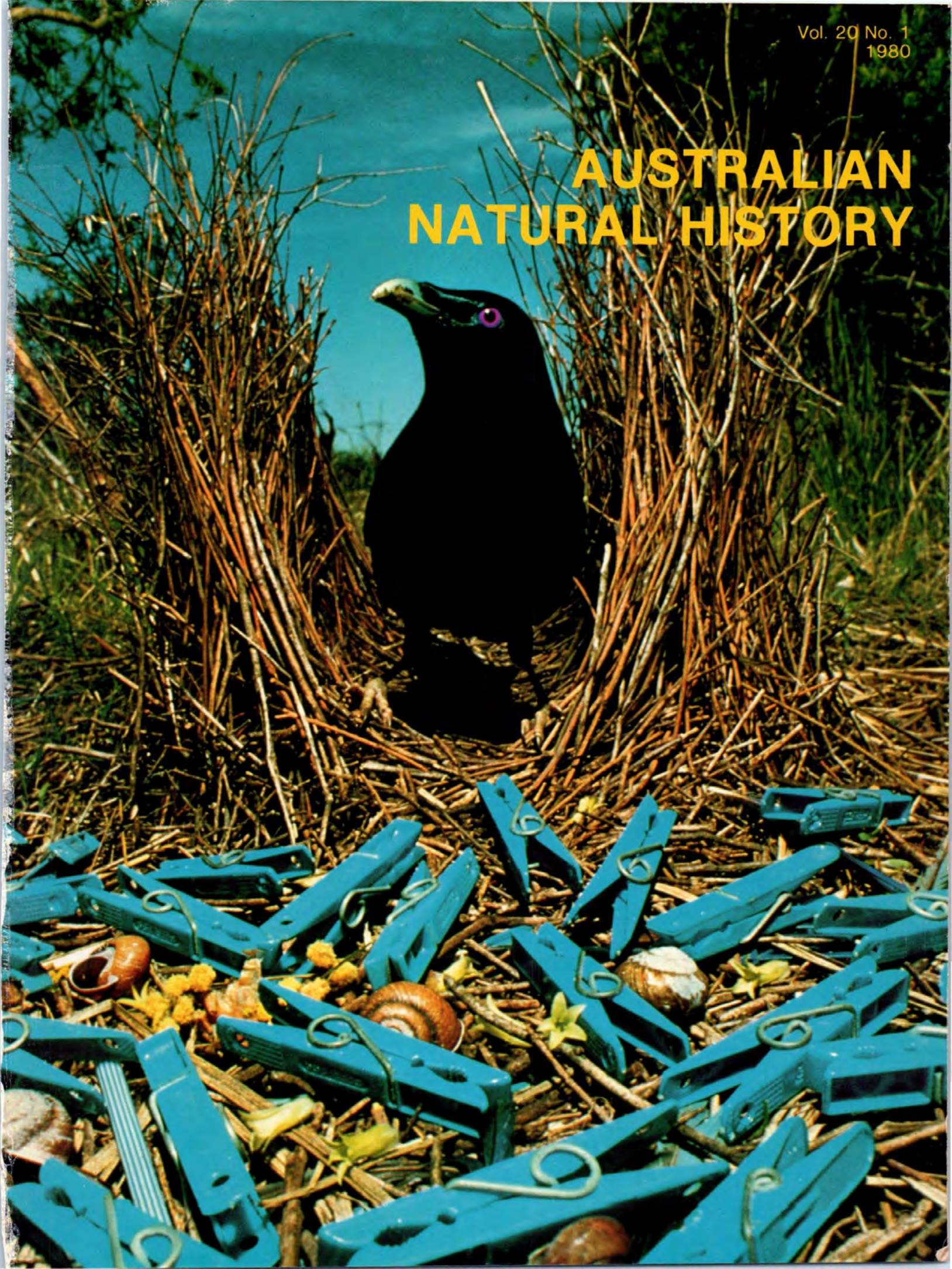


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# AUSTRALIAN NATURAL HISTORY





# AUSTRALIAN. NATURAL HISTORY

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Mimicry and other forms of disguise play a vital part in the survival of most insect species. Here a looper caterpillar, family Geometridae, adopts this pose in which it resembles a stem or twig and thus escapes detection by a predator. Photo by Densy Clyne.



This hawk moth, *Thereva queenstandi*, lives on the stinging tree *Dendrocnide excelsa* without injury. When disturbed it suddenly displays two prominent eye-spots on its thorax which may sometimes scare a potential predator. This phenomena occurs in many moth families either on the wings of the adult or on the larva as in the specimen pictured. Photo by Densy Clyne.

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COVER: Male Satin bower birds are compulsory pilferers of coloured objects for bower decoration. Blue is a favourite and when a bower area is handy to human settlement pegs and other plastic domestic items provide a variety of strange love tokens, as our cover photo by Philip Green shows. See inside for more pictures and stories.

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# FROM THE INSIDE



Beauty greets every visitor to Lizard Island on the Great Barrier Reef. An appreciation of this natural asset is vital at a time when the future of the Reef itself has become a matter for discussion. Sunset from the Lizard Island Research Station (top). The crinoid (or feather star) *Himerometra robustipinna* on *Acropora* coral (above). Photos by Charlotte Short/The Australian Museum.

This is the first issue in the new design for *Australian Natural History* magazine. It stands as one of The Australian Museum's most important means of communication with the public and for that reason we are most concerned with meeting changes in tastes and preferences among other potential subscribers.

The Royal Zoological Society made its first awards of the Whitley Medal during 1979 and at their presentation the President of the Society, Dr Michael Augée, drew attention to the "inevitable communication barrier between the specialist and generalist", a barrier often felt between scientists and members of the public. He said that "the main avenue of communication remains the printed word" and that in making the Whitley Awards one of the Society's hopes was to show that accuracy in the printed word does not need to mean dullness. It is with such ideas in mind that we have redesigned *Australian Natural History*. We hope we have made it a more attractive magazine, while not sacrificing accuracy or information. The magazine is intended as a reliable source of information on the natural history of Australia and the surrounding regions.

This first issue is special in many ways. There is a concentration on photographs. A place like The Australian Museum has access to a wonderful range of nature photography; not only do we have our own excellent staff photographers, there is too, the National Photographic Index of Australian Wildlife which has been established in association with the Museum, and the many contributors to the magazine. We thought readers should have more benefit from this resource.

Philip Green, an outstanding amateur photographer, and Densy Clyne, well known for her photographic studies of the miniature world of insects and spiders, have both made important contributions to this issue. Photography plays an important part in the working of a museum. It is often a tool in research and may be the only record of extinct species or old cultures. The Hurley collection of 1922 Papua New Guinea photographs, held by the Museum and featured in this issue, are a case in point.

Books seem to have been in the foreground of activities of the Museum lately. *Rare and Curious Specimens*, a history of The Australian Museum, was published last year to commemorate its sesquicentenary and you will read about it in this issue. The Whitley award winners are also reviewed in this issue.

I do hope you will enjoy this first number of Volume 20 and the new design. We would love to hear your comments, favourable or otherwise, and hope you will help us to make it a better form of communication.

Susan Quirk  
Editor.







# LOVE TEMPLES OF THE BOWERBIRDS

People who are forever collecting miscellaneous items are often called 'bowerbirds'. The colloquialism has its origin in the behaviour of some members of the family Ptilonorhynchidae, the bowerbirds which are unique to Australia and New Guinea. They are closely related to the birds of paradise, family Paradisaeidae. The common name 'bowerbird' derives from the male's habit of building a bower or a theatre for display to the female. Some species array the bower with a most amazing collection of objects. Philip Green, self-taught naturalist and world renowned photographer, is particularly fascinated by bowerbirds and has been able to closely study the satin bowerbird on his Jillaby property in the Gosford district of NSW. The photographs on this and following pages and the stories with them are a result of seven years of dedicated study by Philip Green in an intensively citrus-cultivated 2km<sup>2</sup>, bounded on one side by a sclerophyll forest.



A fallen log in dappled sunlight is the most favoured site for bower building by male satin bowerbirds (above). Walls of the bower are built of sticks from the surrounding bush; up to 500 sticks may be used, each one carefully selected for uniform length and diameter, each one firmly planted in the platform of the bower. Decoration of the bower is generally placed on the northern aspect of the platform.

This beautiful study of a female satin bowerbird (left) timidly entering the bower avenue shows the delicate colour patterns of the breast plumage to full advantage. Throughout her life the female is clad in softer and more varied colours than the adult male. Juvenile males are similar in appearance with the female until four years old, when the beak begins to turn white. Full adult male plumage does not appear until the seventh year.

A torrent of loud 'aarks' penetrates the early morning valley mists announcing the commencement of the strange courtship of the satin bowerbird *Ptilonorhynchus violaceus*. At sunrise the male flies to his tree-top lookout. After a brief preening session he commences calling a female; a movement in the tree-tops indicates her approach and the male quickly drops to the forest floor and moves to his 'arbour'.

Bizarre yet beautiful is the mating ritual of the satin bowerbird. Not content to court one female, a dominant male will have mated with up to five or more females by the end of the six month breeding season. During seven years spent in observation I watched ten courtship rituals of these polygamous birds living on the edge of a forest and surrounded on all other sides by various forms of human settlement.

As a prelude to the bower display the male gives voice to a variety of quivering calls designed to entice the female into the painted, flower-decked bower. Branch by branch she hesitatingly approaches until she alights at the rear of the bower. Eyes bulging with excitement the male crams his beak with blossoms and perhaps a more solid decorative piece from his collection. This activity in no way inhibits his vocal activity. At this point the female timidly moves forward and enters the bower avenue from the rear. The male display increases in tempo, the lavender edge of his iris becomes brighter, he fans his tail and lowers his head, proffering his bouquet or a tasty insect morsel. His repertoire continues with an astounding concert of mimicry of local birdcalls including a perfect rendition of a kookaburra's rollicking laugh. He now stands on stiffened legs with body feathers fluffed out and gives voice to a torrent of harsh notes. Selecting another display item the male commences his last act of the courtship dance with a strange whirring noise punctuated by dazzling flashes of outflung wings . . . without warning he shies violently sideways and quickly mounts the female crouching in the avenue. This performance, which may last half an hour, is performed many times.

The ritual ended, the female is summarily dismissed and withdraws to the forest to commence her task of nest building, incubation and care of the young. Lady of all work she

carries out all the nesting duties without any assistance from the male who remains engrossed in caring for his arbour and winning new mates.

Usually situated amid the forest undergrowth the bower is often positioned near a fallen log or a moss-covered rock in a dappled patchwork of sunlight. The bower consists of a mat of sticks and dried grass stems upon which two sturdy parallel walls of sticks are erected. Walls are formed by thrusting slender twigs a few centimetres into the platform. Each wall may contain up to 500 sticks gathered from the surrounding forest. In one bower kept under close observation the walls were maintained by the bird at a height of 30cm enclosing an avenue 12cm wide and 23cm long. The satin bowerbird is a most selective builder, rejecting any sticks which do not conform to his standards of straightness and a uniform 2mm in diameter. For some obscure reason the avenue is always orientated in a north-south direction. A J. (Jock) Marshall, noted Australian naturalist, once carefully altered the orientation of an avenue only to have the bird return it to its original position. The bower may be used year after year.

In surroundings isolated from human habitation the collection of display objects will include naturally occurring items such as parrot feathers, flowers, snail shells and berries. On more than one occasion I have seen a length of sloughed snake-skin among the collection of decorative items. Although a partiality for the colour blue is shown, four other colours are assembled: greenish-yellow flowers and berries; brown cicada cases and snail shells; bright yellow flowers; and grey paper-wasp nests or sloughed snake-skin. Objects placed experimentally on the bower which do not conform to this colour criterion will promptly be removed. Shape and form also influence the bird's choice. For example brown snail shells are readily used but leaves and stones of a similar colour placed on the bower are immediately rejected.

Where the bird has ready access to human habitation he will help himself to any blue domestic items such as clothes pegs. One bower on the forest fringe close to a school displayed a collection of 31 0 objects of which 143 were blue plastic straws.





Courtship display begins as the female approaches the bower-generally from the rear (top). The male shows great excitement, crams his beak with flowers-wattle blossom in this case-as the female timidly moves forward along the avenue, to the male accompaniment of harsh notes, sometimes interspersed with mimicked birdsongs. Tail fanning, stilt-legged strutting, presentation of his bouquet follow in rapid sequence (centre and below). The grand finale of this act begins with the selection of another display item, a strange whirring noise and some dazzling wingflashes. The third picture of this sequence is actually a practice of this display exercised on a communal platform bower.



Painting the bower is another interesting behaviour pattern about which little seems to be known. The paint is formed by mixing saliva with a thoroughly masticated foreign material. This material varies according to the individual-bark, charcoal or other vegetable matter are most frequently used. One bird observed during this study deposited a small piece of decaying bark on the perimeter of the platform to obviate repeated trips into the forest each time paint was required. Scraping it with his bill he obtained a powdery substance for the paint mixture.

The beak serves as a brush to paint the interior walls of the avenue. During painting sessions, lasting up to five minutes, a jabbing, nibbling motion repeated once every second is used to transfer the paint onto the sticks. This ritual is most frequent during the early hours of the morning. The freshly applied paint contains innumerable fine particles and fibres suspended in a salivary liquid. One hour after application the paint is thoroughly dry and appears as a matted brown fibrous coating adhering to individual sticks which can be easily removed by lightly rubbing with the fingers. There are a number of theories as to the purpose of bower-painting. Some observers suggest that it is a substitute for courtship feeding whilst others believe it provides visual or olfactory identification of the bower.

All male satin bowerbirds are promiscuous and need to possess a territory frequented by large numbers of females. The dominant male occupies the prime territory. Domination is determined by superiority in brief physical encounters, but should a dominant bird die or for some reason be incapable of defending his bower a lesser male will immediately take control. All males in the region will then move 'one rung up the ladder'.

When opportunity affords, a rival male will go so far as to wreck his opponent's avenue. Beakfuls of sticks go flying through the air in all directions. One bower kept under constant surveillance for seven days was demolished five times by a rival. Complete destruction of one avenue containing 300 to 500 sticks was accomplished in an unbelievable two minutes.

During the non-breeding season from late summer to early winter most bowerbirds roam the forest valleys in flocks, following ripening native and cultivated fruits. This diet is supplemented with nectar, succulent herbage and insects. When mid-winter heralds the beginning of the breeding season the wandering flocks disperse and adult males return to their former territories. Every activity for the following six months is influenced by the courtship process.

The nest is usually constructed high in densely foliated trees some distance from the bower. In normal seasons two eggs are laid, their colouration merging with the mottled pattern of the leaf-lined nest. Incubation extends over approximately 21 days. The young are naked when hatched but fluffy down soon appears and after 19 days they clamber out, although still unable to fly, and begin exploring the world around them.



Blue is the favourite colour used in selecting items for bower decoration (right). although the colour scheme always includes yellow, green, brown and grey. No departure from this scheme is tolerated and when Philip Green attempted to introduce additional colours his offerings were firmly rejected as can be seen by the picture of a male removing red plastic pegs placed among his own collection of traditional items. Pilfering is not confined to pegs, the bower pictured lower right was built near a school. Of the 31 Objects used 143 of them were blue plastic drinking straws.



The female tutors her young in the ways of the wild and once able to fend for themselves they join roving bands of immature males. A long apprenticeship in the art of courtship follows for it takes six years for the satin bowerbird to become fully qualified. For the first two years construction efforts by young males scarcely get past a flat mat of sticks termed a platform bower. A young male will occasionally attempt to place a stick in a vertical position. Varying contortions are effected to drive the stick into the platform and it takes some time to acquire the knack of turning the head sideways as mature birds do to 'plant' the sticks in a vertical position. In the final years of development bower painting practice commences, a learning process which, as far as I am aware, has never been recorded on film.

Initially the bird under observation endeavoured to munch up a parrot feather apparently for the purpose of obtaining paint. This proving unsuccessful, he selected a yellow weed from a few display items collected and again commenced munching. Using a motion similar to that employed by adult birds whilst painting he tried to stick the partially masticated weed on the wall of the avenue. This too met with failure and the weed was discarded. A two-minute painting session ensued using pure saliva.

During the fourth year the male becomes easily distinguishable from the female as his formerly dark beak begins to change to adult white. Vigorously practising the courtship display, fifth year males, with fully coloured adult bill, have mastered the courtship technique. In fact they are now capable of mating and ready to enter into competition with other adult blue males as an 'architect-owner' of an avian temple of love.







Ten species of bowerbirds are found in Australia: the golden bowerbird *Prionodura newtoniana*; regent bowerbird *Sericulus chrysocephalus*; satin bowerbird *Ptilonorhynchus violaceus*; fawn-breasted bowerbird *Chlamydera cerviniventris*; great bowerbird *Chlamydera nuchalis*; western bowerbird *Chlamydera guttata*; spotted bowerbird *Chlamydera maculata*; tooth-billed bowerbird *Ailuroedus dentirostris*; spotted catbird *Ailuroedus melanotis*; green catbird *Ailuroedus crassirostris*. Philip Green's camera has brought us these close-up studies of three of these species. In the highland rainforest of north-eastern Queensland, in a very restricted area near the coastline, lives the golden bowerbird (top far left). This medium-sized species (23-26cm) builds one of the most fantastic bowers to be found in Australia. It begins as a collection of twigs and sticks interwoven around the bases of two saplings growing approximately one metre apart. Each year the bird adds more twigs until the structures are joined between the two bases in a U-shaped formation, the sides rising up the trunks sometimes to a height of 76cm (top left). The bird leaves a horizontal branch or root in the centre as a display perch. The toothbilled catbird (centre far left) gets its common name from its notched bill, useful in cutting leaves which figure largely in the diet and bower decorating activities of this 23cm denizen of north-eastern Queensland. The 'bower' consists of a cleared 'stage' or 'playground' about 3m in diameter. Leaves placed on the playground number from 40 to more than 100 all deposited pale side uppermost (centre left). Fresh leaves are brought to the stage each morning, withered leaves are removed each evening. Males sing their serenades from regularly used perches a few metres above the display area. Along the coastal forest of Queensland and New South Wales live the brilliantly marked regent bowerbirds (below). Rarely seen, these shy members of the bowerbird family are believed to be fairly common in suitable stands of forest between the Gosford-Wyong district of NSW, along the lower slopes of the Great Dividing Ranges and the coastal lowlands of southern Queensland. Bowlers of the regent bowerbirds are less elaborate than those of satin bowerbirds, decoration is far less showy and concentrated within the bower avenue. The bower itself is much smaller than that of most species and is usually inconspicuously placed under dense bush. One unusual claim made by observers of this species is that it builds two bowers, one rather fragile structure used only for a brief period and another more substantial bower for permanent use. Because of its timidity and the fact that its bower is smaller and secretive not a great deal is known of its display and breeding habits in the wild.



# MYSTERY IN MUSEUM HISTORY

Until recently no one questioned the celebration of The Australian Museum's sesquicentenary in 1977. However, late in 1979 the museum published a history of its first 150 years, called *Rare and Curious Specimens* and the book poses an intriguing question-just when did The Australian Museum begin?

To some, that grand building on the corner of College and William Streets in Sydney has always been there. Museums somehow impart a feeling of permanence and inevitability.

To the trustees of The Australian Museum, however, its existence began in 1827. In that year a letter from Earl Bathurst in London to Lt. General Darling gave approval for 'commencement' of a museum.

The letter was as follows:

Colonial Office  
Downing Street  
30 March, 1827

Lt-General Darling  
etc. etc. etc.  
Sir,

It having been represented to me that it would be very desirable were the Government to afford its aid towards the formation of the Public Museum at New South Wales where it is stated that many rare and curious specimens of Natural History are to be procured, I do myself the honour to acquaint you that although I feel a difficulty in authorising the commencement of any Building for that purpose until an Estimate of the expense shall have been first submitted to my consideration, yet I am disposed in the meantime, to allow a sum, not exceeding £200 per annum, to be disbursed for the purpose of assisting in the accomplishment of this object, and as one of the first steps towards ensuring its success seems to be the sending out some proper person to assist in collecting and arranging such specimens as it may be possible to procure in that quarter, I have been further induced to consent to the appointment of a young man to that particular duty who has been recommended to me as peculiarly fitted for it, and who will, therefore, be immediately sent out to the Colony in the capacity of Zoologist with the same rate of salary and allowances as appear to have been given to Mr Fisher, the present intendant of the Botanic Gardens at Sydney.

I have, etc.

Bathurst

It had been previously assumed that the "young man" was a William Holmes and that he was sent from London as a result of Bathurst's letter to become the "first custodian of the infant collections of the Colonial Museum, the original designation of the institution".

In pursuing background material for the book, the most thorough history of the museum yet to be attempted, author and editor, Ronald Strahan, uncovered information which led to some doubt about just when Holmes took up his position although it seems certain that Holmes was in fact "first custodian", but Strahan offers evidence which

suggests that Holmes did not in fact take up his post until some time in 1829, and that this then should be regarded as the first year of the museum.

He tantalisingly poses questions for future scholars who may help to complete the story of the sequence of events between Bathurst's letter and the appointment of Holmes.

All of this, of course, raises the question-just what constitutes a museum and when can a museum be said to have been established.

A collection of curiosities, official recognition, a custodian and opportunity for the public to view the collection-all seem to have been important elements in the making of The Australian Museum-as they would be for any museum. Professor Geoffrey Blainey who contributed the preface of the book, goes further. He points out that, in fact, The Australian Museum has earned its own place among museums of the world.

To those who were just discovering this new land in the late 1820s it was envisaged as a scientific depot for the many rare and exotic animals and plants which would inevitably be found here. It would be a "grand encyclopaedia of knowledge on Australia and the southwest Pacific, and a sedate entertainment parlour wherein might be seen 'the many rare and curious specimens of natural history'".

No other country but Australia "has ever produced a more extraordinary assemblage of indigenous productions: no country has proved richer than Australia in every branch of natural history". The Australian Museum has thus become the nation's celebration of this "extraordinary assemblage".

Although there have been years of failure and turmoil, The Australian Museum has become an educator, researcher, adviser and entertainer and a place for people to wonder. Geoffrey Blainey says it has become "the great museum".

Not only does *Rare and Curious Specimens* make interesting reading about Australia's "great" museum but it is also a valuable contribution to Australian history and is a must for any personal or institution library.

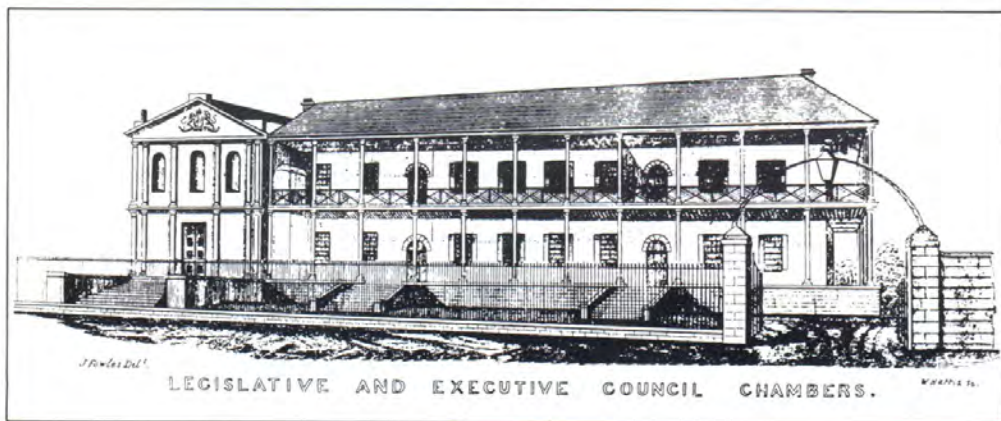
Illustrations from the book form the bulk of this article.







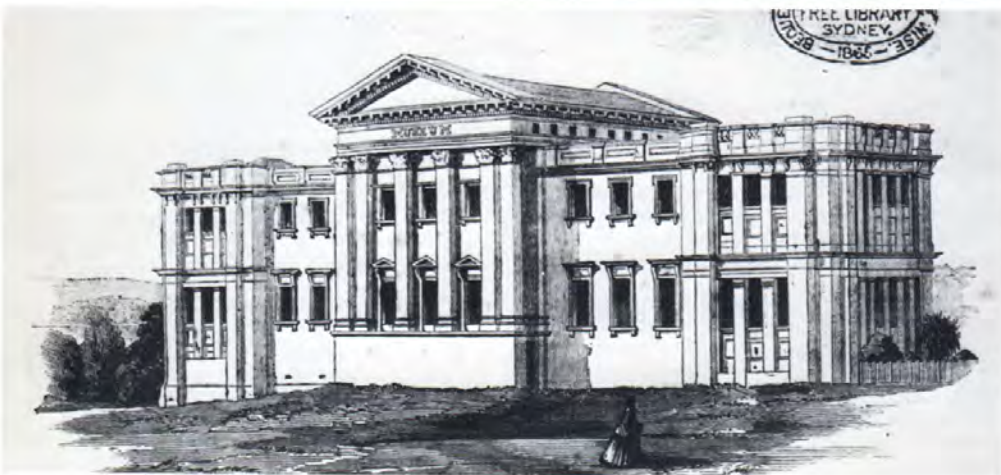
The arrival of Alexander Macleay (far left) to take up duty as Colonial Secretary in 1826 did much to stimulate public interest in the establishment of a museum. Macleay was a keen naturalist, an interest he pursued in Australia with great vigour. His unflagging enthusiasm and influence was decisive in the establishment of The Australian Museum. Macleay's position and association with the Secretary of State for the Colonies, Earl Bathurst, no doubt led to the latter's agreement to fund a museum and to send a "young person to the colony as a Zoologist". The despatch from Bathurst was written on March 1827 and arrived in Sydney aboard a convict transport *Manlius* in August 1827. Nothing more seems to have been heard or done about "sending out some proper person to assist in collecting and arranging . . . specimens", nor yet does there appear any record identifying the person to whom Bathurst referred.



William Holmes, a carpenter and joiner, was appointed head of the Colonial Museum on 16 June 1829. Succeeding historians assumed Holmes to be the young man referred to in Bathurst's despatch. By the beginning of the following year the museum was housed in a shed at the back of the Judge-Advocate's old office in Macquarie Place backing onto Bent Street. The outbuildings had previously housed Australia's first post office shown here (near left) as a small shed behind the gate and possibly the small outbuilding on the left. Sufficiently out of the way to cause the Sydney Gazette of 31 August 1830 to advise: "The public are not generally aware that a beautiful collection of Australian curiosities, the property of Government, is deposited in the old Post Office (in Bent Street). This museum is under the Superintendence of Mr. Holmes, who, between the hours of ten and three, politely shows the same to any respectable individuals who may think fit to call." William Holmes was accidentally killed during a collecting trip at Moreton Bay in 1831 and the museum collection was moved to rooms in the Legislative Council building (upper centre) where it remained until 1836 under the superintendence of Edward Deas Thomson, clerk to the Legislative Council, and William Galvin, a pardoned convict who was employed as parliamentary messenger, assisted by John William Roach, a taxidermist sentenced to seven years' transportation for stealing but granted a ticket-of-leave when formally employed by the museum. The two-year gap between Bathurst's despatch and the appointment of William Holmes has so far not yielded confirmation that Holmes and Bathurst's "young person" were one and the same being.



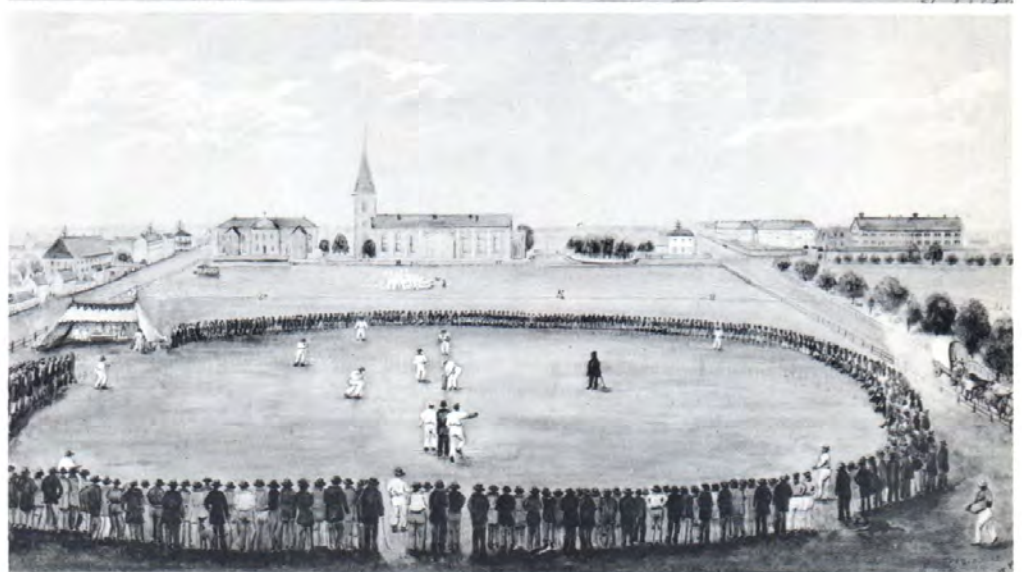
In 1844 the Governor of NSW Sir George Gipps gave approval "for a sum not exceeding £3,000 for the erection of a museum and requested the Colonial Architect to prepare a plan of a building suitable to the purpose". The present site in William Street was chosen for the purpose and construction began in March 1846, the building was completed in March 1852. This first section faced William Street and the oldest known photograph taken from Hyde Park (mid centre left) shows the unmade roadway, now College Street, in the foreground and the original buildings of Sydney College, now Sydney Grammar School. The Museum was eventually opened to the public in May 1857. Four months later plans were afoot to extend the Museum with a West wing facing College Street (lower left) an extension which was completed in 1866.





The history of The Australian Museum is studded with great names in Australia's past and present. Surveyor-General Thomas Mitchell, the distinguished explorer (near right), was a member of the first Committee of Superintendence of the Museum, appointed in 1836. His diaries and sketches of Australian fauna were a valuable contribution to the study of natural history. The engraving of the wedge-tailed eagle (far right) is based on one of his excellent original drawings.

Panoramic sketches of Hyde Park by artists of the time capture the spirit of Sydney's early days. John Rae's sketch (centre) shows the view across Hyde Park from Elizabeth Street, in the top right hand corner is the museum under construction. The base of one of Old Sydney's windmills can be seen in the centre of the skyline, probably 'Craigend windmill' built on the grounds of 'Craigend' mansion, home of Sir Thomas Mitchell for many years. A view across Hyde Park to St. James Church (lower left) shows the courthouse and the Parsonage, also said to be a residence of Sir Thomas Mitchell. Painting by T. H. Lewis. Both views show the use of Hyde Park as a cricket ground.







Through many years of ebb and flow, internal conflict, parliamentary enquiries, political manoeuvring, dedicated effort and world conflict The Australian Museum has steadily advanced. The scientific staff increased in number, scientific research in the field and the laboratory became the accepted core of activity and endeavour, the role of educator has been firmly established. Charles Anderson (far left) was appointed director in 1921 and remained in that office for 20 years. Senior staff in 1895 numbered eight (far left centre), today it numbers 163. Many extensions have been added to the original buildings such as a third floor to the Long Gallery in 1890 (left) and the excitingly modern extension of 1963 (below) which takes The Australian Museum the full length of a block along William Street, from College to Yurong Streets. It is to the great credit of editor and author Ronald Strahan and the numerous contributors to *Rare and Curious Specimens* that the reader is taken on an intimate, sometimes rollicking, journey, through the galleries of The Australian Museum and through the corridors of scientific and political history which made the museum the great institution it is today—and there yet remains to be discovered the true identity of that 'proper person' Earl Bathurst proposed as zoologist in his letter of 1827.





# LIZARD ISLAND: JEWEL IN THE SUN



Scientists collecting marine invertebrates with air lift pump (left). Underwater research activities play a major role in the Lizard Island Research Station's objectives. Photo by Charlotte Short/The Australian Museum.

Aerial view of Lizard Island looking north (right). Palfry Island is on the left and South Island on the right in the foreground, and the lagoon is in between. Photo by Howard Hughes/The Australian Museum.



Lizard Island is situated within Australia's Great Barrier Reef about 32 kilometres off the coast from Cooktown and only 14 kilometres from the Outer Barrier Reef. Covering approximately 7 square kilometres, Lizard Island is a high (370 metres) continental island; the main hill of which was used by Captain James Cook as a vantage point to find a route through the almost encircling Barrier Reef for the *Endeavour* on its historical voyage in 1770.

Lizard Island itself is connected within a reef complex with two nearby islands, Palfry and South, enclosing an approximately 10-metre deep lagoon. For the most part, the main island is rocky and grass-covered on the highlands, with small pockets of rainforest in protected valleys on the southeastern end of the island, and grass, small eucalypt forest and mangroves covering the lowland.

Included among the most conspicuous land animals on Lizard Island are the large monitor lizards for which Captain Cook named the island, the tourists that use the resort on the west side and the scientists found at the research station operated by The Australian Museum on the southwest corner. However, it is the splendour of the marine environment surrounding the island that is so immediately apparent to any visitor.

Lizard Island's close proximity to a wide variety of reef and island types characteristic of the Great Barrier Reef—fringing reefs, lagoonal reefs, cays, continental islands and ribbon reefs—and a wide diversity of marine organisms—over 63 genera of corals and 1,000 species of fish—makes the Lizard Island Research Station an important centre for studies of one of the largest unspoilt coral reef systems in the world; a system, however, which is seen by some as moving precariously close to the hand of exploiting-man because of recent changes in legislation.

The establishment of a research station at Lizard Island illustrates the concern of The Australian Museum that it not only pursue research itself but encourage others to do so

as well; a place where scientists throughout Australia and the world can conduct research contributing to a better understanding of coral reef systems. The Research Station is currently in a development phase with funds for present maintenance coming from The Museum and visiting scientists, and prospects for advancement depending upon environmentally conscious institutions, organizations and individuals. Present donations are through The Australian Museum Trust and the Lizard Island Reef Research Foundation.

Although the Lizard Island Research Station was not started until late in 1973, The Australian Museum has been intimately involved in research on the Barrier Reef since the turn of the century, initially through the work of Mr Charles Hedley, Assistant Curator of The Australian Museum and Scientific Director of the Great Barrier Reef Committee. The Lizard Island Research Station's situation at the northern end of the Barrier Reef complements the research facilities on Heron Island and One Tree Island (established by The Australian Museum in 1966, now managed by the University of Sydney) on the southern end and the recently established station on Orpheus Island near Townsville. The world's shallow tropical seas are currently extremely important in fulfilling the demands of tourism, fisheries and mineral exploitation—demands that obviously will be even greater in the future. Thus it is imperative that the abiotic and biotic interrelationships within the Great Barrier Reef ecosystems are understood, before the Reef's very existence is placed in jeopardy.

Studies carried out by Museum personnel and other scientists include analyses of general reef structure, diversity and distribution of coral species, the role of bacteria in coral sediments, ecology and taxonomy of coral cryptofauna (animals which bore into corals), and the habitat requirements and feeding behaviour of crinoids. But apart from the scientific value of visits to Lizard Island, it would be hard for anyone to overlook the examples of exquisite beauty readily found in almost every corner.



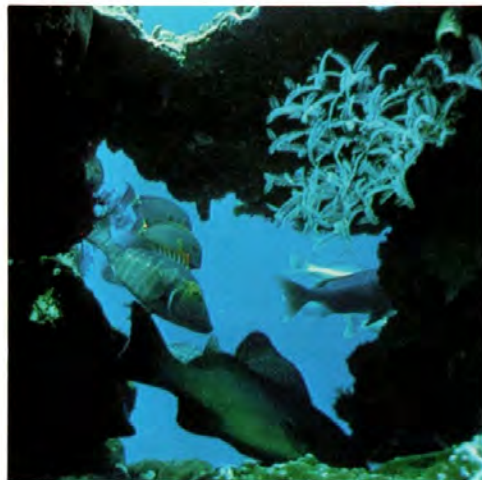
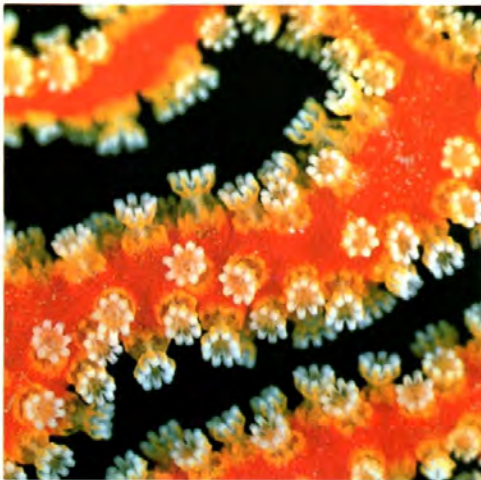


An undescribed species of the nudibranch, or sea slug, *Nembrotha* (left). Nudibranchs lack the protective shell found in most other molluscs and are among the most brightly coloured of the marine animals. Such colouration possibly serves as a defensive mechanism to warn a potential predator of a bad tasting or toxic dinner. Photo by Charlotte Short/The Australian Museum.

Closeup of reef-forming coral (centre far left). Fleshy feeding-polyyps protrude through the hard external skeleton of living coral. However, it is the hard skeleton material of coral that provides the framework for reef formation. Photo by Keith Gillett/NPWS.

A coral bommbora, or 'bommie' (centre left), with the resident fish *Lethrinus chrysostomus* (the banded fish in the middle of the picture) and hydroid *Lytocarpus* sp. A 'bommie' is an isolated coral head and often attracts large numbers of fish because of the increased number of hiding places. Photo by Charlotte Short/The Australian Museum.

The sea anemone *Callactis miriam* (below). Although attached to a substrate, an anemone will catch unwary passersby for food with its waving tentacles. This particular species of anemone is often found attached to the mollusc shells of hermit crabs. Photo by Keith Gillett/NPWS.





# CAMERA ON EXPEDITION

The National Museum and Art Gallery of Papua-New Guinea was officially opened in 1977 and to mark the occasion The Australian Museum Trust returned 17 artifacts from its own Papua-New Guinea collection. This gift underlined the close and harmonious relations existing between museum authorities of both countries. Since 1972 The Australian Museum has directly participated in discussions and negotiations for the return of cultural property to New Guinea and to the Solomon Islands. Mutual respect and understanding has made it possible to widen negotiations beyond return of the artifacts and into the field of exchange. Against this development it is interesting to examine experiences in gathering ethnological collections. In 1927 The Australian Museum purchased an extensive collection of photographs taken by Captain Frank Hurley during an expedition he led into Papua-New Guinea at the end of 1922. The glass negatives have been carefully preserved by the staff of the Museum's photographic department and testify to the important role accurate photographic records play in the development of science. The collection provided a superlative reference for Museum departments engaged in creating authentic ethnological displays of Papua-New Guinea life of that time; it remains a constant resource for contemporary scientists, technologists and students.



A detail from the exhibit The Australian Museum created using Captain Frank Hurley's photographs for reference and the artifacts collected during the 1922 expedition.

James Francis Hurley (1885-1962) was a legend in his own time. Variouslly dubbed 'explorer', 'adventurer', 'innovator', 'opportunist', 'pirate', 'mercenary', he undoubtedly earned the respect of all his contemporaries for courage, initiative and, above all, photographic skill. He was associated with the great events of his day, from the Antarctic to the Pacific islands, from natural history discovery to technological advancements in motion pictures and was usually among the 'firsts' in all these ventures. Some historical episodes in which Hurley participated were: the first Australasian Antarctic Expedition 1911-1913 led by Douglas Mawson; the ill-fated trans-Antarctic expedition with Shackleton in 1914-1916; the Australian Expeditionary Forces 1917-1918 (where he held the rank of captain); the Ross and Keith Smith England to Australia flight, on the Australian lap, 1920, and, last but not least, his many expeditions in post-World War I to Papua, New Guinea and the Torres Straits islands.

From the time of his service with the AEF, Hurley became generally and affectionately known as Captain Hurley. His Papua New Guinea expeditions were the realisation of dreams conjured in the frozen wastes of the Antarctic, but his organisation and execution of these expeditions marked Hurley as a practical and efficient organiser of men and materials. In 1922 he was the first man to introduce seaplanes to the area, motivated by the need to explore the swampy hinterlands by camera in the air. He backed this dream with practical support in the shape of a vessel constructed for navigating the shallow waterways typical of west New Guinea, equipped with scientific gear and a powerful radio. He sought and found generous subsidies from leading Sydney businessmen such as Lebbeus Hordern. With him on this expedition went Alan Riverstone McCulloch, scientific representative of The Australian Museum; Captain Andrew Lang in charge of aviation; aeromechanic A. J. Hill; Mr R. Bill in charge of the vessel and navigation; and eight native canoe veterans from Port Moresby. Mr Williams, an

ethnologist of the Papuan Government, joined the party in Papua.

The declared objectives of the expedition were publicly outlined by Captain Hurley as "(1) discovery and map making by aerial survey, (2) ethnological and zoological study and collecting specimens for The Australian Museum, (3) motion pictures and still photographic records of natives, customs and scenes". (*Pearls and Savages* by Frank Hurley, March 1925.)

McCulloch and Hurley acquired an extensive collection of valuable artifacts for the Museum from the area toured. At the conclusion of the journey and on the eve of the party's departure from Port Moresby for home the entire collection was impounded by the PNG authorities.

The battle for its return to the explorers and The Australian Museum was led by Captain Hurley, who, in typical flamboyant style, captured public interest and support by highlighting the sensational aspects of the expedition in newspaper articles, public addresses and, of course, his films and photographic shows.

Charges of piracy by the administration of Papua, and of dubious dealings with the natives were met by Hurley's vivid descriptions and counter-charges of native fear of administration and of "Gilbertian Comedy in Government," and this controversy, lasting nearly six weeks, was spicily underlined by Hurley's special articles (exclusive to the *Sydney Sun* newspaper) of the experiences of the explorers. References to "bone-bags collected and filled with skulls, human bits, and tit-bits" exchanged for axes, knives and fabrics whetted the public appetite for more information and assured public support for the return of the collection if only in order to confirm the writer's claims.

In particular, the methods used to acquire some skulls and stuffed heads from 'wild' natives in the Lake Murray area came into





question. These, Captain Hurley claimed, were grisly human remains, 'trophy' left by a party of head-hunters who ran away on the approach of the Hurley party. The explorers took possession of these curiosities "in the interests of science, leaving gifts in exchange, and conveyed, with other ethnological objects that they had collected by purchase from the natives, to Port Moresby. By orders of the Acting-Administrator of Papua, the whole collection was seized, and a statement was made that the explorers were suspected of piracy, and the articles would be sequestered pending an inquiry into the circumstances in which they were obtained." (*Sydney Sun* 6 February, 1923.)

Hurley and McCulloch returned to Sydney without the collection and on arrival McCulloch put the affair in proper perspective when interviewed by the *Sun* (6 February, 1923):

"Papua has been scoured many times for freaks and wonders," he said, "everything superficially striking has probably been found," he went on, "but we hope to give the ethnologists a surprise with the more unobtrusive details of our discoveries. We haven't got any pigmies or giants, or men with tails, or Lake Murray bunyips to show—but on the other hand, I believe we have a very fine collection of insect and minor novelties. Of course nobody can tell yet until an examination has been made, and the only examination in progress at present is being conducted by the Port Moresby cockroaches . . ."

"The Australian Museum itself holds the official Papuan collection in trust for the Papuan Government," Mr McCulloch continued. "Captain Hurley's collection would amplify it considerably. In fact, our ethnologist, Mr Thorpe, has no knowledge of many of the things we accumulated in the Lake Murray district."

"With the approval of the trustees we hope to make an exhibit in the Museum, giving an idea of the weird structure of the Kaimari ravis, with their skull-racks. Captain Hurley secured some skulls, and even had one of the racks made by the natives themselves, so that the ensemble should be strictly correct. We hope to be able to display this at about the same time as the screening of Captain Hurley's pictures, so that after seeing the shadows of the objects on the screen, people will be able to come along to the Museum and see them in reality.

"Altogether," he concluded, "the results of the expedition will be of distinct scientific and museum value, especially as we succeeded in reaching the far side of Lake Murray, where apparently nobody has been before. Each tribe in this extraordinary region differs from its neighbour, and so it may well be that we have many surprises in our collections for ethnologists—but that will have to wait until we get our collections back from the Administration," said Mr McCulloch wistfully. "Listen to those cockroaches!"

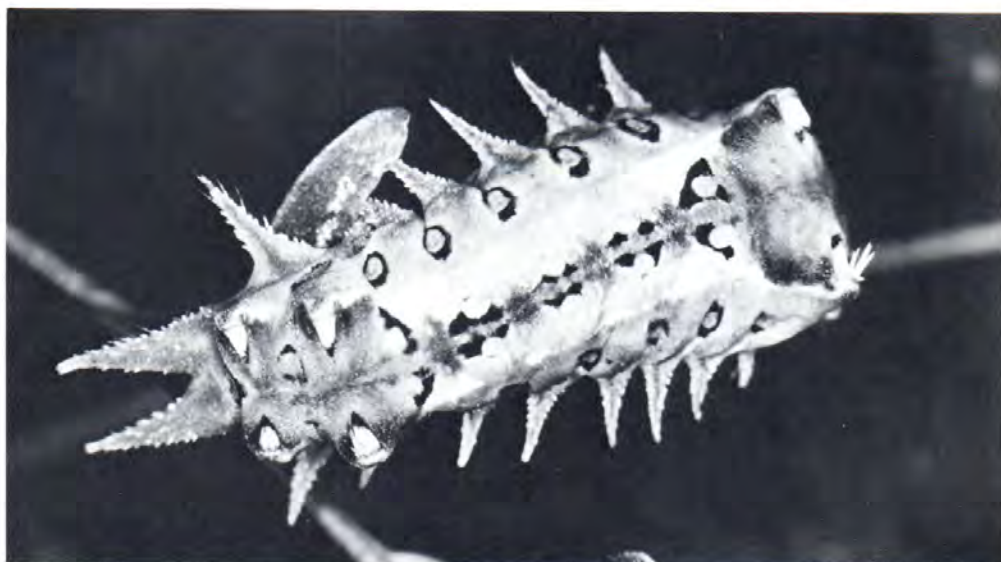
A Papuan village from the air as it looked nearly fifty years ago. Taken by Frank Hurley from the seaplane *Seagull*, this view of Kaimari village on the Gulf of Papua was probably the first aerial view of a Papuan village ever published. It vividly records the pattern of native life. Three great ravis or longhouses dominate the scene; each ravi is surrounded by a cluster of family homes. The centres are connected by bridges and all structures stand on a framework of wooden poles well above the high tide mark. Other factors revealed by this remarkable photograph are the unexpected size of a village and its populous nature, the amazing architectural skills of its builders and the nature of the terrain on which the village is built—muddy, tidal swampland typical of the deltas which edge the Gulf of Papua rather than the higher forestland immediately behind the village.



# CENTREFOLD NO. 4

## The Cup Moths

by DAVID McALPINE



This cupmoth caterpillar, *Doratifera oxleyi*, shown with stinging spines retracted, sometimes causes major defoliation to inland NSW eucalypts. Photo by Densley Clyne.

Cup moths derive their common name from the appearance of the empty cocoon after the adult moth has left it. After the top has been forced from the hard oval to pear-shaped cocoon there remains attached to its support an urn- or cup-shaped structure. This is made from the caterpillar's silk which is woven and matted so tightly as to be almost woody in texture and quite durable. The cocoon is usually attached to a twig or the bark of the food plant but is in at least one species buried in the soil.

There are many species of cup moths distributed mainly in the subtropical and warm temperate parts of the world. The scientific name for the family to which they belong is Limacodidae, though at one time they were termed the Eucleidae. Australia probably has about 80 or more different species of the family, many of which appear not to exist in other parts of the world. We cannot give a precise figure for the number of Australian species because they are incompletely known, particularly in the north of the continent where the fauna is undoubtedly richest.

The winged adult moths do not attract much attention because of their quiet colourings, mostly fawn, cream or brown, or combinations of these, and because the size is only moderate. Most of the moths have a wing span within the range 20-45mm, with the female of each species averaging larger than the male. They fly at night and are without the long extensible tongue characteristic of many moths and butterflies. As one might, then, expect most of the feeding is done in the larval (caterpillar) stage.

The larvae of cup moths are usually of striking appearance though quite diverse. The shape is generally broad and flat and usually there are tubercles, spines or hairs which add to their grotesque appearance. Most moth

larvae have five pairs of soft stumpy legs (pro-legs) on the abdomen. Cup moth larvae are without these and the ventral surface of the abdomen forms a single continuous creeping pad. The colouring is predominantly green in some species, where it presumably renders them difficult for predators to see among the foliage. In other species it is quite bright, and seems to render the larva more conspicuous. Black with yellow, or patterns including mauve-red and yellow combined with brown or green are typical.

Despite its appearance the larva is frequently forced on one's attention through being touched rather than seen. In most of the familiar species the fine sharp hairs are capable of injecting an irritating poison comparable to that of nettles and stinging trees. As a result contact with them, which can easily happen if the foliage on which they are feeding is brushed, can be quite painful. The stinging hairs are usually located on the fleshy appendages which fringe the margins of the depressed body, and may also be present on dorsal tubercles. The most elaborate arrangement is found in those species where certain of the stinging hairs are kept withdrawn into cavities on the dorsal tubercles. When disturbed, the larva suddenly protrudes the bunches of hairs which resemble little sea anemones.

Many of the Australian cup moths feed, as larvae, on leaves of *Eucalyptus*. In inland parts of New South Wales the larvae of a common species *Doratifera oxleyi* can cause severe defoliation of these trees. The green slug-like larva of *Susica fasciata* eats leaves of waratah *Telopea* and woody pear *Xylomelum*. It can cause notable damage to cultivated plants of the former. The most unusual food-plant is recorded for an uncommon species *Hedraea quadridens* which eats fronds of bracken fern *Pteridium* near Brisbane.



Cupmoth caterpillar, *Doratifera vulnerans*, with stinging spines erected. The cup-like, lidded cocoon of the species is behind it, still attached to the twig. Photo by D. Clyne.











Cup moth *Doratifera quadriguttata*, showing the adult female, two larvae and a cocoon attached to the young foliage of an unspecified eucalypt. The colour of the larva is bright green, ornamented above with rose-coloured lozenge-shaped marks edged with black and connected by two rows of rose-coloured tubercles. The adult moth is fawn, shaded with brown and dotted with black; its wingspan is about 36mm. Drawing by K. Gregg, after A. W. Scott.



Continued from page 14

Meantime the Captain was rounding up public support for the return of the collection. At an official civic welcome to Hurley the Lord Mayor of Sydney, Alderman Gilpin, was among the first of many public figures to seek the release of the collection and its return to Sydney, "where it can receive proper care and attention at the hands of the Museum authorities", (ibid).

Judge Murray, Lieutenant-Governor of Papua, was at the time in Sydney and entered the lists on behalf of his administration in particular on behalf of the Acting-Administrator at Port Moresby, Mr Staniforth Smith. In the course of his numerous letters to the *Sun* and the *Sydney Morning Herald*, the Lieutenant-Governor threw much light on the problems of administering a country bedevilled with "collectors" and "souvenir hunters", at the same time revealing some interesting factual matter on the customs of some of the native tribes. "On the subject of skulls," he told a *Sun* reporter (7 February, 1923) "it is a mistake to suppose that these are necessarily the trophies of headhunters. The natives carry about the skulls of their dead friends and relatives with them instead of burying them. In all probability the relics that Captain Hurley obtained from the natives were the remains of their friends." Later the *Sydney Morning Herald* (10 February, 1923) published a lengthy account by the Judge of the exploratory work the administration officers had carried out in Papua. . . . "Papuan exploration during the last few years has been carried out without assistance from outside, and almost entirely by Government officers in the ordinary course of their duties . . . in very difficult country, often among a very hostile and savage population, with hardly the loss of a life. That this has been possible speaks well for the self control and discipline of the police, and for the tact and patience of their officers."

Before the controversy had worn itself out the people of New South Wales were certainly very conscious of the fascinating country to their north, and were ready for more information on the "Wilds of Papua".

In the middle of the following month (March) the Acting Administration of Papua released the collection except for some bullroarers and a carved shield which were returned to the village of Kaimari. And to Hurley, of course, goes the last word: "Such a specimen (the shield, ed.) would be far more valuable amongst the records and treasures of a museum than in the dinginess and filth of a dismal Dubu. However, this object was photographed, and this is the next best record to the object itself." *Sun*, 21 March, 1923.



Map of New Guinea and the Torres Straits showing the territory covered by Captain Hurley on his tour of exploration. From *Pearls and Savages* by F. Hurley.

Human skulls (below) featured prominently in the press controversy engendered by the collection of artifacts during the 1922 expedition. Allan McCulloch, representative of The Australian Museum who accompanied Frank Hurley on the trip, here examines some of the stuffed heads. In the foreground are some decorated skulls and some artificial skulls made from coconut shells all of which figure largely in the culture of Papua New Guinea.

The variety and detail of the arrowheads in this collection are of intense interest to anthropologists. Among those pictured here and later used in Museum exhibits are single-bladed bamboo spears, carved hardwood barbs and cassowary claw and bone-barbed heads; the latter probably made from bird bone.







External view of a Kaimari ravi (far left). These longhouses were the seats of government in Papuan villages. Government was entirely male; women and children were not permitted to enter a ravi. Inside a ravi (left) hand-carved ceremonial or gopi-boards are arranged on the floor, and clan figures at the top; all are meticulously arranged to show the status or class divisions of the society of that time and place.

This interior view of a ravi (below) gives detailed information of these buildings. Over 91 m long, nearly 22 m high at the entrance, the ravis reduce in height to little more than three metres. Inside are cubicles or lavara ranged along the sides. Great poles which support the roof also mark the boundaries of the lavara, and each cubicle is used exclusively by one clan member. The great skill of Papuan architects is underlined by the fact that such complex structures were built with axes of stone.





Skull rack in ravi (right) which may be trophies or a collection of mementos of deceased relatives. This photograph served well when The Australian Museum created its exhibit of a Papuan house over 50 years ago (far right). The 1924 Annual Report of The Australian Museum stated: 'An important addition to the ethnological exhibits is a reconstruction of a Papuan house or ravi of the delta region. This is based upon measurements and photographs taken by Captain Frank Hurley and Mr A. R. McCulloch while in New Guinea, and the objects displayed in it were largely obtained at the same time. The Trustees are greatly indebted to Captain Frank Hurley for his efforts on their behalf in helping to procure the specimens and information, which has made possible the reconstruction of this exhibit. The striking skull racks, in which the remains of victims of many generations are preserved, form an important part of the exhibit, and numerous dance masks, carved gopi-boards, pipes, bows and arrows . . . are scattered about just as they were observed in Delta villages.'



Among the dramatic studies Captain Hurley made of Papuan life was this photograph (centre) of a canoe on the Aramia River. These handcrafted vessels were especially adapted for navigation in the reeds of the marshes, and the design is still used today, often with the addition of an outboard motor. The Museum Annual Report of 1924 noted: 'Two dug-out canoes have been placed on exhibit in the New Guinea room, one coming from the Kikori River, the other from the Aramia Lakes. The latter is a fine example of native craftsmanship, being nearly forty-two feet long and elaborately decorated. For this striking addition to our collection we are further indebted to Captain Hurley.'



The seaplane *Seagull* aroused intense interest wherever it went in Papua. At Elevala (lower right) the entire community gathered to discuss it, and the bolder of the men rowed out for closer inspection. Within twenty-four hours of its arrival every village boy had a model of the seaplane carved with skillful accuracy from light wood.







Pottery-making at Hanuabada village near Port Moresby (top left). The technique of beating out with paddle and anvil is clearly shown in this study. When Frank Hurley took this photograph, artifacts produced like this were used by the Papuans for trade with other tribes around the Gulf of Papua.

Native homes in a village are the centres of family life. Hurley's photographs of these homes (lower left and below) show clearly the domestic modes of home-life. Fish traps, pig skulls and other paraphernalia of home-life adorn the entrances declaring the 'wealth' of each household unit.





# SECRETS OF INSECT SURVIVAL

Not many people have spoken with Densley Clyne's enthusiasm when it comes to insects and spiders and other members of the small world she photographs. Through the lens of her camera she has managed to show the rest of the world just how fascinating those creatures can be.



Beauty lies in the lens of the camera, this unusual study of a drone fly, *Eristalis* sp., in flight emphasises the delicate tracery of the veins in the wings. True flies have one pair of forewings, hindwings are missing but in their place are two tiny knobs, called halteres, which serve as balancing organs. Its larva is a maggot which lives in decaying matter—liquid manure is especially favoured. Photo by J. Frazier.

In her book *The Garden Jungle* Densley Clyne says, "When you come to think about it, every city backyard and suburban garden is a kind of nature reserve. No matter how tiny or how tidy, the wilderness is there, partitioned by fences that bear no relation to the territories of any but the human occupants. It's true there are no lions or wildebeeste, no pandas, sloths or capybaras, no boa constrictors or man-eating tigers lurking among the shrubs. But there are creatures fiercer than these, more bizarre and colourful . . ."

Together with that other remarkable and innovative master of camera nature studies Jim Frazier, Densley Clyne has embarked on making nature films dealing largely with the world of insects and spiders; Mantis Wildlife Films.

But it is in the field of still photography that both these dedicated Australians are best known at present. In the following pages is a selection of the weird and wonderful characters Densley and Jim have been able to capture for your close examination. These studies emphasise the important role of mimicry, of camouflage, of parasitism and of predation, in the story of insect survival.

Insects are probably the most successful animals on earth, indicated by the fact that they are the most numerous, some 850,000 species are known and some thousands more species exist but have not been named, yet more remain to be discovered. All species are numerous to the extent of millions. They are believed to be one of the oldest groups of animals and over the millions of years of their existence have evolved some very exclusive modes of survival. Insects belong to the arthropod phylum or group, which covers centipedes, millipedes, arachnids and crustaceans, and are the only class in this group which can fly. This may account in some part for its greater numbers; flight allows an animal to travel long distances in search of food or in search of a mate and flight often provides a 'get-away' from predators. Insects can and do produce vast numbers of eggs which guarantee perpetuation, and they live off an extraordinary variety of materials: waste products of other animals, dead and decayed plants or animals, dried remains of feathers and hide and putrid water are but a few insect food sources and habitats, most of which are ignored by other animals. Such small animals, as to be expected, have very little brain and therefore insect behaviour is largely instinctive. Some advertise their presence with brilliant colour signals, some conceal their identities by imitating other insects, others literally camouflage themselves out of sight, while still others have external features like false eyes which may confound their enemies.



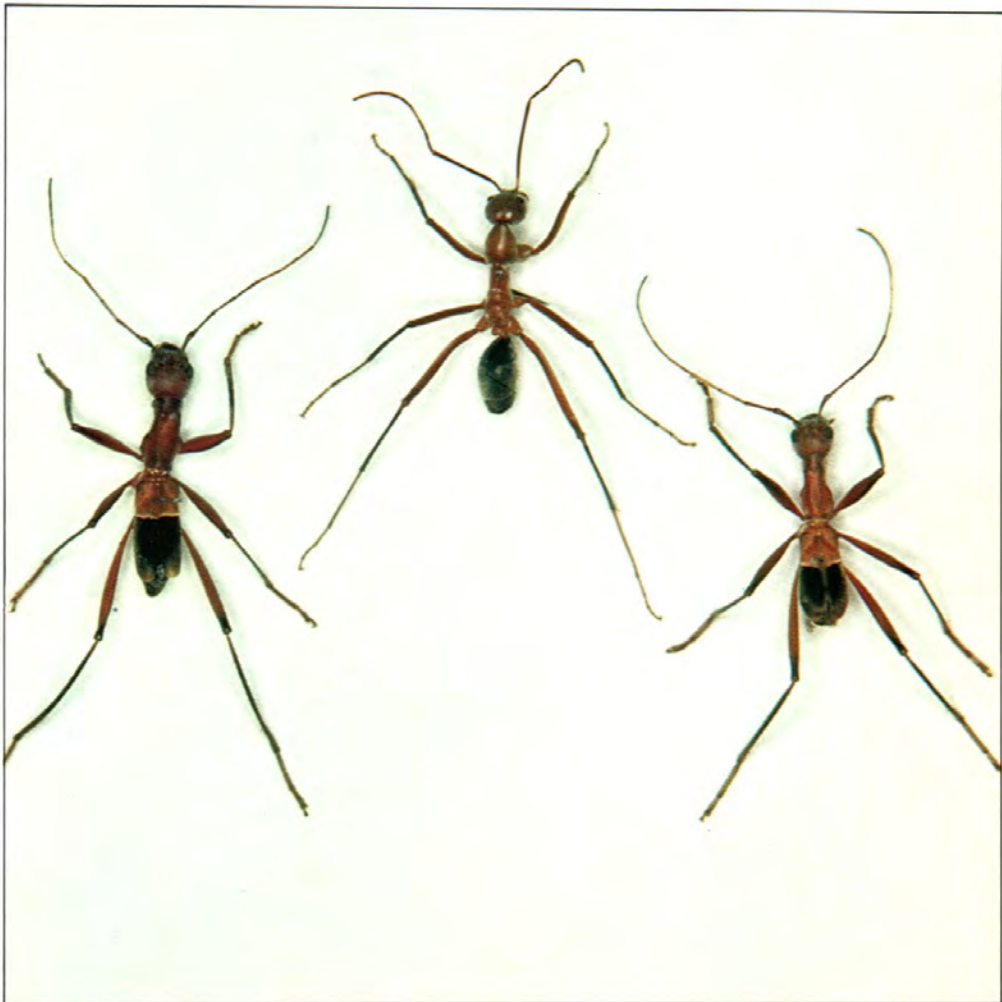


The very lovely Blue-triangle butterfly, *Graphium sarpedon choredon* (below), common throughout Australia, bears very little resemblance to its offspring in the pupal stage (top left) when its bright green camouflage makes it hard to distinguish from the leaf on which it depends. Despite the disguise some pupae do not escape death—here a fully fed larva of a parasitic tachinid fly is shown emerging from a Blue-triangle pupa (lower left). The fly larva will drop to the ground and pupate. Photo by Densey Clyne.





Which is the ant and which the beetle? Here is a classical example of mimicry. The creature in the centre of this trio (right) is the genuine article—a worker ant of *Leptomyrmex* sp. The other two are in fact beetles *Formicomimus mirabilis*, whose real identity was exposed by the latter's dubious habits shown in picture two (below)—worker ants do not mate. Photo by D. Clyne.







A decayed section of an angophora leaf provides sanctuary for this geometrid larva (above) which almost defies detection so well does it match its surroundings. Photo by D. Clyne.

It is hard to tell whether the animal (top left) is coming or going. False 'eyes' are found in many insects, both on larvae and adults. The larva *Neola semiaurata* pictured here could certainly bamboozle a normal human being, for what appear to be eyes are merely decorations on the rear of the animal. Photo by Densy Clyne.



Some insects such as this spectacular grasshopper *Petasida ephippigera* (lower left) permanently display their bright colours and appear not to use mimicry or camouflage of any kind. An interesting proposition is put forward by E. G. Matthews in his book *Insect Ecology* (University of Queensland Press, 1976, pp. 11-13) dealing with prey and predation, he states: 'The more distinctive the colour pattern of an unpleasant prey item the more easily it will be remembered as such by a vital predator.' Whether *Petasida ephippigera* is such a signaller is not certain. The beautiful well-known study by Densy Clyne reproduced here is of a female of the species. This grasshopper was first known from only a handful of specimens collected between 1837 and 1843 by the purser of *HMS Beagle*.



# WHITLEY BOOK AWARDS

In celebration of its centenary in 1979, the Royal Zoological Society of New South Wales inaugurated a series of annual awards for books on the natural history of Australian animals. These awards commemorate, and in part are funded by a bequest from, Gilbert Percy Whitley (1903-75), Councillor of the Society for forty-five years, editor of its publications for thirty years, and three times president.

Head of the Department of Ichthyology in The Australian Museum for forty years, Whitley was the author of five books and more than 500 papers—mostly on fishes but also on the history of zoology and zoologists in Australia. In recognition of his two interests, the Whitley Awards commend excellence in books on Australian natural history and on the history of natural history in Australia.

Specifically, the Whitley Medal is awarded annually to the book judged to have made the best contribution (in the year of the award or the previous year) to a better understanding of Australian animals (vertebrate or invertebrate, native or introduced) and their environmental or evolutionary relationships or to the history of zoological studies in Australia.

Certificates of Commendation to authors and publishers are awarded in various categories at the discretion of the Whitley Awards Committee.

The Committee for 1979 comprised five members of the RZS Council—Mr Ronald Strahan, Mrs Penni Brydon, Dr Leighton Llewellyn, Mr Jack Prince, and Dr Gordon Grigg.

Harold G. Cogger, MSc, PhD, and Harold J. Frith, PhD, each received Whitley Medals at the first annual presentation of these awards in December of last year.

Dr Cogger, Deputy Director of The Australian Museum, Sydney, and previously Curator of Reptiles, is author of the award-winning revised edition of *Reptiles and Amphibians of Australia* (Reed). Dr Frith, Chief of the Division of Wildlife Research, CSIRO, is the author of *Wildlife Conservation* (Angus and Robertson), a revised edition of which was successfully submitted for a Whitley Award.

Corresponding certificates were presented to the publishers of each work: A. H. and A. W. Reed and Angus & Robertson respectively.

The presentation ceremony was held at Taronga Zoo Education Centre, Mosman, Sydney.

The report of the Whitley Awards Committee, given by Mr Ronald Strahan, research fellow of The Australian Museum and vice-president of the Royal Zoological Society, noted that it is the policy of the society to award only one Whitley Medal annually, but that "on this occasion the Committee found it impossible to make a distinction between these two very different but equally excellent books. We do not intend this to constitute a precedent", the report firmly stated, and continued:

"... the 32 entries, which include books

from most of the major Australian publishers, constitute a representative sample. We hope that next year will see more entries from the smaller publishing houses, for a book does not need to be a lavish production in order to qualify for an award.

"Indeed, the Committee deplores the extent to which publishers continue to produce beautiful books with excellent illustrations—of much the same range of familiar birds and mammals—but with texts that are uninformative, platitudinous, or downright erroneous. Some very successful author-photographers make astonishing errors of fact and interpretation—errors which could easily be corrected if publishers would submit manuscripts to professional zoologists for factual editing.

"In general, it can be said that books on birds (of which there are far too many covering much the same ground) are least prone to error; that books on mammals usually contain many ancient errors and betray a lack of knowledge of discoveries over the past twenty years; and that books on reptiles, frogs, fishes, and invertebrates are seldom very good. Of course the response to this should be for professional zoologists to write in their areas of expertise but, since unsolicited manuscripts are seldom welcome, the initiative lies with the publishers. We note that William Collins has responded to this challenge with its Australian Naturalist and Handbook series but there is plenty of room for others.

"We have a plethora of very similar books on Australian animals. Surely there is a market for equally attractive works of smaller scope and greater depth—on the smaller wallabies, for example, or possums, small carnivorous marsupials, goannas, geckoes, snails or starfishes—combining excellent illustrations with accounts of the lives of these animals.

"The Whitley Awards Committee was instructed to determine the excellence of a book primarily from the text and the extent to which this presented significantly new information; existing information in a new synthesis; or existing information in a more understandable form than in earlier books.

"The Committee is empowered, at its discretion, to award certificates of commendation within special categories such as the best children's book, best illustrated book, best





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textbook, and any others which appear to be appropriate.

"We looked at a number of books allegedly designed for children and were particularly disappointed by the text of most of them. Characteristically, the sentences were broken into short lines which often failed to match the phrases and there was a bewildering inconsistency in vocabulary, ranging in some books from the level of 'Tom runs: see Tom run.' to long polysyllables. A book on cicadas had gone to the trouble of substituting 'food-tube' for 'proboscis' but used 'ovipositor' when consistency suggests 'egg-tube'.

"Illustrations, in general, were careless—even inept. One essay in Art (with a capital A) consisted of broad washes of colour with barely discernible smudges indicative of the animals referred to in the pretentious text. However, an essay on cicadas (there were two entries on this subject) had excellent photographic illustrations. Some books which were little more than collections of pictures linked loosely by text, appeared to serve no useful purpose but there were several in which text and illustrations were well integrated.

"Consonant with the mandate for the Whitley Medal, the Committee decided this year to give an award for the best book on the history of studies on Australian animals. It was, to be frank, the only book in this area and it is a compilation rather than an original work. *Australia's Animals: Who Discovered Them?* by Dr Peter Stanbury (Macleay Museum).

"One book was singled out for a certificate of commendation for the most original book on the natural history of Australian animals—*The Garden Jungle* (Collins) by Mrs Densley Clyne.

"Judged to be the best textbook on the natural history of Australian animals published in the past two years—*A Natural Legacy: Ecology in Australia* (Pergamon) is edited by Harry Recher, Daniel Lunney, and Irina Dunn, with chapters by these three and by Donald Adamson, Stephen Clerk, Marilyn Fox, Allin Hodson, Peter Jarman, Peter Myerscough, Peter Sale, Jeremy Smith, Josephine Springett, Brian Springett, and Ronald Strahan", the report concluded. (The Chairman excused himself from the last citation, which was presented by the President.)

(For details and evaluation of the award winning books see In Review.)



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# IN REVIEW

## Reptiles & Amphibians of Australia

H.G. COGGER



Seven of the thirty-two books entered for the 1979 Whitley Awards were rewarded—two with the silver Whitley Medals and five with certificates of commendation. All review notes are taken from the Whitley Awards Committee's report.

### Silver Medal Winners

**Wildlife Conservation** by H. J. Frith, revised edition, Angus & Robertson, Sydney 1979, 416 pages, illustrated, \$17.95.

In making this award the Committee said the second edition of Frith's *Wildlife Conservation* brings up to date his valuable contribution to our understanding of the changes in the Australian terrestrial fauna since European settlement. Earlier books on the subject have documented the effects of mindless killing, uncontrolled exploitation, land clearance, and the introduction of exotic animals, but more often in the form of protest than as a basis for positive action. In general, it can be said that prior to Frith, authors concerned with the fate of Australian animals were emotional preservationists rather than rational conservationists. Frith makes it clear that, since few species—here or elsewhere—have become extinct as the direct result of human predation, few will be saved by simple prohibition—however strict—on their being trapped or shot. Animals exist in environmental contexts and we can do little to reverse the decline of a species except by enlightened management of the ecosystem of which it is a part.

This is a massive task, requiring more knowledge of Australian biology than is to hand at present. Frith has brought together the available information in a systematic manner, defined the problems, and indicated what we



Australia's Animals  
who discovered them?

The  
Macleay  
Museum

can do now and how we should prepare for the future. His book is a cool, connected argument and so crammed with facts that it is a work of reference for professionals as well as laymen. The text is attractively printed and well divided by sub-headings. There are abundant references and an excellent index. The line illustrations are well executed but the quality of the photographic illustration is not impressive—many could be deleted without detriment.

**Reptiles and Amphibians of Australia** by H. G. Cogger, revised edition, A. H. & A. W. Reed, Sydney 1979, 608 pages, illustrated, \$29.95.

The first thing to be done in tackling any biological problem is to know what species one is dealing with. Australian birds and mammals were fairly well identified before the end of the nineteenth century but reptiles were given much less attention. Despite the work of Gerard Krefft in the nineteenth century and Eric Worrell in the twentieth, Australian biologists have long been in need of an authoritative guide to the identification of turtles, tortoises, crocodiles, lizards and snakes. We have been even more in need of such a guide to our frogs.

Harold Cogger has filled both gaps with his *Reptiles and Amphibians of Australia* (revised edition, 1979, with accounts of fifty more species than in the first edition). Every known species of Australian reptile and frog is described, illustrated, and named. Its distribution is mapped and its habits briefly noted. The book is necessarily a compilation of the work of many other herpetologists but these have been digested by one man who has had the knowledge, resources, time, energy, and dog-

ged determination to revise and unify their data.

Despite its size, the book has a strictly limited aim: the identification of species by means of descriptions, illustrations, and keys. This it does superbly. It is not too much to say that this book is a landmark—perhaps a benchmark—in Australian zoological literature with a necessary place on the bookshelves of every reference library, every biological laboratory, and every broadly based naturalist in Australia. Overseas zoologists will use it as the prime reference to the Australian herpetofauna.

### Certificates of Commendation

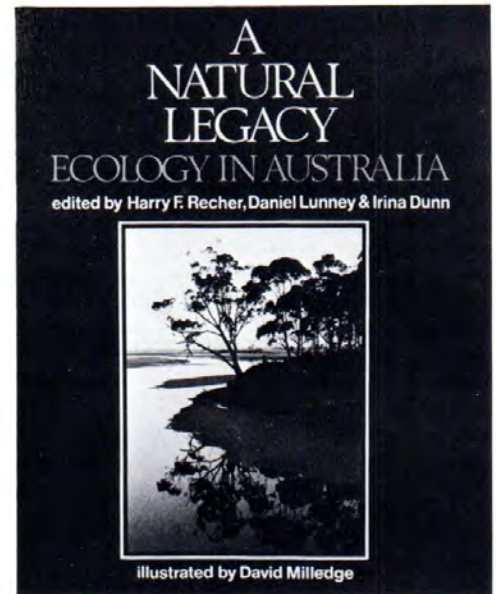
**Australia's Animals—Who Discovered Them?** by Peter Stanbury, Macleay Museum, University of Sydney, 122 pages, illustrated, \$5.00.

Awarded a certificate for the best book on the history of studies on Australian animals. The quotations and illustrations selected by Peter Stanbury as representative of the first phase of Australian natural history provide an excellent introduction to the subject and should stimulate readers to search out original works.

**Rare and Vanishing Australian Birds** by Peter Slater, Rigby Ltd, Sydney 1979, 96 pages, illustrated by author, \$15.95.

This is a book of high quality, sensitively written and with accurate, attractive and relevant paintings. The Committee awarded Peter Slater a certificate of commendation for the best illustrated book.





*The Gould League Book of Australian Birds* by Don Goodsir, Gould League and Golden Press, Australia 1979, 48 pages, illustrated by Tony Oliver, \$7.99.

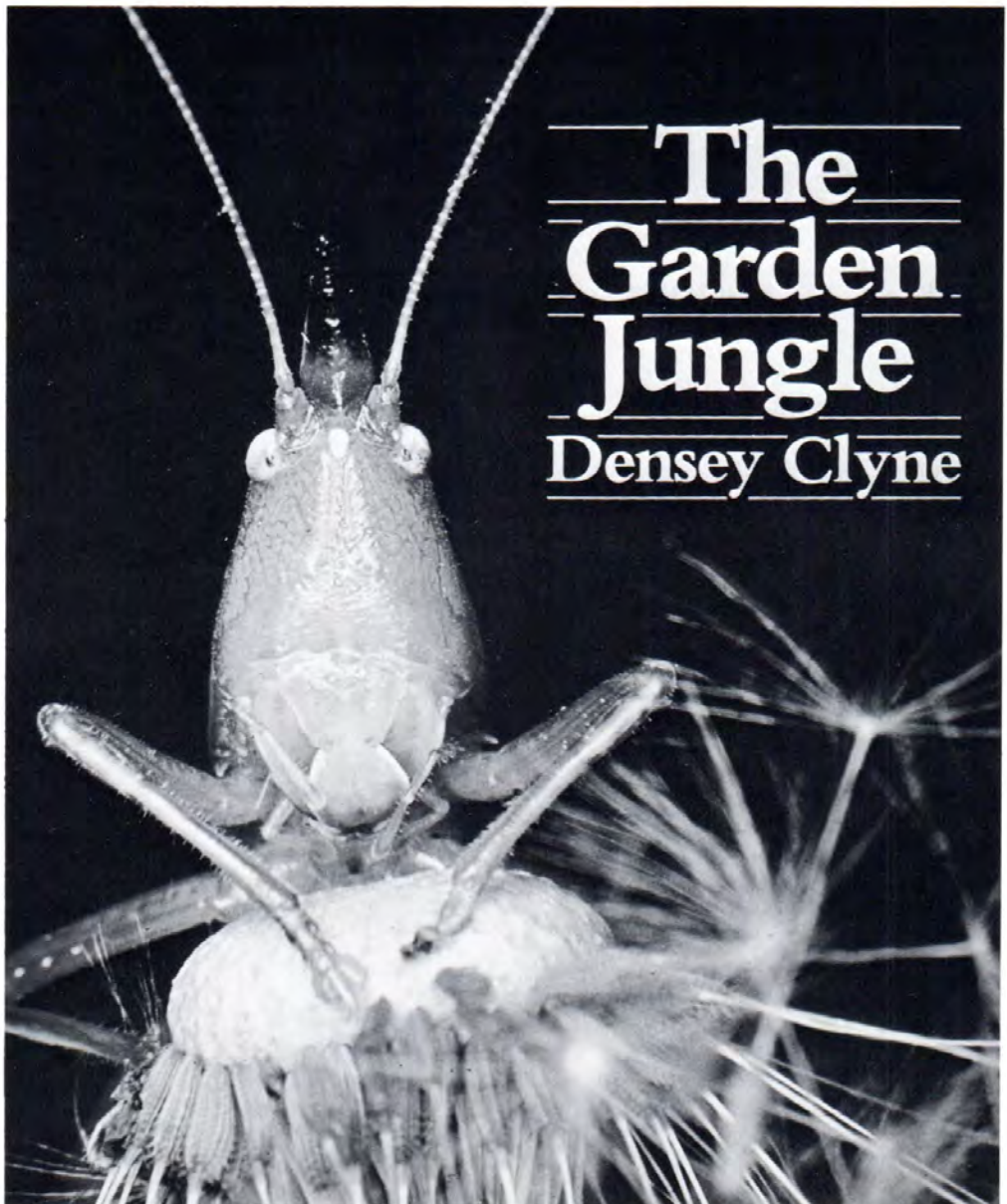
This was an outstanding entry well worthy of best children's book award; it fits into the upper age level of what we regard as children and, for them, it provides a clear, simple, and interesting text. The range of birds is well chosen and the illustrations are brilliant and vital.

*A Natural Legacy: Ecology in Australia* edited by Harry Recher, Daniel Lunney and Irina Dunn, Pergamon Press, Australia, 276 pages, illustrated, \$7.95.

Judged to be the best textbook of the year the Committee points out with such a multiplicity of authors (16 ed.) one might expect a disjointed symposium but the editors have fashioned the book into a well-integrated exposition of the principles of ecology with particular reference to the Australian situation. It is suitable for upper high schools or for university courses for students not majoring in botany or zoology, but it can be read with ease by the ordinary citizen who is confused by the trendy catchcries of "ecology", "ecosystem", "environment", and "conservation".

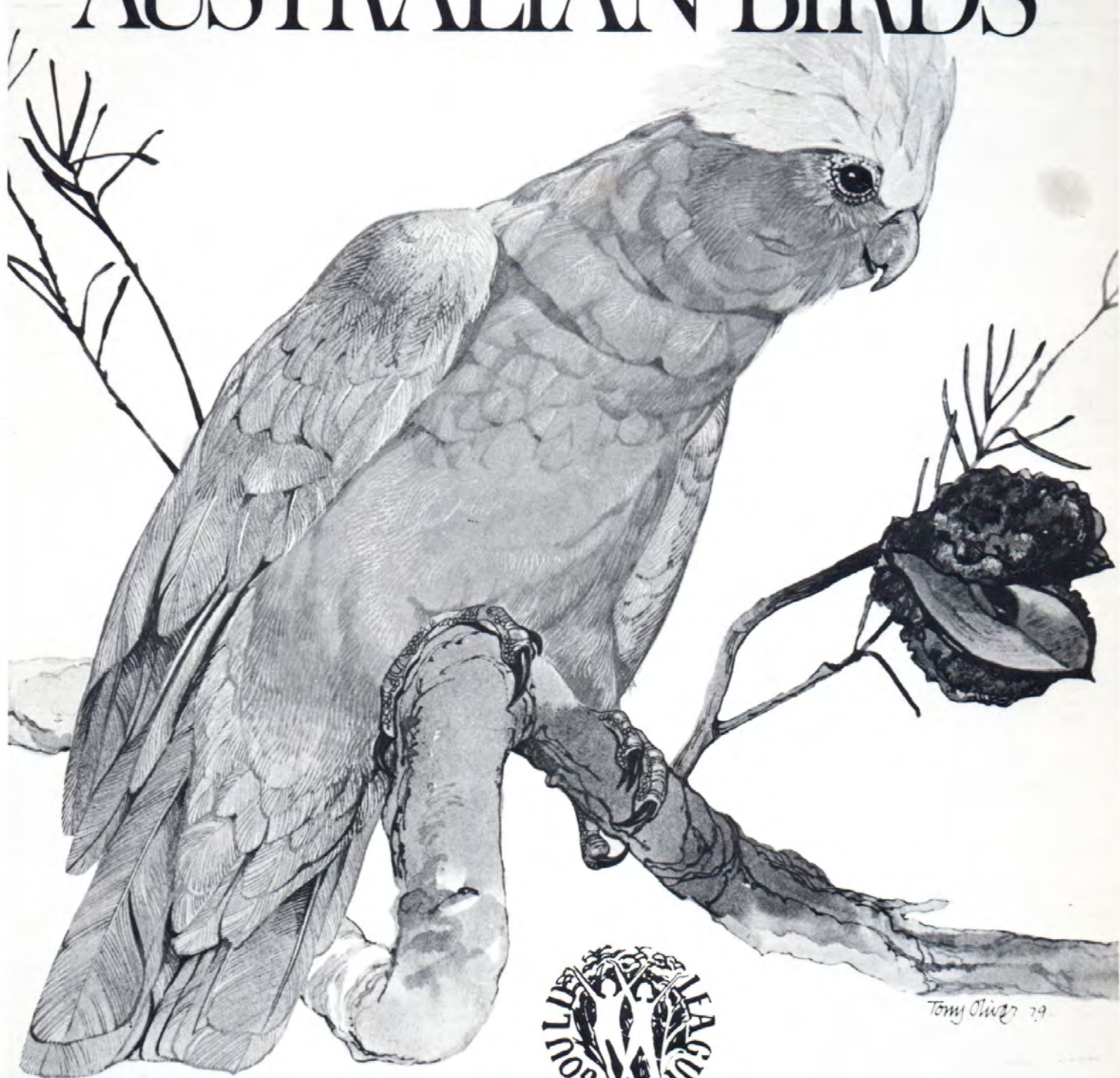
*The Garden Jungle* by Densley Clyne, William Collins, Sydney 1979, 182 pages, illustrated, \$19.95.

The Garden Jungle is a very personal account of observations on the behaviour of small invertebrates in the garden of the author's home in Turrumurra, some of them species which have not yet been formally named. It is characteristic of the work that can be done by an observant amateur who is prepared to rely more on observation than on what has been written in books. It is illustrated by beautiful, crisp colour photographs and somewhat less professional black-and-white drawings. The book was awarded a certificate of commendation for the most original book on the natural history of Australian animals.





# THE GOULD LEAGUE BOOK OF AUSTRALIAN BIRDS



DON GOODSIR  
TONY OLIVER



*Grzimek's Animal Life Encyclopaedia*.  
Editor-in-Chief, **Bernhard Grzimek, Van Nostrand Reinhold, Company, Melbourne, 13 volumes, \$500 or \$40 per volume.**

Although most people of British extraction profess a love of animals, they have been poorly served with basic reference books on zoology. The *Cambridge Natural History* is sadly out of date and Parker and Haswell's *Textbook of Zoology*, despite its multitudinous revisions, has had its day. Nothing has ever been written in English comparable with Délagé and Herouard's old *Traité de Zoologie*, let alone Grassé's monumental current work of the same name nor have we attempted to match Bronn's *Das Tierreich*. Although English is the language most used in scientific communication, it seems that we lack either the authors or the publishers to provide us with a comprehensive reference book. This is not to say that there are no good reference books or texts, merely that no English authors have provided us with a set of volumes dealing with the entire range of animal life.

Even at the popular level, we are very poorly served, with nothing more recent than the three-volume *Harmsworth Natural History* of 1910. There are many excellent books on birds and mammals but other vertebrate animals get short shrift and the general reader might well come to the conclusion that there is nothing worth knowing about the invertebrate animals which make up by far the greater part of the animal kingdom.

The situation was relieved in 1968 when Hamlyn published a translation of Bertin's excellent *La Vie des Animaux* as a single-volume *Larousse Encyclopaedia of Animal Life* but this was eclipsed in 1972-74 when Van Nostrand Reinhold published Grzimek's thirteen-volume *Animal Life Encyclopedia*. The fact that, since its original publication in German in 1970, it had sold well in Italian, French, and Dutch translation probably encouraged the U.S. publisher but, whatever their motives, they are to be thanked for giving us the best general zoological text yet to have appeared in English.

A well-thumbed set has been on my shelves for more than four years but The Australian Museum has recently obtained it for its library. It is reassuring to discover that it is still in print.

The editor, Bernhard Grzimek, was, until recently, director of the zoological gardens in Frankfurt-on-Main which, under his leadership, became one of the most outstanding zoos of the world, whether the excellence be measured by display, husbandry, research, or conservation. As one of the tiny minority of zoo directors who recognised a responsibility of zoological gardens to further the science of zoology, he was an active publicist and educator, and the concept of a comprehensive, up-to-date, readable reference book on animals arose directly from his position as an intermediary between animals and people. (A. S. Le Souef, a former director of Taronga Zoo, Sydney, responded similarly, although on a much smaller scale, with *The Wild Animals of Australasia* (1926) which for many years was the most authoritative text on the mammals of Australia and New Guinea.)

To compile the text of his encyclopaedia, Grzimek recruited over two hundred zoologists of international reputation, about forty of whom acted as joint editors of particular volumes. Such an approach could have led to fragmentation but Grzimek exercised such strong editorial command that a consistent style is maintained throughout the ten thousand pages.

The overall treatment is orthodox. After eighty pages of general introduction in the first volume, one comes to the Protozoa and the last volume deals with mammals. Animal groups are not, however, allotted space proportional to their zoological status: the invertebrates are disposed of in the first three volumes; two are devoted to fishes and amphibians; one to reptiles, three to birds; and four to mammals. In this sense it is unbalanced but we may be thankful that birds and mammals occupy not much more than half of the contents.

The text achieves a remarkable balance between scientific accuracy and intelligibility to the general reader. Each group is formally defined, described, and classified but usually with such fluency and gentle introduction to unfamiliar concepts that paragraphs flow on as a continuous narrative. Much of the basic information can be found in university textbooks but I know of few that convey information so pleasantly and none which supplement accounts of the structure of an animal with such abundant information on its life—where it is found, how it moves, what it eats, the dangers it faces, and its strategies for survival. Although I regard myself as a rather widely experienced zoologist, I have seldom opened any of the volumes and read a few pages without gaining new insight. One is reminded of the writings of J. Z. Young or A. S. Romer at their best.

The volumes are copiously illustrated. The wide margins of the text pages are utilised for line drawings and maps and about one page in six is occupied by coloured illustrations—photographs or paintings of whole animals or diagrams of their structure. Most are of high quality but the work of a number of artists demonstrates that some are better than others.

It is not possible to review an encyclopaedia as a whole but one always checks on the treatment of one's own pet topics and, in respect of two of mine, Grzimek scores well. Apart from several infelicities of translation, the section on jawless fishes (lampreys and hags) is very good, taking account of researches published as recent as 1968 and excluding the many nineteenth-century misapprehensions that are repeated in most current textbooks.

The 136 pages devoted to monotremes and marsupials are also reasonably up-to-date and enlivened by Grzimek's personal observations. It is very refreshing to read a non-chauvinist account of marsupials which gives reasonable space to the American fauna. There are minor errors of translation and of fact (including misidentification of the Royal Society of South Australia and the British Association for the Advancement of Science) and one very unfortunate howler. It is stated

that the common opossum of the Americas, *Didelphis marsupialis*, is an introduced pest of New Zealand whereas the real culprit is the brushtail possum, *Trichosurus vulpecula*, from Australia.

In the first printing of a work of this magnitude there are bound to be many minor errors but these hardly detract from the value of this great work. Although, in terms of value per page, the volumes are remarkably cheap, the overall price of the set will keep it off many home bookshelves. It should, however, be in every high school and public library.—*R. Strahan, The Australian Museum.*

*Journal of the Mineralogical Society of N.S.W.*  
Editor **Richard Depledge, The Mineralogical Society of N.S.W., Sydney, 64 pp, illustrated, Vol. 1 June 1979. \$3.00**

The first issue of this much-needed journal for laymen and professionals is welcome indeed, not only as a guide to members of the society but as an informative publication for the uninitiated. The sixty-three pages are liberally sprinkled with illustrations—black and white—and the variety of subjects covered within the journal's impressive covers is sufficient to satisfy the most discriminating reader: there are several feature articles dealing with matters of history, ultra-violet rays and mineral fluorescence, private collections, and essays on present day collecting. Department articles cover society reports, mineralogical and museum notes, and reports of recent papers from overseas and Australia. In short, everything to interest the mineral-world population and much to inspire the novice, the amateur and professional mineralogist and collector. Planned as an annual publication at the present stage the editorial workers and publishers are hoping to eventually publish the journal quarterly. Copies may be obtained from the Society, P.O. Box R35, Royal Exchange, Sydney, 2000, and from The Australian Museum Bookshop.—*Barbara Purse, Assistant Editor, The Australian Museum.*



Grzimek's  
**ANIMAL LIFE  
ENCYCLOPEDIA**





