely in physical terms? I do not think so. An adequate explanation can be found only in what Russell (7) calls a "functional biology," which is opposed to "the exclusive use of the hypothesis of material determinism in the interpretation of biological results" and is based ultimately upon "a psychological conception of life." This integrating life force is, of course, closely linked with the physical organisation of the animal and cannot transcend certain levels in the different organisms.

BIRDS THAT FEIGN INJURY.

Having now considered some general principles related to bird behaviour, I would like to devote the second part of my address to a particular kind of behaviour, which illustrates, I think, some of the points mentioned. This behaviour is commonly described as "injury-

feigning"—a definition which is descriptive but perhaps not entirely suitable because it implies that the bird has some concept of the nature and effect of injury and deliberately simulates injury. Gordon (8), and others, refer to this behaviour as a definite act of simulation, while Alverdes states that some parent birds entice an enemy away from the nest by "a cunning retreat, pretending to be wounded, limping, etc." Coward (9) uses the term "squatting," which, he states, is Scottish in origin, and is used by many ornithologists to describe these "eccentric performances" of birds. Armstrong (10) describes the bird's behaviour as "disablement reactions," and, while this avoids the implications of the term "injury-feigning," it is not strictly accurate for the bird is not disabled. A similar objection applies to Friedmann's phrase "crippled departure." Having pointed out the limitations of the term, I shall retain "injury-feigning" because it connotes one very specific reaction among several to which reference will be made.

It is a common belief that injury-feigning is indulged in only by ground-nesting birds. Jourdain (24) gives a comprehensive list of Palaearctic birds which resort to injury-feigning, this kind of behaviour being "the exception" rather than the rule among them. It is most prevalent among birds belonging to the order Limicolae. Jourdain observed a Hawfinch "drop almost perpendicularly from the nest for 30 or 40 ft. and then fly away easily, but that was all." Swarth (11) states that he has never seen a Passerine bird feign injury, nor has he read of any bird other than plovers and doves following the practice. Allen (12) thinks that this reaction could be expected of ground-nesting birds and draws attention to the fact that ground-nesting birds which build in thick cover, such as high reeds, do not exhibit it because it "could not be worked with advantage." However, in a postscript, Allen admits that

A BIRD NOTED FOR "INJURY-FEIGNING."

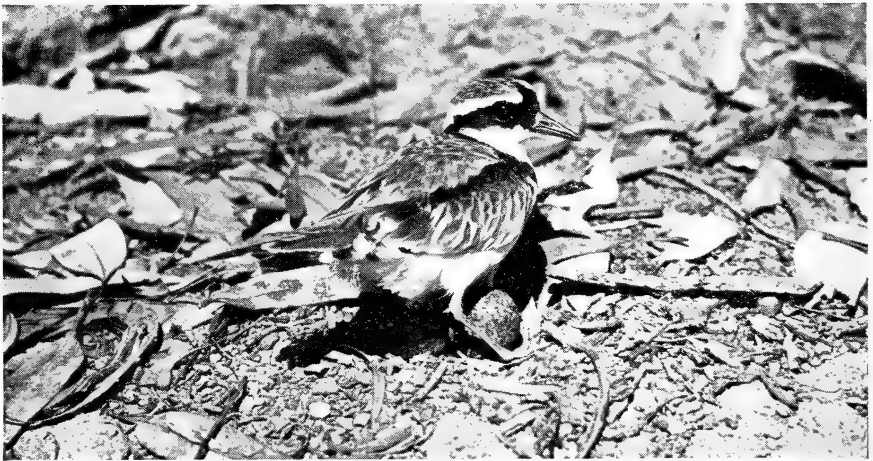


Red-capped Dotterel.

—Photograph by K. A. Hindwood.

since the publication of his letter his attention had been drawn to three tree-nesting birds that practice the habit—the Mourning Dove and the Long-eared and Great Horned Owls. Swarth's letter drew a reply from Chisholm (13), who pointed out that in Australia the trick is by no means confined to birds which nest on the ground. Chisholm includes in his list "tree-nesting pigeons of several species, certain Plovers, certain Ducks, and (among Passerine birds) certain Robins, Whistlers, Wrens, Quail-Thrushes, Chats, and some few other small birds." Hindwood (in litt.) also refers to injury-feigning among some of our robins. "Sometimes, when disturbed," he writes, "they will fly to the ground and, with feathers fluffed out, hop slowly about. I have records of both the Yellow Robin (*Eopsaltria Australis*) and the female Hooded Robin (*Melanodryas cucullata*) doing this. Similar actions have been recorded in the case of the Yellow-throated Scrub-wren (*Neosericornis lathamii*), which often nests within a few feet of the ground." Hindwood records that injury-feigning is practised by the following species of honeyeaters that nest close to the ground, i.e., within a few inches to several feet above the ground: Tawny-crowned (*Gliciphila melanops*), White-bearded (*Meliornis novaehollandiae*), White-cheeked (*M. niger*), the White-eared (*Meliphaga leucotis*), and the Yellow-tufted (*M. melanops*). Moreau (14) examined two nests of an African bird (*Nicator chloris gularis*), about three feet above the ground, one with eggs and the other with young. While he was examining the nestlings, one of the old birds

ANOTHER "INJURY-FEIGNING" BIRD.



Black-fronted Dotterel.

—Photograph by K. A. Hindwood.

approached and gave "a wonderful display" of injury-feigning, lasting about a quarter of an hour. Swarth's letter elicited substantial evidence that several American tree-nesting species feign injury. Potter (15) describes an interesting exhibition of this type of behaviour by the Yellow Warbler (*Dendroica aestiva*), the bird indulging in the broken-wing action while still in the branches. Grimes (16) mentions eight species of Florida warblers which feign helplessness. "A Pine Warbler here," he writes, "will frequently flutter the thirty-five to forty feet from its nest down to the ground after the climber has reached nest level. The bird will usually hobble about with wings drooped and tail spread, returning to the tree shortly to make a vocal protest at the intrusion. Even after returning to the nest tree the bird will sometimes flutter along the branches in the same way as it did on the ground." Armstrong cites bulbuls and mivets, which sometimes nest high up (Dewar, 1928) and certain eagles, falcons and hawks which occasionally "plunge headlong from their their eyries, almost striking the ground before dashing away"

—apparently a kind of aerial method of feigning injury. While it is clear that several tree-nesting species indulge in injury-feigning, all the evidence indicates that the habit is confined chiefly to species which nest near, or on, the ground. Those which nest at a considerable height seem to be significant as "exceptions" which prove the rule, although their number may increase with further observation. Hindwood (in litt.) makes an interesting reference to the Jacana (*Irediparra gallinacea*), which nests in open situations in swamps and "will sometimes feign injury and flutter over the surface of the water, at times with the body partly submerged."

It seems necessary to distinguish between injury-feigning and other protective reactions. The fluffing-out of feathers which is so characteristic of the Yellow Robin I prefer to regard as illness-feigning, the bird appearing to be sick and dejected. Other reactions are, as Hindwood says, more in the nature of self-advertisement in order to attract attention from the nest or young birds. "A case in point," he writes, "is the Spotted Quail-Thrush (*Cinclosoma punctatum*) which will flush noisily from its nest on the ground and move about nearby in full view, wings open, and tail spread like a fan, displaying the prominent markings of its feathers." Hindwood and I watched the behaviour of a Variegated Wren (*Malurus lamberti*) when we examined its nest, which contained a young cuckoo. The bird depressed the tail, lowered the wings and ran with quick, mouse-like movements over the vegetation surrounding the nest. Although it came very near, it was alert to every movement we made and would have eluded capture. Hindwood has observed three male Variegated Wrens behaving in this way near one nest and has noted similar behaviour by Emu Wrens (*Stipiturus malachurus*).

THE FACTOR OF VARIABILITY.

Injury-feigning is not confined to one sex, species, or family. Moreover, it is not always constant in a given species and the behaviour reactions may vary considerably. Chisholm writes: "In a long experience with certain tree-nesting birds I have known injury-feigning to be practised by them only on rare occasions, and a colleague has told me that after about thirty years' experience with the ground-nesting Pilot-bird he recently, for the first time, saw one resort to 'the broken wing trick.'" Some interesting examples of variability are quoted by Coward. A lapwing which had been dragging a broken wing across a pebble ridge in "an agony of terror" rose and flew around them when he turned to look for the crouching young. A common sandpiper which he disturbed on a nest with three eggs scuttled off squealing and began the broken-wing trick. Four days later, it slipped away quietly, ran a few yards, then spread its tail, dropped its wings, and ran away squealing, only to stop and feed complacently after covering a short distance. A week later, it ran silently along the track to the water, and flew away. Coward noticed a variation in the behaviour of the Ringed Plover, which seemed to be linked with the "acuteness of its anxiety." When the tide was high the baby birds were on the shingle and effectively camouflaged, and the old birds simply called or stood. When the young were on the sand at the water's edge at low tide and exposed to full view the old birds were greatly excited and resorted to every trick they knew to divert attention from them. Arctic skuas in the Shetlands began tumbling about, beating their wings and squealing when Coward and his friends were some distance away, but ceased this bluff and attacked boldly as they approached the nests. I saw a Willie-Wagtail reverse this behaviour. The nest was blown down, and when I approached to find the young ones a parent bird swooped at me frequently, uttering angry chattering notes. When I stooped to peer under a bush which concealed the baby birds the parent flew to the ground near my hand, puffed its feathers and hopped about slowly on the ground in exactly the same way as the Yellow Robin. Chisholm⁽¹⁷⁾ states that the Stone Curlew tries "various devices" to protect its nest. If jerking the head and raising and spreading the tail are not effective, the bird feigns disablement and utters piteous cries. In one instance, when these tactics failed, the curlew ran within four yards of the intruder and menaced him with outspread wings and tail, uttering, at the same time, some ominous notes. In a letter to me a Canadian ornithologist, Mr. P. A. Taverner, describes the behaviour of a Killdeer Plover (*Oxechus vociferus*) which had a nest close to his camp in Manitoba. "We and the

horses, cattle and dogs," he writes, "roamed about and often disturbed the incubating bird. We noticed the different reactions the bird exhibited to these different dangers. Should a man or a dog stray close to the nest the bird fluttered off in an agony of helplessness, at first just escaping human hands and snapping jaws by a hair's breadth. At a little distance from the nest the margin of safety was gradually increased and the paroxysms greatly decreased, until far from the nest they disappeared altogether. A return towards the nest brought a repetition of the 'convulsions' and a re-enactment of the farce. However, when a horse or a cow threatened to step on the nest the bird lay very close and then, at the final moment, flew directly up in the animal's face, causing it to start and deflecting it from its threatened course." An Australian ornithologist, Norman Chaffer, told Hindwood he witnessed a similar incident. He was concealed in a hide near the nest of a Black-breasted Plover (*Zonifer tricolor*) when a cow grazed right up to the nest. The sitting bird waited until the head of the cow was within a few inches of the nest and then pecked it sharply on the nose. This caused the startled cow to jump back out of the way of the nest. The same bird would leave its eggs when a man was a hundred yards or more from the nest. Deane ⁽¹⁸⁾ states that the Killdeer Plover, with man as enemy, displays when twenty to thirty feet away from the intruder, the distance "appearing to decrease as hatching time approaches." When the young hatch, the distance is reduced to about ten feet. For a dog the distance is about six feet, but for sheep and cattle the bird does not leave the nest but flies up at them when they are three or four feet away.

There is considerable variation in the behaviour patterns of different species. Jourdain ⁽²⁴⁾ quotes numerous descriptions of different patterns of injury-feigning. May ⁽¹⁹⁾ has observed that the Ovenbird runs a short distance, then stumbles and flutters its wings "as if one leg refused to function properly." This stumbling gives "a rather aimless appearance to the performance." Swarth noticed that the Semipalmated Plover run "a long distance" from the nest towards the intruder before feigning injury.

In the case of the Killdeer Plover, Deane states that the duration of the broken-wing trick lasts "from the time the Killdeer assumes a recognised breeding territory until the young are seven to ten days old." Hindwood informs me that the Red-capped Dotterel (*Charadrius ruficapillus*) and the Black-fronted Dotterel (*C. melanops*) are adept at injury-feigning "especially when their eggs are heavily incubated or when they have young," and Moreau records that *Nicator* made no attempt to distract their attention from a nest containing eggs, but only from one containing young. I have known a Yellow Robin feign illness while I inspected a new empty nest, but the reaction was a very brief one. A Florida Prairie Warbler, with young on the point of leaving the nest, allowed Grimes to set up a camera within a few feet of the nest with apparent unconcern, but reacted strongly when he caused the young to leave the overcrowded nest. The Southern Parula usually does not feign injury, but when Grimes attempted to photograph some fledglings just out of the nest the mother bird "carried on in the conventional Warbler fashion." Deane states that a Spotted Sandpiper which had its nest thirty feet from that of a Killdeer never once displayed until its eggs had hatched, and then one of the adults "ran along the water's edge with both wings half-closed and beating widely." Jourdain ⁽²⁴⁾ writes: "Among the *Sylviae* the excitement of the parents seems to reach its culminating point when the young are leaving the nest." It seems natural that behaviour which is so closely correlated with nesting operations should be most intense during the period in which the young are most exposed to danger.

SOCIAL INJURY-FEIGNING.

Armstrong quotes Dewar's description of communal injury-feigning by the Swallow-plover in the Gogra River: "A search of less than a minute served to reveal a couple of eggs placed on the bare ground between two small plants that were growing out of the sand. As I stooped down to examine these eggs I looked round and saw a very curious and pretty sight. Swallow-plovers were surrounding me. They were nearly all on the ground and striking strange attitudes. Some were lying on the sand as though they had been wounded and fallen on the ground; others were floundering in the sand as if in pain; some were fluttering

along with one wing stretched out limply, looking as though it were broken; while others appeared to have both wings broken. I did not count the birds, but at least twenty of them were seemingly wounded." Chisholm records a similar habit of the White-fronted Chat. "So strong is the impulse of these birds to feign injury," he writes, "that when a nest is discovered the two owners frequently are reinforced by neighbouring Chats, and all take part in the tumbling and scrambling tactics in their efforts to lead the intruder away." Grimes states that the Hooded Warbler is the "most consistent" performer among the Passerine birds in Florida, and adds that occasionally "even a neighbour or two" will flutter around. Guthrie-Smith⁽²⁰⁾ describes the communal injury-feigning of the Pied Stilt, and Seebohm⁽²¹⁾ of the Pratincole. Coward states that Arctic Skuas tumbled about when he approached a nesting colony, "perhaps half a dozen at once."

THEORIES OF EXPLANATION.

Explanations of injury-feigning range from pure reflex action to the highest degree of intelligence. Southern⁽²²⁾, with a fellow-ornithologist, carried out some simple experiments with nesting Arctic Skuas and concluded that the birds show no "purposive" leading away and that their behaviour seems "purely automatic." "In other words," he writes, "there is no conscious aim in the bird's actions, but it is merely a sort of breakdown in the nervous mechanism, similar to what happens when a wounded or frantic bird goes into a nuptial display." Friedmann's theory of a conflict of impulses, leading to a "crippled departure," has been referred to previously. Armstrong thinks that both in courtship displays and injury-feigning the most reasonable interpretation of the facts is that "the crude emotional expression of the hungry chick appears in a modified form." "No meaningful gesture," he writes, "is more widespread among birds than wing-fluttering. It is so characteristic of importunate young that examples would be superfluous, but it is worth while to note that the gesture may be used by a bird on occasions of very different emotional tone." Armstrong also points out that some species have a sexual display which is "almost identical" with injury-feigning. Coward confesses that after watching these strange, avian "bluffs" for many years, he is "still in doubt as to whether they are intentional, intelligent, reasoned actions, deliberately performed to deceive, or that the bird acts instinctively and unconsciously." Deane thinks the Killdeer's behaviour is "too polished a performance" to be merely a reflex action and involves "a considerable amount of training and intelligence." Huxley⁽²³⁾ believes the bird has no conscious purpose or knowledge and that "shamming wounded is an inborn pattern of behaviour, like sneezing in ourselves." Chisholm suggests it is "not yet proved that the injury-feigning lacks conscious purpose." "At any rate," he adds, "it seems to me that the bird possesses at least instinctive knowledge of the situation, and that its actions thereby become instinctively purposeful." Chisholm also challenges the view of an English writer, supported by W. H. Hudson, that a bird feigning injury "is deliriously excited and has a fit." Taverner's view is that the Killdeer's behaviour "shows too much adaptation to the source of danger to be altogether an automatic response to danger." "How far the bird is conscious of all this train of thought," he writes, "I would hesitate to say, but I am convinced that the reaction is more or less voluntary and adaptable to circumstance. I do not see that the basic instinct needs a conflict of emotions explanation any more than other elaborate instincts such as nest building, migration technique and other elaborate inheritances do. By elimination, the species has found that certain defences work for survival against certain enemies and so have been perpetuated in the genetic inheritance. That it works is sufficient explanation of its origin and the introduction of involved psychology is unnecessary. I have little doubt that the bird is more or less aware of the reason for its actions, which awareness is just an integral part of its instinctive inheritance." Swarth, querying Friedmann's theory of a fear and emotion conflict, points out that on the Galapagos Islands there is a Dove which shows no fear of man, but when incubating it flutters away from him. "I cannot believe," he writes, "that this bird is any more frightened in this situation than are the neighbouring Frigate-birds and Boobies, that flatly refuse to leave their nests at all. The Dove is using a method of protection that has been implanted among her reactions

for ages past. . . . Frigate-bird and Booby, too, are using the one method of protection that they know to be efficacious, for unless a nest is actually occupied it will certainly be robbed of contents or structural material contents by neighbouring Frigate-birds. A brooding Frigate-bird may be lifted from its nest, but howsoever reluctant it is to leave, contending emotions will not result in an imitation of injury." Swarth considers the fact that injury-feigning is invariably exhibited in some species and not in others is itself an argument against "a purely mechanical cause."

Grimes also questions the "fear" explanation, pointing out that the Swainson's Warbler has to be pushed off the nest and will sometimes attempt to straddle the fingers. When driven off, the bird "fluttered along the ground" in the manner of a crippled bird, but in a few minutes it was back in the nest accepting flies from the intruder. Jourdain (24) states there are cases "where there seems to be an element of deliberation about the action of the bird." Referring to the Reed-Bunting, he writes: "If you do not respond to the invitation but remain still by the nest, you will see that she is watching you all the time. Presently she stops and regards you for a moment; then deliberately she approaches and goes through the programme again."

My own view is that injury-feigning is primarily instinctive but suffused with a quality of awareness which enables the bird to take account of all the factors in the situation at a given time. A bird is not "intelligent" in the sense that it has the same kind of "concept" as a human being. Having no "word" language, it can have no "ideas." But it is conscious in the sense of being fully aware, and is not the slave of instinct in the sense that it cannot adapt its behaviour in a given experience. The bird is a living thing, limited in its mental expressions by the behaviour patterns that the species has found to be adequate in its evolution, but it is not a fixed and final entity that is incapable of contributing an impulse to some new pattern or of originating some new mode of behaviour to meet some vital and persistent new need.

In this paper I have referred to some general principles of avian psychology and attempted to "synthetise" the existing literature on the subject of injury-feigning. It does not seem possible to find a generally satisfactory solution of the behaviour problem involved, even though Job wrote: "But ask now the beasts and they shall teach thee; and the fowls of the air, and they shall tell thee." But perhaps the very fact that they refuse resolutely to divulge some secrets strengthens their charm and appeal, and maintains in us that sense of "mystery" without which life would be indeed a very dull and uninteresting affair.

I desire to acknowledge gratefully the help of Mr. A. H. Chisholm who supplied some very interesting and informative notes. Mr. J. Ross kindly sent me "The Oologist" containing Mr. Jourdain's paper.

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THE PRESIDENT ON THE AIR.

During the past year our president, Mr. Noel L. Roberts, has broadcast over the National network several talks on nature subjects. The following are the titles of the talks given: Birds in the Garden; Getting to Know Australian Birds (3 talks); Saving Our Nature Heritage; Wild Life in a Garden; Snakes and Snake Yarns; Songs of Birds; The War Against Insects; Animals in Wartime; Let's Talk About Spiders.

REVIEWS.

"The Birth of a Baby Platypus," by David Fleay. Bulletin of the New York Zoological Society, N.Y., Vol. xlvii., No. 3 (1944).

This detailed account of the first recorded birth in captivity of *Ornithorhynchus anatinus* is by the Director of the Badger Creek Sanctuary, Healesville, Victoria. Mr. Fleay records briefly the antecedents of Jack and Jill, the two adult platypuses at Healesville, and sets down in orderly sequence their mating and the subsequent discovery of a young platypus in the nesting burrow. While giving full credit to the valuable field work of Mr. Harry Burrell, he shows the advantage of close observation of the animal's behaviour in captivity and the resulting correction of some previous hypotheses. The article makes fascinating reading, and the illustrations from photographs by the author and others are produced in the best American style.

"The Platypus," by Charles Barrett, F.R.Z.S. Robertson & Mullens, Ltd., Melbourne, 1944. Price, 2/6.

This is a profusely illustrated booklet, recounting the story of "Splash," the platypus which was a captive at "Glen Eadie," Healesville, Victoria, for four years. There are introductory chapters relating to the history of the platypus, its discovery and the stir it created in the scientific world; and the work of Mr. Burrell and other investigators who traced its habits in the field or laboratory. These are linked up with the story of "Splash," and the illustrations include three plates of exhibits in the Burrell collection in the Australian Institute of Anatomy, Canberra. Owing to the use of a rather poor class of paper the illustrations are not as effective as they might be, but "war conditions" prevent the use of suitable art paper.—A.F.B.H.

REPORTS OF SECTIONS.

AVICULTURAL SECTION.

Annual Report.

The year 1943-44 opened with wartime conditions on the home front much the same, if not worse, than the previous year, and with organisations of a similar nature to our Section being obliged to curtail their activities, if not to close down for the duration of hostilities.

Strangely enough, the effect on the Avicultural Section appears to have been a steadying one, as a glance through the attendance book for past years reveals that in 1939 the attendances averaged around the 15 to 20 mark, sometimes getting as low as 8; then, after 1940, the attendances maintained the average of 15 to 20, but never seemed to drop to the low levels noticeable in previous years. Members drop out; others come along to take their places, and so it has gone on until this present year, when our attendance has kept up around the 20 mark.

Added to all these obstacles there has been the decided shortage of birds which, in turn, has caused the prices to rise and has seen many a fancier hard put to it to replace losses. Then some difficulty has been experienced in obtaining certain kinds of seed, such as hemp; and even plain canary seed has at times been hard to obtain.

Despite all these adverse conditions the past year has seen an increase in the membership of 13 members, and the additional fanciers that have sprung up in all parts of the metropolitan district testifies to the increased interest shown in aviculture. This may be explained, I think, by the conditions of restricted travel and the curtailment of many sporting activities which have caused the individual to find his recreation nearer home.

During the year a number of very interesting and instructive lectures were presented to this Section, and we here take the opportunity of thanking Messrs. Goodacre, Kinghorn, Roy Cooper, Tom Iredale, Patten, Longley and LeSouef for those contributions to our store of general knowledge. A talk by Mr. Ormsby, home on leave from a battle station, was one of the highlights of the year.

Some fine breeding successes have been accomplished by members of this Section: some cases, in point, being Mr. Ron Probert's Princess Alexandras, Mr. Ed. Scott's success with Emblema Picta and Noumean Parrot Finches of the Red Face variety and the Dotterel or Button Quail. Mr. Simons has also been successful with several kinds of Wax-bill, viz., the Crimson-winged, Orange-breasted and the African Fire Finch.

During the past year it was decided to try the success of a bulletin similar to the one circulated by the Victorian League and, although the flow of matter to date has not been very encouraging, it is hoped that the first edition will be out in July.

In conclusion, ladies and gentlemen, I wish to thank you on behalf of Mr. Brain, Mr. Harvey and myself for the spirit of good fellowship which has prevailed at our meetings during the past year, and at the same time to express the hope that we will all try to stir up interest in this Section during the year that is before us, always remembering that these meetings provide an opportunity of getting together and engaging in discussion and the exchange of information, which all helps to make the life of the feathered friends in our aviaries as pleasant as is possible.

JOHN E. SIMONS, Acting Hon. Secretary.
A. H. BRAIN, Chairman.

BUDGERIGAR SECTION.

Annual Report.

In the absence of Mr. P. Harvey, transferred away on Air Force duties, it is my privilege to present the Annual Report for year ended June, 1944.

Whilst we are unable to look back on any great measure of progress, there is every reason to be pleased with the results of our activities during a period fraught with much anxiety and difficulty.

Attendance at Meetings.—Members are to be congratulated on their enthusiastic co-operation reflected in the increased attendance at monthly meetings. During year ended 1943, attendances at meetings totalled 113; average attendance per meeting approximately 9. For year just ended, 1944, total attendances increased to 186, an average attendance of 16 per meeting, or an increased average attendance of 7 per meeting.

It is with regret that we have to record the death of Mr. J. Palmer, an esteemed member, and an ardent worker for the Section. We extend to his wife and family our deepest sympathy in their sad loss.

New Members.—Nine new applicants were nominated and welcomed to membership of the Section.

Lectures.—Many interesting and informative talks were given, and members are duly appreciative of the lecturers who have come along at personal inconvenience to give of their knowledge and their time.

The following is a list of subjects dealt with by different lecturers:—

Subject.	Lecturer.
"Parrots" (illustrated from skins)	Mr. T. Iredale.
"Birds of Paradise"	Mr. C. Camp.
"Red Mite"	Mr. H. Yardley.
"Line Breeding and Mendel's Theory"	Mr. Bell.
"Reptiles" (illustrated by live specimens)	Mr. G. Longley.
"Wool and Wool Classing" (illustrated by different specimens of wool)	Mr. H. Yardley.
"Parrots in Captivity"—Breeding Experiments	Mr. R. B. Browne.
"Color Breeding in Budgerigars"	Mr. R. J. Murray.

Amateur Judging Competition.—An amateur judging competition resulted in Mr. Casey being awarded 1st place, Mrs. R. B. Browne, 2nd, and Mr. H. Yardley, 3rd. Points score award for birds exhibited was won by Mr. P. Harvey.

Table Show for Type.—Many typical Budgerigars were displayed, the most outstanding being a Laurel Green, exhibited by Mr. H. Yardley.

Eighth Annual Lawn Show.—The event of the year was staged in the lovely grounds of "Elaine," home of Mr. and Mrs. J. Hubert Fairfax, to whom we owe a debt of gratitude for their kindness and generosity.

Entries for the Show totalled 155 of all different varieties of Budgerigars. Best bird was a Yellow, exhibited by Mr. H. Yardley, and he is to be congratulated on winning the "Sydney Mail Trophy."

Mrs. Fairfax expressed her pleasure in being able to donate to the Red Cross a cheque for £18/8/-, proceeds of various activities at the Show.

Our thanks are tendered to all those who worked so hard to make the Show a success, and in particular to Mr. and Mrs. Browne, Messrs. Palmer, Murray, Sheers and Mills.

Classification for Opalines.—Normal and clear-wing greens and blues of opaline variety have been classified and standards drawn up for the purpose of exhibition.

Aviary Notes.—We have not been favoured with any records of breeding achievements, and members are reminded that the Society encourages and is happy to recognise any outstanding success in the production of new colour combinations.

Visits to different aviaries, however, show that some beautiful specimens have been created by a combination of Cinnamon and Opaline factors with other varieties.

Pied Budgerigars are increasing in numbers. They are a motley variety, and it is bewildering to choose the most outstanding. Those that appear striking display an even distribution of colour on the wings, whilst others to attract have a bar across the body or a bright patch on the back. The coloration introduced by the "Pied" factor—rich

yellow in greens and pure white in blues—makes a pleasing and distinct contrast.

Birds of yellow faced variety have also considerably increased and are to be seen in most aviaries. Very little headway has been made and few mature specimens show much blue body colour, although vivid shades of blue-green have been obtained by introducing the opaline factor.

Fallows are still scarce, and it is hard to understand why they have not established themselves in popularity. There appears to be plenty of scope for breeders seeking new colour combinations to make more use of the fallows.

In wishing members success for the ensuing year, it is suggested they let us know more about their achievements so that we may record them in the Annual Report.

T. J. McSWIGGAN, Acting Hon. Secretary.

MARINE ZOOLOGICAL SECTION.

Annual Report.

The meetings have been regularly attended, and most enlightening evenings have been held. Three new members have joined.

The enthusiasm of shell and specimen collectors has not abated, despite the wire entanglements round the coast, which have prevented holding the usual Field Days.

A number of members visited the aquarium of Mr. Howell at Allawah and spent a most enjoyable and instructive evening.

Mr. Longley brought to a meeting many interesting live hybrid lizards which had been bred from other hybrids; also some of his pet snakes.

The officers of this Section wish to thank the members and lecturers who have made the evenings such oases of harmony and goodwill in this war-torn world.

The following was the syllabus for the year:—July 5, 1943: "Collecting at Bingara," by Miss Thornley. August 2: "Boats," by Mr. Helsham. September 6: "Edible Spiders," by Melbourne Ward. October 4: "Limpets of N.S.W.," by Miss Thornley. November 1: "Deep Sea Fishing," by Mr. Helsham. December 6: "Exhibition Night." Supper.

1944.—February 7: "Extinct Birds," by Mr. Tom Iredale. March 6: "Molochs," by Miss McFadyen. April 3: "Lord Howe Island," by Mr. Helsham. May 1: Lectures by Members. June 5: Annual Meeting; President's Address; Mr. Oldham; Election of Officers.

Owing to war conditions, no set syllabus has been drawn up for 1944-1945.

ELIZABETH BUTTERS, Hon. Secretary.

ROLAND V. OLDHAM, Chairman.

ORNITHOLOGICAL SECTION.

Annual Report.

Regular monthly meetings have been held by the Section during the year; interesting and helpful lectures being arranged for each meeting night.

Despite many members being associated with the various branches of the Fighting Services, the average attendance of 25 showed a slight improvement over that of the previous year.

Service personnel on leave, as well as some oversea and inter-State visitors, were present at some of the meetings. Amongst those who received words of welcome from the Chairman, were L/Cpl. J. Waterhouse (N.S.W.), Warrant-Officer S. R. White (W.A.), Mr. J. Jones (Victoria), Miss N. Fletcher (Victoria), Dr. Neal (Georgia, U.S.A.), Cpl. Axel Poignant (W.A.), and Mr. N. L. Roberts (President, R.Z.S.).

Although organised field-outings were not arranged, observations reported by individual members at each meeting contained records of interest and resulted in continued enthusiasm. Four members of the Section paid an enjoyable visit of two weeks' duration to the Moree district, north-western New South Wales, in November, 1943, and reported some interesting observations. Mr. N. Chaffer secured a film record of the trip, which contained some excellent views of the Spotted Bower-bird, as well as various other species, in colour. This was shown to a large attendance at the March meeting.

Throughout the year, interesting articles by various members have been published in "The Emu" and other journals.

The following is a summary of the meetings, together with details of the lectures delivered:—July 16th, 1943: "Australian Plovers," by Sgt. M. S. R. Sharland. August 20th: "Gould League of Bird-lovers of N.S.W.," by J. E. Roberts. September 17th: "Photographing Bird-life," by Roy P. Cooper. October 15th: "Faunal Areas," by Tom Iredale. November 19th: General Discussion. December 17th: "Birds of Canberra," by G. M. Mathews. January 21st, 1944: "Fairy Wrens," by Neville W. Cayley. February 18th: "Sea Birds," by P. A. Gilbert. March 17th: Bird Films in Colour, screened by Norman Chaffer. April 21st: "Camouflage," by J. R. Kinghorn. May 19th: "A Trip to Central Australia," by Roy P. Cooper. June 16th: "Some Birds of the Wianamatta Shale Area," by K. A. Hindwood.

The thanks of the Section are extended to the lecturers.

Sgt. J. A. Keast, who has been Secretary for over four years, was recently transferred to a distant centre, and in consequence tendered his resignation. The Chairman, Mr. K. A. Hindwood, who has held office for two years, did not seek re-election. These two energetic workers were included in a general vote of thanks to all retiring officers at the annual meeting.

The following were elected for 1944-1945:—

Chairman: J. E. Roberts.

Vice-Chairman: Roy P. Cooper.

Secretary: A. R. McGill.

Committee: Miss E. Butters, Messrs. G. R. Gannon and N. Chaffer.

WINTER-BREEDING SEA-BIRDS.

By Tom Iredale.

At the Kermadec Islands, during the summer months, very many thousands of sea-birds frequented the group to breed. On the main island hundreds of thousands scattered all over the surface breeding while many thousands of several species occupied burrows. On some islets adjacent a few birds burrowed but none was observed on the surface. However, during the winter months, the opposite was noted, the main island being deserted, while the small islets were covered with breeding birds, some on the surface, others in burrows. The bird occupying the burrows was a small White-breasted Shearwater, and it was dragged out, if it had not completed its purpose, by the summer-breeding much larger Black Burrower. The small White-breasted Shearwater, long known as *Puffinus assimilis*, was known also to occur on Norfolk Island and New Zealand, also breeding in the winter-time. From the latter place reports were confused, as there was a slightly larger white-breasted bird, known as *Puffinus gavia*, also breeding there, and some reports were in the summer-time, some in the winter-time.

The latter bird has occurred numerously off the New South Wales coast, and controversial arguments have been printed without much reason or basis. Research along the islands of this coast, both in summer and winter, have so far revealed no breeding-place, though one or two suggestions may prove valuable at a later time. Recently a form or ally of the *gavia* style has been found in South Australian seas. This is not the place to discuss nomenclature, though *gavia* is undoubtedly indefinite, but this note is to record an overlooked item.

In the Papers and Proceedings of the Royal Society of Tasmania for 1868, p. 32, Chas. Gould, Government Geologist, the son born to John Gould in Tasmania, reporting upon a trip to the south, wrote: "interesting habit of a small Petrel occupying to some extent the same burrows as the Mutton Birds, prior to their arrival, from which, however, they are at once expelled by the latter." The exact locality cited was Port Davey, and this at once suggests the *gavia* bird, either the eastern or, more probably, the South Australian form.

Another early unconfirmed record is that of a white-breasted bird determined as *Procellaria cooki*, nesting on the islands off the Victorian coast between Wilson's Promontory and Cape Gabo.

A NOTE ON THE SHINGLE BACK LIZARD (*TRACHYSAURUS RUGOSUS*).

By G. Longley.

During the last few days of March of this year I noticed some fungi which resembled mushrooms that had grown on the lawn over night, and on the morning of March 27th I gathered them, but upon turning them over noticed that instead of the "gills" being the usual delicate pink shade, they were quite white underneath. Not having sufficient botanical knowledge for this purpose, my wife and I thought it might be unwise to cook them for breakfast, although the upper surface "peeled" quite well, and the smell and taste was that of a mushroom. I therefore decided to try an experiment, and placed some of them in a vivarium containing several species of Lizards, including a Shingle-back (*Trachysaurus rugosus*). The balance of the fungi I placed in another vivarium in which there was also a Shingle-back Lizard.

When I returned from the city in the evening every trace of the fungi had disappeared in the larger enclosure and only a small piece of very tough stalk remained in the other.

I was rather puzzled to know which reptiles were responsible. However, a few days later the mystery was elucidated, when finding some more specimens of the fungus. I offered it to a Shingle-back, and he ate it with avidity, seeming none the worse for his experience. In fact, both these lizards are alive and well at the time of writing.

SYLLABUS OF SECTIONAL MEETINGS, 1944-45.

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).

1944—

August 14.
September 11.
October 9.
November 13.
December 11.

Owing to war conditions no set Syllabus has been drawn up for 1944-45, but speakers' names will be published in the Bird column of "The Sydney Morning Herald" on the Saturday previous to the meeting night.

1945—

January 8.
February 12.
March 12.
April 9.
May 14.—Lecturette.
June 11.—Annual Meeting and Members' Night.

BUDGERIGAR SECTION (Third Tuesday in the Month).

1944—

August 15.
September 19.
October 17.
November 21.
December 19.

Owing to war conditions no set Syllabus has been drawn up for 1944-45, but speakers' names will be published in the Bird column of "The Sydney Morning Herald" on the Saturday previous to the meeting night.

1945—

January 15.
February 20.
March 20.
April 17.
May 15.
June 19.

MARINE ZOOLOGICAL SECTION (First Monday in the Month).

1944—

August 7.
September 4. } Subject to be selected.
October 3 (Tuesday). }
November 6. }
December 4.—Exhibition Night and Supper.

1945—

February 5.
March 5. } Subject to be selected.
April 3 (Tuesday). }
May 7. }
June 4.—Annual Meeting.

ORNITHOLOGICAL SECTION (Third Friday in the Month).

1944—

July 21.—"Similarities between the Birds of Australia and New Guinea," by J. A. Tubb.
August 18.—Films of Nesting Sea-Birds, by Cpl. Axel Poignant.
September 15.—"Extinct Birds," by Tom Iredale.
October 20.—Selected Bird Talk, by M. S. R. Sharland.
November 17.—Illustrated Talk at Random, by P. A. Gilbert.
December 15.—"Colour in Birds," by Roy P. Cooper.

1945—

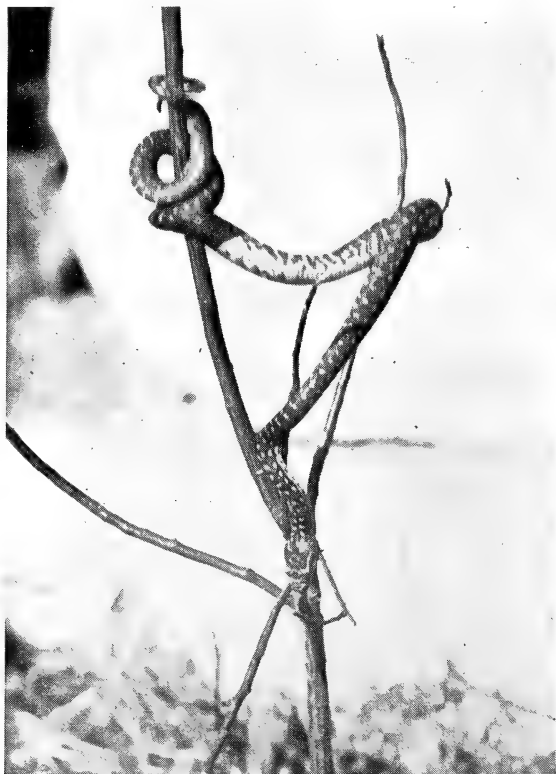
January 19.—"Migrant Waders of the Sydney District," by A. A. McGill.
February 16.—"Economic Ornithology," by J. R. Kinghorn.
March 16.—Colour Films of Birds: Screened by N. Chaffer.
April 20.—"Bird Behaviour," by G. R. Gannon.
May 18.—"Quail-like Birds," by Neville W. Cayley.
June 15.—Chairman's Address: By J. E. Roberts.

NOTES ON THE FEEDING AND REARING OF YOUNG DIAMOND SNAKES (PYTHON SPILOTES).

By G. Longley.

On the 1st May, 1944, Mr. R. A. Patten, B.V.Sc., Superintendent of Taronga Park, granted me permission to take care of four of the young Diamond Snakes (*Python spilotes*) hatched at Taronga Park, March 8th, 1944. The total brood consisted of 25 young ones.

Mr. G. Cann, who is in charge of the reptiles selected four healthy youngsters, and these were transferred to a small cardboard box containing hay, leaves, etc. Upon my arrival home the young *Pythons* were placed in a heated vivarium, about 18 inches long, the bottom of which was covered with dead leaves and bark. It also contained a shallow art porcelain rectangular bath, and branches upon which the reptiles could exercise. After they had become used to their environment I commenced feeding operations. When suitable natural food is not forthcoming one has to have recourse to artificial methods. One



Young Diamond Snake (*Python spilotes*).

method is to fill a narrow bore glass tube, the ends of which have been rounded in a bunsen flame, with fine chopped raw meat, and discharge the contents down the snake's throat by means of a piece of glass rod which fits the bore of the tube. The snake usually disgorges the first tubeful of meat, but if a second is administered quickly, before the snake recovers from the muscular exertion required in the effort of

disgorging, the second tubeful is usually retained, particularly if the snake is gently replaced in the vivarium.

As these young Diamond Snakes were of rather tender age I did not employ the above method, and for the benefit of people who may wish to rear young non-venomous snakes I will describe the method at present in use.

The snake is allowed to twine round the fingers of the left hand until the head is in such a position that it may be gently but firmly held from behind between the thumb and forefinger of the left hand. A piece of cooked mutton or lamb, cut into a strip of suitable thickness and about 1 inch long, but having one end slightly tapered, and consisting of the outward harder roasted part of the meat, is introduced towards the back of the snake's jaws. The snake will open its jaws wide, thus giving the opportunity of pushing the meat into the throat; the little finger of the right hand now comes into play, and with its help the meat is pressed further down. A short, smooth rounded stick is now used gently to force the meat still further into the oesophagus, after which the jaws are very gently pressed together by the finger and thumb of the right hand, and the meat may be further helped towards the stomach by gentle massage from outside.

Everything depends upon patience and gentle handling, and after a while the snakes cease to struggle against this treatment; and, in fact, in most cases submit to it quite readily. These young snakes are fed in this manner twice or three times a week. The four young Diamond Snakes are thriving under this way of feeding. They have improved wonderfully in condition. Three of them have sloughed, the slough in each case being perfect, and, at the time of writing, the fourth is preparing to slough.

One point I would like to stress is: When introducing the cooked meat into the snake's jaw, always place it towards the back and never at the front. If placed at the front injury is liable to be caused to the glottis or else the sheath in which the snake's tongue reposes.

I have kept numbers of European and other solid toothed snakes (*Aglypha*), and found them all respond well to this kind of feeding.

It is unwise to grasp snakes in a heated vivarium if one's hands are cold, as the snakes are thereby likely to receive a chill, and are also liable to be irritated and annoyed.

NOTES ON A HYBRID BLUE TONGUE LIZARD.

By G. Longley.

The parents of which were:—

♂ *Tiliqua nigrolutea.* ♂
♀ *Tiliqua scincoides.* ♀

This Lizard was born in my vivarium on 29th January, 1941. On two previous occasions I had bred Hybrids, but through accidents had not been successful in rearing them. However, by placing her in an artificially-heated vivarium during her first winter she grew rapidly, and during the ensuing summer was transferred to a glass-covered vivarium outside, where, with plenty of suitable food, such as garden snails (*Helix aspersa*), raw and cooked meat, fruit, etc., she very quickly developed into wonderful condition.

About the 29th October, 1943, she mated with a *Tiliqua nigrolutea*, and on the 16th February, 1944, ten young Hybrids were born.

Of this brood five were still-born, and five alive, three of which were very weak. These three subsequently died. The two remaining survive, the larger of which measures 9½ inches, and the other 8 inches. The mother is the Hybrid shown in the photograph in this Society's proceedings for 1940-41.

Every care was taken with these young Lizards. They were placed in a heated vivarium and supplied with plenty of food (chopped snails, etc.) and drinking water, but some days elapsed before even the survivors responded to this treatment. However, they are now quite

vigorous, and have sloughed on several occasions. Since January, 1941, the following Hybrids have been born in my vivarium: Eleven on January 31st, 1943, and nine January 7th-10th, 1944.



Young Hybrid.—*Tiliqua nigrolutea* and *T. scincoides*.

—Photograph by G. C. Clutton.



Young Hybrid Blue-tongue Lizards.—Hybrid and *T. nigrolutea*.

—Photograph by G. C. Clutton.

ILLUSTRATIONS OF SOME WESTERN AUSTRALIAN FISHES.

By Gilbert P. Whitley, F.R.Z.S.

(Figures 1 to 6.)

Numerous rare or interesting fishes were encountered during my recent residence in Western Australia, and some new species were described in the last "Australian Zoologist"; there is a great deal of research to be done on the fishes of that vast State. A few illustrations are offered here with brief descriptions to distinguish some novelties from their congeners.

I am grateful to Mr. S. Fowler, Senior Research Officer, C.S.I.R., Division of Fisheries, for his excellent photographs of the specimens.

(1) An unnamed Shark, *Mystidens innominatus*, gen. et. sp. nov.

These new generic and specific names are provided for the unnamed Galeid shark from Useless Inlet, Shark's Bay, figured in my "Fishes of Australia," Vol. I., 1940, p. 105, fig. 103. This shark is distinguished from all others by having smooth teeth, without trace of serrations, acute, broad-based, not notched, subequal in each jaw except for smaller teeth at symphyses. In front of each jaw on either side of the symphyseal teeth are thirteen teeth. Holotype, Regd. No. I.B.278, in The Australian Museum, Sydney. Known only from jaws.

Originally, I thought that these teeth might have been those of the elusive "nervous shark," a small dark Galeid which I saw at Shark's Bay in 1939. When there in 1943, however, I obtained a specimen of this shy species and found it was the Swan River Whaler Shark, *Galeolamna greyi*, Owen. Thus the smooth-toothed shark requires a new name, as the teeth are quite different from those of hundreds of various sharks personally examined in Western Australia.

(2) A Conger Eel, *Leptocephalus wilsoni hesperius*, subsp. nov. (Fig. 1.)

Conger Eels are not often met with in Western Australia. The drawing was made from a specimen, 464 mm. (nearly 18½ inches) long, found on Leighton Beach, near Fremantle, 19th April, 1944. (W.A. Mus., Regd. No. P.2603.) It differs in colour from the *Gymnothorax wilsoni* of Bloch and Schneider (Syst. Ichth., 1801, p. 529, New Holland, i.e., New South Wales), being dull greyish above, with slight olive tinge on sides and milk white below; pectoral fins very dark grey; dorsal and anal fins milky-bluish, margined with black; there are no rosy spots. The teeth are shown at lower left; they are mostly uniserial, cardiform, with some enlarged anteriorly; none on roof of mouth.

The depth of the body is subequal to its width anteriorly. The eyes are large and the interorbital is 10 mm. across. About 150 pores in lateral line; the a-d percentage is 16.9. The species is found around the south-western Australian coastline.

(3) The Breaksea Cod, *Epinephelides armatus* (Castelnau, 1875).

This is a fairly common fish on rocky reefs in south-western Australia, but is not reported from any other State.

The colour is variable, southern specimens at least are usually orange-brown, with darker edges to the scales, whilst some northern examples are darker, almost blackish in hue; the eye is red, often surrounded by yellow, and there is a conspicuous black spot at the vent.

I have seen many examples from Esperance to Geraldton; the one photographed here from life was caught at Square Island, Pelsart Group, Houtmans Abrolhos. The vernacular name is derived from Breaksea Island, off Albany, but the species is also known as Rottnest Cod in Perth, and She Chinaman at Geraldton because females predominate. The true Chinaman Cod (*Epinephelus homosinensis*) of Geraldton is not the male, but a quite different genus, having no scales on its back anteriorly, eleven dorsal spines and seventeen rays, and smaller lateral scales. The Breaksea Cod always has ten dorsal spines and twenty rays, and has tiny auxiliary scales between some of the

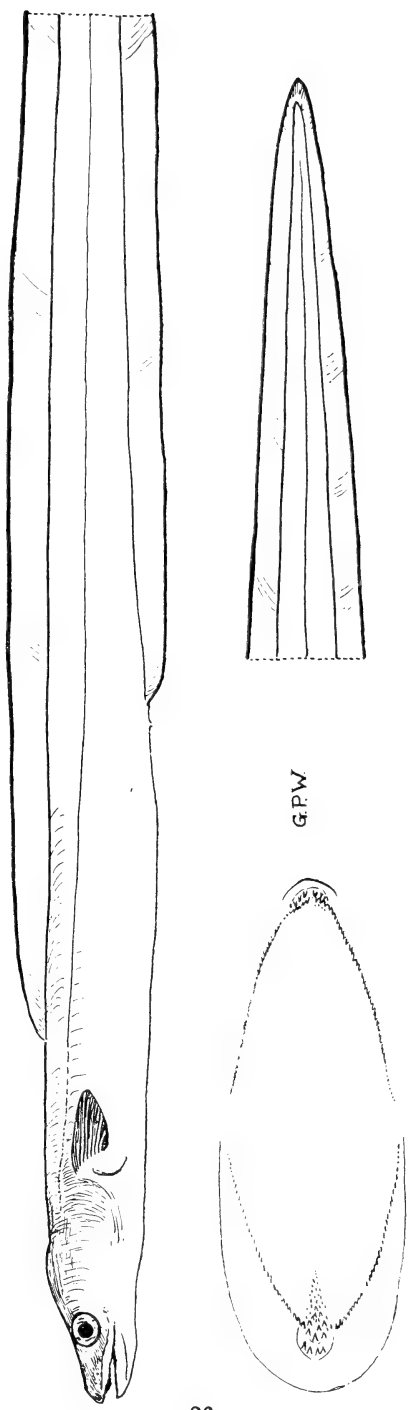


Fig. 1.—Conger Eel.

ordinary ones; also one to three large teeth on each side of mandible. Length up to about sixteen inches and weight 2½ lb.

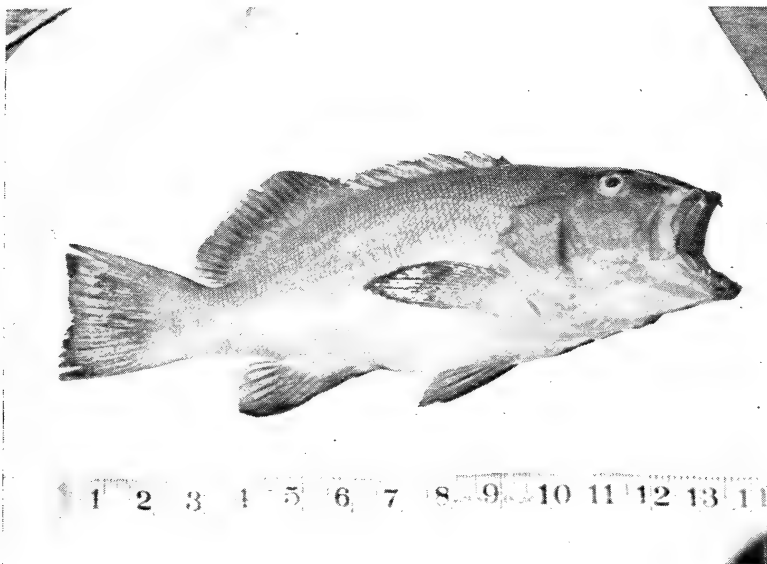


Fig. 2.—Breaksea Cod.

It is an excellent fish for food, either fresh or smoked, but no good illustration has been published before and the species deserves to be better known.

(4) Drummer, *Segutilum cornelii*, sp. nov.

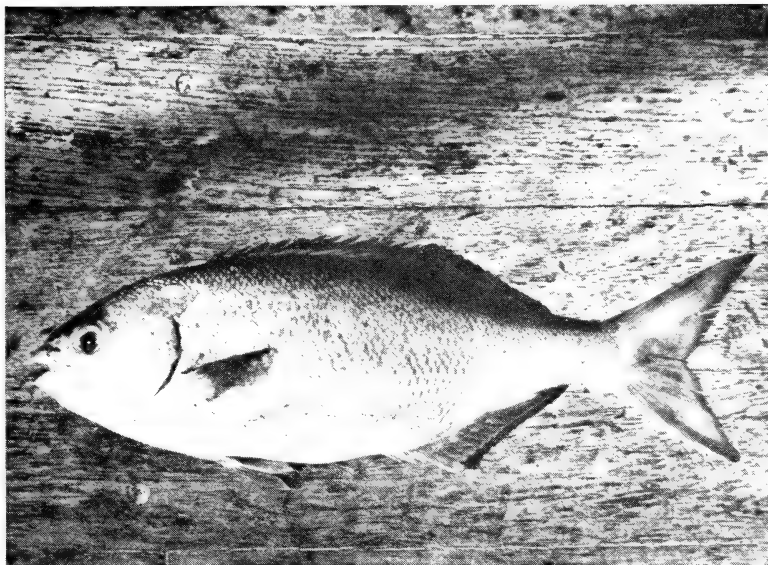


Fig. 3.—Buffalo Bream.

The fishes called drummer in eastern Australia have an impolite name in Western Australia because of their offensive taste and odour. There are several species, distinguished by their fin- and scale-counts. At Pelsart Island, Houtmans Abrolhos, a school was surrounded by our nets on 4th November, 1943, and yielded forty specimens of this new species which has D.xi., 15 or 16; A.iii., 14; l.lat. 50 to hypural, plus 6 scales on tail. Total length, 4.15 mm. Head, 90; depth, 112; standard length, 335 or 374 to caudal fork. Weight, 2 lb. 2 oz. to 2 lb. 11 oz.

Very pale in colour, mostly silvery to grey, becoming pale brownish grey on fins and eyes. Brownish longitudinal bands along scale-rows of flanks. A bronze band before and another below eye.

I name this fish after the "villain" of the *Batavia mutiny* which, more than 300 years ago, occurred by the place where it was caught.—Cornelius.

(5) Boarfish, *Paristiopterus gallipavo*, sp. nov.

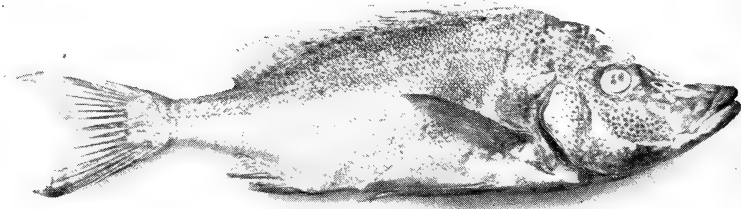


Fig. 4.—Boar Fish.

This remarkable novelty was found floating dead off Rockingham on 23rd February, 1944 (W.A. Mus., Regd. No. P.2589). It was just over two feet in total length, pearly-greyish in colour, with numerous round brownish spots along back; eyes and fins greyish. May be distinguished from all other boarfishes by the following combination of characters: (1) base of spinous dorsal fin shorter than that of soft; (2) posterior dorsal spines elongated and longer than the rays; (3) anal spines three.

(6) Angler Fish, *Echinophryne glauerti*, Whitley, 1944.

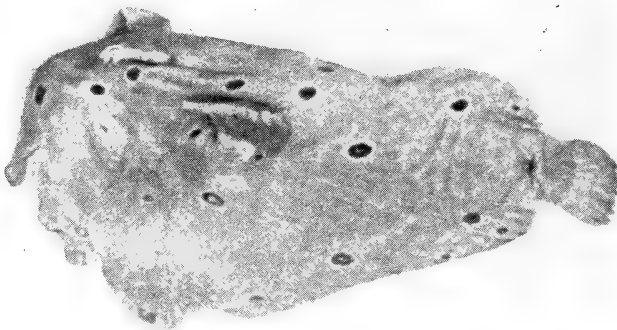


Fig. 5.—Angler Fish.

This remarkable little Angler Fish was described in the last "Australian Zoologist." Only two specimens are known from Cottesloe,

and it is possible that the species hides amongst seaweeds on the jagged limestone reefs. Length, 6½ inches.

- (7) Rough-skinned Leatherjacket, *Meuschenia platifrons* (Hollard, 1854).

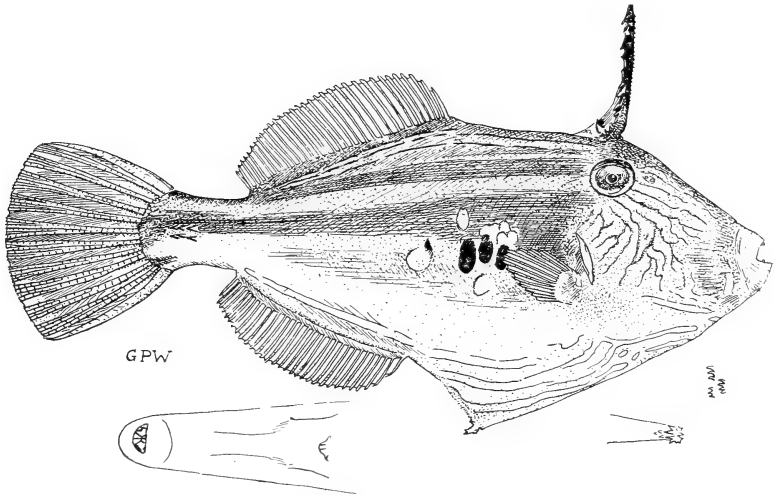


Fig. 6.—Rough-skinned Leatherjacket.

There are many nominal species of Australian leatherjackets, but few good descriptions or figures of them. Since these fishes vary in colour and shape a good deal, they are difficult to identify.

The Rough-skinned Leatherjacket of the Albany district is apparently the same as Hollard's "*Monacanthus platifrons*," described ninety years ago from a damaged specimen from King George's Sound. My drawing shows one from that locality, 9½ inches in total length, weight 8 oz., caught 2nd October, 1943 (W.A. Mus., Regd. No. P.2456). The sex was indeterminable, but I suspect that *platifrons* may be the opposite sex of *M. guttulatus* (Macleay, 1878) = *brownii* (Richardson, 1846), which is called the Smooth-skinned Leatherjacket.

The Sand Leatherjacket of the Albany district is *Nelusetta ayraud*, whilst another genus, *Scobinichthys*, is called Beady Leatherjacket.

Many years ago, leatherjackets were netted by the hundred in King George's Sound, and used as manure by the Chinese market gardeners around Albany. Then it was found that they were of the few fish which would keep on the long train trips to the goldfields (Kalgoorlie, etc.), where there was a sound demand for them.

MORE ABOUT NEW GUINEA LAND SHELLS.

By Tom Iredale.

Mr. H. W. Hermann, of Brisbane, has sent down a series of land shells collected by Sergeant F. Shaw, in New Guinea. These proved very interesting, as small shells were included and most of these are, of course, novel. Some notes on animals were added, and these are valuable.

In the order of my Basic List of the Land Mollusca of Papua (Austr. Zool., Vol. X, pp. 51, et. seq., December 19, 1941) the species may be noted as follows: **Pleuropoma**, sp. nov., **Helaposa (crossei)**, **Pupina speculum**, **Diancta**, sp. nov., **Subulina octona**, **Papusuccinea (simplex)**, **Durgellina**, sp. indet., **Xesta**, sp. nov., **Zagmena lissorhapha**, **Zagmena (juvenis)**, **Hunsteinia armiti**, **Mecyntera septentrionalis**, **Kendallena**, sp. nov., **Canefriula**, sp. nov., **Rhynchotrochus praefectus**, **Rhynchotrochus**, sp. nov., **Letitia latiaxis**, **Disteustoma**, sp., **Goldielix globosa** and **G. rehsei**. A **Viviparus** from the creek in Sangara, Buna Bay, was also included.

The animal notes given were: **Letitia latiaxis**, "is a purple colour streaked with grey. Four well-developed rhinophores with eyes at tip of dorsal pair." **Rhynchotrochus praefectus**, "is creamy white colour with cream-coloured mantle." **Hunsteinia armiti**, "mantle and foot are of a brownish-red colour, speckled with black dots, and a black patch." **Goldielix rehsei**, "is a purplish-grey colour." **Xesta**, unnamed species, "of cream-grey colour, the tail has a distinct tip, the mantle covers the shell."

Nearly all the species came from Sangara and Buna Bay, and differ from the Port Moresby shells, but are of the same facies. However, from further west Dr. Consett Davis sent a couple of shells from Lae and these, while of the **Zagmena** form, differ at sight in the development of a fine subreticulate threaded ornamentation and a slightly wider umbilicus. Further, among some marine shells picked up at Finschhafen were two Cyclophorids quite unlike the southern forms.

Sergeant Bruce Shipway, who was interested in freshwater fishes, tells me that these differ altogether in the streams of the north from those of the south, thus confirming the distinction of the Gaimardian from the Leichhardtian Fluvifaunulae (South Australian Naturalist, Vol. XVIII, pp. 64-68, map, April 30, 1938).

The Rev. H. K. Bartlett has been back to Misima, Louisiades, but has returned through ill-health, and has brought back some shells collected, among them being a new Cyclophorid of the **Dominamaria** series; a beautiful flat **Rosselidena** which can be called **bartletti**, nov., as it is much flatter than either of the two named species, **nigrans**, Smith, and **cornea**, Hedley, measuring 12 mm. in breadth by only 3 mm. in height; a new **Elasmias**, a new **Durgellina** and a new **Imputegla**.

This note is merely to show what a big field for discovery awaits the student. **En passant**, it may be recorded that the type of **Cochlostyla papuensis**, Hedley, and the cotypes have been examined, and these are undoubtedly common Philippine Island shells, and must be eliminated from the New Guinea fauna.

LIST OF MEMBERS.

As on 1st August, 1943.

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

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

PATRONS.

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

Air Vice-Marshal Sir Philip Woolcott Game, G.B.E., K.C.B., D.S.O., Langham House, Ham Common, Surrey, England.

BENEFACTOR.

Edward John Lees Hallstrom, 462 Willoughby Road, Willoughby.

ASSOCIATE BENEFACTORS.

Albert Littlejohn, 9 Young Street, Sydney.

Walter and Eliza Hall Trust, Box 130 C.C., G.P.O., Sydney.

Gustavus Athol Waterhouse, D.Sc., B.E., Australian Museum, Sydney.

FELLOWS.

Barrett, Charles, C.M.Z.S., "Maralena", Maysbury Street, Elsternwick, Victoria.

Burrell, Harry, O.B.E., "Yarrenbool", 141 Darley Road, Randwick.

Cayley, Neville W., 32 Cecil Street, Gordon.

Chisholm, A. H., "The Herald" Office, Melbourne.

Dakin, Professor William John, The University, Sydney.

Hindwood, Keith A., Wingello House, Angel Place, Sydney.

Hull, Arthur Francis Basset, M.B.E., Box 704, G.P.O., Sydney.

Iredale, Tom, "Solander", Queenscliff Road, Manly.

McKeown, Keith Collingwood, Australian Museum, Sydney.

Mathews, Gregory Macalister, C.B.E., Parliamentary Library, Canberra, A.C.T. (or 100 Coonanbarra Road, Wahroonga).

Musgrave, Anthony, Australian Museum, Sydney.

Roughley, Theodore, Cleveland, B.Sc., Fisheries Department, Chief Secretary's Department, Sydney.

Troughton, Ellis Le Geyt, C.M.Z.S., Australian Museum, Sydney.

Turner, Dr. A. Jeffries, Wickham Terrace, Brisbane, Queensland.

Ward, Melbourne. "Pasadena," Cross Street, Double Bay.

Waterhouse, Gustavus Athol, D.Sc., B.E., Australian Museum, Sydney.

Whitley, Gilbert Percy, Western Australian Museum, Perth, Western Australia.

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Johnston, Professor T. Harvey, The University, Adelaide, South Australia.

Lyell, George, Gisborne, Victoria.

McKeown, Keith Collingwood, Australian Museum, Sydney.

Stiffe, R. J., 350 George Street, Sydney.

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Bryce, Ernest John, 47 Nelson Road, Killara.

Buckle, Frank, 104 Hunter Street, Sydney.

Coles, Clifford, C.M.Z.S., Millions Club, Rowe Street, Sydney.

Crommelin, Miss Minard, "Warra" Sanctuary, Pearl Beach, Woy Woy.

Dellow, Walter Joseph, 32 Albion Street, Ashfield.

Dixon, Robert Craig, J.P., 33 Hunter Street, Sydney.

Dixon, Sir William, "Merridong", 586 Pacific Highway, Killara.

Foreman, Dr. Joseph, "The Astor", 123 Macquarie Street, Sydney.

Friend, Alfred Harry, B.Sc. (Agr.), 10 Laurel Street, Willoughby.

Golding, Miss Maisie, 2 Broderick Street, Balmain.

Halloran, Aubrey, B.A., LL.B., Bull's Chambers, 28 Martin Place, Sydney.

Hallstrom, John E., 462 Willoughby Road, Willoughby.

Minell, Mrs. Dorothy Ebsworth, 20 Wylde Street, Potts Point.

Hordern, Sir Samuel, "Babworth House", Darling Point, Edgecliff.

Monticone, Dr. Charles Albert, Box 2058, G.P.O., Sydney.
 Murray, C. Stuart, Box 2427 M.M., G.P.O.
 Musgrave, Anthony (see Fellows).
 Nash, Albert Edward, 8 Alt Street, Waverley.
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CONTENTS.

Sixty-fourth Annual Report	1
Officers, 1944-45	3
Balance Sheet	4
Presidential Address: "The Study of Bird Behaviour," by N. L. Roberts	6
Reviews	15
Reports of Sections—	
Avicultural Section	16
Budgerigar Section	16
Marine Zoological Section	18
Ornithological Section	18
Winter-breeding Sea-birds, by Tom Iredale	19
A Note on the Shingle-back Lizard, by G. Longley	20
Syllabus of Sectional Meetings	21
Notes on the Feeding and Rearing of Young Diamond Snakes, by G. Longley	22
Notes on a Hybrid Blue-tongue Lizard, by G. Longley	23
Illustrations of Some Western Australian Fishes, by Gilbert P. Whitley	26
More About New Guinea Land Shells, by Tom Iredale	30
List of Members and Associates	31