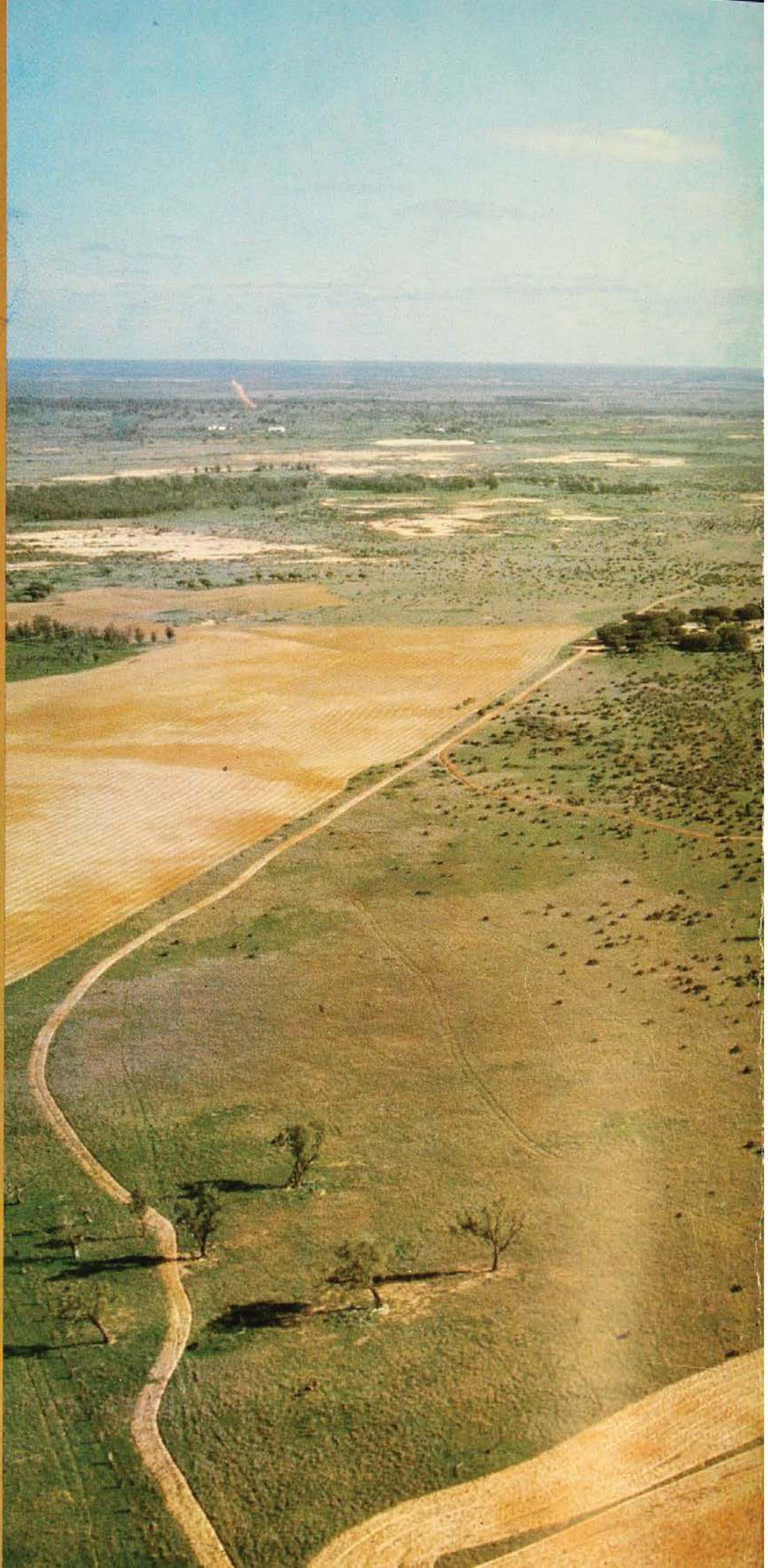
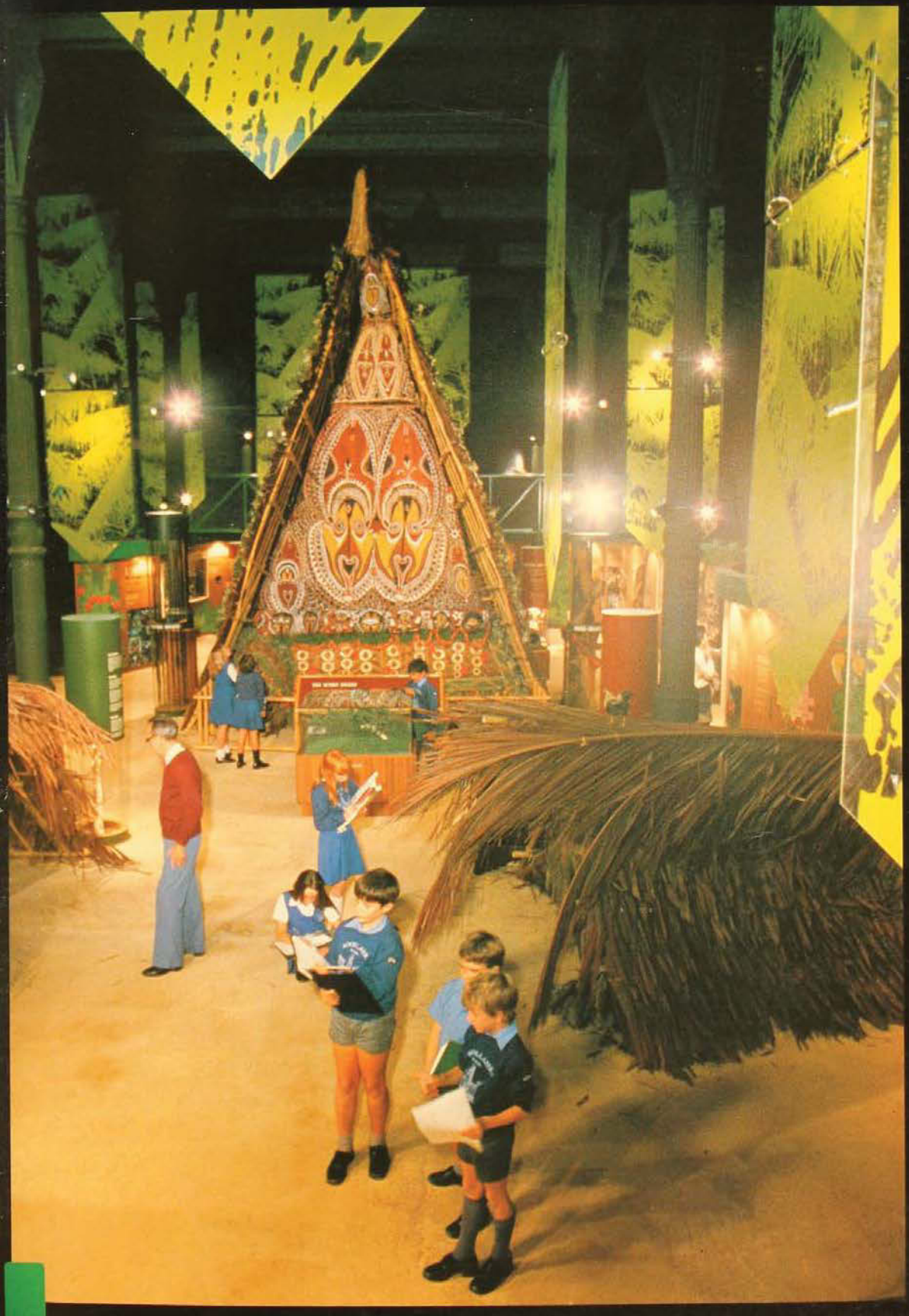


the australian museum sydney



Annual Report 81/82

The Australian Museum Trust

Annual Report for the Year ended 30 June, 1982

The Trust and staff of the Australian Museum have pleasure in thanking the following organisations and individuals who provided financial assistance by way of research grants or donations during the year.

Benefactors

Bank of New South Wales
Bernard van Leer Foundation
Mr William Bowmore, Newcastle, NSW
Mr Peter Bridge, Victoria Park, WA
The Broken Hill Proprietary Company Ltd.
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The Australian Museum Society

Donors

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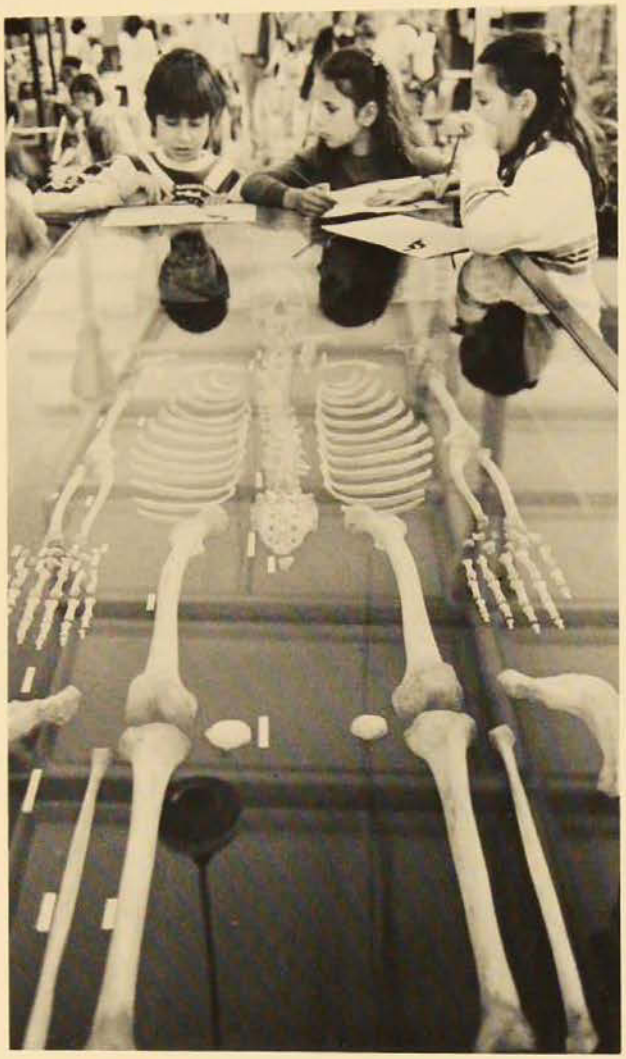
NSW Department of Youth and Community Services
NSW Forestry Commission
NSW State Rail Authority
Queensland National Parks and Wildlife Service
Rudy Komon Art Gallery and Mr Arthur Boyd
State Pollution Control Commission

Cover:
The centrepiece of the Abelam Gallery, which was opened to the public on May 1st, 1982, is a *haus tambaran* or spirit house.
Photo: K. Lowe.

Contents

The aims of the Australian Museum are . . .



Children are forever fascinated by skeletons and particularly by this human skeleton. These children are completing a project sheet on skeletons.
Photo: J. Fields

- to increase and disseminate knowledge of man's natural environment and cultural heritage;
- to increase man's understanding and appreciation of these things.

In achieving these aims the Museum gives special emphasis to the Australian region.

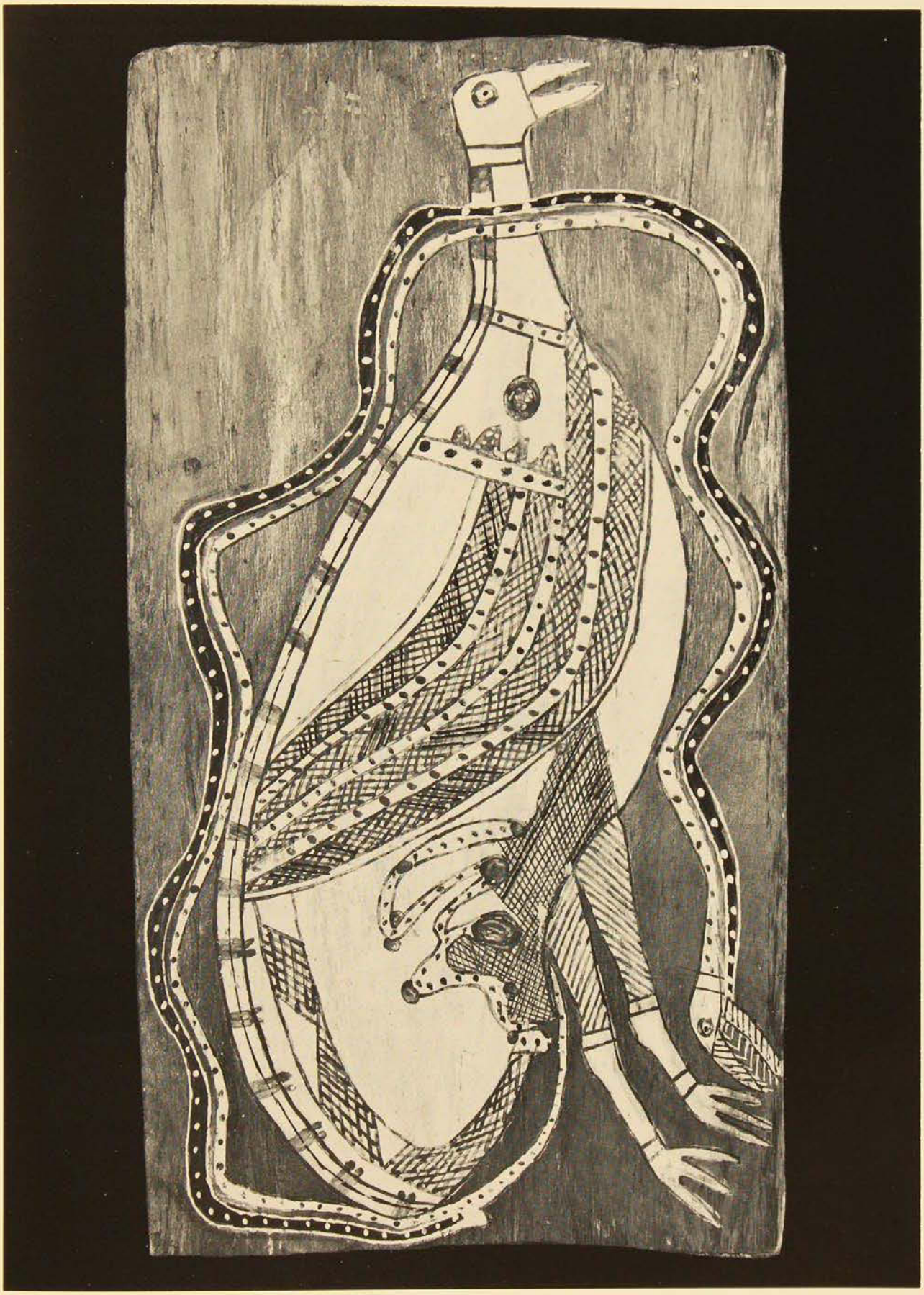
Rich and extensive collections of animals, rocks, minerals and anthropological artefacts are held by the Museum. These constitute reference material to identify, describe and classify the features of our natural environment and, through further research to enhance understanding of the world around us . . . this is the Museum's scientific function.

The Museum creates exhibits and conducts educational programmes . . . this is the Museum's interpretive function.

As a centre of expertise the Museum provides information to the public, industry and government . . . this is the Museum's service function.

The Museum gives emphasis to good public relations and engages in promotional activities, including publishing, to provide information about its activities . . . this, in part, is the Museum's public responsibility.

Jim Hood of the Preparation Department adds finishing touches to an exhibit being prepared for display in the Museum Train.
Photo: J. Fields



Aboriginal bark painting of a bustard and poisonous snake by the Gunwinggu artist, Yirawala (1894-1976). The painting was purchased by the Anthropology Department for its collection in 1966. The bustard and snake are creatures of importance in the Kunapipi myth and ceremonial cycle of the people of Western Arnhem Land.
Photo: H. Hughes.

The Australian Museum Trust

President:

J. T. Baker, OBE, MSc, PhD, FRACI

Deputy President:

K. H. Cousins, CMG

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K. Klugman, BA, MA
J. A. Landels
P. Pigott, AM
Professor M. G. Pitman, OBE, MA, PhD, ScD, FAA, FRSA (until 21 April, 1982)
C. M. Serventy, OAM, BA
I. Wojak, BA

The Australian Museum Trust comprises ten persons. Eight are appointed by the Governor of NSW on the recommendation of the Minister responsible for Cultural Activities. The remaining two members are elected by the eight appointed Trustees. Each Trustee is appointed for a term of four years, and five Trustees retire every two years. The President and Deputy President are elected by the Trust each year.

Besides yams and taro, sago is one of the most important elements of the Abelam diet. Here a woman prepares sago flour to feed her family. This display can be seen in the Museum's new exhibition, 'The Abelam, A People of Papua New Guinea'.
Photo: J. Fields.

National Photographic Index of Australian Wildlife

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G. McKenzie

Lizard Island Research Station

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Until 30 March, 1982

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Associate Professor P. Sale, PhD
H. S. Williams
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* Member of Executive

From 1 April, 1982

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D. J. G. Griffin, MSc, PhD
B. Goldman, MSc, PhD (Director, Lizard Island Research Station)
Professor H. Heatwole, PhD
A. W. Winterton

The Committee is appointed by the Australian Museum Trust

The Australian Museum Society Council

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R. A. Pearson, BA, LLB (from 7.4.82)

Vice-President:

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C. Williams (from 7.4.82)

Executive Secretary:

S. Bridie

Secretary:

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E. Ireland (to 7.4.82)
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D. M. Tuckson (from 7.4.82)
R. Ross-Wilson
A. B. Wilson, ACA, ACIS (Honorary Treasurer)
C. Williams (to 7.4.82)

President's Report

The Honourable, The Premier of New South Wales,
Mr Neville Wran, QC, MP,
Parliament House,
Sydney

Dear Premier,

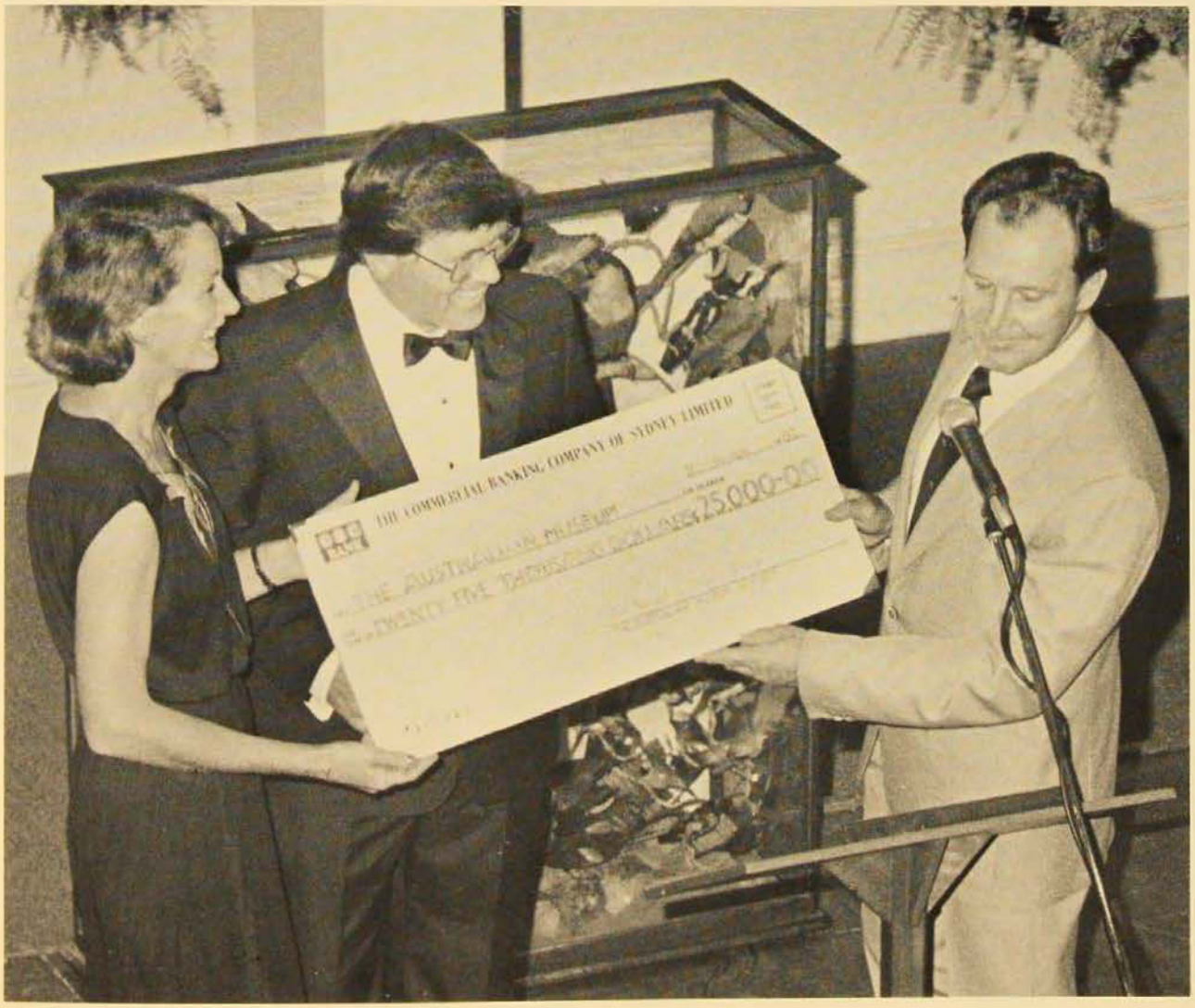
I have pleasure in presenting the Annual Report of the Australian Museum Trust for the year ended 30 June, 1982.

The Trust met 10 times during the year. The October, 1981, meeting was held on Lord Howe Island which allowed the Trust to inspect the local museum and gain a first-hand awareness of research projects carried out by museum staff on the Island and its adjacent waters.

All other meetings were held within the Australian Museum.

During the year, two Trustees retired from membership. Their commitment and dedication to the Trust and the Museum was most effective and greatly appreciated. One was the immediate Past President, Professor M. G. Pitman, OBE, FAA, who also led the Programme Review sub-committee of the Trust. The other was Mr R. J. Hunt who had led the Finance and Staffing Committee of the Trust.

The Trust was pleased to congratulate the following members on recognition received: Mr Keith Cousins, Deputy President, on the Award of the CMG for services to the community; Dr Joe Baker, President, on the award



At the opening of the Bird Gallery the President of the Australian Museum Trust, Dr. J. T. Baker, received a somewhat large cheque for $25,000 from the President, Dr. Jim Hazel, and the Executive Secretary, Ms. Susan Bridie, of the Australian Museum Society. The cheque represented the Society's sponsorship of the new gallery.
Photo: J. Fields

of the OBE, for services to science; Professor Michael Pitman, immediate Past President, on his election as a Fellow of the Australian Academy of Science; Dr Des Griffin, Director, on his election as President of the Museums Association of Australia.

On 21 April, 1981, five Trustees retired on the completion of defined terms of appointment. Mr Keith Cousins, Mrs Kris Klugman and Mrs Carol Serventy were subsequently reappointed to the Trust for a further four year term. Two positions remained vacant as of 30 June, 1982.

The year 1981-1982 was one in which significant analyses were made of museum functions and responsibilities. These were conducted within the framework of the advanced planning of the Trust, and in total accord with the excellent review procedures suggested and implemented by the Director, Dr Des Griffin. Close involvement with senior staff of the Museum was effected by a series of joint Trust/staff working committees: Building, Community Relations, Staffing and Finance, Programme Review and Bi-centenary planning. This system ensured that the Trust was more aware of Museum functions, developments and planning, and resulted in an excellent relationship between Trust and staff.

In addition to this involvement the Trust supported the Director's continuing expert external review of Museum programmes and was pleased to participate in the major review of education programmes. Also, in keeping with the Trust's declared policy to take the Museum to the people of New South Wales and make it more attractive to all visitors, the Trust supported two major surveys — one on 'Attitudes and Perceptions of the Museum' and the other on visitation patterns. Such internal and external evaluations are essential in maintaining the relevance of Museum programmes and general functions, and are important indicators to planning future developments.

Being Australia's initial and foremost museum on natural history, it is your Trust's objective for the Museum to be associated with significant developments to commemorate the Bi-centenary of white settlement in Australia in 1988. Certain redevelopment programmes have already been placed before you in this regard. Space presently available in existing buildings on the College Street site for most activities conducted by the Museum is now critically short. My Trust earnestly hopes that your Government will agree to provide funds for the staged redevelopment. In considering other aspects of the Museum's involvement in the Bi-centenary celebrations the Trust has established a special Bi-centenary committee.

During this past year the Australian Museum was particularly active in projecting its image to the public by the opening of four major exhibitions. These were the Mammal Gallery, the Bird Gallery, Aboriginal Australia (a temporary exhibition developed by the Australian Gallery of Directors Council) and the Abelam Gallery. The Trust is very happy to have your continued support on such occasions and was delighted that you were able to open the Abelam Gallery.

Each of these exhibitions was launched in opening ceremonies involving close collaboration between the Museum Trust and The Australian Museum Society (TAMS). TAMS continues to be a success story in bringing more and more people to close affiliation with the Australian Museum. Their development and involvement took a major step forward in 1981-1982 in their raising sufficient funds to be the major sponsor of the new Bird Gallery. The Trust is indeed proud of their achievements. The opening of the Bird Gallery was one of the most spectacular in recent museum history and was highlighted by a review of the past century of the Museum's development by "Charles Darwin".

The main publication of the Australian Museum, "Australian Natural History", has developed into a high standard magazine on our natural history and is an excellent extension of the Museum's research, education and exhibition programmes.

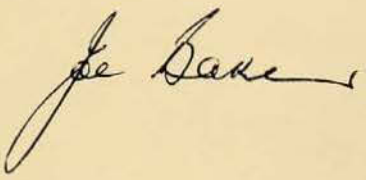
Research workers at the Australian Museum attracted significant research funds from Australia's major research granting agencies, in terrestrial and marine science and in anthropology. In marine research, the efforts of your Trust and of the Museum in development and use of Lizard Island Research Station continue to be greatly assisted by the grant from the Japan Foundation, which was initiated through the interests of the Suntory Company.

Such grants, beyond those available through normal State avenues, are essential to maintain the active research programmes of the Museum, and the Trust is committed to continuing enhanced effort to attract sponsors of the Museum's research, exhibitions and education programmes. The subsidy system which you have introduced is a most significant advantage to the Trust in its approaches to potential donors.

The year 1981-1982 saw clear evidence of tightening budget constraints in all areas of society. The Museum Trust is conscious of the implications of such moves to the operation of the Museum. However, the advance planning that has been a feature of this Museum and of its Trust, and the continuing assessment of all aspects of Museum functions, will prepare us for any difficult times which may arise.

I can assure you that your Trust is committed to the maintenance of the Australian Museum as a major natural history museum of world standards, and to making it a central feature in the developing life of all Australians and of our visitors.

It is an honour to represent the Trust in presenting this report.



J. T. Baker,
President

Opposite page:
The Australian Museum Society combined its tenth anniversary celebration with the opening of the 'Birds in Australia' gallery on 30 April. The highlight of the evening was when 'Charles Darwin' declared the gallery open and balloons cascaded into the audience.
Photo: J. Fields.

Director's Report

John Fairfax Limited has sponsored the Museum in its school loan travel case scheme and have made 30 new cases possible. Each case, such as this one on the Abelam people of Papua New Guinea, is a self-contained teaching unit which can be loaned out to schools.
Photo: J. Fields.

This year the Australian Museum opened three major new exhibitions. The Education programmes were revised. A review of the process for planning and constructing new exhibitions was commenced. The Museum again raised $200,000 from corporate and private donations.

Major scientific programmes were continued.

Perhaps of most importance for the future was the careful examination by staff and Trustees of the public's attitudes to and perceptions of the Museum. The importance of this review lies in the fact that it will provide basic information for marketing the Museum. If the Museum is to carry out its mission to increase understanding and appreciation of the natural environment and cultural heritage then it has to reach people, it has to communicate with them effectively. It won't do this if people don't come to the Museum because they aren't aware of the new exhibitions and other activities that are being staged and that these are of great interest to them. So a museum not only has to put on good exhibitions and run imaginative programmes but it also has to be an inviting place to go and it has to tell the public about what it is doing in language that can be understood and that is relevant to their background and interests. This is no more than what is fundamental to effective communication.

By June, 1981, the Museum had completed
- a survey of visitors
- a report on surveys of visitors to other museums
- a quantitative survey of awareness and visiting patterns for major museums and similar activities in the State
- a qualitative market survey commissioned from Neil Riley and Associates

These surveys and reports showed that more than 70% of people over 16 in NSW had visited the Museum at some time. About 90% knew of the Museum. The preponderance of family groups was revealed in the Museum's own survey. From all surveys it was clear that the Museum reached a very wide cross-section of the population: attendance is not confined within the higher income or better educated groups, although level of educational attainment is clearly the best indicator of tendency to visit. It has been estimated that between 35% and 50% of the population of metropolitan Sydney visit the Museum over a five year period. Most visitors spent between one and two hours in the Museum. That people are visiting mainly for enjoyment, learning and in order to take the children, was confirmed with well over 70% giving these as reasons. These results are essentially the same as have been found in studies of visitors to other museums around the world. Comparison with studies of sports audiences shows that many more people visit museums than attend or participate in sporting events. A study for the Australia Council revealed that visiting museums was the tenth most popular leisure activity being rated as important to very important by 44% of respondents. As a result of the consideration of all these reports a number of significant changes are to be made.

In the entrance areas new seating and other furnishings are to be introduced and better orientation facilities and guiding materials made available. New arrangements for 'information officer' staff are to be made: visitors will be assisted by informally dressed staff rather than being confronted by the austere, uniformed guard. Advertising activities are to be more carefully planned to make more effective use of all the media.

The report of the first major review of all education programmes was made available to the Trust in August, 1981. Among the 36 recommendations which were endorsed by the Trust, were proposals for restructuring the programmes for school group visits by reducing class sizes, producing better activity notes to assist the groups using the exhibitions and developing better guiding materials to assist groups visiting by themselves. Other recommendations included better marketing of the 'Museum on the Road' touring exhibitions, introduction of planned formal evaluations for all programmes and the use of volunteers. By the end of the year substantial progress had been made in implementing these important recommendations. In particular, trained volunteers now assist in many aspects of all programmes in Education. Detailed evaluations of the school visits programme and the Museum Train have been completed.

The past year was certainly the most active yet in respect of exhibitions. The three major exhibitions which were completed substantially advanced the plan to upgrade all of the Museum's exhibition spaces by 1988. The Museum was presented with the Museum of the Year Award for best new exhibition for its 'Mammals in Australia' gallery. This presentation by the NSW Branch of the Museums Association of Australia was no small recognition of the level of excellence achieved by the Museum's Exhibitions staff and their collaborators in other departments. As in 1981, the Trust devoted substantial financial resources to exhibitions — some $300,000 from all sources.

By year's end a substantial review was underway of the process for initiating, designing and producing exhibitions. With up to 50 people in any one year involved in the exhibition programmes in some way or another, it has become urgent that great attention be paid to definition of roles and responsibilities of the members of project and production teams in order to reduce conflict and enhance co-operation.

Major scientific activities in maintaining and improving collections and in conducting research continued. These continued to be assisted by Visiting Curators and by temporary staff. As in past years, many programmes were made possible by substantial grants gained competitively from agencies such as the Australian Research Grants Scheme and the Australian Marine Sciences and Technologies Advisory Council. Some 25 grants totalling $300,000 were obtained.

The Lizard Island Research Station's accommodation was at last significantly upgraded by the completion of three new units of which two were funded by the grant from the Japan Foundation. After protracted negotiation with government agencies the contract was let for the construction of the new research vessel, RV *Sunbird* to be launched in late 1982. With additional laboratory equipment and facilities including a desk top mini computer, the Station has now advanced to be the leading research base on the Great Barrier Reef itself.

The importance of the work of the Materials Conservation Section was recognised through greater involvement in conservation work as part of the exhibition programmes.

The Museum's Library and its functioning was the subject of an audit report by the NSW Public Service Board. The audit team concluded that the Library was an extremely valuable resource but drew attention to the serious problems arising from the large backlog of material awaiting binding. Some 17,000 volumes await attention and the necessary funds are as yet not provided.

Although progress was made in many areas, a number of substantial difficulties faced the Museum in the past year. With further restrictions in government spending and the tighter economy generally, staff levels were frozen, some travel curtailed and various planned expenditures cancelled. Despite careful planning, involvement of volunteers and the adoption of project budgeting, the Museum can hardly expect to escape altogether from the current economic conditions. Amongst the most worrying effects are the increasing difficulties of setting appropriate wage and salary levels in some areas. Salaries for attendant and security staff and for senior exhibitions staff are significantly less than apply in many other areas of the workforce for staff with similar responsibilities.

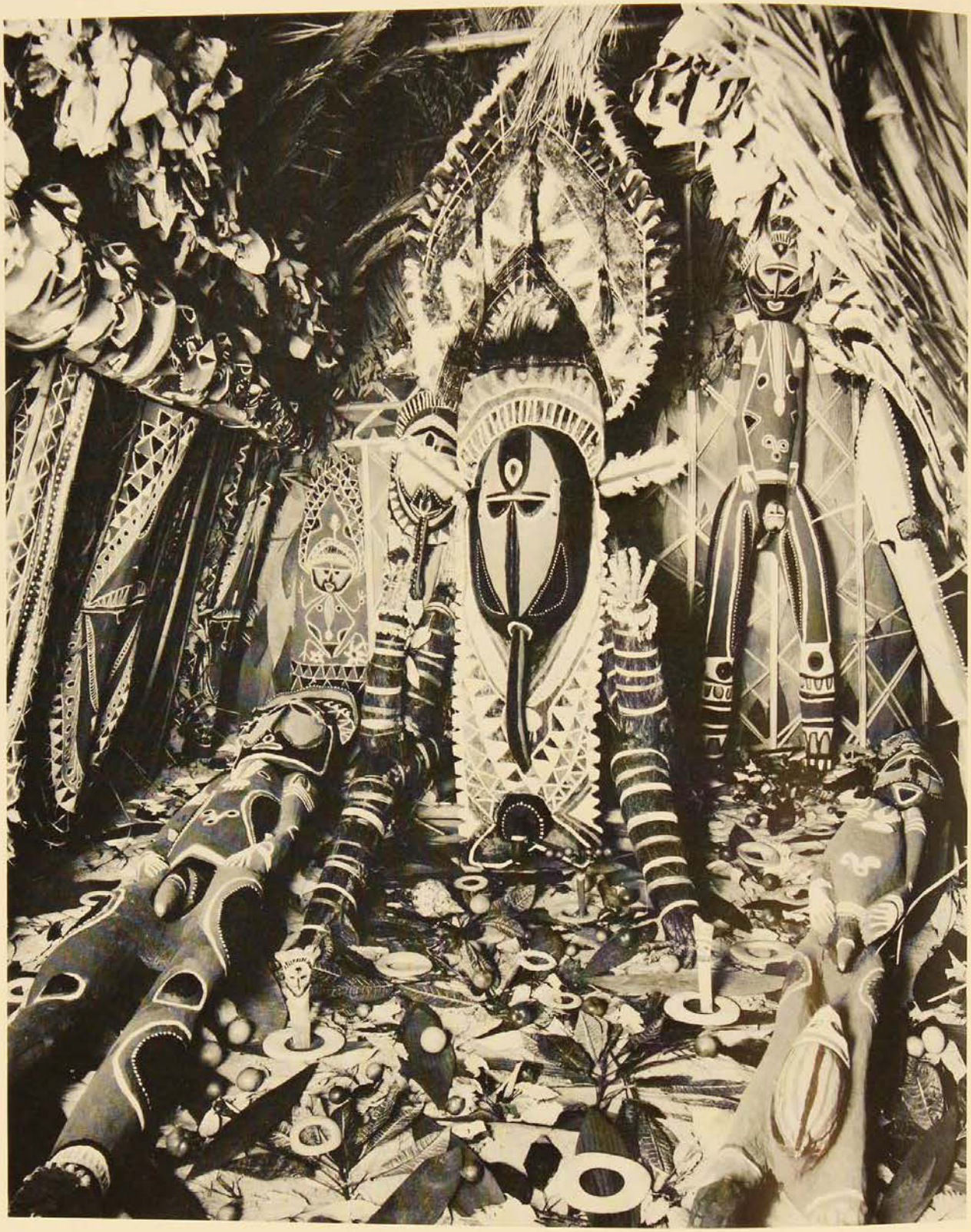
Accommodation continues to be a major problem. As in past years staff in many sections work in corridors or stair landings. Many collections are crammed together making access to them difficult and leading to deterioration and physical damage. The proposal before the government for construction of the first stage of redevelopment, an eight storey block along the back of the site, housing collections, laboratories and the Library, requires the most careful consideration.

Strenuous efforts were made during the year to improve communication between people within the Museum and to improve induction, training and development procedures. Extensive discussions were held during the formulation of procedures for grievance resolution and of the Equal Employment Opportunity Management Plan. Firm, workable plans have yet to be established for staff training and development and the Trust, through its committee structure is to assist in this task.

Funds available to the Museum this year were 14% more than in 1980-81. However, the proportional contribution of State Government to the total barely reached 70% compared with 76% three years ago and 82% six years ago. The Trust was thus responsible for $1.8 m. At the same time, with overall expenditures increasing by 20% over the previous year, accumulated funds declined by 33%; the reserves in the Trust's General Funds have not increased significantly in three years.

The Museum now comprises some 200 people plus volunteers. Assisted by the Australian Museum Society (TAMS) and many others in the community, it continues as one of the leading natural history museums in the world. But if it is to remain so it will need continued and dedicated effort. It is my pleasure therefore to again thank the Trust, especially Dr Baker, President, my colleagues and staff of the Museum for their support during the year.

D. J. G. Griffin,
Director



The interior of the spectacular A-framed *haus tambaran* or spirit house constructed in the exhibition, 'The Abelam, A People of Papua New Guinea'. The carved and painted figures play an important role in the ceremonial initiation of Abelam men. Women and uninitiated men are forbidden to enter the house.
Photo: J. Fields.

Anthropology

The primary concerns of this department are the past and present indigenous peoples of Australia and the Pacific Islands, with a lesser emphasis on Indonesia and other parts of the world. The department seeks to promote and improve knowledge and understanding of the non-western cultures of these regions, particularly through research in the field and on the reserve collections and through exhibitions. It encourages the involvement of indigenous people in museum practice and matters of cultural heritage, particularly where these can contribute to the achievement of cultural aspirations.

Dr Ron Lampert continued planning the development of the new Aboriginal Gallery in association with Dr Diane Losche, Ms Kate Khan and Mr Phillip Gordon. This planning received much assistance from the contacts with Aboriginal people established by Mr Kevin Cavanagh.

Aboriginal Australia: Following re-structuring within the Premier's Department, Mr Cavanagh was seconded to the Museum to assist the Anthropology Department in liaison with Aboriginal communities within the State. Mr Cavanagh aims to achieve a better understanding between the Museum and Aboriginal people. His liaison work consists of consultations with rural and urban based Aboriginals, especially with isolated settlements in depressed conditions near towns. One of his priorities is to seek out elders and spokespersons in various groups who can contribute advice to the Museum on aspects being portrayed in the new Aboriginal Gallery. This work involves trips to Aboriginal communities throughout the State and results in visits to the Museum by several Aboriginal people for discussions.

Consultation with Aboriginal people has extended beyond the State. Mr J. Atkinson of the Aboriginal Keeping Place in Shepparton, Victoria, visited the department to advise on relevant aspects of the Aboriginal Gallery.

Mr Gordon continued as a trainee under the Commonwealth Government's National Employment Strategy for Aboriginals and successfully completed his first year at the University of New South Wales.

The department continued its programme of loans of artefacts to Aboriginal communities for display. The arrangement with the Woolitji Cultural Centre in Maclean is now a regular part of that programme.

Gallery Development: The new gallery, 'The Abelam — A People of Papua New Guinea', was officially opened on 30 April, 1982. The gallery sets new standards for anthropological displays and has received very favourable comment from both media and public.

In addition to her anthropological input into this gallery, Dr Losche was heavily involved in media promotion of the gallery, the preparation of a special calendar and the gallery guide. Two senior men of Apangai village, East Sepik Province, Papua New Guinea, spent two months at the Museum. Narikowi Konbapa and Nera Jambruka touched up the paint work of various artefacts to be displayed, and assisted with the correct presentation of several sections of the gallery. Many people gave freely of their time and advice towards the gallery; in particular we wish to thank Professor J. A. Forge, Australian National University, for the loan of artefacts and photographs.

Several major requests for information about the department's Pacific Island's collections have highlighted the problems of data accessibility. Ms Bolton spent much of the year improving card catalogues and access to several sections of the collections. Under her guidance, Ms S. Thomsett, of the Museum Studies Diploma course at the University of Sydney, prepared a detailed catalogue of our Hawaiian collection. Ms T. Corkill reorganised the Fijian collection and conducted a survey of the department's holdings of artefacts acquired prior to the destruction of the majority of our holdings in the Garden Palace fire in 1882.

Notwithstanding improvement of data and storage access to parts of the collections, only limited further progress can be made until additional space is available. The progress achieved during the year was heavily dependent on voluntary assistance. Total value of donations made under the Commonwealth Government's Tax Incentives for the Arts scheme was $7,534.

Acquisitions: Pursuing a policy of improving holdings of materials from New South Wales, several members of the department attended auctions in both the city and in country centres. About 300 artefacts of women's crafts were purchased from Yuendumu, Northern Territory. These fill a major gap in the department's collection and will be displayed in the 'Women in Art' exhibition at the Museum later in 1982. Among the 16 artefacts received under the scheme were two important earthenware pots from Malekula Island, Vanuatu.

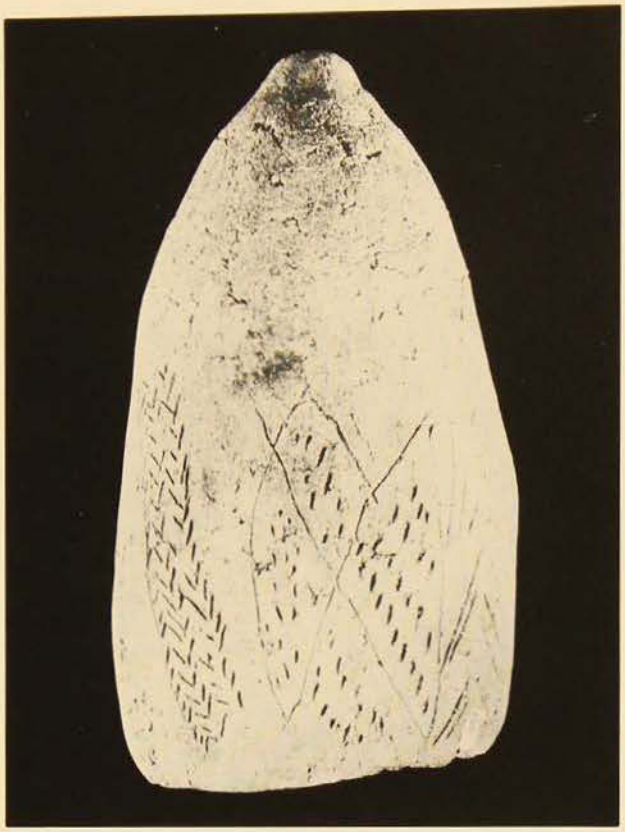
Among the many donations were photographs from the Brungle Aboriginal Mission, near Gundagai, taken in the early 1900s. These photographs, presented by Mr T. Hubbard, are an important addition to the department's collection of historical materials relating to the Aboriginal people. The department also purchased at auction four brass 'kingplates'. These items, although not strictly ethnographic in the sense of representing traditional or contemporary Aboriginal crafts, are important historical documents.

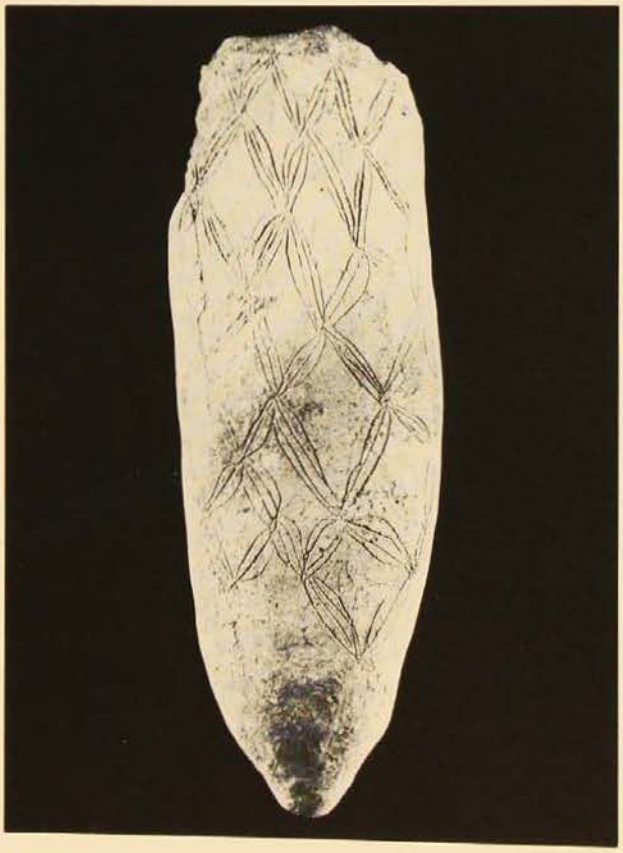
Research: Dr Lampert undertook further field work in the Flinders Range and around Lake Frome in South Australia, examining early Aboriginal settlement of those areas. His project is directed towards elucidating early prehistory of Australia, with special reference to stone industries and environmental correlates. As part of this project he made two visits to archaeological sites near Tambar Springs, NSW, being excavated by Professor R. V. S. Wright, University of Sydney, from which relevant early industrial materials have been recovered. Dr Lampert also visited the Mackay district of Queensland to examine waisted stone axe blades similar to those found during earlier research on Kangaroo Island.

Dr Specht revisited West New Britain Province, Papua New Guinea to continue his project on the cultural history of that area. With Dr J. Hollis, he examined geo-archaeological questions on the north coast, and identified a previously unreported location of obsidian, which was a likely source for artefacts of the area and has helped indicate possible trade routes. In the Kandrian area, together with Mr J. Normu of the West New Britain Cultural Centre and Mr I. Lilley of Queensland, he continued excavations at two sites tested in 1980. Dr C. Pain, University of New South Wales, joined the team to advise on site formation processes.

Donations: J. H. Browne; M. Calthorpe; S. Church; C. Crocombe; D. Edwards; C. Fitzpatrick; W. L. Gard; L. Gilmore; A. N. Grant-Cook; H. Jenkins; L. Kikerist; M. von Krusenstierna; Lt B. McDonald, RAAF (36 Squadron); J. P. Ramsay; M. Ronnell; B. F. Rutter; C. Sadlier; N. Searle; N. Smith; C. Sorenson; E. W. Swain; B. Wynn.

Visitors: A. Lavondes, J. M. Chazine, French Polynesia; S. Bard, Hong Kong; G. Vargyas, Hungary; M. de Keikzer, Netherlands; S. Mead, S. Edson, New Zealand; B. Craig, S. Eoe, S. Taba, C. Wungi, N. Konbapa, N. Jambruku, Papua New Guinea; H. Isa, Solomon Islands; J. Sawe, T. Hutagalung, Switzerland; M. Rogers, P. Kirch, A. Schutz, J. Fowler, M. Kahn, S. Errington, J. Roscoe, P. Martin, United States of America; S. Kuchler, R. Dennell, United Kingdom; K. Huffman, Vanuatu.





These prehistoric ceramic vessels originate from Malekula, Vanuatu. Their age is uncertain and these pots were, until recently, used by the Malekulan people in ceremonial initiations and funeral rites. Both vessels were donated to the Museum under the Taxation Incentive for the Arts scheme — the pot at the top by Dr. P. Elliot and the one at the bottom by Dr. H. Gallagher.
Photo: J. Fields.

Arachnology

Significant advances have been made in studies of Funnel Web spiders during the year. Much attention and time has been given to keeping all sectors of the public advised of the department's activities in this sphere.

Other aspects of the department's work have continued in line with its aims to contribute to the understanding of Australian spiders and other arachnids — scorpions, millipedes, centipedes and related minor groups and their evolution, classification, distribution and biology. Information about these animals is provided to scientific and other educational groups and to the public.

Funnel Web Spider Study: Work on Funnel Web spiders genus *Atrax* continues with emphasis on a numerical taxonomic study of the male of the species. Further chemotaxonomic work on *Atrax* is in progress. Species from southern New South Wales have been sampled and sampling of northern species is proceeding. This work has been assisted by a grant from the Australian Biological Resources Study which has made possible employment of a field assistant.

Two short collection trips to mid-northern NSW — Port Macquarie, Wilson River and Washpool State Forest yielded useful Funnel Web specimens for research and for exhibits in the proposed new Insect Gallery.

Other Spider Studies: A trapdoor spider group Actinopodidae, with a single endemic Australian genus, is being revised in conjunction with R. Faulder of Yanco Agricultural Research Station. A review of the family Filistatidae in Australia was completed. Filistatids are a specialised group which like other cribellate spiders spin an elastic silken web. Until recently these were known only from one locality in Queensland.

Data Sheet Records: Good progress was made in computerising data concerning the collections. Since 1976 almost 10,000 specimen lots have been recorded. Lack of funds has restricted the project.

Services: Staff of the department gave lectures to the Entomological Society of NSW, the Royal Society of NSW, the NSW College of Nursing and the NSW Intensive Care Society.

Education: Staff contributed to a diversity of Education programmes including Peer Teaching, Drop-In After School, Sunday at the Museum and Work Experience.

Visitors: Brother G. Nicholas Sullivan, FRS.

Director's Research Laboratory

The laboratory is responsible for conducting research of special interest to the Director. Dr Griffin and Mrs Helen Tranter are continuing studies on spider crabs (family Majidae) and have completed a study of all the known species occurring in the Indian and Western Pacific Oceans. A report is now in press. More than 100, or nearly a third, of the species from this region are now known to occur in Australian waters and the relationship between these species and the rest of the family Majidae is being examined.

A study of midwater and deep water shrimps and prawns (carids and penaeids) was completed with the help of visiting curator to the Crustacea department, Dr Brian Kensley of the Smithsonian Institution. Work concentrated on species occurring off the NSW coast and was based on collections from the NSW State Fisheries FRV *Kapala*.

Entomology

Activities of the department are extremely varied and aim to carry out research on insects, acquire knowledge of them and provide services in entomological matters to the public, students and colleagues in science.

Collections: Most departmental research is collection-based. The year has been important in that several extensive and valuable donations to the collection have considerably enriched the Museum's resources, in addition to the material gathered by staff.

Bees, Beetles and Butterflies: The beetle collection of the late Mr D. Doolan, estimated to consist of about 15,000 specimens, was received late in the year. Specimens are all beautifully set, with full data. Many of them were collected in and near Sydney over a number of years and provide a useful comparison with other collections made prior to the spread of housing and alteration of the Sydney environment. Mr K. Long, of Cherrybrook, donated a collection of approximately 4,000 butterflies, including several paratypes of species described by A. N. Burns. This collection was previously on public display in a small country museum.

The following additional donations were made: Mr M. S. and Mrs B. J. Moulds' extensive collections, carrying full scientific data; Mr and Mrs G. Williams' extensive collections of Psocoptera (Booklice) from the Taree area and voucher specimens of the beetles referred to in their published papers.

Mr V. Robinson has again donated a large important collection of Lepidoptera (butterflies and moths), mainly from the Wollongong area, specially selected to include species not in our collections.

Hymenoptera (ants, bees, wasps) of many families, have been donated by Mr N. Rodd, of Mt. Tomah. A substantial sample of the wasp and bee fauna of the area is represented. The collection is particularly important to current studies on native bees by Dr T. Houston of the Western Australian Museum. Mr and Mrs K. Carnaby, of Western Australia, have donated large series of beetles and specimens of other groups relevant to current staff research.

Specimens of Diptera (flies) have been received from Dr. J. Bock and Dr H. Roberts.

Mr Bryan Cantrell of Department of Primary Industries, Queensland, donated a rare fly specimen (Diptera) of great interest. This is only the second known specimen of the genus *Nothoasteia*, which was first described by the late John R. Malloch in 1936 from a damaged specimen collected at Brisbane. The new specimen was collected by Anthony Postle near Dwellingup, Western Australia, and apparently represents a second species of the genus. Recent study suggests that this fly should be placed either in the upside-down fly family (Neurochaetidae) or a new family of its own.

Mr R. McLean has continued to donate butterfly specimens collected from islands off the coast of eastern and northern Australia. It is hoped to use this material as a basis for a synopsis of the butterflies of these island groups.

Valuable Help: We have been helped again by our Associates and volunteers; it would be impossible to deal with all the material which comes into the department without their help.

Field Work and Research: During field work in Western Australia, Dr Courtenay Smithers received considerable help from staff of the Western Australian Museum and the Department of Agriculture. The Western Australian Department of Fisheries and Wildlife kindly provided permits for entry to collect specimens on Barrow Island, an "A" class Reserve for which very strict entry controls are applicable.

Dr Smithers won the Western Australian Petroleum Company 1982 grant. The WAPC grant is not a fixed sum but provides transport between Perth and Barrow Island, all requirements for research, transport and accommodation on the island and field assistance from their consultant, Mr W. H. Butler.

Study of Two-winged Flies: Dr David McAlpine's research is largely concerned with the fauna of acalyptrate flies native to Australia and New Guinea, naming and defining the new kinds and discovering as much as possible about their lives and evolution. This group includes more than 2,000 species in Australasia, some of which are leaf-mining flies, true fruit flies, picture-winged flies, and drosophilids.

Nobody Flies: In the second half of 1981 Dr McAlpine completed his study of the 'nobody flies', minute flies (average length about 1.5 mm) found on smooth tree trunks and large-leaved plants. They are completely new to science and are confined to Australia and South Africa. They are considered to constitute a new subfamily of the small family Aulacigastridae. Mr Barry Day has gained considerable expertise in finding these elusive insects in the field. Dr B. R. Stuckenberg of the Natal Museum, Pietermaritzburg and Dr J. F. McAlpine of the Biosystematics Research Institute, Ottawa, contributed significant material to the project. Results are being published in Australian Journal of Zoology.

Dr McAlpine's research has been assisted by a grant of $15,942 from the Australian Research Grants Scheme.

A major project, on which Dr McAlpine has already produced several papers, concerns the description and classification of heleomyzid flies. Mainly inhabitants of temperate forests of both hemispheres, these flies are all endemic to Australia.

Mr K. C. Khoo has commenced a study of the species of *Cyamops*, a genus of flies of the family Periscelididae found mainly in damp situations in Australia, New Guinea and the Americas.

Dr Smithers has studied collections of Psocidae from New Britain, New Ireland and the Solomons as part of his major research, in collaboration with Professor I. W. B. Thornton of La Trobe University. He completed a study of the Psocoptera of South Australia based largely on the extensive collections made by Mr Geoffrey Holloway on two field trips. Little has been published or collected by

museums on the psocopteran fauna of South Australia. The work indicates some relationships of the fauna with Western Australia and with Tasmania. A paper is in press. Western Australia Psocoptera collected during field work are now being studied as well as extensive collections from New South Wales.

Scorpionfly Rediscovery: Discovery by Mr Holloway of specimens of the primitive scorpionfly *Austromerope poultoni* in the collection of the Western Australian Department of Agriculture led to a special search for it in jarrah forests by Dr Smithers and Mr T. Burbidge of the Western Australian Department of Agriculture. Additional material could not be found. *Austromerope poultoni* can be considered one of Australia's rarest, most interesting, but little known insects. It is extremely primitive with relatives only in the Americas. All are rare in collections. Until its recent rediscovery, only one specimen of *Austromerope poultoni* was known, collected in 1914 and described in 1933. The original specimen was a male. Recent material includes both sexes and Dr Smithers is preparing a description of the female.

Dr Smithers' work on Neuroptera has centred on his revision of the Sisyridae (spongilla flies) which is nearing completion and on material collected on Barrow Island.

Insect Migrations: Aggregations of ladybirds (Coccinellidae), well known in Europe during winter, have been observed at various times of year in Australia and are not restricted to the winter season. Dr Smithers made observations on aggregations north of Singleton, NSW, and Mr Holloway in South Australia. A paper on this research is in press.

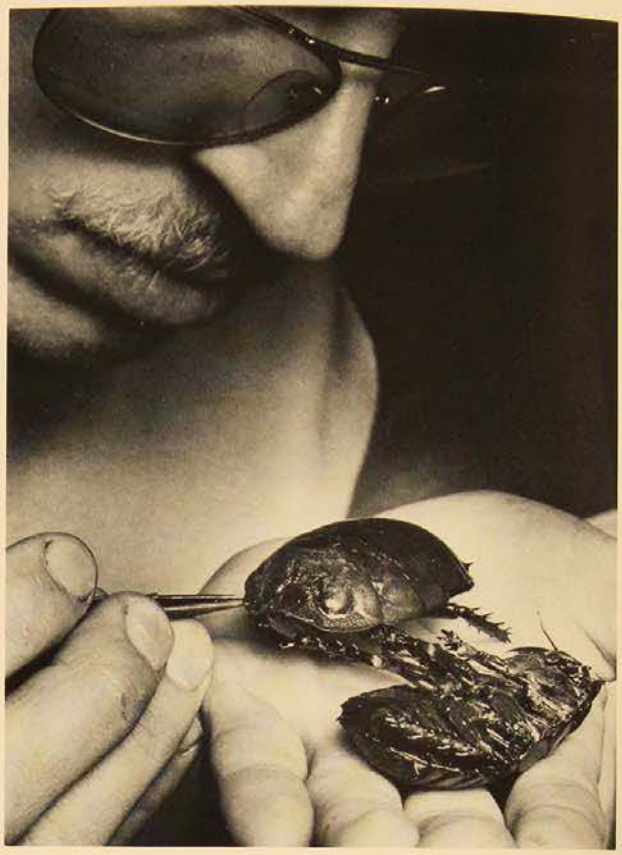
New Insects: The Western Australian Petroleum Company Research Grant enabled Dr Smithers to carry out a survey of selected insect orders on ten islands in the Monte Bellos, Lowendals and Barrow Island groups. These islands have not been intensively surveyed and most of the specimens collected represent new records. One new genus and several new species are among barklice collected and many new distribution records among the butterflies, dragonflies, and lacewings. Papers on this material are in preparation and will form a significant contribution to the faunal survey of the islands.

Mr Holloway has continued his postgraduate studies on the Australian Icheumonidae (Hymenoptera) and continued to supervise the Museum's involvement in the European wasp survey.

Services: Identifications of material for many specialists, research institutions and the public have been carried out. Recipients included the Department of Primary Industries, Port Moresby; Departments of Forestry in New South Wales and Tasmania; Departments of Agriculture in New South Wales, Western Australia and Victoria as well as several other museum departments. The staff has been heavily involved in student education and scientific society activities.

The large collections obtained by staff and by donation makes the curatorial load in the department very heavy. About 46,000 specimens were added to the collections, including 180 types. Loans involving more than 7,000 specimens, including 91 types, were dealt with.

Overseas Visitors: Dr D. Thorpe, Riverside, California; Dr D. Brothers, Natal University; Drs H. and A. Howden, Carlton University, Canada; Dr P. Voss, University of Michigan; Dr W. Rossi, Rome; Dr A. Anciber, Buenos Aires; Mr I. Gould, British Museum, London; Dr V. R. Bejsak, Academy of Sciences, Prague, Czechoslovakia; Dr J. Kukulova-Pack, Canada; Dr J. Ismay, Department of Primary Industries, New Guinea; Drs U. and H. Aspock, Vienna Museum; Dr Bohard, University of California; Dr E. Hardy, University of Hawaii.



Owen Griffiths of the Entomology Department examines male and female specimens of the largest species of cockroach in the world, *Macropanesthia rhinoceros*. A complete growth series of this cockroach was donated to the Museum's collection by Dr. Harley Rose, University of Sydney.

Photo: J. Fields.

Functional Anatomy

This small section of the Museum consists of a Research Fellow, sometimes with an assistant. Its output has been largely determined by the various tasks assumed by Mr Strahan, ranging from research on the anatomy of hagfishes and marsupials, writing and editing books on Australian mammals, to museum exhibitions and historical research. In the year under review, Mr Strahan's zoological research centred on the Musky Rat-kangaroo and the Koala. His *Dictionary of Australian Mammal Names* was published in 1981, and *The Young Observer's Book of Australian Mammals* in 1982. The text of *The Mammals Of Australia*, of which he is editor-in-chief, was completed.

Mr Strahan attended the Second Koala Symposium in Brisbane and chaired one of the sessions. He was chairman of the syndicate on research in the working party convened by the Department of Home Affairs and the Environment to develop a National Conservation Strategy for Australia. He contributed a joint paper on Koala biology with Mr R. Martin of Monash University to a symposium of the Australian Academy of Science on *Australian Species at Risk*. He was appointed to a working party of the Interim Council of the Museum of Australia to advise on biological display policy. He attended the 1982 Congress of ANZAAS held at Macquarie University and chaired a session on human population problem.

He was elected President of the Royal Zoological Society of NSW and continued as a councillor of ANZAAS and Honorary Editor of its journal, *Search*.

Herpetology

Research advances in several fields and expansion of consultation services are among the highlights of the year's activities in pursuing the department's aims.

The principal aims of the department are to undertake research, to educate, advise and consult on the biology, systematics and evolution of the reptiles and amphibians of the Australian region, and to maintain and increase the research collections of specimens in these two groups of animals.

Research: Dr Allen Greer continued his studies on the systematics and evolution of scincid lizards, on limb reduction in skinks and on a study of evolutionary relationships of major groups of lizards. Mr Ross Sadlier continued his work on the skinks of New Caledonia and the taxonomy of the *Egernia cunninghami* (Cunningham skinks) complex, and completed the first stage of a survey of the herpetofauna of the Jabiru uranium mine site in western Arnhem Land for the Office of the Supervising Scientist. In April, 1982, Dr Greer was granted six months leave to undertake research in North America and Europe on the classification of lizards. Dr Cogger and Miss Elizabeth Cameron continued research on the systematics of sea snakes (families Hydrophiidae and Laticaudidae). In July-August, 1981, Dr Cogger took up a senior fellowship awarded by the Japan Society for the Promotion of Science to undertake research on sea snakes at the Department of Chemistry at Tohoku University, Sendai.

Using a grant from the Bureau of Flora and Fauna, Canberra, Dr Cogger transferred his manuscript checklist of Australian reptiles and amphibians to the computer-based files of the Bureau. He compiled the additional data needed to transform the checklist to the standards required for the Australian Zoological Catalogue, of which it is to become the first volume. At the request of Comalco Ltd., Miss Cameron accompanied a party from the Queensland National Parks and Wildlife Service in further surveys of the fauna of the Weipa region. The herpetofaunal survey, which is a continuation of one previously undertaken by the Museum, has as its primary purpose the acquisition of baseline data against which the effects of the introduction of the exotic cane toad, *Bufo marinus*, can be measured.

Peter Rankin Trust Fund: This fund, set up by the Australian Museum Trust in 1979 to assist students in herpetology, made its first awards in 1981. The fund exceeded its capital target of $10,000 in a little over a year after the appeal was launched. $1,080 was disbursed in four grants, to Mr Mark Fitzgerald (Mullumbimby), Mr Arthur Georges (University of Queensland), Mr Russell Parker (Rockhampton C.A.E.) and Mr Glen Shea (Australian Museum).

Education: The department participated in the Peer Group teaching project for primary school students and the Work-Experience Scheme for secondary students organised by the Education Section. The department continued assistance to promising secondary and tertiary students.

Consultation Service Grows: The department continued to identify specimens and articles for the Bureau of Customs, the Department of Health (Animal Quarantine) and private industry. With Australia now a signatory to the International Convention on Trade in Endangered Species (ICTES), the number of animals or animal products requiring specialist identification has grown considerably. This places an increasing burden on Museum staff to provide such services which are not possible to maintain at current staffing levels.

Dr Cogger continued in his post as Secretary to the Division of Zoology of the International Union of Biological Sciences, as a member of the International Commission for Zoological Nomenclature and as a member of the Advisory Committee for the CSIRO journal Australian Wildlife Research. During the year he also became a member of the Snake Specialist Group of the Survival Service Commission of the International Union for Conservation of Nature.

Collections: The department moved into new laboratories in late 1981. More than 6,000 specimens were registered during the year and emphasis continued on the systematic reorganisation of the collections. Computerisation of the herpetological catalogue is now complete, and considerable effort continues to be put into upgrading the data base to facilitate retrievals. Unfortunately, serious interruptions to the department's programmes have resulted from major building works activities which effectively isolated large sections of the herpetological collections for long periods.

Significant additions to the collections were made by departmental staff and by collections from the following individuals and institutions: Dr G. J. W. Webb, a large collection of hatchling and juvenile crocodiles as part of a research project for the Conservation Commission of the Northern Territory; G. Webb, Research Officer for the NSW Forestry Commission from a survey of reptiles of the South Coast and Highlands of NSW; R. Wells, part of a survey of the herpetofauna of the Sydney Basin; Professor N. Tamiya, Tohoku University, Japan, a large sea snake collection for the seas between Australia and New Guinea; NSW National Parks and Wildlife Service, collections from the Washpool, Bega and Mt Boss district surveys; R. Wells and G. Shea, collections from Western Australia, South Australia and NSW in conjunction with research projects funded by a Peter Rankin Trust Fund Grant.

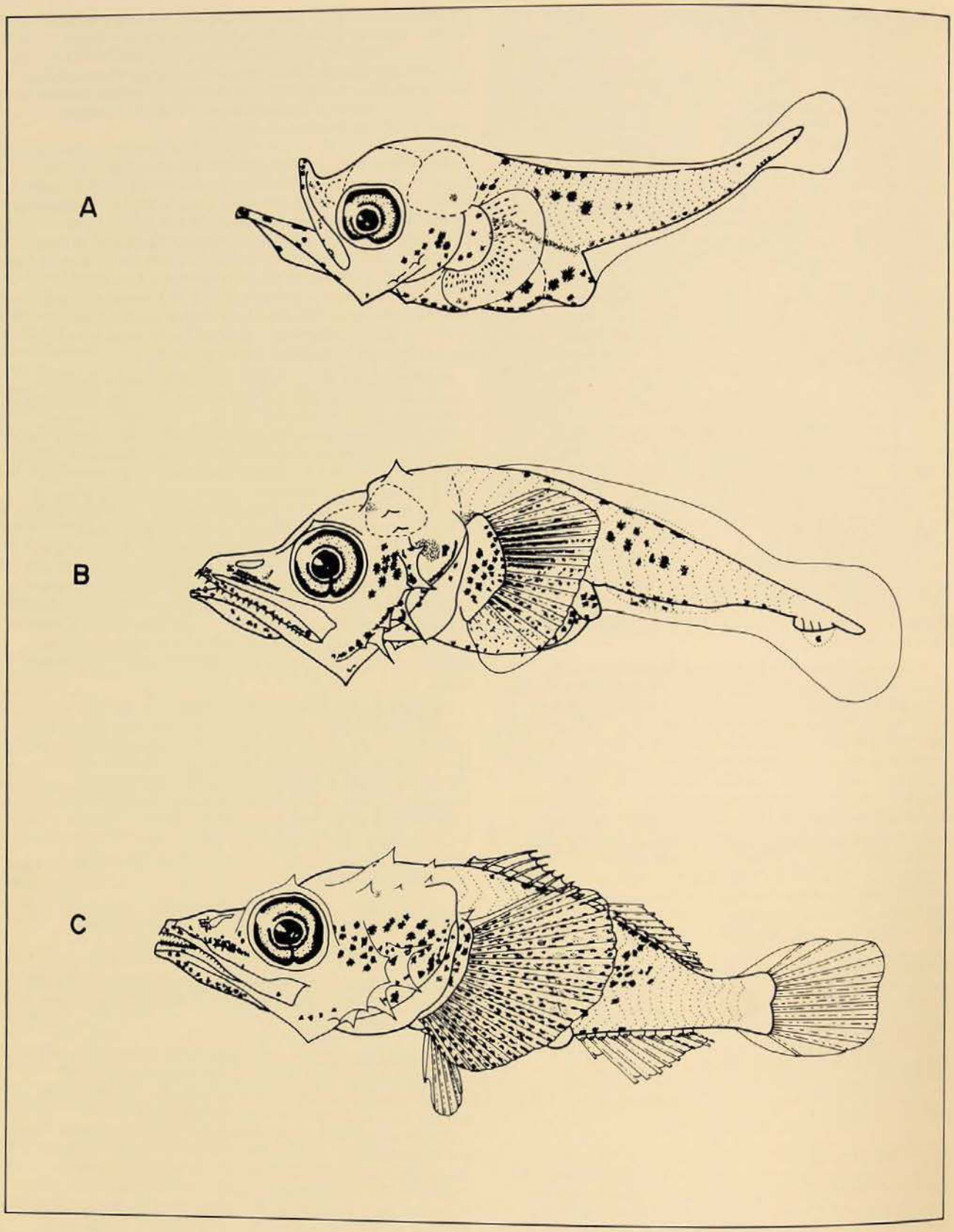
Exchange programmes have resulted in several valuable collections containing overseas taxa previously absent from or poorly represented in the collection. Dr Greer, Mr Sadlier and Ms Stewart and Visiting Fellow, Professor J. Allen Keast from Queens University, Ontario, Canada, conducted field work in Western Australia with two overseas visitors, Dr W. Haacke and Dr A. Russell. The purpose of the trip was to collect specimens for Dr Greer's research and the general reference collections.

Local Visitors: Mr Fred Patchel, Sydney University; Dr Rick Shine, Sydney University; Mr Keith McDonald, Queensland National Parks and Wildlife Service.

Overseas Visitors: Dr Wulfe Haacke from the Transvaal Museum, South Africa; Dr Anthony Russell, University of Calgary, Canada.

Temporary Assistance: Mr Glen Shea assisted Dr Allen Greer in his research by x-raying, skeletonising and alizarin-staining specimens of lizards; Mr Richard Wells helped to reorganise the agamid lizard and turtle collections, as well as registering 2,000 specimens from his Sydney Basin survey; Mr Phillip Griffin from Western Australia, aided in identification and sorting of many Western Australian agamid lizards in the collection; Ms Helen Ponton assisted in the computer registering of the backlog of the department's computerised geographic records.

Loans: A total of 110 loans were processed to or from the following institutions: British Museum of Natural History; Museum of Comparative Zoology, Harvard University; Wichita State University, Kansas; San Diego State College, California; University of California, Berkeley; University of Calgary, Canada; Transvaal Museum, South Africa; Flinders University, SA.; Western Australian Museum, WA.; Australian National University, ACT; Macquarie University, NSW.



Different-aged larvae of a flathead, *Platycephalus* sp., from the Great Barrier Reef near Lizard Island. (A 2.7 mm, B 4.1 mm, C 6.2 mm). The spiny head and large pectoral fin are typical of the adaptations of many coral reef fish larvae, but in the case of the flathead, they are not entirely lost in the adult. This plate is one of 75 prepared for a forthcoming book, 'The Larvae of the Coral Reef Fishes', by Museum Fish Department members Jeff Leis and Denise Rennis. Illustration by J. Leis.

Ichthyology

The primary aim of the department is to increase knowledge about fish found in the freshwater, estuarine and marine environments of Australia. This is achieved by both research and support for the work of other researchers. The department cares for a large fish collection, answers public and scientific enquiries and offers advice to students.

Research: Research over the year concentrated on the systematics of gobies and weedfish (Clinidae), the ecology of Sydney Harbour fish, the systematics of the whalefishes (Cetomimidae) and dories (Zeidae), the taxonomy and distribution of larval fishes of the northern Great Barrier Reef and a continuation of the checklist of Australian fishes. A guide to the larvae of Indo-Pacific coral reef fish was completed by J. Leis and D. Rennis. This work was funded by the Australian Biological Resources Study (ABRS).

Visits by Distinguished Scientists: Dr Peter Castle of Victoria University of Wellington, New Zealand, a world expert on eels, spent four months in the department as visiting curator. During this time he continued his long-term studies on eels. He used the Museum's collections for his present project which is the production of a long needed key to the families and genera of all eels. Previously there was no comprehensive reference of the 16 families and 140 valid genera of eels. As a result of Dr Castle's work, the Museum now has the descriptions of the 140 genera with a cross-referenced index to the 500 generic names, a comprehensive bibliography, draft keys for identification of the families and genera as well as sketch-sets of the 30 species types held in the Museum collection. Professor N. B. Marshall, recently retired from Queen Mary College in London, spent three months as a Senior Queens Fellow in Marine Science using the department as his base institution. He continued his work on deep sea fish and gave a series of lectures in various marine institutions. Professor Marshall is one of the world's leading experts on deep-sea animals.

Collecting Trips: A number of collecting trips were made to Lizard Island, the Daintree River, Escape Reef, the JLB Smith Institute in Grahamstown, the Northwest Shelf and the mangroves between Brisbane and Townsville, to obtain marine, estuarine and freshwater material for scientific study.

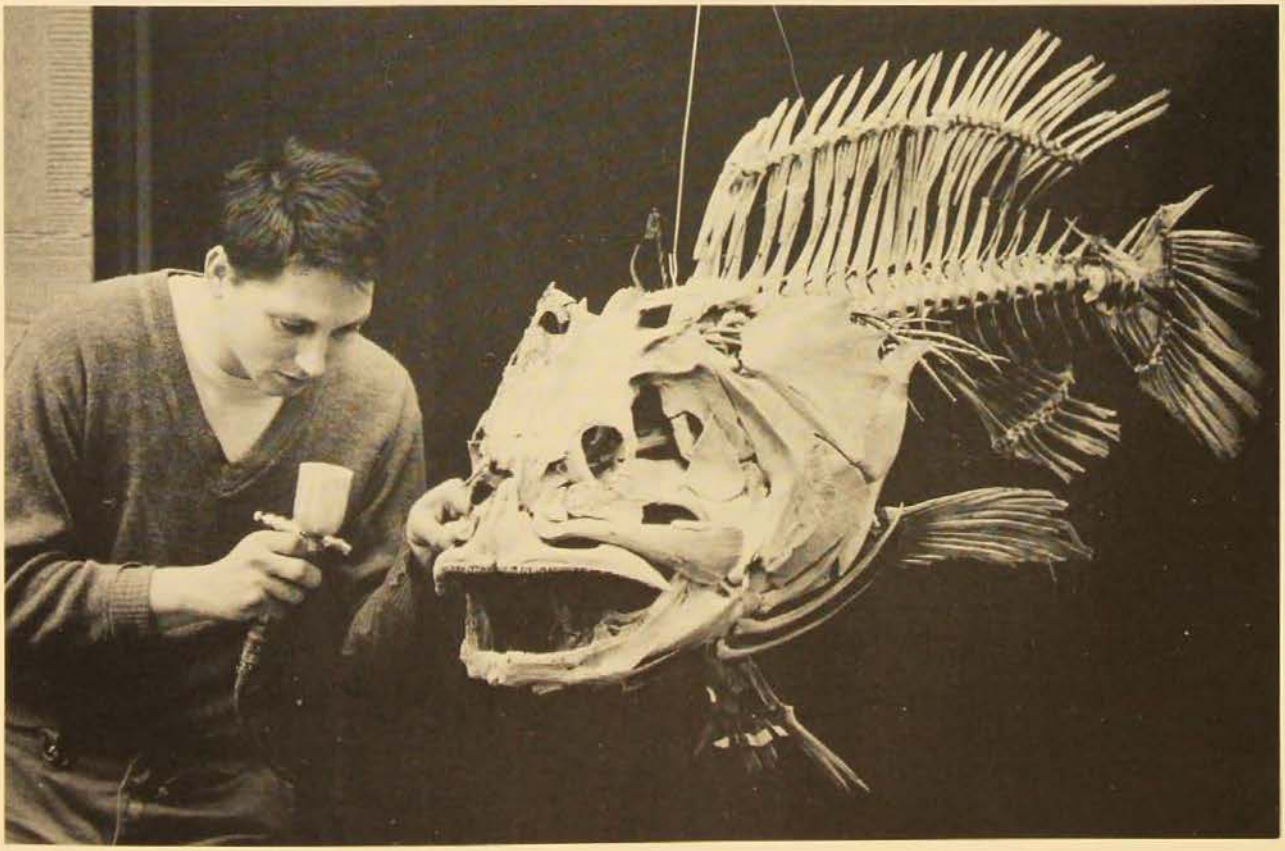
Collections: Computerisation of the data associated with the fish collection continued. Some 2,200 lots of specimens were registered into the collection. A total of 110 loans were sent out involving 1,400 lots and 4,500 specimens. An additional 100 lots were exchanged or given as gift material. Reorganisation of the shelved material was completed but problems of space for both collections and staff are becoming more acute.

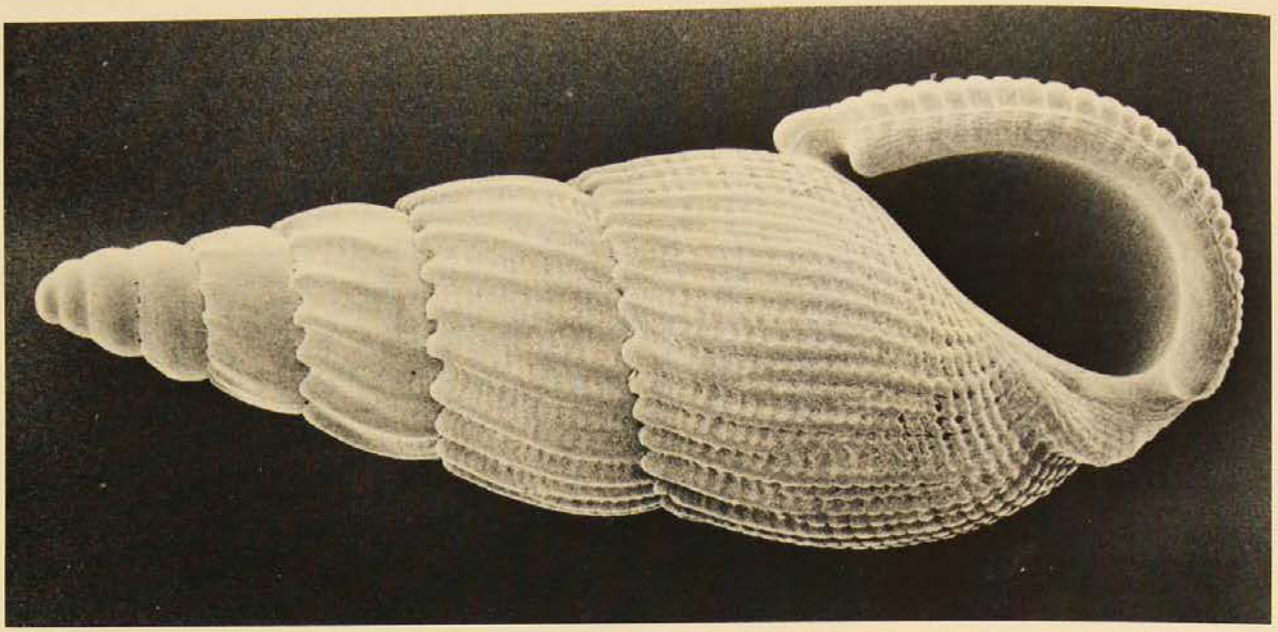
International Conference: The department organised a week's conference in September on the systematics and evolution of Indo-Pacific fish. A total of 109 fish researchers participated including 42 overseas scientists representing 14 countries. During the conference 55 papers were given, including "Symbiotic relationships of gobiid fishes and alpheid shrimps", by Dr Doug Hoese; "Australian fish collections: a computer linked network", by Dr John Paxton; and "The larvae of coral reef fishes — a potential systematic tool" by Dr Jeffrey Leis.

Staff also attended the 8th annual conference of the Australian Society for Fish Biology in Brisbane in July and presented three papers.

Overseas Visitors: Among the 109 scientists attending the International Conference were Dr P. Castle, NZ; Mr C. Dawson, USA; Dr R. McDowall, NZ; Dr J. Randall, USA; Dr C. R. Robins, USA; Dr T. Shimizu, Japan; Dr W. Smith-Vaniz, USA; Dr C. Swift, USA; Dr P. Whitehead, England and Dr R. Winterbottom, Canada.

Euan McLeod prepares a Groper skeleton for its new home in the Skeleton Gallery, which opened in 1982.
Photo: J. Fields.





***Folinia ericana*, from the west coast of Central America, is a member of the Rissoidae, a family currently being studied by Dr. W. Ponder of the Malacology Department. The total length of the shell is 2.8 mm, most rissoids being about this size or smaller. Rissoids are common in many parts of the world but are difficult to classify because of their small size and the tendency for unrelated groups to produce very similar shells.**
Photo: J. Hall

Malacology

The department is responsible for building and maintaining research collections of molluscs as well as pursuing research on molluscs (snails, slugs, bivalves, squid, etc.).

Research and curatorial projects are progressing well and the assistance of volunteer helpers is invaluable. Research projects continue to concentrate on micromolluscs and opisthobranchs and both curators continue to be supported by Commonwealth Funding agencies.

The department's collections continue to expand as a result of activities of staff as well as institutional exchange programmes and individual donations. Most collecting activity involves expanding specialist collections in areas covered by research programmes. Heavy usage of collections by outside workers is evidence of the great scientific value of the collections and the contribution to knowledge of the Australian fauna that study of them will make. Shortage of space and of man-power and money, restrict general collecting activities. Priority is given to collecting in locations poorly represented in existing collections or to acquiring specimens which will not duplicate existing material but which will enhance areas in the collections.

Overseas Loans and Exchanges: There were a high number of requests for study material from scientists in Australia and overseas. In the last year 50 loans were sent out comprising 2,549 specimens. It was also possible to improve collections by exchanging a large amount of material with overseas institutions while 47 loans comprising 11,349 specimens were borrowed from other institutions for research purposes.

Keith Sutherland Award: In memory of the late Dr Keith L. Sutherland, OBE, one of Australia's most distinguished scientists and a former Trustee of the Museum, an annual award was instituted by the Trust to assist outstanding graduate students and others to undertake research in malacology. The high standard of applications for the award augurs well for its future success. The successful candidate was Mr D. G. Reid, a post-graduate student at James Cook University, Townsville. Mr Reid's research project 'A re-evaluation of the Australian species of *Littorina (Littorinopis)* (Gastropoda) and an investigation of the predation ecology of the group' is now well advanced.

Research: The evolutionary relationships of lower Mesogastropoda forms part of Dr Winston Ponder's research. Reviews of the Rissoidae, Barleeidae, Iravidiidae and the small mesogastropod snails from the Antarctic and the sub Antarctic were undertaken. Recent field work in Tasmania has significantly increased the number of species known from there and an interesting radiation of hydrobiids in desert springs in South Australia is currently being studied. Other projects include: a revision of the genus *Murex* and a joint project with Mr Phillip Colman and Mr Bruce Jenkins, on a grant from the Australian Museum Trust, to produce a list of molluscs from the continental slope of NSW. These are mainly based on collections from the NSW State Fisheries FRV *Kapala*.

Dr Bill Rudman's main research activity continued to be a major revision of the Chromodoridae, a large group of spectacularly coloured nudibranch molluscs with over 350 species found in the tropical Indo-West Pacific faunal region. Two major papers on the chromodorids were completed in the year. This work is funded by a research grant from Australian Marine Sciences and Technologies Advisory Committee Funding Advisory Panel (AMSTAC-FAP). Further work is also being undertaken on nudibranchs feeding on scleractinian corals and alcyonarians, particularly concerning those with symbiotic plant-like dinoflagellates which live in their tissues. Lack of a shell and importance of external shape and colouration of the live animal are a major problem in the study of nudibranch molluscs. Specimens must all be photographed and detailed notes on shape and colour taken while the animal is alive. This makes building collections difficult and time-consuming.

Field work: In many shelled molluscs, including the micro-molluscs studied by Dr Ponder, details of the shape of the head of the animals is essential to record important characteristics and to investigate details of their ecology, such as food and substrate preference.

While it is possible to borrow some foreign material it is often essential to visit overseas museums to find and study type material and to collect and study live material. Dr Ponder visited North America this year for this purpose.

Field work within Australia included marine collecting in Northern Queensland, Nth Queensland Continental Slope (in conjunction with Australian Navy); Heron Is, Qld; and northern NSW. Terrestrial and freshwater collecting was undertaken in the Flinders Ranges, Lakes Frome and Callabonna, SA and Tasmania.

Visiting Workers: We continue to receive many visiting workers from within Australia and from overseas. Many come specifically to work in the Museum, others for a short period as part of a longer overseas study tour. Amongst those coming to work with our collections were Dr B. Smith, Dr B. Wilson, Dr C. C. Lu, Mr T. Darragh, Mr R. Tait, Mr K. Bell, all from the National Museum of Victoria. Others from Australian institutions were Mr D. Reid and Mr P. Arnold, both from James Cook University, Townsville, Miss J. Davis, University of Western Australia, Dr F. Wells, Western Australian Museum and Dr S. A. Shepherd, South Australian Fisheries Department, Adelaide. Overseas visitors included Mr B. Parkinson, Papua New Guinea, Mr and Mrs Hamilton, Bahamas, Mr G. Mason, Otago University, NZ, Mr E. Coen, California, USA, Dr J. B. Burch, University of Michigan, USA, Dr T. Habe, Tokai University, Japan, Dr A. Solem, Field Museum, Chicago, USA.

Acknowledgements: University of Sydney Electron Microscope Unit; School of Biological Sciences, Macquarie University; New South Wales State Fisheries Department; Taronga Zoo; Western Australian Museum; South Australian Museum; National Museum of Victoria; Queensland Museum; British Museum (Natural History); Los Angeles County Museum; Australian National Parks and Wildlife Service; National Parks and Wildlife Service, NSW; Australian Marine Photographic Index; Royal Australian Navy; CSIRO, Fisheries Division, Cronulla. Without the help of many voluntary workers, much of the work of the department would not be possible.

Donations: Mr J. Hicks, Conservator of Wildlife, Christmas Is, Indian Ocean, continued to send valuable collections of nudibranchs and colour slides, collections were received from Mr J. Orr, Indonesia and Dr B. W. Darvell, Hong Kong. Mr K. Graham, NSW State Fisheries continued to present valuable collections of molluscs collected off the NSW coast on FRV *Kapala*. Mr M. Dunning, CSIRO Fisheries Division, Cronulla, presented representative specimens of commercial squid species being caught off the East coast of Australia. Dr A. Solem, Field Museum, Chicago presented a valuable collection of paratypes of new species of Australian landsnails from the Kimberley Ranges, WA. Mrs J. Wise and Mrs H. Kurutz donated a large collection of shells from the Is. Other material was donated by T. A. Garrard, A. Ostheimer, M. Shea, O. Griffiths, T. Ireland, N. Ireland, J. Wise, E. M. Povall, V. Kessner, A. Solem, Br Faux, B. Bentel, G. Parkinson, J. Whittle, W. Sheils, L. and H. Hamilton, D. Pearson, J. Kerslake, J. Hunter, H. Woodward, A. Healy, C. Todd and C. Connolly.

Mammalogy

The aims of the department include the education of the general public on the biology of mammals, the initiation and implementation of research projects, publication of research results and acquisition and curation of a representative collection of mammals from both Australia and overseas. Answering public and scientific enquiries and assisting in exhibitions are some of the ways these aims are achieved.

New Gallery and Travelling Exhibition: The new Mammal Gallery opened in September, 1981, and featured many mammal species not seen in previous exhibits. The Mammals Exhibit for 'Museum on the Road' commenced in early 1982 and was completed by June, 1982. As with the main Mammal Gallery, Ms Gibson acted as assistant to Dr Michael Archer, the scientific advisor for both projects.

Rare Hastings River Rat: A live native rat, not sighted for 140 years and believed extinct in New South Wales, was discovered during a field trip conducted by the department. Acquisition of other live Hastings River Rats, *Pseudomys oralis*, by staff from the New South Wales Forestry Commission, allowed study of the behaviour of the animals in captivity. These rats were previously known from two specimens caught in the 1840s.

Computerisation of the Mammal Register: Placing the mammal collection register on computer is complete and, following final editing, will be in use by the end of 1982. Most of the organisation of the programme and transfer of information into the CSIRO computer was carried out by Des Beechy and Juanita Coughlin, from the Division of Computing Research, CSIRO.

Acquisition: A major collection (over 100 specimens) of New Guinea mammals was received from Tim Flannery and Ken Aplin, PhD students working with Dr Michael Archer at the University of NSW.

The cetacean collection donated by Research Associate, Dr Bill Dawbin, is now registered. This collection, numbering over 90 specimens, includes 50 skulls and skeletons of whales, including dolphins and 40 spirit specimens consisting of sections of whale anatomy

and whole foetuses. This is the first time this major order of mammals has been represented in the spirit collection.

Collections were also received from Palawan Island, in the Philippines, Hungary (45 specimens) and South Africa. Specimens were obtained for the scientific collection as a result of the trip made to Papua New Guinea by the preparators working on the Abelam Gallery.

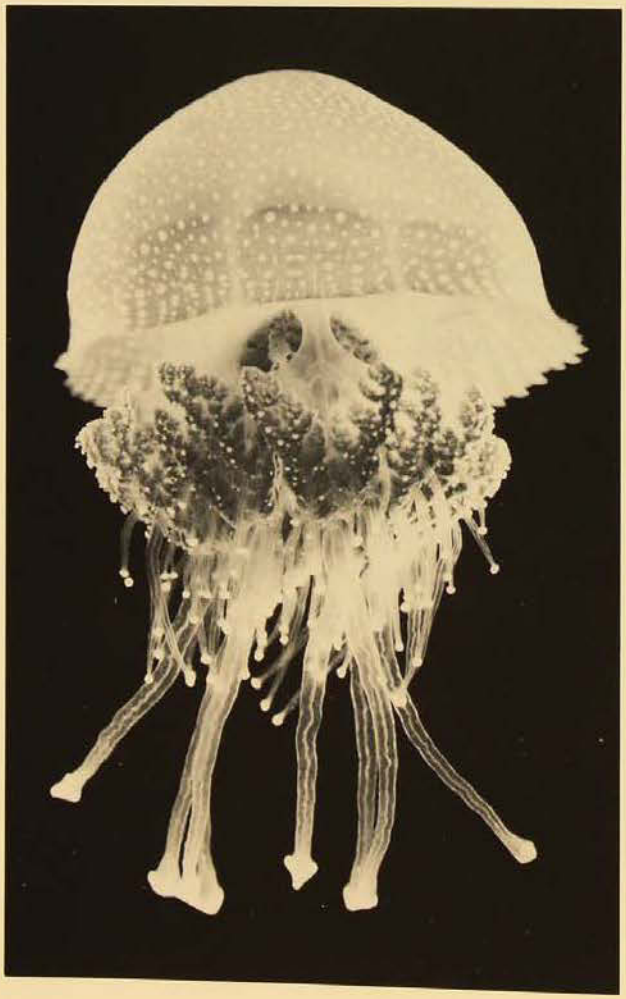
Many single specimens and collections of mammals were received through other NSW services including the Forestry Commission, Taronga Zoo and the National Parks and Wildlife Service.

With the assistance of the Coffs Harbour Dolphinarium and its owner, Mr Hec Goodall, the department was able to obtain specimens of a Minke Whale, *Balaenoptera acutorostrata,* and a Pigmy Sperm Whale, *Kogia breviceps.* Both these species are normally difficult to obtain.

During the year Ms Gibson attended the annual general meeting of the Australian Mammal Society and both Mr John Hoey and Ms Gibson participated in the annual Humpback Whale watch held in the second half of the year. A number of these rare mammals were sighted from the lookout point at Copacabana Beach, east of Gosford.

Difficulties: Present staff numbers in the department have made it difficult to maintain a consistent programme of registration of specimens and at the same time provide the information and service required by the general public and scientific groups.

Overseas Visitors: Dr Judd Case, California, USA; Dr Evan Fordyce, NZ.



Marine Ecology

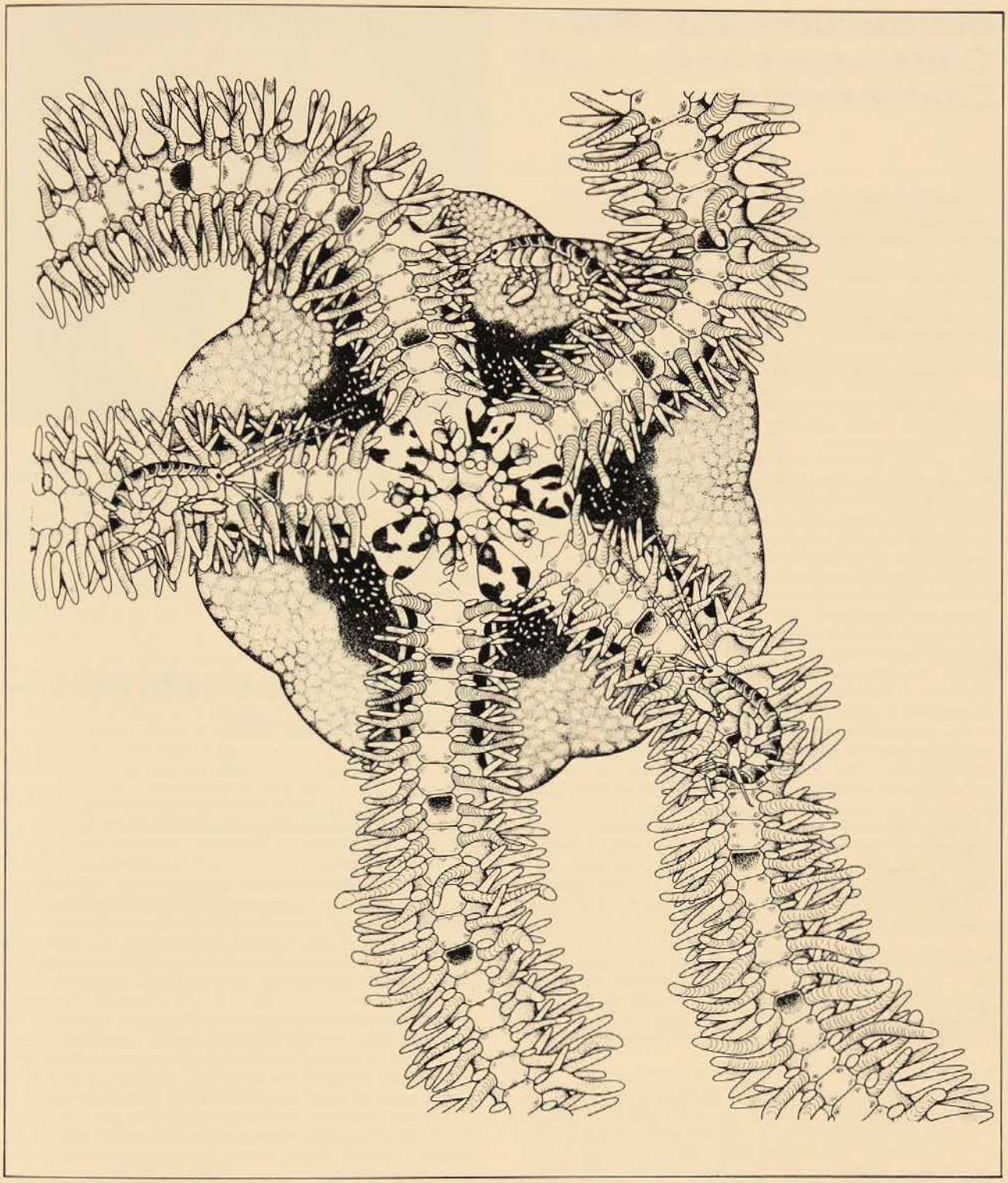
The department aims to provide basic information which will assist in the planning and management of marine environments and to answer specific questions relating to the effects of human impact. Research areas include the Hawkesbury River estuary and selected Great Barrier Reef islands. Both the estuary and the reef are environmentally sensitive and vulnerable. They require major research efforts to provide the ecological framework for adequate management. Long-term information is virtually absent and ecological mechanisms governing the distribution and abundance of species poorly understood. Research has concentrated on the bottom-dwelling (benthic) animals, considered to be the most reliable indicators of environmental conditions, as they are relatively immobile and cannot escape disturbances or pollution.

Current Research: Three research projects are currently underway. The first was initiated in 1976 and seeks to describe and analyse the benthic community of the Hawkesbury estuary. Because estuarine communities vary so much in space (responding to salinity gradients and changing sediments) and in time (both seasonally and annually), an adequate baseline description and monitoring must encompass both aspects. As a result, this study includes sampling sites from the junction with the Colo River to the mouth. During the past five years samples were collected every season. In the future sampling will continue at a reduced intensity. The time-consuming sorting of the samples has been reduced with the assistance of volunteers and three years' data are now available for analysis. A grant from the NSW State Pollution Control Commission (SPCC) enabled five years of sediment samples to be analysed.

The second project involves describing the invertebrate communities from the lagoon floor around selected Great Barrier Reef islands. Such work is new for the reef and required new sampling equipment and techniques to be devised. Difficulties in identifying the animals to species level has proved a major handicap though a section of the results has been prepared for publication.

A third project, located in the Hawkesbury River estuary near Brooklyn, is assessing the effects of maintenance dredging of the boat channel and the disposal of spoil on the bottom-dwelling community. This work, supported by SPCC grants is now virtually complete. The results were presented at the AMSA Conference by Dr Jones and a manuscript is nearing completion.

Several specimens of this spectacular jellyfish, *Phyllorhiza punctata*, are held in the collection of the Museum's Department of Marine Invertebrates (Crustaceans and Coelenterates). Jellyfish are difficult to preserve for display and the Museum's preparators are always looking for new ways to improve the process.
Photo: H. Hughes.



A new species of the amphipod genus *Melita*, which lives in association with the brittle star *Ophionereis schayeri*, is one of the subjects of biological investigation in the Department of Crustacea. (See report.)
Illustration by Sharne Dunlop.

Marine Invertebrates — Crustaceans and Coelenterates

The department is responsible for increasing and maintaining research collections of crustaceans (lobsters, prawns, crabs) and coelenterates such as jellyfish and anemones, and bryozoans (moss animals). The main subjects of research are peracaridan crustaceans — amphipods and isopods — and the research collection for this group is being expanded. Hermaphroditic amphipods and the life history of an amphipod which lives in close association with brittle stars, were among the interesting and important subjects of study this year.

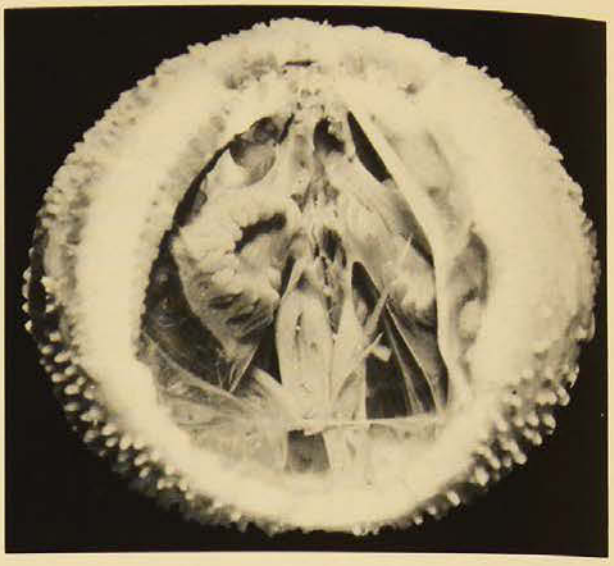
The department is also involved in teaching students at universities and in assisting other scientists studying marine invertebrates.

Research: Studies on subantarctic peracaridan crustaceans continues to be a focus of research. Dr Jim Lowry and Ms Helen Stoddart are completing their work on the diverse and interesting lysianassoid group of amphipods. In addition to the taxonomic work they will report on their discovery of hermaphroditism among the lysianassoids. Several collaborative studies are in progress. One project with Dr Jurgen Sieg; Universitat Osnabruck, West Germany, is a study of the systematics and ecology of tanaidaceans from subantarctic Macquarie Island. Another project with Dr Gary Poore, National Museum of Victoria, Melbourne, on the ampeliscid amphipods of eastern Australia is nearing completion. Dr Lowry and Mr Roger Springthorpe are taking monthly samples of a new species of melitid amphipod to study its life history. The amphipod lives commensally with a commonly occurring brittle star in the Port Jackson area.

Visiting Fellow: Dr Brian Kensley, Smithsonian Institution, Washington, DC, collaborated with Dr Griffin and Mrs Tranter in a study of pelagic shrimps and prawns from the continental shelf of New South Wales. The majority of species in this study have not previously been recorded from Australian waters.

Donations: Type specimens and other important material were donated by N. L. Bruce, P. De Deckker, M. M. Drummond, L. Kornicker, D. Dexter, J. Hall, B. F. Kensley, J. Kirkwood, E. Pope, D. Staples and the Roche Research Institute for Marine Pharmacology.

Loans: 51 loans involving 15 major groups of crustaceans, coelenterates and bryozoans were sent to workers in nine countries during 1981/1982. These included large collections of shrimps and prawns to Dr Brian Kensley at the Smithsonian Institution, USA, anthuridean isopods to Dr Gary Poore at the National Museum of Victoria and dromiid crabs to Dr Colin McLay at the University of Canterbury, New Zealand.



A species of *Podosphaeraster* new to science is currently being described by Dr. Frank Rowe, head of the Department of Echinoderms. The pea-shaped sea-star *P. polyplax*, is shown partly dissected to reveal complex internal structures. Its highly specialized digestive system is discussed in a paper by Drs. Rowe, Nichols and Jangoux. (See report.)
Photo: G. Millen.

Marine Invertebrates — Echinoderms

New species of deeper-water echinoderms will be added to the records of Australian fauna as a result of this year's activity.

The aim of the department is to carry out research on the systematics and zoogeography of echinoderms inhabiting the Indo-West Pacific continental shelf, especially that of the Australian Continent, to publish this information, and to maintain and expand the research collection of echinoderms, sponges and tunicates.

Additions to Collections: The echinoderm collection increased substantially this year due to collections made in northern NSW and the identification and incorporation of deep-sea material resulting from cruises conducted by NSW State Fisheries on FRV *Kapala*. The work was carried out between Coffs Harbour, NSW and Mooloolaba, southern Queensland in January and February, 1982. These collections have provided knowledge of further species range extensions and clarified systematic problems involving southern Australian and some tropical species of feather stars (comasterid crinoids).

Considerable attention has been given to identification of collections of deeper-water echinoderms (200-1,000 m depth), donated over the last few years from collections made during research cruises of FRV *Kapala*. As a result, many new records and a number of new species will be added to the Australian fauna.

It is anticipated that a number of publications will result from this work and preparation of these can begin during the coming year.

Sponge Collection: A start has been made on the incorporation of the collection of sponges formerly maintained by Roche Research Institute for Marine Pharmacology, received in June, 1981, and updating the systematic arrangement of the sponge collection.

Professor Patricia Bergquist, Auckland University, New Zealand, a foremost world authority on sponge systematics, is advising and assisting with this project. Sponges, after coelenterates, are the most significant invertebrate group in terms of biomass and in temperate areas they are dominant. It is, therefore, important to note that Professor Bergquist considers that "after the British Museum (Natural History) and the Paris Museum the collection in Sydney is historically and faunistically the most significant in the world".

Tasmanian Faunal Study: This study continues and has shown a complex pattern of faunal relationships including a widespread southern Australian element; up to 22% of the species are shared with New Zealand. A report on this study was presented by Dr Frank Rowe at the International Conference on echinoderm biology in Tampa, Florida, September 14-18, 1981.

Sea-star Manuscript: This recently completed manuscript was prepared by Dr Rowe with Professor D. Nichols (Exeter University, UK) and Dr M. Jangoux (Universite Libre de Bruxelles, Belgium). It describes the morphology of the pea-shaped sea-star *Podosphaeraster* and has been accepted for publication in *Micronesica*. Dr. Rowe has received more specimens of *Podosphaeraster* which require description from the Museum National d'Histoire Naturelle, Paris. *Podosphaeraster* is related to a Jurassic starfish called *Sphaeraster*. The genus *Podosphaeraster* occurs in the North Pacific and North Atlantic Ocean and the fossil *Sphaeraster* is found in sediments in Germany, France and Spain.

Visit to Overseas Museums: During an overseas study tour Dr Rowe worked at the United States National Museum (Smithsonian Institution) in Washington DC, British Museum (Natural History), London, Museum National d'Histoire Naturelle, Paris, and Universitat Hamburg (Zoologisches Museum), FRG. Studies of type specimens and other material of sea-stars (asteroids) and sea-cucumbers (holothurians) relating to research projects on the Australian echinoderms were undertaken.

Acknowledgements: The undermentioned have generously loaned material to the department: Miss A. M. Clark, British Museum (Natural History), UK; Dr D. Devaney, Bernice P. Bishop Museum, Honolulu, Hawaii; Professor Dr J. Hartmann, Zoologisches Museum, Universitat, Hamburg, FRG; Mr W. Zeidler, South Australian Museum, Adelaide, SA; Miss A. Green, Tasmanian Museum and Art Gallery, Hobart, Tasmania; Mr R. Green, Queen Victoria Museum, Launceston, Tasmania; Mrs S. Boyd, National Museum of Victoria, Melbourne, Victoria; Dr A. Guille, Museum National d'Histoire Naturelle, Laboratoire de Biologie des Invertebres Marins et Malacologie, Paris, France; Dr R. Wollacott, Museum of Comparative Zoology, Harvard University, Cambridge, Massachussetts, USA; Dr D. Pawson, Smithsonian Institution, Washington DC, USA; Dr J. C. den Hartog, Rijksmuseum van Natuurlike Histoire, Leiden, Netherlands; Dr S. van der Spoel, Zoologisch Museum, Universiteit van Amsterdam, Netherlands; Dr F. J. Madsen, Universitetes Zoologiske Museum, Copenhagen, Denmark; Dr C. B. Goodhart, University Museum of Zoology, Cambridge, UK.

Visitors: Dr P. Mather, Queensland Museum; Professor Pat Bergquist, University of Auckland, NZ; Mr Alastair Birtles, James Cook University; Mrs L. M. Marsh, Western Australian Museum; Ms Jan Marshall, Western Australian Museum.

Marine Invertebrates — Worms

Only recently have polychaetes, a large and important group of marine animals, begun to be studied in Australia. The department has three main long term research objectives:
(a) to describe the polychaete fauna of Australia and provide keys for the non-specialist,
(b) to study the recruitment and establishment of polychaete communities on a long term basis and their roles in coral reef ecosystems,
(c) to study bioerosion of coral substrates by identifying the major causal organisms and their rates of action.
Concurrently, the department seeks to stimulate interest in all aspects of the biology of polychaetes.

South Australian Marine Worms Studied: During the year Dr Pat Hutchings undertook a project funded by Australian Biological Resources Study (ABRS) to describe the polychaete fauna of South Australia. As a result, 17 new species of the family Nereididae have been described, even though this family had already undergone recent revision. A paper on this is in press and another on the family Spionidae is nearing completion. The South Australian polychaete fauna shares some species with eastern Australia and others with Western Australia, but a few species seem to occur right across the southern part of the country.

Coral Reef Studies: Dr Hutchings and Ms Anna Murray have recently completed a paper on the patterns of recruitment (addition of new juveniles to the population) of the common polychaete species at Lizard Island. The species selected show different patterns of recruitment according to sites, and the intensity of recruitment varies between years. This work was funded by Australian Research Grants Scheme (ARGS).

Dr Hutchings continued to receive support from Australian Marine Sciences and Technologies Advisory Committee Funding Advisory Panel (AMSTAC-FAP) to study rates of bioerosion and determine major causal organisms at Lizard Island. The preliminary agents of bioerosion of newly available coral substrates are polychaetes. Sponges and sipunculans which are important in advanced stages of bioerosion play no role in the initial process. At Lizard Island rates of bioerosion vary significantly between sites and from month to month.

Studies of Hawkesbury River: The department is also studying the reproductive strategies of a virtually freshwater polychaete, so far only reported from the upper reaches of the Hawkesbury River. Very few polychaetes live in freshwater and little is known of their reproductive patterns.

Research with other Institutions: Dr Hutchings received funding from the Co-operative Systematics Research Program of the United States Antarctic Research Program (USARP) run by the Smithsonian Oceanographic Sorting Centre, to carry out a preliminary sorting of a very large collection of the family Terebellidae from the Antarctic. At the end of the grant period she hopes to have a better estimate of the number of described and undescribed species present in the collections. Additional funds will then be sought to describe the new species.

Dr Hutchings spent four weeks in Israel during July/August, 1981, as a guest of Professor Yossi Loya, the University of Tel Aviv, setting up a series of experiments to investigate patterns of polychaete recruitment in the Gulf of Eilat. Professor Loya is

arranging for the samples to be collected at intervals during the next two years.

Dr Hutchings presented a paper at the Annual Conference of the Australian Marine Sciences Association entitled 'Wetland Conservation — Are the Biologists Failing?', and a joint paper 'The Problems of Managing Coastal Wetlands' at ANZAAS with Dr Harry Recher and Ms Jo Moss (NSW Planning and Environment Commission). Dr Hutchings also gave evidence during an enquiry conducted in the NSW Land and Environment Court on a proposed canal estate at Forster and Tuncurry, NSW. The proposal, first rejected, will now proceed with environmental monitoring. Two major reviews on the fauna of Australian mangroves (in conjunction with Dr Recher) and Australian seagrass beds were completed and will be published next year.

International Conference Planned for 1983: Plans are well underway for the forthcoming First International Polychaete Conference being held at the Australian Museum from 4 July to 9 July, 1983 and a large number of overseas scientists is expected to attend.

Visitors: Dr Peter Davies, Bureau of Mineral Resources; Dr Leong Tak Seng, Malaysia.

Donations: Mr G. Edgar, University of Tasmania; Dr K. Fauchald, US National Museum; Dr R. Gibson, Liverpool Polytechnic, UK; Dr Hartmann-Schroder, Universitat Hamburg, Germany; Mr T. Healy; Dr J. Kudenov, University of Alaska; Mr K. Robinson, University of New South Wales; Dr P. Saenger, Queensland Electricity Generating Board.

Acknowledgements for Loan Material: Dr K. Fauchald, US National Museum; Ms J. Fournier, National Museum of Natural Sciences, Ottawa; Dr D. George, British Museum (Natural History), London; Dr G. Hartmann-Schroder, Universitat Hamburg; Dr M. Jones, US National Museum, Washington; Mr P. Lambert, British Columbia Provincial Museum; Ms L. Marsh, Western Australian Museum; A. Muir, British Museum (Natural History), London; R. Olerod, Swedish Museum of Natural History; Dr C. C. Lu, National Museum of Victoria; J. Phillips, National Museum of Victoria; Dr J. Renaud-Mornant, Natural History Museum, Paris.

Mineralogy and Petrology

Acquisitions and purchases during the year swelled the collections by 175 minerals and 307 rocks.

Important purchases were made of gem crystals of diaspore from Turkey, a range of diamonds, alexandrite, amethyst and rare gemstones among other items. A spectacular example of pyrite crystals from Peru was put on display. A public appeal raised the necessary funds — over $1,000 for its purchase.

These additions greatly help to achieve the department's aims to maintain representative collections of minerals and rocks for scientific research and public display. The collections comprise Australian and overseas specimens, with selections of gem and ornamental stones, meteorites and tektites.

New Mineral Gallery: A fresh approach to the display of the Museum's minerals was suggested by the Curator to overcome the forbidding layout of the present gallery. The Museum commissioned a survey by market research consultants of public attitudes to mineral displays in general and the new proposals in particular. Results from the survey are now being incorporated into a more stimulating and educational gallery design.

New features will include a special gem room displaying the Museum's rare and exquisite gems on moving platforms under innovative lighting. Other features planned include an introduction to minerals in the foyer and special display enclosures simulating the underground atmosphere of mines and caverns. Australian minerals will be a major highlight of the gallery. Fluorescence and radioactivity are just two of the characteristics that will be displayed and specimens will be enhanced by three-dimensional views of mineral localities. A special display on Broken Hill will also be incorporated into the new gallery.

Construction is expected to begin in 1983 and the gallery will be completed mid 1986.

Valuable Research Material: Eastern Australian volcanic rocks and high pressure minerals from the mantle and lower crust are the main research subjects. This study is closely allied to the work of other institutions. Results are now being co-operatively published by the Oslo Museum, Norway; the Bureau of Mineral Resources, Canberra; Macquarie University and the NSW Department of Mineral Resources, Sydney; and the University of Melbourne, Victoria. Some of the study material collected is among the best available in the world. Interesting results are emerging from the department's parallel study of zircons and their origin in eastern Australia.

A magnetic survey, the first geophysical survey by the department, was a highlight of the year's field work. Mr Ross Pogson revealed the detailed structure of a gem-bearing volcanic pipe near Proston, central Queensland. Dr Julian Hollis worked with Dr Jim Specht of the Anthropology Department on a survey of pottery and stone sites in west New Britain.

Cut-backs in funding of universities and Government departments has led to problems in co-operative research and use of sophisticated analytical equipment.

To complete a study of secondary uranium minerals from the Northern Territory, Mr Pogson and Ms Joan Hingley are using the facilities of the CSIRO Division of Mineralogy.

Space Problem: The collection continues to suffer from a shortage of space; plans for reorganisation and relocation are being implemented through the Department of Public Works.

Ross Pogson, Technical Officer, and Albert Chapman, Museum Associate, collect minerals from an outcrop of gossan at the Blackwoods Open Cut, South Mine, Broken Hill, before its removal. The gossan is the decomposed upper part of a mineral vein or ore deposit and that area of this mine has produced many superb specimens of copper, lead and zinc minerals.
Photo: J. Fields

Fourth Mineral Sale: The annual Mineral Sale is designed to increase public awareness of mineralogy and to assist Museum funding. In October, 1981, the department held its fourth sale. Due to good publicity and effective promotion, the sale proved very popular and raised a net profit of $18,000.

Book on Broken Hill Minerals: Photographs of specimens from the Museum's Broken Hill collection were selected for the book being prepared by Conzinc Riotinto of Australia Ltd for the Broken Hill Centenary in 1983. Mr Oliver Chalmers and Mr Albert Chapman, Museum Associates, have contributed chapters to it.

Donations: Core of Starvation Lake meteorite, NSW, from South Australian Museum; iron meteorite, Arnhemland, from M. G. Hume; heavy mineral concentrates, New England, NSW, from stellar minerals.

Visitors: Professor W. Griffin, Oslo, Norway.

Ornithology

Collection: A total of 1,371 specimens were registered during the year. This figure included 350 study skins, 185 spirit specimens and 825 eggs from the notable Bay and Moore Egg Collections. Several hundred specimens were prepared for skeletonisation. These gains will advance the aims of the department to research, collect and promote knowledge of birds in the Australian and Pacific regions. The department offers researchers its scientific resources and materials through short term loans. A number of major additions to the collection have been made during the year. Two previously unrepresented Australian species, White-throated Grasswren *Amytornis woodwardi* and White-lined Honeyeater *Meliphaga albilineata*, as well as some other poorly represented taxa, were collected under permit in the Northern Territory. A pair of Cape Gannets *Morus capensis*, a species first recorded in Australia only last year, was obtained on exchange from the Durban Museum, South Africa. Thirty unrepresented species, primarily from New Guinea and Indonesia, and rare seabirds recorded from Australia, were received on exchange from the American Museum of Natural History, New York. Ms J. Ovenden donated a large series of rosellas collected as part of her postgraduate studies; these included several hybrids and representatives of isolated populations. Ms Ovenden's studies were partly supported financially by the Museum. Specimens of a few previous unrepresented birds were received from Christmas Island. Mr Walter Boles donated specimens that he had collected in Papua New Guinea. Some specimens, including co-type of a subspecies of the Yellow Robin *Eopsaltria australis jacksoni*, were acquired from the estate of E. P. Ramsay, a former consulting ornithologist to the Museum.

While on leave Mr Boles assisted members of the Preparation Department with the collection of specimens in Papua New Guinea for the new Abelam Gallery and the departmental collection.

Computer Register: The current (O) ornithological register of 56,500 specimens has been placed on to magnetic tape. These have been largely edited and corrected. Dictionaries of valid scientific names, countries and collection names have been updated and encoding of the Palmer register (the Museum's earliest register) is nearing completion. Latitudes and longitudes of Australian specimens have been completed. With the assistance of Australian Biological Research Studies (ABRS) funded personnel, the computer register has made considerable advances and should be functioning by the end of 1982.

Curatorial Programmes: Numerous additions were made to the spirit collection. Although started only in the last three years, it now contains 500 specimens of 200 species. Shortage of space to store the collection will be a problem next year if it continues its current rate of growth.

The dermestid or beetle colony housed in a metal shed for cleaning skeletons, is now partially functional; it has been outfitted to keep the insects. Once fully operational, there will be a rapid growth in the skeleton collection. Several hundred specimens are currently awaiting skeletonisation.

The Bray and Moore egg collections were registered, boxed and incorporated in the Museum holdings. Some 7,000 clutches have been curated in this manner and await renovation of the storage area.

Staff Activities: Mr Boles acted as scientific advisor for the new bird gallery which opened in March.

Research: Mr Boles and Mr Longmore continued their work on the avifauna of Clarke Range, Queensland; descriptions of new subspecies of birds from this area were submitted for publication. The first known eggs of the White-lined Honeyeater *Meliphaga albilineata*, have been described by Mr Longmore who discovered them and continued his studies of this species. He is preparing a list of type specimens held by the department. Mr Boles commenced work on the Australian grass finches (Estrildidae) and introduced finches (Passeridae, Ploceidae, Carduelidae) for the checklist of Australian birds. He worked on the description, development and systematic value of juvenile plumages of passerine birds, particularly the Australo-Papuan robins. Work was carried out in the Darwin district and around outlying sections of the Arnhemland Escarpment.

Field Trips: Collecting activities during field work are directed towards filling specific gaps in the collection and towards obtaining necessary specimens for ongoing research projects. Mr Boles, Mr Longmore and Mr Greg Gowing of the Vertebrate Ecology Department, spent six weeks in the Northern Territory in late August to early October. They collected specimens of poorly represented or unrepresented species.

Associates: Mr N. W. Longmore and Mr T. R. Lindsey were elected as Associates of the Museum for their contributions and assistance to the Department of Ornithology.

Ms M. de Jose was funded to help in preparing specimens for skeletonisation. A grant from Australian Biological Resources Study (ABRS) to the Museum for computer registration was used to employ personnel to decode and edit records.

Consultations: During the year consultations were held with the following: Department of Business and Consumer Affairs (Customs); Animal Quarantine Service (NSW Division); NSW National Parks and Wildlife; State Pollution Control Commission; students of several universities; Forestry Commission of NSW; Royal Australasian Ornithologists' Union. The department continues to assist with peer teaching and work experience projects organised by the Education Section. Identification of birds for export continued.

Acknowledgements: Several Australian institutions and overseas museums provided information and specimens for study. These include: New South Wales National Parks and Wildlife Service; National Museum of Victoria, Melbourne; South Australian Museum, Adelaide; Queensland Museum, Brisbane; CSIRO Division of Wildlife Research, Canberra; Queen Victoria Museum and Art Gallery, Launceston; Macleay Museum, Sydney; American Museum of Natural History, New York; British Museum (Natural History), Tring; National Museum and Art Gallery of Papua New Guinea, Port Moresby; Western Australian Museum, Perth; Conservation Commission of Northern Territory; Forestry Commission of New South Wales; Royal Australasian Ornithologists Union; and Australian National Parks and Wildlife Service.

Palaeontology

The Palaeontology Department is responsible for the museum's collections of all fossil remains of plants and animals (invertebrate and vertebrate). It aims to maintain comprehensive collections of Australian fossils from all geological periods and representative examples of material from other continents.

Departmental research work concentrates on the early evolution and distribution of vertebrates (Ordovician, Silurian and Devonian) in Australia and their relationships with similar faunas of other continents, on Devonian marine faunas of eastern Australia, on Palaeozoic and Mesozoic fossil plants of eastern Australia and on Pleistocene fossil marsupials of New South Wales.

The palaeontological collection of over 68,000 specimens includes a wide range of types and specimens illustrated in the scientific literature.

During the year 1868 specimens were registered of which 1300 were donated.

Research and Field Work: Dr Alex Ritchie continued research work on Devonian fossil fish faunas of Australia and Antarctica, particularly on the arthrodiran fish, *Groenlandaspis*. Most of the new material recovered from sites in central Victoria in 1981 has been prepared and Mr J. Long, Monash University, Melbourne, has collected and forwarded for study *Groenlandaspis* material from other new sites recently discovered in Victoria. This brings to about 25 the number of occurrences of *Groenlandaspis* on five continents. An active search for other *Groenlandaspis* sites has been halted pending completion of the monograph currently under preparation.

New Devonian Fish from Braidwood, NSW: The large quantity of well-preserved plates of two Late Devonian armoured fishes recovered earlier from a site east of Braidwood, NSW, has been fully prepared and cast for study. A return visit was made to the site in early 1982 by Dr Ritchie and Mr Robert Jones, assisted by Mr Bruce Ritchie and Mr Tim Cogger. The position of the fishbed in the Devonian succession of the Budawang Range Synclinorium was established and its age clarified. Further excavation of the site yielded some fine additional specimens, including several bone elements which were missing from the original material. A paper describing a new placoderm genus related to *Phyllolepis* has been completed.

Horned Turtles, Lord Howe Island: Preparation of the blocks of calcarenite recovered from sites on Lord Howe Island in 1980 produced a fine bony tail sheath and a considerable portion of the plastron (the underside of the shell). The composite replica of the skeleton of the horned turtle, *Meiolania*, made by Dr E. S. Gaffney and his team at the American Museum of Natural History, New York, arrived in Sydney in April, 1982. It was assembled by Miss Anne Burke, from the American Museum of Natural History, who accompanied Dr Gaffney to Australia in June, 1982, to carry out further field work on Lord Howe Island.

In April, 1982, Dr Ritchie represented the Australian Museum on Lord Howe Island at the celebrations marking the Centenary of the first official NSW Government Scientific Expedition to the Island in 1882.

Storage Space Renovations: The main palaeontology storage area has been completely renovated during a two year programme. The whole area was painted and re-floored and new lighting as well as work benches were installed, vastly improving conditions. The new mezzanine in the Etheridge Room was furnished with over 50 steel cabinets and a Halon gas fire-extinguishing system.

A reconstruction of the extinct horned turtle, *Meiolania platyceps*, was mounted by Museum paleontologist Mr. Bob Jones with the expert assistance of Ms. Ann Burke of the American Museum of Natural History. The only fossil remains of the turtle were found on Lord Howe Island and have been studied by the Australian Museum and by Dr. Eugene Gaffney of the American Museum of Natural History. Photo: J. Fields.

Palaeobotanical Display for 13th International Botanical Congress: To coincide with the 13th International Botanical Congress held in Sydney in August, 1981, the Museum mounted a major display of fossil plants — *The Genesis of Australian Flora*. Under the supervision of palaeobotanist and Research Associate Mrs Mary White (who has been employed on Trust funds to reorganise and curate the fossil plant collections), some of the finest specimens in the Museum's collection went on display for the first time to illustrate the development of vegetation in Australia from early PreCambrian times — over 3,000 million years ago — to the present time.

This helped to attract so many visiting palaeobotanists attending the conference that during August, 1981, over 50 scientists from many countries took the opportunity to examine material in the collections. Some visitors returned several times for lengthy periods and from the contacts made the Museum expects to carry out useful exchanges of palaeobotanical material. Knoxville International Energy Exposition: the department collaborated with the Commonwealth Government's Department of Housing and Construction to provide a range of attractive fossil plant specimens to be displayed in the Australian Pavilion in Knoxville, Tennessee from May 1 to October 31, 1982.

Devonian Fish From Gogo, WA, Reconstructed: During the year Mr Robert Jones completed the delicate task of extracting and reconstructing several more specimens of Late Devonian fish from calcareous nodules collected by Dr Ritchie in north-west Australia in 1970. The most impressive specimen was an almost complete head and trunk shield of the strange, bulky arthrodire, *Holonema*.

Overseas Visitors: Professor H. P. Banks, New York, USA; Dr F. Hueber, Washington, USA; Professor W. Chaloner, London, UK; Dr J. C. Balouet, Paris, France; Mr Liu Fa, Changchu, China; Professor R. Fox, Edmonton, Canada; Professor P. Martin, Arizona, USA; Dr J. Kukalova-Peck, Ottawa, Canada.

Terrestrial Invertebrate Ecology

The department of Terrestrial Invertebrate Ecology is primarily research-orientated and priority is given to studies of man's impact on the natural environment.

Leaf Litter Study: Over the past 12 months the department has concentrated on a major research project designed to investigate the impact of 'prescribed burning' on leaf litter invertebrates. The study, which commenced in the middle of 1980, is being conducted in the Kiwarrak State Forest, 10 km south of Taree. Three plots were burned during the year bringing the total number burnt in the project to six. These are being compared with the six control plots where no burning was conducted. Leaf litter invertebrates were sampled on all twelve plots in July and October, 1981, and January and March, 1982. In addition, the three newly burnt plots were sampled immediately after burning in August.

Six litter fall collectors were installed on each plot to measure the yearly quantity of leaf litter. This is of special interest on burnt plots as a measure of the rate of return of habitat for leaf litter invertebrates. The composition of the flora on each plot was measured during the year so that species composition changes following the fire could be detected.

The formidable task of processing the invertebrates contained in the 800 samples collected has already begun. Over 50,000 animals have been assigned to their taxonomic groups and some preliminary analysis of the results has been carried out. A paper detailing results to date was given at the ANZAAS Congress in Sydney in May.

Mammal Diet Study: During August a study designed to compare different methods of assessing invertebrates available to ground dwelling insectivores (mammals) was carried out jointly with Gary King of the Forestry Commission of NSW. The study compared the use of pitfall traps, Berlese Funnels of two designs and hand sorting. The results of this study are presently being written up for publication.

Faunal Surveys: During the year Dr Kingston undertook faunal surveys of five areas on behalf of State Government departments and private developers. The reports produced made suggestions about how the proposed developments could be implemented with the least impact on the fauna and in some cases made recommendations for more detailed surveys in certain key habitats.

Vertebrate Ecology

Introduced honeybees and their effect on native bees and nectar-feeding birds is a new research programme taken up by this department during the year.

This unique study is in line with the aims of the section which are to conduct basic research on the ecology and behaviour of Australian vertebrates and to apply the principles of ecology to problems of land management.

Fire ecology, the ecology of nectar-feeding birds and the ecology of forest vetebrates are the main areas of research. Studies are also conducted on the abundance of forest vertebrates and the pollination biology of Australian plants.

Fire and Forests: A fire in November, 1980 burnt a number of study plots where Dr Harry Recher had been investigating bird and small mammal populations in the Nadgee Nature Reserve and nearby State Forests. Research programmes were therefore altered to include studies of the effects of this fire on forest environments. The fire also affected small mammal plots in Nadgee where studies have been underway since 1969; analyses of the effects of the 1980 fire were compared with observations made after the 1972 fire in Nadgee and strengthened evaluation of the potential impact of pre- or post-logging burns on forest fauna in the Eden Woodchip Concession.

Honeyeaters, Flowers and Fire: Dr Graham Pyke and Dr David Paton continued studies of honeyeaters and pollination ecology of nectar-rich flowers. These projects were supported by grants from the Australian Research Grants Scheme (ARGS) and the Queen Elizabeth Scheme. Among the plants investigated were Christmas bell (*Blandfordia* spp.), Mountain bell *(Lambertia formosa)* and Waratah *(Telopea speciosissima)*. All are common flowers in the coastal heaths of New South Wales and each require special management to ensure their conservation. Christmas bells and Waratahs are popular cut-flowers and illegal picking is a problem in parks near Sydney. The Museum's work provides an insight into the requirements of these plants and their response to fire. With such information it is possible to fine-tune fire regimes so as to manage the vegetation and ensure these flowers will remain abundant in spite of flower pickers. Investigation into the movements of honeyeaters with respect to abundance of food resources has continued.

Nectar-feeding Birds and Honeybees: A unique study of the impact of the introduced honeybee *Apis mellifera* on native bees and other native nectar-feeding birds was conducted. The only place in NSW found to be free of honeybees was in the Snowy Mountains; as an experiment, hives were taken into the high country and the impact of the bees on other insects and nectar crops was measured. The study, which is important for management of natural areas, has shown that the honeybee seriously affects native wildlife and may interfere with the pollination of native plants. This project was supported by the NSW National Parks and Wildlife Service.

Foraging Ecology in Birds: Dr Ted Davis joined the department in March on sabbatical leave from the University of Boston in the United States. He and Dr Recher joined in studies of the foraging ecology of white-faced herons *(Ardea novaehollandiae)* and mangrove herons *(Butorides striatus)* at Careel Bay and Patonga on the Hawkesbury River. They also studied the winter foraging ecology of brown and striated thornbills *(Acanthiza pusilla* and *A. lineata)* in forests on the southern tablelands and compared this with the habits of the birds in plantations of the exotic pine *Pinus radiata*. Dr Davis also recorded the distress calls of birds as they were taken from mist nets.

Acknowledgements: Research in south-eastern NSW was supported by a grant from Harris Daishowa Pty. Ltd. The Forestry Commission of New South Wales made available its facilities in the Bondi State Forest and encouraged work throughout the Eden district. The Forestry Commission and National Parks and Wildlife Service permitted work on lands under their management.

Interpretive Activities

Children particularly have found the Abelam gallery an interesting place and were only too ready to express their opinions of the new gallery to the television cameras.
Photo: J. Fields.

Community Relations

It is the aim of the Office of Community Relations to forge enduring links between the public and the Museum by disseminating information about the Museum's purpose and activities, and to win increasing support in visitation and sponsorship. To achieve this every means of communication — press, television, radio, advertising and publications — must be fostered and strengthened, and good public relations must be the subject of constant vigilance.

Among the publications produced during the year were two handbooks for the new semi-permanent galleries — "The Abelam, A People of Papua New Guinea" and "Mammals in Australia". These publications although serving as a guide to the galleries are also useful sources of information on these subjects and can be used without reference to the galleries. Both have been distributed throughout Australia as well as being on sale in the Museum.

The 1982 calendar appeared in November. Its theme was also the Abelam people, their decorative art being an excellent subject for a calendar.

Two posters, one on the Abelam gallery and the other publicising the new "Birds in Australia" gallery were produced and placed on sale in the shop.

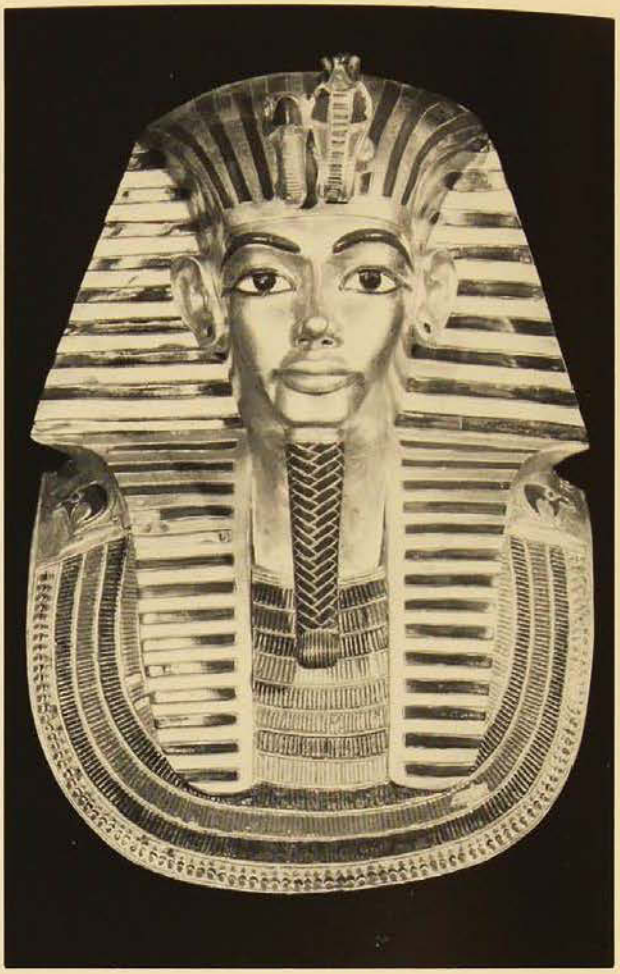
The most important publications are "Australian Natural History" magazine and "Records of the Australian Museum". Six issues of "Australian Natural History" were produced rather than the normal four. This placed the magazine back on schedule. There has been further improvement in the magazine's style and format and this has been reflected in vastly increased sales and subscription numbers. At the end of the financial year the magazine had just over 7,000 subscribers (a 21% increase for the year) and distribution to newsagents has been successfully negotiated. The number of subscribers renewing their annual subscription has also improved to between 60-90%, the higher figure being an unprecedented proportion.

Six issues of the Records of the Australian Museum were published. The largest of these was Part Three of the major study of Snapping Shrimps by world authorities, A. H. and D. Banner, Vol. 34, No. 1. Although there is still a very serious backlog in papers awaiting publication the department expects to overcome this in the coming financial year.

Other publications included three technical reports and four quarterly brochures.

The Museum has gained much attention in the media. The number of articles, interviews and special items appearing in the media is unprecedented. The new galleries — Birds in Australia, Mammals in Australia and the Abelam — all received special attention in newspapers, on radio and on television. Other events such as temporary exhibitions, conferences, the moving of the Skeleton Gallery, the Mineral Sale, International Museums Day, the Museum's lack of space and many other matters all received good publicity.

Every new exhibition is opened at a special function which has served to publicise the new gallery's existence as well as to thank those who have been involved in its production. There were five such functions during the year, each of them being organised by the department's officers. Probably the most exciting and successful of these was the opening of 'Birds in Australia' at the end of March. The function was organised in conjunction with the Australian Museum Society, who were also celebrating their tenth anniversary and had become the benefactor for the gallery. The highlight of the evening was an address by 'Charles Darwin', brilliantly impersonated by Ronald Strahan.



A faithful replica of the funerary mask of Tutenkhamun was one of the items being sold at a special pre-Christmas sale by the Museum Shop. Over 300 people attended the evening sale and all Tutenkhamun replicas were sold.
Photo: J. Fields

The Premier, Mr Wran, officially opened the gallery 'The Abelam — A People of Papua New Guinea' while the Attorney-General, the Hon. F. J. Walker, LIM, opened the 'Mammals in Australia' gallery.

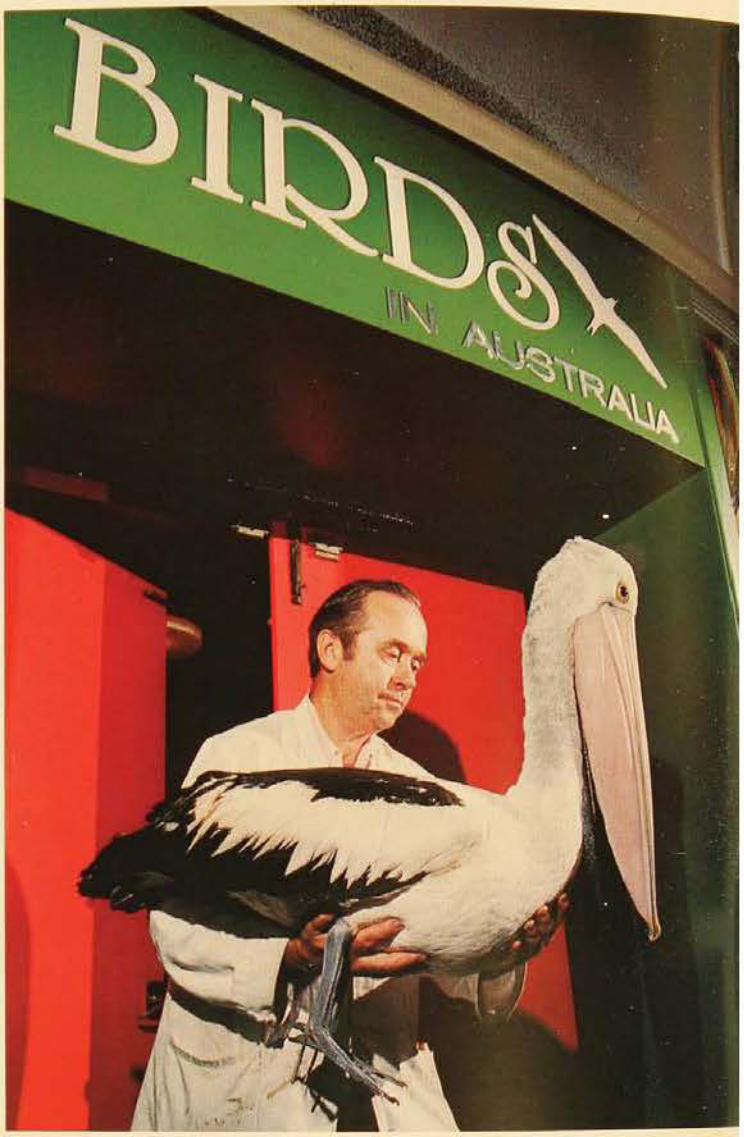
Sunday at the Museum, a combination of concerts and children's activities on the second Sunday of each month, had fluctuating attention from the public. This has depended as much on the performers as on the promotion, and the programme is still undergoing some changes.

The museum shop provides visitors with a source of quality educational goods relevant to the museum as well as providing much needed revenue. It experienced a growth in net profit over the previous year, but seems to have suffered the effects of a poor economy. A highlight was the pre-Christmas sale of Tutenkhamun replicas. The sale was such a success that similar sales are planned for the coming year to boost shop revenue. A continuing effort has been made to upgrade the shop to achieve the image of a supplier of quality, reliable goods. Artefacts and dinosaur toys and models in particular, enjoyed an increase in sales compared with the previous year probably because of better displays.

A *baba tagwa* figure stands at the entrace of the new permanent exhibition, 'The Abelam, A People of Papua New Guinea'. Adult Abelam men wear this costume to frighten the uninitiated away from the area where preparations for male initiations are made.

Photo: J. Fields

1



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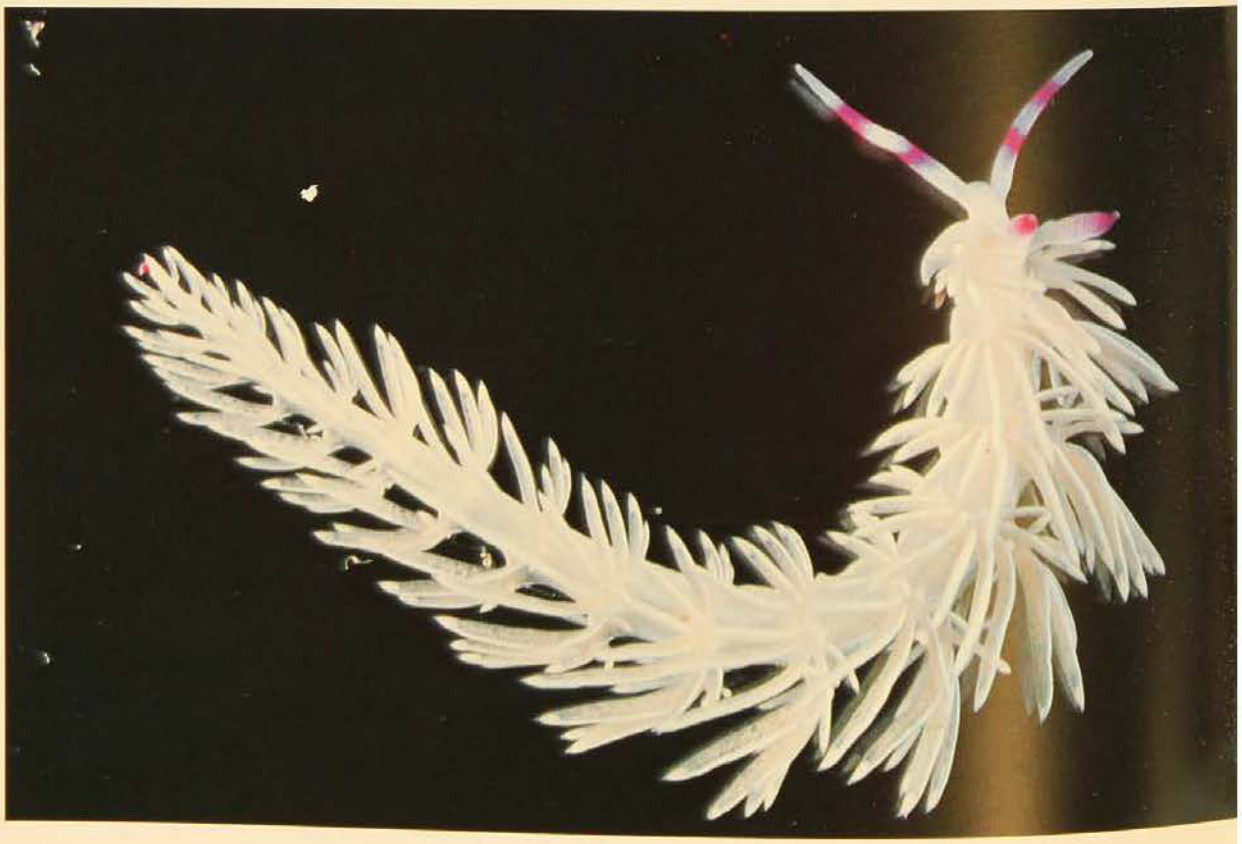


1. Rolf Lossin, Museum Preparator, adds one more specimen to the five hundred excellent examples of Australia's bird fauna on display in the major exhibition, 'Birds in Australia'. Opened in April, 1982, the exhibit describes the origins and behaviour of our birds and features eight audio buttons which allow visitors to listen to 32 bird songs. 'Birds in Australia' was sponsored by The Australian Museum Society.
Photo: J. Fields

2. Jane Hall, Research Assistant of the Malacology Department, examines the mouth parts of a tiny water snail in the course of her work on a large research project on micromolluscs.
Photo: H. Hughes.

4

3. This common Sydney nudibranch, *Pteraeolidia ianthina,* is one of a number of species recently discovered by our malacologists to cultivate microscopic one-celled plants (zooxanthellae) in their tissues. Usually specimens of this size (50 mm long) are coloured brown by the plants living in their tissues, but this white specimen has yet to find a suitable source of zooxanthellae.
Photo: W. B. Rudman.

4. This fine specimen of *Dicroidium callipterioides,* a delicate seed fern from the Bulli roof shales, is just one of the large collection of plant fossils held by the Australian Museum.
Photo: G. Millen.

5. On display from August 20 to October 1, 1981, the temporary exhibition, 'Genesis of Australian Flora', was timed to coincide with the XIIIth International Botanic Congress in Sydney. The exhibition showed a magnificent fossil record of Australian plants through geological time to the present.
Photo: J. Fields

5

Aboriginal rock art from Noarlangie, Alligator River, N.T. Museum anthropologists are continuing to work toward a better understanding between the Museum and the Aboriginal people. As part of this programme, loans of artifacts are regularly made to Aboriginal communities for display.
Photo: R. Edwards.

The new gallery, Mammals in Australia, gained an award in best new exhibition category in the annual "Museum of the Year" competition run by the Museums Association of Australia. This part of the exhibition displays some of the many different kinds of kangaroos.
Photo: J. Fields

Education

The main aims of the Education Section are to provide educational programmes which help to create interest in the subject matter being studied, communicate knowledge and develop attitudes consistent with the Museum's fundamental purpose.

The review of the Education Section in the first months of 1981 brought about a number of changes to the organisation of school groups and the introduction of volunteer training. An important corollary of all these changes was a further evaluation of the effectiveness of each programme.

School Groups: A number of changes to the teaching programme were introduced at the beginning of the 1982 school year. The aims of these changes were to increase the enjoyment and educational value of visits by school groups, to ensure equitable State-wide access to education services and to utilize time, space and teaching resources as fully and efficiently as possible.

As part of the effort to keep schools informed, a newsletter and a calendar of special programmes were produced and sent out.

Special measures have been made to improve the lessons themselves. Twelve trained volunteers began assisting with lessons in Term II and scientific staff have been involved to a greater extent in the preparation and evaluation of teaching material.

An evaluation of these changes was carried out using questionnaires and group discussion among teachers. A report is in preparation. Results show that there has been a significant improvement in teachers' opinions of the lessons.

The total number of school classes attending lessons organised by Education Officers over the past twelve months was 820, comprising about 30,000 children. This is approximately the same as last year. Schools visiting the Museum without appointment totalled 1,400 classes; some of these groups were supplied with activity sheets and general information.

Peer teaching (children teaching each other) involved preparatory sessions at the Museum for four groups, comprising 117 children who, as a result, became peer teachers. In turn, these peer teachers were able to teach many thousands of pupils in the 13 participating schools. Development of the programme has been assisted by Miss Robyn Lilienthal, Consultant in Education for Talented Children and by Neutral Bay and Paddington Public Schools. The CSIRO in conjunction with the ACT Schools Authority, is starting a pilot peer teaching programme based on the Museum's model.

Some 47 secondary school students participated in the Work Experience programme. More rigorous selection procedures have meant that many excellent and highly motivated students have worked in a greater variety of Museum departments.

Volunteers: Following the recommendations of the Education Review, training courses for volunteers were organised. The first intake of 15 people was given a four-week training course two days per week to prepare them to assist in the January school holiday activities. The second intake in February of a further 15 people was trained for holiday and/or school class programmes. Each course consisted of lectures, practical sessions and observations of methods. For the holiday programmes, emphasis was placed on close involvement in planning the activities and this proved most beneficial when the volunteers were working with children and family groups during the May holidays. Five volunteers from the first intake remained. Since May, further training has continued and volunteers are assisting in school lessons and in various other areas of the Education Section.

Volunteers have also assisted in the school loan case scheme.

Teacher Trainees: Demonstration lessons and lectures on the Museum's education facilities were given to groups of trainee teachers from various tertiary colleges. Some students spent several days observing and assisting in lesson or holiday programmes.

Adult Education: The department continues to involve itself with the WEA programme and with the Museum Studies course.

The Australian Museum Train: The train spent the year at centres closer to Sydney, after visiting most of the State during the past four years. On tour for 244 days in 1981-82, the train stopped at 24 centres and was visited by 61,000 people of whom 28,300 were children in 943 school classes.

In Term III, 1981, visits to centres for the handicapped were begun and these were so well received the work was continued in 1982. Greater efforts were also made to interest community groups in visiting the train for special programme in the evenings or weekends.

Results from a questionnaire are being used in the design of new lesson programmes and planning for a new exhibition in the train is well advanced. Work will commence when the train completes its tour of the State at the end of July.

Various breakdowns through the year, particularly to the electrical system, were repaired by the State Rail Authority which, as always, has been most co-operative. Special thanks are also due to the NSW Department of Education which provided co-ordinators for school visits at each stop.

Museum on the Road: These travelling exhibitions are set up in libraries, shopping centres, civic centres or galleries. Public response is dependent on the enthusiastic support given by co-ordinators at each centre. These co-ordinators recorded visits by 23,000 children in school classes and estimated the total number of visitors (school classes and general visitors) at 111,500 people.

Successful country tours of the exhibitions were continued with 'Arid Australia', 'Man — A Peculiar Primate' and 'Story of the Earth' being taken as far north as Kempsey and west to Dubbo. 'Life in the Sea' is still the most popular exhibition and is now nearing the end of its outer urban circuit. 'Man — A Peculiar Primate' was withdrawn in December, 1981, after five years on tour. The newest, most spectacular exhibition, 'Mammals in Australia', opened on 18 June, 1982. It was sponsored by the State Bank of New South Wales and its first circuit will be the outer western suburbs of Sydney.

School Loan Travel Cases: This scheme received a boost from the sponsorship of John Fairfax Limited during the year. Twelve of the 36 new cases — six on bats and six on introduced birds — are now in service and are well received.

A total of 603 loans were made during the year to schools throughout the State and the yearly average of more than 50% new borrowers was maintained. John Fairfax Limited printed a new four-colour brochure advertising the cases which was distributed to schools in May, 1982. This resulted in a much increased demand.

The crew from Channel 10's 'Simon Townsend's Wonderworld' found the school holiday activities a fascinating subject for the programme.
Photo: J. Fields

Microscopes are always a hit with children. For most the "Make-a-Plant" holiday activities in August, 1981, would have been the first opportunity to examine a plant in such detail.
Photo: J. Fields.

Wandervan Extension Service for Handicapped Groups: By its very nature the Wandervan played an important part in the Museum's contribution to the International Year of the Disabled. This year it made 160 visits to 132 separate centres involving 4,572 people.

Once again handicapped groups were encouraged to visit the Museum. Three groups were booked for special programmes during Senior Citizens' Week in which they toured the Museum's new galleries. A peer teaching programme was arranged for eight pupils from Manly-Warringah School for Crippled Children and twelve other special classes were given lessons, while many other groups visited without appointment for a general tour of the galleries.

Three country visits were made, to the Central Coast, the Lower North Coast and the Central Southern areas of New South Wales. These visits involved 14 schools and 530 handicapped children as well as a number of primary school children.

The Wandervan had a special contribution to make to Australia Day and Heritage Week, as well as a number of other functions in support of various handicapped groups.

Sponsorship of the Wandervan by the Bank of New South Wales expired in November after four years' support, a generous contribution to this unique extension service. Since then, the costs of the Wandervan have been met by the Australian Museum Trust. Further outside sponsorship is being sought.

Drop In After School: This activity programme for children living in Sydney's inner city areas operated on five afternoons per week. For the first six months in 1981/82 three of these afternoons were spent at the Museum and two in local schools or activity centres. However, from February, 1982, the programme was held entirely outside the Museum. This change resulted in an increased attendance by local children giving greater exposure to museum-related activities. Drop In was funded by the Australian Museum Trust until the end of June, 1982. Further sponsorship was not found but plans are in hand to provide alternative means to make the resources of the Museum easily available to children in inner city areas.

School Holidays: Special activities to coincide with new exhibitions in the Museum were organised in each of the three school vacations: 'Make a Plant' in August-September (with the special exhibition to mark the International Botanical Congress), 'Mammal Mania' in January (with the new Mammals in Australia Gallery) and 'Abelam — Ples Bilong Papua Nuigini' in May (with the new Abelam Gallery). An evaluation study has shown that the activities, which attracted a total of some 14,000 people, were greatly enjoyed by visitors.

The popular family field trips were also held in each holiday: 'Discovering Spring Flowers' in August-September (in co-operation with the Royal Botanic Gardens), 'Spotlighting Mammals' in January (in co-operation with the National Parks and Wildlife Service) and 'The Geology of Sydney's Rocky Coast' in May.

The Museum Discoverer's Club has been organised for school children. In order to join they must complete a series of questions about the Museum in "the Museum Walkabout question booklet". During the last year 10 students completed the questions and joined the Discoverer's Club. As part of their membership they received a 'Life Nature Book' donated by TIME-LIFE International (Australia) Pty Ltd. Some Discoverers worked in Museum departments during January as part of their club activities.

Two week-long courses on classification and on ecology for senior secondary students were held in January. Each was attended by 25 students and activities included lectures, field trips and practical sessions. The courses were run in association with Taronga Zoo and the Royal Botanic Gardens.

A teachers' seminar on Papua New Guinea was attended by 18 people during the May, 1982, holidays. A distinguished group of lecturers, together with films, lessons in pidgin English and studies in the new Abelam gallery were highlights of this seminar.

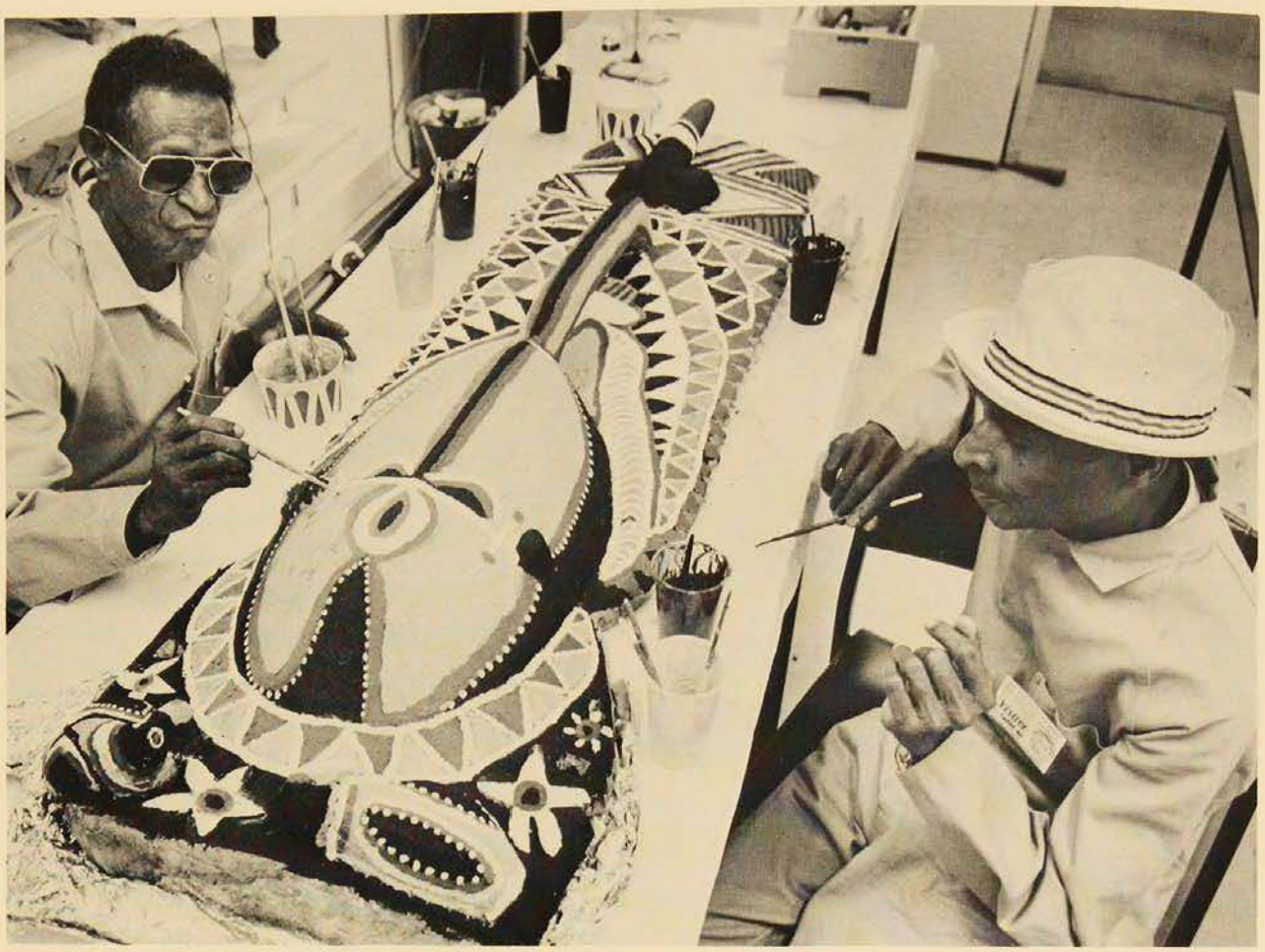
Sunday at the Museum: As part of the Sunday at the Museum programme, educational activities are provided for the family. The themes of the activities related to the Museum exhibitions such as fossils, Eskimos, skeletons or Aboriginal art. Consistently good crowds participated, the number often exceeding 400 people.

Special Activities and Displays: During Children's Week 18-24 October, 1981, the Museum provided the venue for a reception to open the week, at which pupils from Summer Hill Public School performed a dance drama based on their Museum lessons. On 23 October, children from Manly-Warringah School for Crippled Children talked to visitors about the animals they had been studying as part of their participation in the Museum's Peer Teaching Programme. In May an exhibition of entries in the United Nations Association of Australia Junior Media Peace Prize was displayed, and also during the school holidays, the Australia Council for Children's Film and Television screened films in the Education Centre.

Acknowledgements of Co-operation: State Rail Authority; NSW Department of Education; Miss Robyn Lilienthal, NSW Department of Education; Mr Martyn Mather, Paddington Public School; Mr Ian Noffs, Neutral Bay Public School; Royal Botanic Gardens; National Parks and Wildlife Service; Papua New Guinea Information Office; Air Niu Guinea. Thanks must go to the Bank of NSW who generously supported the Wandervan for a full four years.

Donations: TIME-LIFE International (Australia) Pty Ltd, Sydney; Reader's Digest Services Pty Ltd.

Overseas Visitors: Elaine Gurian, Boston Children's Museum, USA; Henry Isa, Solomons Islands Museum; Alex James, British Columbia Provincial Museum, Canada; Renee Klish, West Point Museum, USA; Marjorie Rogers, University of California (Los Angeles), USA and Solomon Islands Museum.



Two Abelam 'Big Men', or tribal elders, were brought from Papua New Guinea to Sydney and the Museum to advise on the construction of the new Abelam Gallery. Mr. Nera Jambruku and Mr. Narikowi Konbapa, skilled artists and craftsmen of Apangai village, East Sepik Province, worked at the Museum for two months recreating handcarved tribal artifacts to give authenticity to the exhibit.
Photo: J. Fields.

Opposite page:
Billed as the best collection of Aboriginal art ever assembled for exhibition, 'Aboriginal Australia' opened as a temporary display in October, 1981 and remained on extended loan until the end of March, 1982. Over three hundred items were shown, all loaned from principal Australian collections including the Museum's own collection. The exhibition was presented by the Australian Gallery Directors Council.
Photo: J. Fields.

Exhibitions

This financial year marked the completion of the first three years of the Exhibition Department's nine year production plan.

The stated objective of the plan is to achieve gallery renewal at the rate of one new semi-permanent exhibition per year and to present two temporary exhibitions each year.

During these three years the Museum has met this objective with four semi-permanent galleries, two new 'Museum-on-the-Road' exhibits and twelve temporary exhibitions.

New Galleries: 'Mammals in Australia' opened in September after 20 months' preparation. The exhibition is a comprehensive survey of Australia's mammal fauna including extinct and endangered species. Audio-visual, tactile and 'live' components are included in the presentation. This exhibition is sponsored by the State Bank. During Heritage Week the Premier presented the Australian Museum's Mammal Gallery with the 1982 Museum of the Year Award of the Museums Association of Australia for Best New Exhibition.

'Birds in Australia' opened in March and occupies half of the level three mezzanine area in the Museum's 'Long Gallery'. The exhibit displays more than 500 Australian birds and is enlivened by eight touch buttons allowing visitors to hear 32 individual bird songs. Birds in Australia is sponsored by the Australian Museum Society.

The largest exhibition, 'Abelam: A People of Papua New Guinea', was opened by the Premier, The Hon. N. K. Wran, QC, MP, in April. This colourful exhibition recreates the centre of a New Guinea village and is

dominated by a towering 'Haus Tambaran'. The exhibit was achieved after extensive New Guinea field work and with the help of two Abelam men who came to Sydney for part of the installation. The Abelam Gallery was sponsored by Unilever Australia Ltd.

Sponsorship of Museum on the Road: The State Bank and Unilever in supporting semi-permanent exhibitions at the Museum also included funds for new 'Museum on the Road' exhibitions. Australian Mammals was completed this year and first displayed at the Bank's headquarters in June. The Abelam touring exhibit will go on the road in 1982.

International Museums Day: 'The Back Room Boys' was the appropriate title for the Exhibition Preparation staff's didactic review held to celebrate International Museums Day on 18 May. Highly skilled techniques were demonstrated with humour and received with surprise by capacity audiences at two sessions arranged by the Australian Museum Society.

'Aboriginal Australia': Billed as the best collection of Aboriginal art ever assembled for exhibition, 'Aboriginal Australia' opened as a temporary exhibition in October and remained on extended loan until the end of March.

Three hundred and twenty-nine items were shown, all loaned from principal Australian collections including the Museum's own collection.

After the unfortunate collapse of the organising body, the Australian Gallery Directors Council, and cancellation of a Brisbane showing and an overseas tour, the Australian Museum undertook responsibility for the return of all material to the original lenders throughout Australia.

The Museum Train: This highly patronized travelling exhibition will have completed five years of continuous touring in July, 1982 and will enter the State Rail Authority workshops for a new exhibition.

Designs for an exhibit entitled 'What on Earth — an Exhibition on Relationships in Nature' have been commenced and the new train will be ready to start its second tour in mid 1983.

Mineral Gallery: Plans for the staged re-development of the Mineral Gallery were placed under the scrutiny of a market research consultant this year. The Museum sought to find out if the gallery proposals, which had evolved over some years, were still appropriate. A report was submitted to the Director by the consultant in April and the majority of the recommendations will be adopted in a new presentation.

Exhibitions Guideline: After evaluation of papers presented at a Museum seminar on exhibition planning in October and subsequent submissions, formulation and review, a guideline has been produced for Museum staff use.

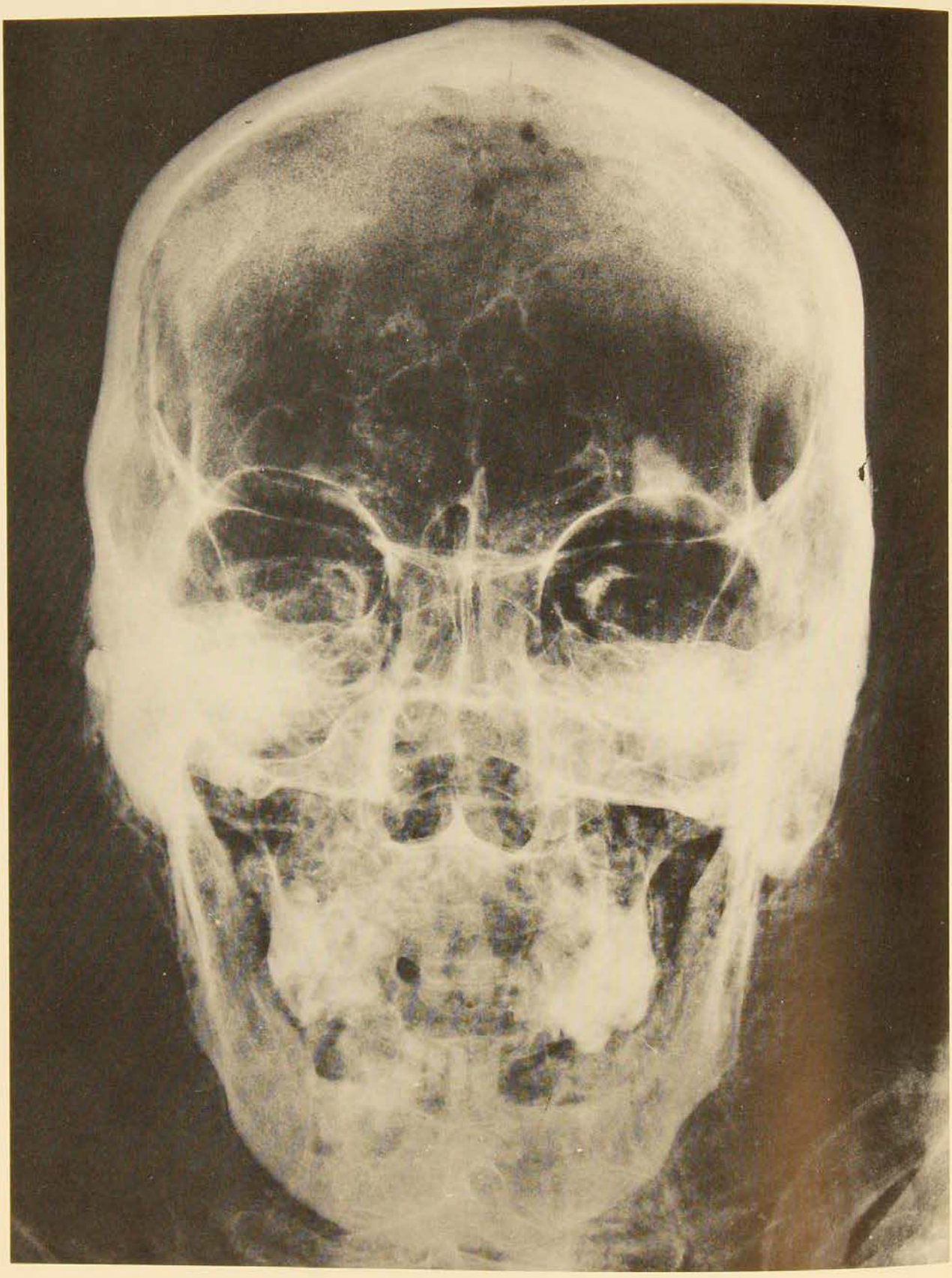
The guideline defines the responsibilities of those staff who collaborate in producing an exhibition, formulates a series of reviews to monitor performance and sets a sequence for the achievement of the project. Appendices will be included which will elaborate on the standards required for key elements of exhibition production.

It is proposed to adopt the guideline as a standard procedure from September, 1982.

Staff: Mr George Hangay was appointed Chief Preparator in September after holding the position for the preceding twelve months in an acting capacity.

The Museum's Artificers were successfully re-classified as Preparators to acknowledge their actual duties, achieve a better salary level and a thirty-five hour week.

The department's Artists were re-classified as Designers and also achieved a better salary level.



X-ray photography is an invaluable aid to scientific research in the Museum. This X-ray shows the skull of one of the Museum's two Egyptian mummies. The mummy is probably of a middle-aged man.

Photo: J. Fields

Library

The Museum Library collection is a major and unique resource in literature on natural history in Australia. This was confirmed by the Public Service Board Audit Team after conducting an efficiency audit on State Government libraries. It is the Library's aim to maintain the collection in good order; to acquire new material consistent with established priorities and to ensure optimum use of all library facilities by Museum staff and others.

The audit team observed that most of the collection is relevant to the Museum's needs and much of it is extremely valuable. Over half the periodical titles are not held elsewhere in the State: 55 per cent of periodicals purchased and 85 per cent of those obtained on exchange are unique to the Museum.

The team made a number of recommendations concerning policies, staff gradings and funding, and these are now being implemented. A major recommendation was that over the next two years concerted efforted be made to reduce the number of volumes requiring binding. However, this depends on the necessary funds being made available.

Continued use of MARC (machine readable cataloguing) cards has considerably reduced the cataloguing backlog. Staff are now able to devote more time to rationalisation and standardisation of the subject catalogue and reorganisation of the map collection. This year 530 monographs and 90 serial titles were catalogued and processed. Half of the 562 monographs acquired were donated. We hope that the future rate of cataloguing and classification will allow us to further reduce the backlog.

Whittling down the Binding Backlog: A small reduction was made this year in the backlog of volumes awaiting binding. This year 1,390 volumes were bound, almost 800 more than last year. But almost 17,000 volumes remain to be bound. Storage of so many unbound monographs and serials increases the risk of loss and damage.

Services to other Libraries: Demands on our services from other institutions and individuals continued to greatly exceed those which the Museum made on other libraries. Libraries and institutions made 1,679 requests for photocopies and volumes; our requests to other libraries and institutions totalled only 651.

Next Year's Priorities: In the next year we will acquire approximately 16,000 donated volumes from the Mel Ward collection, and part of the important Linnean Society collection. Integration of these collections and an increased binding programme will be the priorities for the coming year.

Materials Conservation

The Materials Conservation Section aims to prevent damage to the collections by improving the physical and environmental conditions under which they are displayed, stored and loaned and to stabilize the condition of objects by development and application of research and treatment programmes.

Abelam Gallery: The major effort of the Materials Conservation Section during the year has been in the treatment of objects for the new Abelam Gallery. This gallery recreates the daily life of these colourful people of Papua New Guinea's East Sepik region and is regarded as a world first in Museum exhibit concept and design.

Four permanent and three temporary staff worked full time on the Abelam project as well as five part time students and volunteers. Wood carvings and parts of the haus tambaran made at Apangai, Papua New Guinea, constructed from green timber and other fresh plant materials, required careful seasoning, monitoring and mould control to attain a stable condition for the gallery opening in April, 1982. A large plastic tent equipped with humidity control was set up to house the huge carvings and a schedule of gradual humidity reduction was implemented to season the objects to ambient Sydney conditions. The Wood Technology and Forest Research Division of the Forestry Commission of NSW provided valuable assistance in the planning and seasoning programme as well as with measurement of the wood moisture gradients which were monitored and analysed throughout the year.

The Museum has never before collected a complete initiation scene from such a wide range of fragile plant and animal materials and considerable effort was devoted to treatment of materials such as leaves, grasses, bark fibres and feathers. Under normal conditions these would have deteriorated quickly in the field after their ceremonial uses had been fulfilled. Treatment was primarily concentrated on the consolidation of fragile leaves, plant fibres, feathers and unbound pigments.

In addition, a wide range of conservation work was also carried out on a large number of objects from the Museum's reserve collection and on the Forge loan collection of Abelam objects. Treatment included work on a 46 foot long Solomon Islands war canoe, when a detailed inspection of the structural and surface decoration components of the canoe revealed extensive deterioration. Repair involved intensive consolidation and cleaning of the caulking compounds and the badly deteriorated shell inlay decoration.

Aboriginal Gallery Flooding: Serious leaks in the south-east corner of the Aboriginal Gallery caused major flooding of several showcases. The result was the damage of many objects by staining and mould and some were actually waterlogged. An emergency conservation programme was mounted to treat, clean and carefully dry out the objects. Only four of the objects have sustained any serious damage and have been retained in the laboratory for further treatment.

Mould Research: Dr Paula Casey completed the experimental work of stage two of the mould research programme. This work investigated the interaction between nutrients and water activity on the growth of xerophilic fungi which were identified in stage one of the programme. The study focused on the museum's ethnographic artefacts and the influence of pig fat on the growth of mould. Pig fat is an important part of the culture of the Papua New Guinea highlands and is evident on the surface of a large number of artefacts.

Three stages in the development of microfungi- germination time, growth and fruiting were studied over a range of relative humidity. The penetration of fungal mycelium into wood samples is also being investigated with the assistance of the Sydney University Electron Microscope Unit. The results of this study will enable more precise specification of environmental conditions for the preservation of ethnographic collections.

Another study undertaken during the year in association with the mould research was the analysis, using liquid chromatography, of free fatty acids sampled from a Papua New Guinea highlands headrest and from extracts of pandanus oil. The objective was to reveal possible nutrient sources for mould growth on the surface of objects.

During June and July, a short project, which developed procedures for dyeing plant materials used in the restoration and conservation of ethnographic objects was completed. The chief purpose of the project was to identify appropriate dyes and dyeing techniques to suit the fragile and unusual range of natural materials used in ethnographic conservation and to establish colour charts and formula instructions for fast and accurate colour matching. Successful completion of this project was made possible with financial assistance from the Trust — the results will be of considerable value in treatment and repair of objects for the new Aboriginal Gallery.

Fumigation of Collections: New regulations covering the use of ethylene oxide have been introduced into New South Wales requiring that operators be licensed under the standards issued by the Health Commission. Two members of the Materials Conservation staff have obtained fumigation licenses and First Aid certificates. The fumigation chamber is being relocated near the Yurong Street building and is being redesigned to meet the new, more stringent safety regulations. It is hoped that the new automated chamber will be operational towards the end of 1982.

Environmental Monitoring System: An automated environmental monitoring system has been purchased in order to cope with the continually expanding monitoring programme for display and stored collections. This involves measurement and analysis of temperature and relative humidity in the ethnographic storage areas and in galleries housing permanent and temporary Museum and loan exhibits which are temperature and moisture sensitive.

The complete system consists of a microcomputer with peripherals, environmental sensors and an interface unit. The microcomputer is capable of extensive data storage and statistical analysis. It is also equipped with an alarm system to inform the conservation laboratory when conditioned areas fall outside present limits.

Acknowledgements: J. Hartley, R. Lees and J. Ford, Wood Technology and Forest Research Division, Forestry Commission of NSW; Dr J. Pitt, Division of Food Technology, CSIRO.

Overseas Visitors: Dr Werner, Honolulu, Hawaii; Mrs Florian, Victoria, British Columbia; Miss Demyttenaere, Washington, DC, USA; S. Wangehareon-trakul, Bangkok, Thailand.

Photography

Photography has an important role in communication as a primary service function: it supplies routine photographic services to the Museum and other organisations. The department fulfils a creative function by providing visual material for publication, education, display and scientific activities. It also explores uses of photography and film in all museum projects and maintains a collection of over one hundred thousand black and white and several thousand colour photographs.

Museum's films get a good reception: 'Apangai Village', the Museum's most recent film project was completed on schedule and a contract signed with commercial television station Channel Ten, Sydney. Screening was scheduled for late 1982. 'Dugong Dugong', the Mornington Island film was sold to the NSW Film Library and a contract is pending with the Tasmanian Film Corporation.

Abelam Gallery: The creation of a new gallery for the Museum depicting life in an Abelam village of northern Papua New Guinea involved the department in almost every aspect — from the original proposal to the material published for use in promotion. Detailed construction and progress pictures were produced and used during creation of the gallery and for publicity; off-cuts from the film 'Apangai Village' and its sound effects were used in television and radio interviews: a full length video tape of the film is being continuously screened in the gallery itself.

One of the school travel cases made this year features the Abelam people, and uses photographs and an edited sound tape from the film.

The Hurley Collection: The Museum collection of photographs taken in New Guinea by Captain Frank Hurley during 1926 comprises over a thousand glass plate negatives. This very valuable collection was being upgraded to archival standards. Shortage of funds curtailed the work, but not before all negatives were cleaned and printed and new copy negatives made on film. These prints and negatives now need to be sorted and filed and proper storage of the original negatives arranged. Many of the negatives were in worse condition than originally thought. This gives cause for concern about the state of other unique photographs in the Museum's collection.

Three Dimensional Photography: Following experiments with three dimensional x-rays, the department is now able to produce stereoscopic photographs which show potential for scientific research and public display. A three dimensional image is produced by making two images of one subject then viewing them through an appropriate device. The department has been experimenting with a simple viewing system suitable for use in the Museum galleries; while this innovation cannot cope with mass audiences, it will make an interesting exhibit of special subjects.

Radiography: X-ray photographs are invaluable aids for research workers studying the skeletal structure of fish and lizards, especially where information on hidden details of specimens is required. This highly specialised technique is now also applied to paintings and the internal structures of objects in need of restoration and conservation.

The department is now planning to experiment with radio opaque dyes to show up details of blood vessels, alimentary canals and other anatomical information.

A local beauty of the Purari Delta Region, New Guinea. Circa 1927.
Photo from the Hurley Collection.

Administration

The division is responsible for the staffing, finance, administration — including security, attendants and cleaning — and building development within non-public areas.

Accounts Branch: Reporting systems of the Accounts Branch were developed and streamlined during the year, internal control procedures were further reviewed and additional procedures as suggested by the Auditor General's staff were implemented. A major survey was commenced in relation to the proposed computerisation of the accounting systems during 1982/3.

Staff Branch: The Museum's objectives as set out in its corporate plan are to continue to develop policies which lead to maximum job satisfaction, provide appropriate training, develop skills and acknowledge and reward achievement. Within the Museum's staffing and monetary constraints these objectives continued to receive priority from the Staff Branch. A review of procedure has been conducted to meet the above objectives more efficiently. The induction programme is currently under review and the Equal Opportunity programme is continuing to be given high priority for its full implementation.

Records Section: Advice from the Record Management Division of Premier's Department was sought to review the Museum's records storage and retrieval procedures. A computerised file index listing has now been prepared which will greatly facilitate access to individual files by personnel.

Building Works: Completion of the redevelopment of the Stone Store, Stage 2, the major work undertaken by the Public Works Department during 1981/82, the new toilet block adjacent to the Anthropology Department, Paint and Timber Store and Fumigation Chamber are programmed for September, October, 1982.

Work on renovation of the old toilet block within the Anthropology Department (to be used as an additional storage area) and the Museum's new first aid room (located off the Long Gallery) and painting out of the new Skeleton Gallery will commence early in the new financial year.

The Government Architect's Branch of the Department is continuing with design work in respect of the Anthropology Department air conditioning project; the building works (link way) in that area; attendants' room renovations and further renovations proposed within the Stone Store (Stage 3).

The Lizard Island Research Station is a facility to support coral reef research. Scientists, both from Australia and overseas, are encouraged to visit and are provided with boats, diving equipment and laboratory facilities to assist them in their studies.

Photo: C. Watson-Russel.

Lizard Island Research Station

The digestive processes of sea cucumbers, coral reproduction, reef fish feeding behaviour, ghost crab anatomy and the importance of fish larvae to the reef, are a few of the wide range of research subjects now in progress at the Lizard Island Research Station.

The Lizard Island Research Station is a facility of the Australian Museum to support coral reef research. Accommodation, boats, diving equipment, aquaria and laboratory facilities are available for up to fourteen visiting scientists from Australia or overseas institutions.

Reef Fish Larvae Studies: The Director, Dr Barry Goldman, maintains two research programmes funded by Australian Marine Science and Technologies Grants. The projects involve Dr Jeff Leis and Mr Greg Stroud and study the taxonomy and ecology of coral reef fish larvae in the vicinity of Lizard Island.

Sea Cucumbers and Nutrition: A group of Australian scientists (see list) are researching the role of bacteria in the productivity of coral reef lagoon floor sediments and digestion by sea cucumbers, Holothuria. Study shows that bacteria are important contributors to reef energetics.

Housing, Research Vessels, Computers: Three self-contained bungalows have been completed to house visiting researchers. The new units have been placed at the edge of the tree line in accordance with the Station's master plan approved by the Queensland National Parks Service. These units are in addition to the original visitors' house.

Delivery of a 14 metre research catamaran RV *Sunbird* is expected in seven months. She will be a motor sailer, with a capacity for six scientists plus crew, capable of trawling, mid-water sampling (to 1,000 m) and of carrying scientific parties to nearby reef and islands in the northern Great Barrier Reef.

An Apple II 48K mini computer has been installed; it is coupled with a video screen, dual floppy discs, a Teletype line printer and a Hewlett Packard 7225A graphics plotter/digitiser. The Station's accounts, lists of plant and equipment and stock inventories have been put on the computer.

A walk-in cold room/deep freeze has been installed. Costs were met from the Japan Foundation donation.

Other Installations: A 20,000 litre bulk diesel fuel tank has been installed near the powerhouse and will greatly simplify the handling and storage of fuel for the generators. Electrical and water reticulation services have been renewed throughout the Station.

A concrete sink/work bench has been installed on the laboratory verandah. A new five litres/hour all-glass still has been installed in the wet laboratory with a redistillation set-up for retrieving solvents used in chemicals analyses. A pumped refrigerated water system has also been installed.

Donations: A second $100,000 instalment of a $250,000 donation was received from the Japan Foundation. In addition, donations were received from the James N. Kirby Foundation, Dr and Mrs J. D. Marks; and commitments for support of the *Sunbird* from KFV Fisheries in townsville, and from Alcan Australia Ltd. Other donors prefer to remain anonymous. More funds are urgently needed to complete the development of the research station.

Improved Contact: The Royal Flying Doctor communication service in Cairns has been upgraded and the Station can now receive incoming telephone calls.

A regular two-weekly freight service from Cairns to Lizard Island has been arranged with the tourist vessel TSMV PETAJ operating from May to December. Researchers at the Station can now get heavy or volatile cargo to the island promptly and reliably.

Committee numbers reduced: The Lizard Island Research Station Committee of Trustees met three times — on August 11 and on February 24 at the Australian Museum, on June 22 at the University of Queensland. The February meeting agreed to recommend to the Australian Museum Trustees that the Committee numbers be reduced to minimise the overlap members had with other committees concerned with the Barrier Reef.

Dr Goldman attended the two meetings of the Directors of Island Research Stations, a sub-committee of the Consortium of Island Research Stations established to co-ordinate activities of the four Barrier Reef stations. Dr Goldman was present at a meeting of the Lizard Island Reef Research Foundation on May 24 and was elected to membership of the Foundation. He also attended the coastal engineering and pollution control symposium at James Cook University in July, 1981.

Premier's Visit: In May the Queensland Premier, The Hon. Joh Bjelke-Petersen, visited the Research Station. He spent several hours familiarising himself with current problems in coral reef research and its relevance to the development of Queensland.

Economics Affect Visitation: Reduced funding for marine research and increases in air fares has led to decreased activity on the Barrier Reef this year. Eighty scientists and assistants visited the Station (21 less than last year), although the total amount of work done was not significantly less. The average number of scientific workers at the Station was 5.9 per day (6.2 last year) while the average occupancy was 6.8 for all visitors.

The table below shows visitor statistics for the year (the number in brackets indicating the number of visitors who came twice or more).

	Australian	Overseas
Scientists and Assistants	42 (6)	24 (1)
Post-graduate Students	13 (6)	2 (1)
Spouses	2	
Children	2	

Student Visitors: Brian Lassig, of Macquarie University, was one of the thirteen Australian post-graduate students to utilise the Station this year. Mr Lassig completed field work for his PhD studies on the role of predation in determining reef fish community structure. Randy Olson, Harvard University, USA, made a special study of Barrier Reef larvae — growth rates, space requirements and dispersal. Australian scientific visitors studied an infinite variety of coral reef life. Among the 42 scientific visitors were: Gary Denton, James Cook University, Qld: survey for bio accumulation of heavy metals in coral reef biota; Mr Dilwyn Griffiths and Mr Jim Luong-Van, James Cook University: Relationships between certain compound ascidians and their algal symbionts using C14 tracers; Pat Hutchings, Australian Museum: Continuing long term studies on coral reef endolithic cryptofauna, polychaete taxonomy, and bioerosion in dead coral substrates; Jeff Leis, Australian Museum: Current systems and fish larval dispersal in the vicinity of Lizard Island — project in collaboration with that of the Director, assisted by Jenny Gates, Australian Museum, and David Malec, James Cook University; Dave Moriarty, Chris Moriarty, Peter Pollard and Ted Wassenberg, CSIRO Cleveland: The role of bacteria in the productivity of coral reef lagoon floor sediments and digestion by sea cucumber, Holothuria; Margaret Streamer and John Wellington, James Cook University: Assay for argenine decarboxylase and other enzymes in Acroporid and Pocilloporid corals.

Under construction, one of three self-contained bungalows to house visiting researchers at the Lizard Island Research Station.
Photo: B. Goldman.

Overseas Scientists: There were 24 distinguished scientific visitors from overseas during the year, all engaged in vital aspects of life on the coral reef. Among them were: Andy Benson, Scripps Institution of Oceanography: Arsenic metabolism in molluscs and lipid studies in the foram *Marginopora;* Howard Choat, Auckland University: Systematics of Parrotfishes; ecology of herbivorous reef fishes; Daphne Dunn, California Academy of Science: Study of factors controlling specificity for particular host anemones by the symbiotic Pomacentrid fishes *Amphiprion* and *Premnas;* Art Goldberg, Southampton University.

New York: Extraction and analysis of biotoxins from trunkfishes of the genus *Ostracion;* Langdon Queton and Robin Queton, Santa Barbara: Behaviour, composition and distribution of mysid schools amongst coral reefs; Katy Muzik, Suntory Institute for Bio-organic Research: Systematics and ecology of octocorallia (soft corals); Don Potts, University of Santa Cruz: Population genetics and evolution of hard corals; Ross Robertson, Smithsonian Tropical Research Institute, Panama (assisted by Hui Purdy): Studies on the effects of crown of thorns starfish predation of reef structure and resulting changes in fish community structure.

Non-research Visitors: An increasing number of Australian parliamentarians are showing keen interest in the work of the Research Station. Premier of Queensland, The Hon. Joh Bjelke-Petersen; The Rt. Hon. J. D. Anthony, Deputy Prime Minister and the Hon. David Thompson, Commonwealth Minister for Science, all inspected the Station and discussed priorities for the Great Barrier Reef and the problems of funding island research stations; the Hon. A. Elliot, Queensland Minister for National Parks and the Environment, visited the Station in July to familiarise himself with its activities and to discuss the Station's development plans with the Director, and The World Heritage Committee, led by Professor Ralph Slatyer, visited the Station in November at the time the Great Barrier Reef was nominated for inclusion on the World Heritage list.

Opposite page:
Founded in 1969, the National Photographic Index of Australian Wildlife (NPIAW) originally sought photographic material of all species of Australian birds. However, it later expanded its collection to include mammals and is now developing into the most comprehensive photographic archive of Australian wildlife. This photograph of three barn owl nestlings is taken from the Index's collection.
Photo: K. Ireland.

National Photographic Index of Australian Wildlife

The aim of the National Photographic Index is to assemble, catalogue and preserve an expanding collection of well-documented colour photographs illustrating the appearance and behaviour of all species of Australian mammals and birds. The scope of the Index will soon be increased to include Australian reptiles and amphibians and, when these are adequately represented, other animal groups will be considered.

Staff: Mr Ronald Strahan was appointed Executive Officer of the Index on 1 July, 1981 (unpaid and concurrent with his position of Research Fellow).

Committee of Management: The Committee of Management, which determines the policy of the Index and supervises its finances, met on four occasions during the year.

Publications: Final page-proofs of *Wrens and Warblers of Australia*, the first book to be produced entirely by the Index, were checked in May, 1982, and publication is expected in September, 1982.

The Mammals of Australia, a comprehensive work with more than a hundred contributors and seven section editors, has been under the chief editorship of Mr Strahan since 1980. The species descriptions have been completed and the marsupial section of the book was delivered to the publishers in May, 1982. Publication is expected in November, 1983.

A third edition of the *Mammal Index: Species and Subspecific Forms of Australian Mammals* was published in March, 1982. In this edition, for the first time, an attempt has been made to distinguish between biologically acceptable and unacceptable subspecific taxa. Originally produced for the convenience of contributors to the National Photographic Index, this list is now widely used as reference to the current taxonomy of the Australian mammal fauna.

Collections: The main section of the Bird Index consists of 175 x 120 mm prints and contact internegatives which are stored separately. A duplicate of each print is lodged in the National Library, Canberra. The main section is supplemented by a collection of 35 mm transparencies of equal quality to the photographs in the main section, but which are surplus to the requirements of that section: this is referred to as the "XT" section. A third section, designated "T", consists of 35 mm transparencies which, irrespective of their quality, are retained for their scientific interest. A systematic attempt is being made to expand the "XT" Section, which is of greater utility for publication purposes than the print collection.

The main section of the Mammal Index consists of pairs of 125 x 105 mm transparencies, one of each being designated for low-temperature storage. This is supplemented by "SX" and "S" sections, equivalent respectively to the "XT" and "T" sections of the Bird Index.

Two calls were made during the year for bird photographs, resulting in the addition of 161 photographs. Four calls were made for mammals, resulting in the addition of 681 photographs, including 19 species registered for the first time.

BIRD INDEX
As at end of Stage 40 (2 calls)

	1980-81	1981-82	Totals
Submissions	1,451	401	21,332
Acceptances:			
Prints	282	16	4,920
"XT"	377	138	1,154
"T"	137	7	2,297
Species added during year	9	—	
Total species	753	753	

MAMMAL INDEX
As at end of Stage 12 (4 calls)

	1980-81	1981-82	Totals
Submissions	2,103	947	4,572
Acceptances:			
Main	256	197	859
"SX"	489	480	1,092
"S"	84	3	303
Species added during year	38	41	
Number of species represented	207	248	

General: A pamphlet explaining the nature of the Index and featuring colour photographs of two birds and two mammals has been circulated to publishers and advertising agents in Australia.

The Index has worked closely with the Office of Community Relations, providing illustrative and textual material for *Australian Natural History*, and the 1983 Museum Calendar. As usual, it has provided considerable material for commercial publishers and it put together the material for a large exhibition on rare and endangered species for the Conservation Commission of the Northern Territory.

A request to contributors to the Mammal Index for use of their photographs without charge in publications of the Index brought a positive response in more than 90% respondents. This will considerably reduce the cost of publications and thus increase the return that these can make towards the operating costs of the Index.

Donations: Mr and Mrs A. D. Trounson donated fifty bird photographs, valued at $20,000.

The Australian Museum Society

In March, 1982, The Australian Museum Society celebrated its first decade by becoming a benefactor of the Museum in its own right. An amount of $25,000 was promised to the Museum to be paid over two years as a contribution to the new Bird Gallery. For this reason the Society's ten year birthday and the opening of the Bird Gallery were celebrated together. Beginning with a strong membership in 1972, it now boasts an active continually growing membership of over 2,100.

The Museum and the Society benefit greatly from the very valuable assistance of volunteers who work in many capacities in almost all the departments of the Museum. This year volunteers were brought into the Education Section for the first time.

The retirement of Dr Jim Hazel after two years as President was a loss to the Executive Council of the Society, as also was the loss of the tireless Mrs Teddie Ireland, Mr Graham Galt and Mr Arch Sinclair.

Trips and Lectures: The Society continued its overseas visits to places of interest in natural history during the year — the Galapagos Islands and India.

Weekend excursions within Australia included visits to Hill End, Lightning Ridge and to Mount Seaview in rain forest country near Wauchope.

The Secretary was fortunate in securing internationally respected speakers both from overseas and from within Australia — among them Dr David Bellamy, Dr Paul Ehrlich, Professor Walter Minchinton and Professor Stuart Fleming. Mr Vincent Serventy's series on bird identification was fully booked out, and Ron and Valerie Taylor, Professor Anthony Forge and Dr Jim Specht were equally successful local speakers. This report, however, does not set out to catalogue the activities of the Society, but seeks to indicate that once again the Society has enjoyed a stimulating and successful year.

Finally, the Society is indebted to a number of benefactors and sponsors, whose generosity has assisted the Society's rapid growth.

Benefactors: Reader's Digest Services Pty Ltd; Mr W. S. Tatlow, Unilever Australia Pty Ltd; Esso Australia Ltd; CRA Ltd; Amatil Ltd; The Commercial Banking Company of Sydney Ltd.

Sponsors: Dr Jim Hazel; The National Bank of Australasia; Myer Sydney Ltd; Brambles Industries Ltd; Repco Ltd; Comalco Ltd; Australia and New Zealand Banking Group Ltd; Mrs Jess Wise; Dr and Mrs W. H. Hensley; Ms A. Sheridan; Mr and Mrs J. D. Macnash; Jose Rodriguez; Janina Rodriguez; Mr and Mrs Waterhouse and family; Mr A. J. Flores; Miss J. Rooke; Mr Herbert Mitterer; Dr H. and Professor L. Kramer; Miss Jean Cooney; Dr Rosanna McEvedy; Miss Lynn Holecombe; Mrs D. Ferguson; Tooth and Co Ltd.

Major Donors to the Sponsorship of the Bird Gallery by the Society

Dr D. K. Baird
Dr J. F. and Mrs V. Baker
Mr J. S. Bentley
Miss W. Bishop
Mrs G. Bishop
Mrs H. M. Bisley
Mr H. A. Blakeney
Mrs N. A. Blatchford
Mr B. E. Bullock
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Mr E. White
Mr K. J. and Mrs J. Winsbury
Justice and
Mrs J. H. Wootten

Opposite page, top:
This view of the new 'Birds in Australia' exhibition highlights one of two huge bird mobiles (foreground) featured in the gallery.
Photo: J. Fields

Opposite page, bottom:
The Abelam Gallery was a popular subject for the media and received a lot of publicity. Here Channel 10 films some aspects of the gallery while Dr. Jim Specht assists.
Photo: J. Fields


BIRDS
IN AUSTRALIA

Museum's Finances

Highlights for 1981/82

Detailed financial accounts appear as Appendix A from pages 54 to 60.

Revenue from all sources during the year amounted to $5.4 million, an increase of 14% over the previous year. Funds from the State Government for working expenses and Statutory Endowment amounted to $4.06 million and represented a contribution of 70% towards the total funds available to the Museum, compared with 72% in 1980-81 and 76% in 1979-80. The Statutory Endowment amounted to $137,000, an increase of 5.4% over the allocation for the previous year, whilst a further $200,000 was provided by the State Government as a special incentive by way of a subsidy of $1 for every $1 raised, to attract sponsorship for Museum programmes from private sources. In all, support from State sources increased by 12% over the previous year.

The income of the Trust (exclusive to the State Government's contribution towards salaries and working expenses) increased by 26% or $180,909 over the previous year. Without the Statutory Endowment and State Subsidy for special projects and grant funds, Trust General Funds still increased by 15% or $73,909. The main sources of revenue were Shop sales, 'Australian Natural History' magazine subscriptions, Mineral Sale proceeds, interest on investments and donations.

During the year the income for Grant Funds decreased by 12% over the previous year. The main sources of income were the Australian Research Grants Scheme, the Australian Biological Resources Study, The Australian Marine Science and Technologies Advisory Council Funding Advisory Panel and funds from benefactors for special programmes including the Lizard Island Research Station.

Payment from all sources increased by 20% compared with the previous year. This reflected increased activity in respect of Trust General Funds in such important areas as printing of literature about the Museum (+66%), Exhibitions (+80%) and 'Australian Natural History' magazine production (+32%). Overall payments in Trust General Funds increased by 27%. At the end of the financial year a balance of $43,868 was available as Trust General Funds reserve, a decrease of $3,126 or 7% on the reserve held as at the end of the previous year.

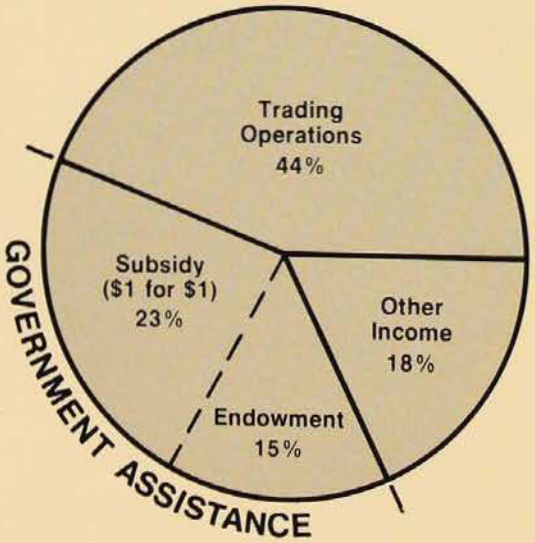
Grant Funds payments increased by 42% during the year and reserves decreased by 46% compared to previous year. The decrease in reserves is mainly due to large payments made for the additional accommodation facilities at the Lizard Island Research Station.

The Australian Museum Society increased its revenue by 34%. The main source of revenue were subscriptions and proceeds from functions. Payments increased by 77% and cash reserves at 30 June stood at $18,361, compared with $27,109 at balance date the previous year. The reduction in reserves is due to a donation to the Museum of $12,417, the first payment of $25,000 sponsorship of the Bird Gallery.

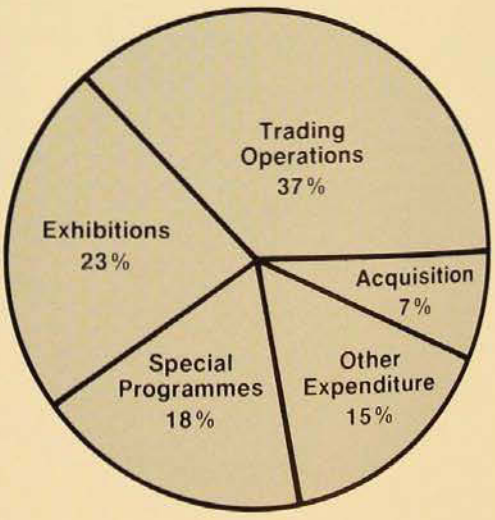
The consolidated accounts for the National Photographic Index of Australian Wildlife which were taken over by the Museum on 1 July, 1981, show that revenue decreased by 55% and payments decreased by 61% compared to 1980-81. The effect of this was that cash reserves increased by $11,497 or 29% over the previous year.

Growth in funds in 1981-82 again exceeded the average rate of inflation through substantial increase in funds provided by way of corporate sponsorship and government assistance for scientific research and gallery development and running expenses. This has improved the spending capacity of the Trust and allowed for the implementation of new programmes and the expansion of some of the existing activities which carry a high priority. Although the Trust's total reserves decreased the Museum is still in a very satisfactory financial position.

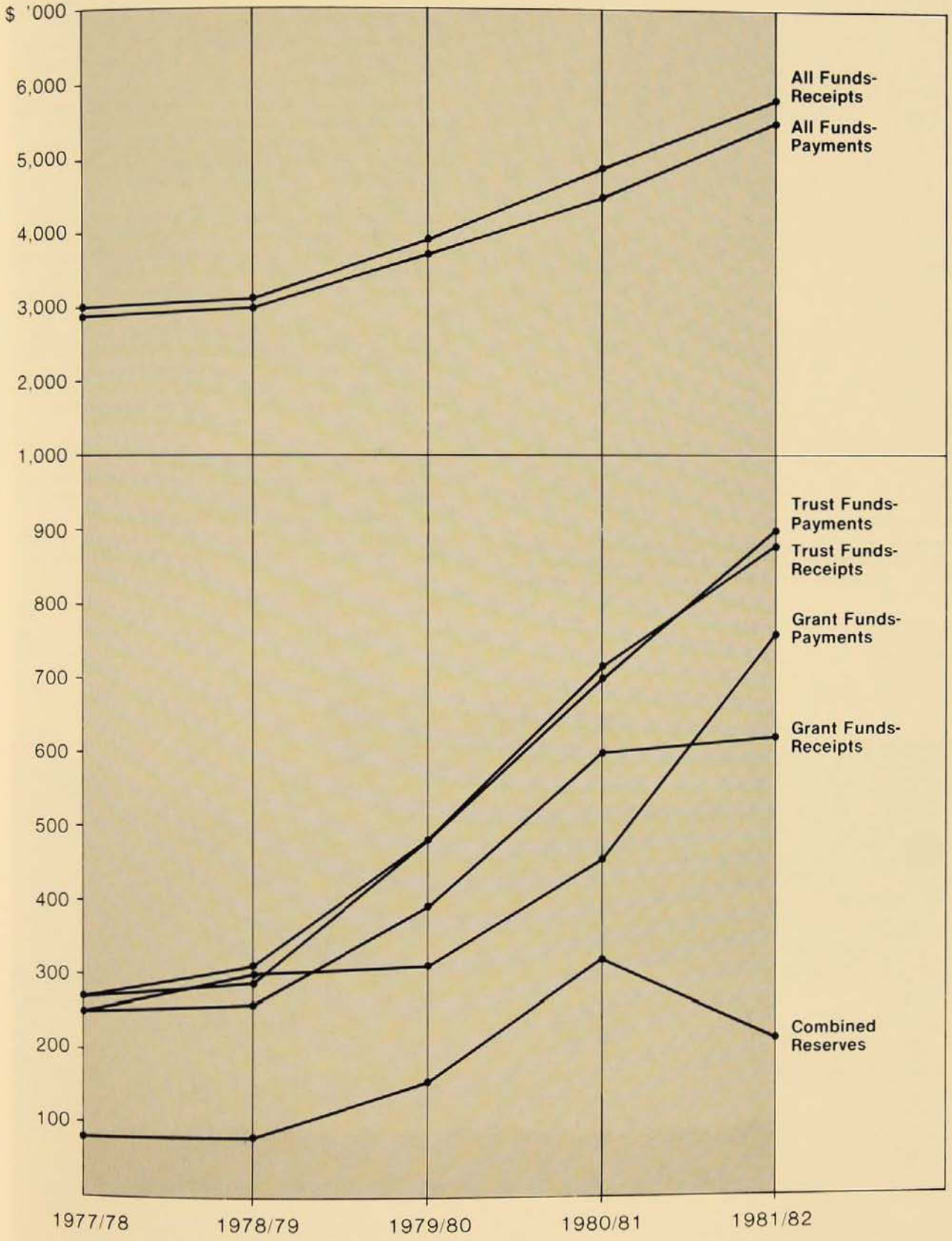
Trust Funds Receipts 1981/82



Trust Funds Payments 1981/82



The Australian Museum
Receipts and Payments/Combined Reserves



Appendix A

Summary of Accumulated Funds

The Trust's General, Grants and Reserve Funds for the Five Year Period Ended 30 June, 1982

Trust General Funds: These funds are the separate income of the Trust of which the major items are the State Government Statutory Endowment and Subsidy for Special Projects both provided by Shop Sales and Magazine Subscriptions. The growth in those funds over the last five years has been +220% in revenue and +228% in payments.

The Trust General Funds accumulated surplus as at 30 June, 1982, showed a decrease of $3,126 (6.7%) over the figure for the previous year. This is an improvement of $63,133 over the five year period 1977-78 to 1981-82.

Grant Funds: These funds are received from granting agencies and the private sector for specific projects in the fields of scientific research, exhibitions and education programmes. The growth of these funds over the five year period has been +146% in revenue and +203% in payments.

As at 30 June, 1982, the accumulated Grant Funds surplus was $170,730 a decrease of $103,971 (38%) over the figure as at the end of the previous financial year. This was mainly due to a large expenditure at the Lizard Island Research Station for new accommodation building.

Reserves (Trust General and Grants): At 30 June, 1982, the combined reserves (Trust General and Grant Funds) stood at $214,598 a decrease of $107,097 (33%), over the figure at the end of the previous financial year. Although there was a decrease in reserves during 1981-82 the final balance is still a healthy figure.

A 1906 view of the Museum showing the corner of William and College Streets. The original building, completed in 1852, can be seen to the left of the picture hidden behind the trees.

Summary of Trust Funds for Five Years

Trust Funds

Year	Balance B/F $	Receipts $	Payments $	Closing Balance $
77-78	−25,158	277,633	271,740	−19,265
78-79	−19,265	308,455	248,775	40,415
79-80	40,415	482,765	482,893	40,287
80-81	40,287	707,936	701,229	46,994
81-82	46,994	888,844	891,970	43,868

Grants Funds

Year	Balance B/F $	Receipts $	Payments $	Closing Balance $
77-78	101,288	251,108	250,986	101,410
78-79	101,410	258,783	312,015	48,178
79-80	48,178	394,157	315,849	126,486
80-81	126,486	602,067	453,852	274,701
81-82	313,850*	617,604	760,724	170,730

Combined

Year	Balance B/F $	Receipts $	Payments $	Closing Balance $
77-78	76,130	528,741	522,726	82,145
78-79	82,145	567,238	560,790	89,593
79-80	89,593	876,922	798,742	166,773
80-81	166,773	1,310,003	1,155,081	321,695
81-82	360,844	1,506,448	1,652,694	214,598

* This included balances from National Photographic Index of Australian Wildlife accounts which were taken over by the Museum on 1 July, 1981.

Summary of all Receipts and Payments

1981 $	%	Receipts	1982 $	%
216,399	4	Balance as at 1 July	**418,474**	**7**
3,623,176	72	Consolidated Revenue	**4,059,125**	**70**
377,935	7	Trustee Accounts	**551,844**	**9**
698,410	14	Grant Accounts (including National Photographic Index)	**617,604**	**11**
77,821	1	The Australian Museum Society	**104,396**	**2**
3,986	1	Peter Rankin Memorial Fund	**2,194**	**1**
57,271	1	Coffee Shop	**73,466**	**1**
5,054,998	100		**5,827,103**	**100**
		Payments		
3,012,288	60	Salaries	**3,466,031**	**60**
307,823	6	Stores and Equipment	**470,506**	**8**
125,680	2	Travel	**106,266**	**2**
1,190,733	24	Other payments	**1,531,936**	**26**
418,474	8	Balance as at 30 June	**252,364**	**4**
5,054,998	100		**5,827,103**	**100**

Statement of Balance as at 30 June, 1982

1981 $	Funds		1982 $
—	Consolidated Revenue		—
46,994	Trustees Account		43,868
313,850	Grants Account		170,730
27,109	The Australian Museum Society		18,361
11,156	Peter Rankin Memorial Fund		12,256
19,365	Coffee Shop		7,149
418,474			252,364
	Represented by Investment		224,000
		$	
30,000	Trustees Account	40,000	
276,353	Grants Accounts	160,000	
26,121	The Australian Museum Society	10,000	
9,450	Peter Rankin Memorial Fund	10,000	
	Coffee Shop	4,000	
	Cash at Bank		28,364
16,994	Trustees Account	3,868	
37,497	Grants Accounts	10,730	
988	The Australian Museum Society	8,361	
1,706	Peter Rankin Memorial Fund	2,256	
19,365	Coffee Shop	3,149	
418,474			252,364

Statement of Receipts and Payments Consolidated Revenue Funds

1981 $		Receipts		1982 $
3,293,176		Treasury Appropriations		3,722,125
3,293,176				3,722,125
		Payments		
2,647,866		**Salaries**		3,036,064
111,911		**Travel**		98,348
	37,950	Motor Vehicle Running Cost	51,637	
	73,961	Travel Removal and Subsistence Expenses	46,711	
199,741		**Stores**		196,228
		Stores, Provision, Furniture, Equipment, Minor Plants, etc. (including Maintenance and Repairs)		
82,383		**Building**		110,759
	2,498	Maintenance, Alterations, Additions and Renewal	3,557	
	79,885	Rents, Rates, etc.	107,202	
175,735		**Other Working Expenses**		200,781
	33,862	Books, Periodicals and Paper	36,393	
	21,062	Fees for Services Rendered	25,859	
	22,058	Freight, Cartage and Packing	10,844	
	666	Laundry Expenses	1,490	
	1,976	Meal Allowance	3,239	
	393	Minor Expenses	353	
	14,923	Other Insurance	17,192	
	6,245	Postal and Telephone Expenses	7,294	
	74,550	Printing	98,117	
75,540		**Special Appropriation**		79,945
	59,947	Major Plants and Equipment and Other Equipment for Storage of Museum Specimens	70,000	
	15,593	Overseas Visits	9,945	
3,293,176				3,722,125

Trust Funds

1981 $	$	Receipts	$	1982 $
330,000		**Government Funds**		**337,000**
	130,000	Endowment	137,000	
	200,000	Special Projects	200,000	
324,099		**Trading Operations**		**390,566**
	230	Audio Guide	110	
	75,439	Australian Natural History Sale	82,191	
	4,500	Coffee Shop (share of surplus funds)	7,000	
	4,136	Film Sales	10,269	
	38,052	Mineral Sales	51,460	
		Records and Memoirs of the Museum	5,362	
	443	Red Phone	436	
	201,299	Shop Sales	233,738	
3,855		**Special Programmes**		**23,776**
		Aboriginal Art Display	3,430	
		Archaeometry Conference	4,282	
	1,185	Fish Conference	11,906	
	2,670	Sunday at the Museum	4,158	
49,981		**Other Income**		**117,893**
	2,327	Contribution from Grant Accounts to Administration Costs	—	
	1,429	Donations	19,609	
	17,840	Interest	78,937	
	4,500	Minor Grants	3,000	
	10,046	Miscellaneous	14,044	
	908	Photocopy Receipts	2,303	
	69	Royalties and Copyrights	—	
		Suspense		**19,609**
707,935		**Sub-Total**		**888,844**
40,289		Balance as at 1 July		**46,994**
748,224				**935,838**

Trust Funds

1981 $	$	Payments	$	1982 $
68,882		**Acquisitions**		**59,314**
115,951		**Exhibitions**		**208,863**
		Aboriginal Art	18,521	
	454	Aboriginal Gallery	15,082	
	10,978	Abelam Gallery	54,877	
	33,077	Birds/Insects		
		Bird Gallery	65,465	
		Insect Gallery	90	
	40	Hall of Life	—	
	18,761	Mammal Gallery	30,035	
		Mammal OUE	977	
	1,852	Mineral Gallery	2,314	
	29,863	Marine Invertebrates	6,462	
	6,843	Awareness Exhibition	3,424	
		Flora Exhibition	7,379	
	12,071	Other Temporary Exhibitions	1,589	
	2,012	'Treasures' Exhibition	651	
		Maintenance of Galleries	1,997	
271,391		**Trading Operations**		**331,592**
	1,881	Audio Guides	—	
	84,297	'Australian Natural History' Production	110,912	
	2,547	'Australian Natural History' Promotion	73	
	2,579	Film Production Costs	6,523	
	25,361	Minerals Purchased for Re-Sale	33,182	
	154,222	Shop Purchases	180,419	
174,534		**Special Programmes**		**162,326**
		Aboriginal Art Display	7,832	
		Archaeometry Conference	4,394	
	20,457	Education Programmes	22,671	
	1,777	Fish Conference	15,619	
	7,838	Honoraria	13,235	
	7,940	Minor Grants	3,107	
	10,000	Contribution to Lizard Is. Research Station	15,000	
	—	Contribution to National Photographic Index	5,000	
	18,177	Scientific Assistance	17,167	
	13,717	Sunday at the Museum	9,931	
	3,526	Research Grants	5,378	
	7,236	Visiting Curator	6,000	
	83,866	Special Project Distrib.	36,000	
	—	K. L. Sutherland Award	992	
48,491		**Other Operating Costs**		**129,875**
	—	Audit Fees	5,000	
	—	Advertising	5,780	
	2,416	Computer Fees	2,789	
	14,692	Entertainment	19,933	
	6,498	Miscellaneous	7,594	
	911	Photocopy Payments	2,203	
	7,169	Printing	54,907	
	—	Seminar Expenses	1,683	
	12,430	Travelling Expenses	20,392	
	—	Video Film Purchases	3,480	
	4,375	Visitor Surveys	6,114	
21,981		**Suspense**		
701,230		Sub-Total		**891,970**
46,994		Balance as at 30th June		**43,868**
748,224				**935,838**

Grants Statement

Grants	Receipts 1981 $	Receipts 1982 $	Payments 1981 $	Payments 1982 $	Balance 30 June 1981 $	Balance 30 June 1982 $
Australian Government Grants						
Australian Biological Resources Study						
Dr H. Cogger I	35,404	**40,341**	15,581	**39,708**	21,519	**22,151**
Dr P. Hutchings	6,817	**7,157**	7,225	**9,670**	408 DR	**2,921** DR
Dr J. Leis	7,315	**5,925**	9,740	**8**	1,391 DR	**4,526**
Dr J. Paxton	5,486	**22,975**	4,168	**14,220**	1,318	**10,073**
Dr W. Ponder I	5,234		5,234		NIL	
Dr W. Ponder II	5,272		5,463	**4,015**	191 DR	**4,206** DR
Dr H. Cogger II		**4,500**		**3,123**		**1,377**
Dr M. Gray		**8,000**		**1,933**		**6,067**
Australia Council — Aboriginal Arts Board						
Aboriginal Conference					112	**112**
Grant to Dr McCarthy			485	**140**	1,726	**1,587**
Minor Grants					500	**500**
Grant towards the purchase of Tiwi Carvings					178	**178**
Visiting Curator of Tribal Art	5,000		18,887		835	**835**
Grant towards production of 'Dugong Dugong' film	26,526		13,300	**8,128**	13,226	**5,098**
Australian Institute of Aboriginal Studies						
Australian Marine Science and Technologies Advisory Council						
Dr H. Choat		**6,645**		**2,141**		**4,504**
Dr B. Goldman and Dr F. Talbot	21,950		16,597	**10,975**	10,975	NIL
Dr B. Goldman	30,625	**26,028**	19,085	**33,378**	11,540	**4,190**
Dr D. Griffin	11,000		11,000		NIL	
Dr P. Hutchings	15,012	**19,000**	16,199	**17,763**	14,781	**16,018**
Dr W. Rudman	13,420	**15,030**	5,888	**12,908**	7,531	**9,653**
Australian Research Grants Committee						
1979						
Dr P. Hutchings	827				NIL	
Dr J. Lowry	207				NIL	
Dr D. McAlpine			48		NIL	
Dr W. Ponder	2,291				NIL	
Dr J. Specht	2				NIL	
Dr G. Webb/Dr H. Cogger			299		NIL	
1980						
Dr P. Hutchings	3,100		325	**235**	235	NIL
Dr J. Lowry	2,722		386	**273**	273	NIL
Dr D. McAlpine	3,500	**22**	7,022		22 DR	NIL
Dr W. Ponder	8,233		7,313	**2,690**	2,690	NIL
Dr J. Specht	8,138		5,654	**4,878**	5,621	**743**
1981						
Dr P. Hutchings	3,075	**3,075**	613	**4,479**	2,462	**1,058**
Dr R. Lampert	2,325	**2,325**	2,206	**1,475**	119	**969**
Dr D. McAlpine	6,400	**6,400**	5,770	**5,953**	630	**1,077**
Dr H. Recher	13,935	**13,935**	10,450	**16,915**	3,485	**505**
Dr W. Ponder	7,878	**8,522**	6,957	**5,964**	921	**3,479**
Dr F. Rowe	4,930	**4,930**	3,863	**5,250**	1,067	**747**
Dr J. Specht	7,963	**7,963**	1,505	**15,714**	6,458	**1,293** DR
1982						
Dr R. Lampert		**2,550**		**112**		**2,438**
Dr D. McAlpine		**7,971**		**6,996**		**975**
Dr H. Recher		**12,008**		**12,519**		**511** DR
Dr W. Ponder		**7,536**		**7,802**		**266** DR
Dr F. Rowe		**5,500**		**7,345**		**1,845** DR
Dr J. Specht		**6,185**		**46**		**6,139**
Department of Science and Environment Queen's Fellowship						
Dr J. Leis	16,888		19,443	**122**	1,244	**1,122**
Dr D. Paton	14,139	**45,284**	10,176	**30,863**	3,963	**18,384**
National Employment Strategy for Aboriginals						
Mr P. Gordon	6,451	**12,369**	9,874	**12,080**	6,751 DR	**6,462** DR
Ms V. Duncan				**1,114**		**1,114** DR

Grants Statement

Grants	Receipts 1981 $	Receipts 1982 $	Payments 1981 $	Payments 1982 $	Balance 30 June 1981 $	Balance 30 June 1982 $
Other Scientific Grants						
Australian Conservation Foundation — Sperm Whale Survey	4,000	**640**	4,640		640 DR	NIL
Australian Garbage Project					1,608	**1,608**
Cape York Study Grant from Comalco	2,068		2,087	**106**	14	**92** DR
Conzinc Riotinto of Australia Ltd Grant for Malanggan Restoration					500	**500**
Electricity Commission						
Colo River Project				**191**	191	NIL
Angus Colliery Project		**3,925**		**719**		**3,206**
Great Barrier Reef Marine Park Authority						
Dr J. Leis	600	**2,400**	44	**2,956**	556	NIL
Dr B. Russell	13,581		14,248		667 DR	**667** DR
Greenpeace — Sperm Whale Survey				**515**	515	NIL
Larval Fish Study — Grant from Dr J. Leis	500	**500**		**965**	500	**35**
Forestry Commission of NSW Grants —						
Dr Holmes	750		226	**233**	524	**291**
National Parks and Wildlife Service	2,700		272	**254**	2,428	**2,174**
"Whales Trust"		**9,000**				**9,000**
Ian Potter Foundation — Upper Mantle Project	875			**875**	NIL	
Lizard Island Research Station	226,083	**165,030**	126,379	**305,131**	144,693	**10,408** DR
State Pollution Control Commission of NSW	5,544	**899**	3,187	**3,555**	2,358	**298** DR
UNESCO — Oceanic Cultural Property Survey			(−4)		378	**378**
Harris-Daishowa Grant for Forestry and Wildlife Research		**15,791**	13,568	**9,704**	2,836 DR	**3,251**
National Photographic Index of Australian Wildlife						
Main Accounts	39,993	**10,533**	48,205	**24,174**	5,861	**7,780** DR
Sales Accounts	35,493	**32,550**	34,460	**7,915**	9,335	**33,970**
Page Sponsorship Scheme	20,857	**503**	1		23,953	**24,456**
Commonwealth Scientific Industrial Research Organisation						
Dr G. Pyke		**4,855**		**4,500**		**355**
Smithsonian Institution Grant to						
Dr P. Hutchings				**1,522**		**1,522** DR
Education/Exhibitions Grants						
Bank of NSW Grant for 'Wandervan'	17,080		16,822	**19,728**	11,152	**8,576** DR
Broken Hill Proprietary Co Ltd Sponsorship — Aboriginal Gallery	10,000	**20,000**	1,820		8,180	**28,180**
Bernard Van Leer Foundation (Australia)						
Drop-In	475		595		NIL	
Scholarship			450		4,558	**4,558**
John Fairfax and Sons Grant for School Case Project		**12,000**		**10,541**		**1,459**
Bushell Trust Grant — travelling exhibition	5,000		4,034		1,674	**1,674**
State Bank — Mammal Exhibition		**11,655**	4,280	**13,389**	437	**1,297** DR
The Australian Museum Society — Sponsorship of Bird Gallery		**12,417**		**2,152**		**10,265**
Unilever (Australia) Ltd — Sponsorship of Abelam Gallery	10,000	**12,500**	19,292	**36,382**	4,292 DR	**28,174** DR
Department of Youth and Community Service Drop-In	746		532		214	**214**
	698,410	**617,604**	536,518	**760,724**	313,850	**170,730**

Coffee Shop

1981 $	Receipts	1982 $
3,664	Balance as at 1 July	19,365
56,745	Sales	72,649
526	Interest	817
60,925		92,831
	Payments	
29,428	Purchase of goods for resale	38,239
1,955	Salaries	32,169
1,187	Other Costs	1,274
	Distribution of surplus funds:	
4,500	The Australian Museum Society	7,000
4,500	The Australian Museum	7,000
19,365	Balance as at 30 June	7,149
60,935		92,831

Peter Rankin Memorial Fund

1981 $	Receipts	1982 $
7,170	Balance as at 1 July	11,156
3,337	Donations	952
649	Interest	1,242
11,156		13,350
	Payments	
—	Scholarships	1,080
—	Bank Charges	14
11,156	Balance as at 30th June	13,350
11,156		13,350

Opposite page:
An Aboriginal family fishing from a bark canoe near Port Macquarie, N S W Circa 1920.
Photo from the Thomas Dick Collection.

Appendix B

Research Associates

M. Archer, PhD
H. Bell
I. Bennett, MSc
J. B. Burch, PhD
R. Burn, MAScS
R. Catala, DSc
C. E. Chadwick
R. O. Chalmers, ASTC
G. Coates
W. Dawbin, DSc
H. J. de S. Disney, MA
B. Egloff, MA, PhD
J. W. Evans, MA, ScD, DSc
H. O. Fletcher, MSc
J. Forshaw
V. Gregg
K. Huffman, BA, DipEthnol
P. Kailola
F. D. McCarthy, DipAnthrop, Hon DSc
J. Mahoney, BSc
J. E. Marlow, BSc (Hons)
L. Moffat, PhD
R. B. New, PhD
D. Newton
J. Pickett, MSc, DPhilNat
E. C. Pope, MSc, CMZS
A. A. Racek, RNDr (Brno)
L. R. Richardson, MSc, PhD
W. Starck, PhD
F. H. Talbot, MSc, PhD
I. W. B. Thornton, PhD
G. Theischinger
J. P. White, MA, PhD
J. C. Yaldwyn, MSc, PhD

Appendix C

Associates

B. Bertram
A. Chapman
N. Coleman
L. Courtenay-Haines
G. Daniels
A. F. D'Ombrain
D. D. Francois, MSc, PhD
J. Frazier
T. A. Garrard
K. Gillett, ARPS
A. Healy
J. Kerslake
R. Kuiter
C. Lawler
D. Lindner
T. R. Lindsey
N. W. Longmore
D. F. McMichael, CBE, MA, PhD
W. McReaddie
R. Mascord
D. R. Moore, MA, DipAnthrop
M. Moulds
F. Parker
H. Paxton, BA (Hons)
D. Rae
V. Robinson
N. W. Rodd
D. Scambler
R. Steene
M. Tuckson
A. H. Voisey, DSc
J. Voorwinde

Appendix D

The Australian Museum Magazine **was first published in 1921. It aimed to provide readers with a basic knowledge of Australia's environment and its diverse fauna. In 1962 the magazine's name changed to *Australian Natural History* — its popularity and reputation continued to grow. Today a new issue of the magazine is mailed out each quarter to over 6000 regular subscribers.**

Photo: A. Musgrave.

Publications

Atkinson, G., Hutchings, P., Johnson, M., Johnson, W. D. and Melville, M. D., 1981. An ecological investigation of the Myall Lakes region. *Aust. J. Ecol.* 6: 299-327.

Boles, W. E., 1982. The Young Observer's Book of Australian Parrots. Illustrated by P. Slater. Sydney: Methuen Australia Pty. Ltd.

Boles, W. E., 1982. The juvenal plumage of the White-throated Thicket-flycatcher *Pachycephalopsis poliosoma*. *Bull. Brit. Orn. Club* 102: 40-41.

Casey, P. S., 1981. Controlled Environment: Fact or Fiction. *ICCM Bulletin* 7(4): 10-21.

Casey, P. S. and Walston, S., 1980. Systems for the Control of Pests. *ICCM Bulletin* 6(1): 31-36.

Casey, P. S., 1980. Cultural Materials, Microenvironment and Mould. Proceedings of the Annual Conference of the Museums Association of Australia.

Casey, P. S., 1982. The Isolation and Identification of Fungi on Museum Ethnographic Artefacts. *Int. Biodeterioration Bulletin* 18(2).

Christensen, P., Recher, H. and Hoare, J., 1981. Response of dry sclerophyll forest to fire. *In:* Fire and the Australian Biota. Australian Academy of Sciences, Canberra, pp 367.

Cogger, H. G., 1981. A biogeographic study of the Arnhem Land herpetofauna, pp. 148-155. *In:* C. B. Banks and A. A. Martin (eds.). Proceedings of the Melbourne Herpetological Symposium, 1980. Zoological Board of Victoria, Melbourne.

Cogger, H. G., 1982. The Young Observer's Book of Australian Lizards. Illustrated by Kay Breeden Williams. Methuen Australia, Sydney, 48 pp.

Dingley, M., 1980. A Note on the Preparation of Cranial Endocasts. Proceedings of the Preparators Conference. Published by The Australian Museum.

Dingley, M., 1980: A Note on the Surface Finish of a Plastic Embeddment. Proceedings of the Preparators Conference. Published by The Australian Museum.

Faulkner-Dick, D. et al., 1981. Aboriginal Australia: a student introduction. Australian Gallery Directors Council.

Ford, H. A. and Paton, D. C. Portioning of nectar source in an Australian Honeyeater Community. *Aust. J. Ecol.* (in press).

Gray, M. R., 1981. A revision of the spider genus *Baiami* Lehtinen (Araneae: Amaurobioidea) *Rec. Aust. Mus.* 33(18): 779-802.

Gray, M. R., 1981. Spiders. *In:* Lord Howe Island — A summary of current and projected scientific and environmental activities. *Occ. Rep. Aust. Mus.* 1: 16.

Gray, M. R., 1981. Getting to know Funnel Web Spiders. *Aust. Nat. Hist.* 20(8): 255-270.

Gray, M. R., 1981. Telescoping Spiders. *Aust. Arach.* 6: 5.

Greer, A. E., 1982. A new species of Geomyersia (Scincidae) from the Admiralty Islands, with a summary of the genus. *J. Herp.* 16(1): 61-66.

Greer, A. E. and Haacke, W. D., 1982. A new and unusual species of Lygosoma (Lacertilia: Scincidae) from the Horn of Africa. *Ann. Transv. Mus.* 33(10): 153-164.

Greer, A. E. and Simon, M., 1982. *Fojia bumui,* an unusual new genus and species of Scincid lizard from New Guinea. *J. Herp.* 16(2): 131-139.

Hangay, G., 1980. The use of Polyurethane foam for Fossil Replicas and Manikins. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hangay, G., 1980. Squeeze-casting of Carcasses — an aid for the Sculptor-taxidermist. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hangay, G., 1980. Historical taxidermy specimens in the Australian Museum. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hangay, G., 1980. Stuffed with Life. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hangay, G., 1980. Home Tanning. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hollis, J. D., 1981. Crustal Accretion in Eastern Australia — Evidence from xenoliths in Basaltic Rocks. *5th Aust. Geol. Conv. Abs.* p 75 (with WASS, S.Y.).

Hollis, J. D., 1981. Pageantry in the Skies. *Aust. Nat. Hist.* 20(60): 175-180.

Holloway, G. A., 1982. Lord Howe Island. A summary of current and projected scientific and environmental activities. Hymenoptera. *Occ. Rep. Aust. Mus.* 1: 22.

Hood, J. A., 1980. Topographical Models. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Hutchings, P. A., 1981. Polychaete recruitment on to dead coral substrates at Lizard Island, Great Barrier Reef, Australia. *Bull. Mar. Sci.* 31(2): 410-423.

Hutchings, P. A., 1981. The Fauna of Mangroves. *Wetlands* 1(1): 4-5.

Hutchings, P. A. and Rainer, S., 1981. Designation of a Neotype of *Capitella filiformis* Claparede, 1864, type species of the genus *Heteromastus* (Polychaeta: Capitellidae). *Rec. Aust. Mus.,* 34(4): 373-380.

Hutchings, P. A., 1982. Bristleworms (Phylum Annelida), *In:* Marine Invertebrates of Southern Australia, Part 1. S. A. Sheppard and I. M. Thomas (eds). Handbook of the Flora and Fauna of South Australia Series.

Hutchings, P. A. and Recher, H. F., The fauna of Australian mangroves: a review. *Proc. Linn. Soc.* (NSW). (In press).

Hutchings, P. A. and Recher, H. F. The faunal communities of Australian mangroves. Proc. Int. Symp. Biol. and Management of Mangroves. (In press).

Jones, R. K., 1981. Acid preparation of fossils in calcareous rocks — a brief description. Proceedings of the Preparator's Conference. Published by The Australian Museum, pp 139-141.

Jones, R. K., 1981. Basic moulding and casting of fossils using rubber latex and plaster. *ibid.* pp 144-145.

Jones, R. K., 1981. A useful application of Carbowax 4000 (polyethylene glycol) in fossil preparation. *ibid.* pp 144-145.

Lampert, R. J., 1980. Variation in Australia's Pleistocene stone industries. *Journal de la Societe des Oceanistes* 68: 190-206.

Leis, J., 1982. Hawaiian creediid fishes *(Crystallodytes cookei* and *Limnichthys donaldsoni):* Development of eggs and larvae and use of pelagic eggs to trace coastal water movements. *Bull. Mar. Sci.* 32(1): 166-180.

Leis, J. and Randall, J., 1982. *Cheilomycterus spilostylus,* a new species of Indo-Pacific burrfish (Pisces, Tetraodontiformes, Diondontidae). *Rec. Aust. Mus.* 34(3): 363-371.

Losche, D., 1982. Gardens, Gods and Body Language. *Aust. Nat. Hist.* 20(9): 304-310.

Losche, D., 1982. *The Abelam: A People of Papua New Guinea.* Sydney, The Trustees of The Australian Museum.

Losche, D., 1982. The Abelam: A People of Papua New Guinea. The Australin Museum Calendar, 1982.

Losche, D. and Walston, S., 1982. Conserving ethnographic collections: problems of documentation. *Museum* 34(1): 34-36. UNESCO.

Lossin, R., 1980: New Methods in Large Mammal Taxidermy. Proceedings of the Preparator's Conference. Published by The Australian Museum.

Lossin, R., 1980. Anything new in Freeze Drying? Proceedings of the Preparator's Conference. Published by The Australian Museum.

Lowry, J. K., 1981. A redescription of *Sphaerophthalmus grobbeni* Spandl based on type material from the Red Sea and new material from the Great Barrier Reef (Amphipoda, Dexaminidae). *Crustaceana* 41(2): 190-198.

Lowry, J. K. and Fenwick, G. D., 1982. *Rakiroa,* a new amphipod genus from The Snares, New Zealand (Gammaridea, Corophiidae). *J. Nat. Hist.* 16: 119-125.

Lowry, J. K., 1982. The status of the gammaridean Amphipoda collected by the Australasian Antarctic Expedition. *Crustaceana* 42(3): 319-320.

McAlpine, D. K., 1981. *Nothoasteia* rediscovered. *Aust. Ent. Soc. News Bull.* 17(4): 147.

McAlpine, D. K., 1981. Amazing orchids of southern Australia *Aust. Nat. Hist.* 20(6): 181-184, illustr.

McAlpine, D. K., 1981. Acalyptrate flies. *In:* Recher, H. F. and Ponder, W. F. (eds). Lord Howe Island. *Occ. Rept. Aust. Mus.* 1: 21.

McAlpine, D. K., 1982. The acalyptrate Diptera with special reference to the Platystomatidae. *In:* Gressitt, J. L. (ed). Biogeography and Ecology of New Guinea. Junk, W., The Hague, pp 659-673.

McAlpine, D. K., 1982. Saving the Illawarra greenhood *(Pterostylis ceriflora). Orchadian* 7(4): 75.

McDonald, P. M., 1981. *Museums and Galleries in the Regions of New South Wales,* Div. of Cultural Activities, NSW Premier's Dept.

Morton, S., Recher, H. F., Thompson, S. and Braithwaite, R. Reproductive strategies of marsupials and placentals. *Amer. Nat.* (In press).

Murdy, E. O., Ferraris, C. F. Jr., Hoese, D. F. and Steene, R. C., 1981. Preliminary list of fishes from Sombrero Island, Philippines, with fifteen new records. *Proc. Biol. Soc. Wash.* 94(4): 1163-1173.

Paton, D. C., 1981. The significance of Pollen in the diet of the New Holland Honeyeater, *Phylidonyrus novaehollandiae* (Aves: Meliphagidae), *Aust. J. Zool.* 29: 217-24.

Paton, D. C. The diet of the New Holland Honeyeater *Phylidonyris novaehollandae. Aust. J. Ecol.* (in press).

Paxton, J. R., 1981. Ichthyological Expedition to Lord Howe Island. *Nat. Geogr. Soc. Res. Rept.* 13: 599-602.

Paxton, J. R. and Hoese, D. F., 1981. Fish. *In* Lord Howe Island, a summary of current and projected scientific and environmental activities (H. Recher and W. Ponder, eds.) *Occ. Rep. Aus. Mus.* 1: 25.

Ponder, W. F., 1981. *Posticobia norfolkensis* (Sykes), an apparently extinct freshwater snail from Norfolk Is. (Gastropoda: Hydrobiidae) *Proc. Linn. Soc. NSW* 105(1): 17-21.

Ponder, W. F., 1982. Hydrobiidae of Lord Howe Island (Mollusca: Gastropoda: Prosobranchia). *Aust. J. Mar. Freshwat. Res.* 33: 39-159.

Ponder, W. F., Colman, P. H., Yonge, C. M. and Colman, M. H., 1981. The taxonomic position of *Hemidonax* March, 1871 with a review of the genus (Bivalvia: Cardiacea). *J. Malac. Soc. Aust.* 5: 41-64.

Posamentier, H., Clark, S., Haynes, D. and Recher, H., 1981. Plant succession following wildfire in coastal heathland. *Aust. J. Ecol.* 6: 165-175.

Pulliam, H. R., Pyke, G. H. and Caraco, T. Scanning for predators by flocking juncos. *J. Theor. Biol.* (in press).

Pyke, G. H., 1981. Hummingbird foraging on artificial inflorescences. *Behav. Anal. Letters* 1: 11-15.

Pyke, G. H. and Waser, N. M., 1981. On the production of dilute nectars by honeyeater and hummingbird flowers. *Biotropica* 13: 260-270.

Pyke, G. H., 1981. Optimal travel speeds of animals. *Amer. Nat.* 118: 475-487.

Pyke, G. H., 1981. Effects of inflorescence height and number of flowers per inflorescence on fruit set in Waratahs *(Telopea speciosissima) Aust. J. Bot.* 29: 419-424.

Pyke, G. H., 1981. Optimal nectar production in a hummingbird-pollinated plant. *Theor. Pop. Biol.* 20: 326-343.

Pyke, G. H., Foraging in bumblebees: Rule of departure from an inflorescence. *Can. J. Zool.* (in press).

Pyke, G. H., 1981. Honeyeater foraging on *Lambertia formosa:* a test of optimal foraging theory. *Anim Behav.* 29: 878-888.

Pyke, G. H., 1981. Why honeyeaters perch and hummingbirds hover. *Anim. Behav.* 29: 861-867.

Pyke, G. H., 1981. Optimal foraging in hummingbirds: Rule of movement between inflorescences. *Anim. Behav.* 29: 889-896.

Pyke, G. H. Local distributions of bumblebees near Crested Butte, Colorado: Competition and community structure. *Ecology* (in press).

Pyke, G. H. Animal movements: An optimal foraging approach, *In:* The Ecology of Animal Movement. Swingland, I. R. and Greenwood, J. P. (eds). Oxford (in press).

Pyke, G. H. Evolution of inflorescence size and height in Waratahs *(Telopea speciosissima):* The difficulty of interpreting correlations between plant traits and fruit set. *Cunninghamia* (in press).

Recher, H. F. and Christensen, P., 1981. Fire and the evolution of the Australian biota, 55 pp. *In: Ecological Biogeography in Australia.* Keast, A. (ed) pp 137-162, Junk, W., The Hague.

Recher, H. F., 1981. Why are there so many species of herons? *For:* Symposium on 'Factors Affecting Nesting Success of Colonial Waterbirds', Linnean Soc. of N.Y., October, 1978. *Linn. Soc. (N.Y.) Trans.* 9: 135-158.

Recher, H. F., Rohan-Jones, W. and Smith, P., 1980. Effects of integrated logging on wildlife with recommendations for management, pp 1-60. Research Reports (Forestry Commission) NSW, No. 42.

Recher, H. F. and Hutchings, P., 1980. The Waterlogged Forest. *Aust. Nat. Hist.* 20(3): 87-90.

Recher, H. F., Fox, M. and Tranter, H., 1981. Nature's Flower Gardens. *Aust. Nat. Hist.* 20: 111-116.

Recher, H. F., 1981. Bird communities of heathlands and their management and conservation requirements in NSW. NSW National Parks and Wildlife Service.

Recher, H. F., 1981. Nectar feeding and its evolution in Australia. *In: Ecological Biogeography in Australia.* Keast, A. (ed.), pp 1639-1648, Junk, W., The Hague.

Recher, H. F. and Rohan-Jones, W., 1981. Forests and wildlife management: conflict or challenge. Living Earth, June, 1981, pp 11-14.

Recher, H. F., 1981. Death of an Australian myth: Fire and its effects on wildlife. *In: Bushfires, their effect on Australian life and landscape* (ed. P. Stanbury), pp 39-47. The Macleay Museum, Sydney.

Ritchie, A., 1981. First complete specimen of the dipnoan *Gosfordia truncata* Woodward from the Triassic of New South Wales. *Rec. Aust. Mus.* 33(11): 606-616.

Rowe, F. W. E., 1981. A new genus and species of ophidiasterid sea-star (Echinodermata: Asteroidea) from Lord Howe Island, Tasman Sea. *Proc. Linn. Soc. NSW* 105(2): 89-94, fig. 6.

Rowe, F. W. E. and Marshall, J. I., 1981. Crinoids of the Malagasy Republic. *Bull. Mus. Nat. Hist. Nat.*, Paris (4) 3(2): 379-413, 2 pls.

Rowe, F. W. E., Shepherd, S. A. and Marshall, J. I., 1982. Feather-stars (Class Crinoidea) *In:* Shepherd, S. A. and Thomas, I. M. (eds). *Marine invertebrates of southern Australia.* Part 1: 396-400, 2 text figs., pl. 29 figs. 1-2, pl. 30, fig. 1.

Rowe, F. W. E., 1982. Sea cucumbers (Class Holothurioidea) *In:* Shepherd, S. A. and Thomas, I. M. (eds). *Marine invertebrates of southern Australia.* Part 1: 454-476, 11 text figs., pl. 29 fig. 6, pl. 30 figs. 3-4, pl. 3 figs. 1-5, pl. 32, figs. 1-5.

Rowe, F. W. E. and Clark, A. M., 1982. Revised proposals for the stabilisation of the names of certain genera and species of Holothurioidea. Z.N.(S) 1982. *Bull. Zool. Nomencl.* 39(1): 29-35.

Rudman, W. B., 1981. The anatomy and biology of alcyonarian-feeding aeolid opisthobranch molluscs and their development of a symbiosis with zooxanthellae. *Zool. J. Linn. Soc.* 72: 219-262.

Rudman, W. B., 1982. The taxonomy and biology of further aeolidacean and arminacean nudibranch molluscs with symbiotic zooxanthellae. *Zool. J. Linn. Soc.* 74(2): 147-196.

Scott-Child, R., 1980. Wave Tank Construction for Museum Display. Proceedings of the Preparators' Conference. Published by the Australian Museum.

Smithers, C. N., 1981. A new species of *Dirla* Navas (Psocoptera: Calopsocidae) with comments on the position of the genus. *Aust. Ent. Mag.* 8(2): 24-28, 12 figs.

Smithers, C. N. and Thornton, I. W. B., 1981. The Psocidae (Insecta: Psocoptera) of New Guinea, including a new coleopteriform genus from high on Mt. Wilhelm. *Aust. J. Zool.* 29: 921-961, 125 figs.

Smithers, C. N., 1982. The Young Observers Book of Australian Butterflies. Sydney. Methuen, 48 pp illustr.

Smithers, C. N., 1982. Psocoptera. *In:* Parker, S. (ed). Synopsis and classification of living organisms. 2 vols. McGraw Hill. New York. (Psocoptera: pp 394-406, illustr.).

Smithers, C. N., 1982. Lord Howe Island. A summary of current and projected scientific and environmental activities. Insects. *Occ. Rep. Aust. Mus.* 1: 17-20, 1 pl.

Smithers, C. N. and Thornton, E. W. B., 1982. The role of New Guinea in the evolution and biogeography of some families of psocopteran insects. *Monographiae Biologicae* 42(2): 621-638, 15 figs.

Specht, J., 1980. Preliminary report of archaeological fieldwork in West New Britain. *Oral History* 8(8): 1-9.

Specht, J., 1980. Aspects of the oral history of the Bali-Witu Islands, West New Britain Province. *Oral History* 8(8): 10-22.

Specht, J. and Koettig, M., 1981. An obsidian flaking area near Talasea, West New Britain, Papua New Guinea. *Archaeology in Oceania* 16(3): 168-72.

Strahan, R., 1981. A Dictionary of Australian Mammal Names. Angus and Robertson, Sydney.

Strahan, R., 1982. The Young Observer's Book of Australian Mammals. Methuen Australia, Sydney.

Strahan, R., 1982. Mammal Index, Species and Subspecific Forms of Australian Mammals, 3rd Edition. National Photographic Index of Australian Wildlife, Australian Museum, Sydney 15 pp.

Sutherland, F. L., 1981. Pattern of Magmatic Evolution through the Cainozoic Volcanism of Eastern Australia. *5th Australian Geographical Convention Abs.*, p 75.

White, M. E., 1981. Fish beds reveal lush fossil forest. *Aust. Nat. Hist.* 20(7): 227-230.

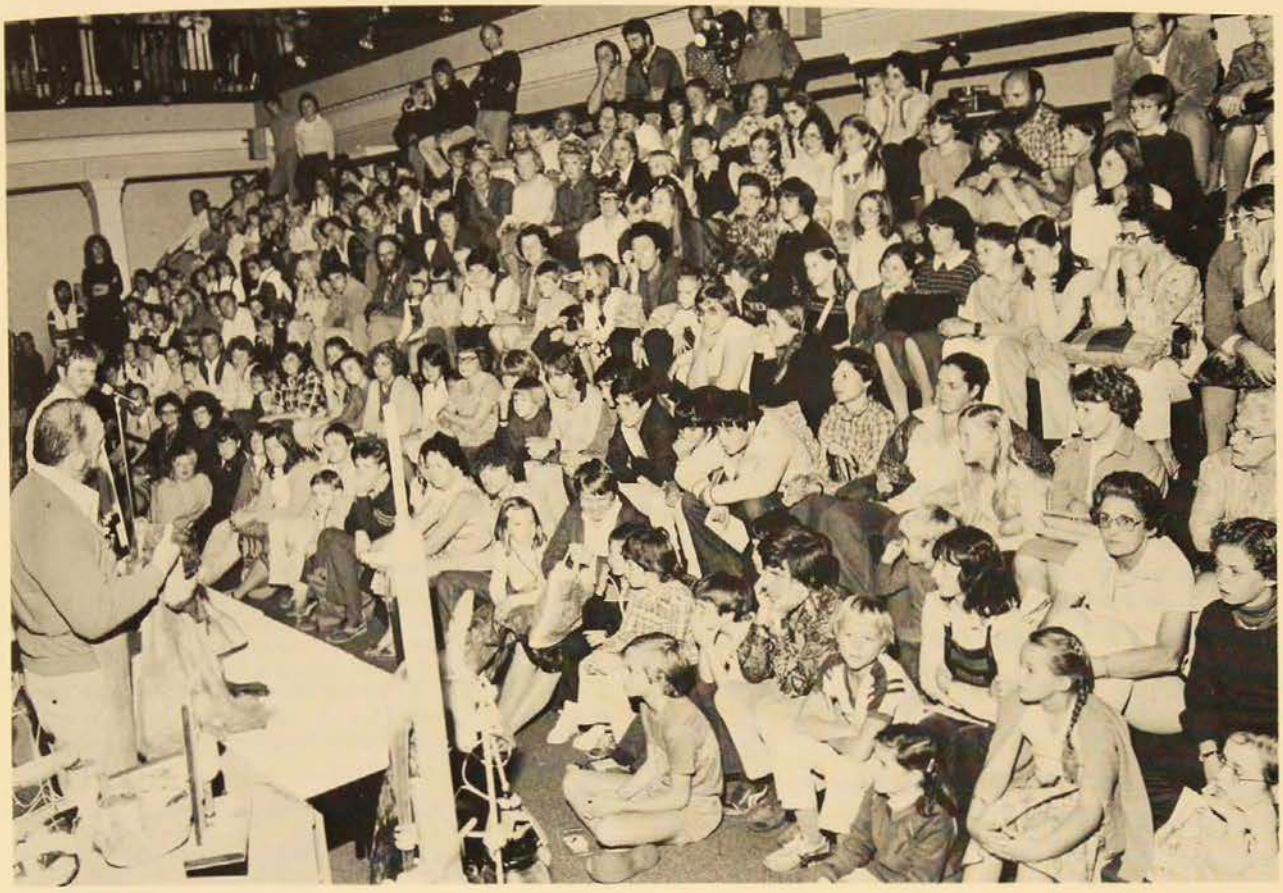
White, M. E., 1981. Revision of the Talbragar Fish Bed flora (Jurassic) of New South Wales. *Rec. Aust. Museum* 33(15): 695-721.

White, M. E., 1981. *Cyclomeia undulata* (Burges) gen. et comb. nov., a lycopod of the Early Triassic strata of New South Wales. *Rec. Aust. Museum* 33(16): 723-734.

Wilson, E. J., 1981. The Australian Museum Visitor 1979, No. 2. Australian Museum.

Witchard, R., 1980. Fish Casting. Proceedings of the Preparators' Conference. Published by the Australian Museum.

Appendix E



International Museums Day on 18 May was the opportunity to show the public some of the skills of preparators in a tongue-in-cheeks performance called the Back-Room Boys. It was organised by the Australian Museum Society.
Photo: J. Fields

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DEPUTY DIRECTOR — H. G. Cogger, MSc, PhD

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ASSISTANT CURATOR — D. Losche, MA, MPhil, PhD.

TECHNICAL OFFICERS — L. Bolton, BA(Hons), DipMusStud; K. Khan, BA(Hons), DipAnth, JP (from 1.10.81); Z. Horning, BA(Hons); G. O'Donnell, BA(Hons); V. O'Sullivan, BA(Hons) (from 17.11.81 to 30.11.81); S. Thomsett, BA(Hons), DipMusStud (from 12.7.82).

TECHNICAL ASSISTANT — P. Gordon.

TEMPORARY WORKERS — K. Cavanagh (from 1.2.82); J. Petersen; C. Sadlier.

Arachnology

ASSISTANT CURATOR — M. R. Gray, MSc (Head of Department).

TECHNICAL ASSISTANT — C. A. Horseman.

Entomology

CURATORS — C. N. Smithers, MSc, PhD (Principal Curator and Head of Department); D. K. McAlpine, MSc, PhD, DIC.

RESEARCH ASSISTANTS — K. C. Khoo, BSC(Hons) (from 4.1.82); M. R. Robinson, BApplSciBiol (to 21.8.82); D. Kent, BSc, DipAgrEnt (to 11.12.81).

TECHNICAL OFFICER — G. A. Holloway, BSc; O. Griffiths, BSc(ZooHons) (from 4.1.82).

ASSISTANT — B. J. Day.

Functional Anatomy Unit

RESEARCH FELLOW — R. Strahan, MSc, MIBiol, FLS, FSIH, FRZS.

Herpetology

CURATORS — H. G. Cogger, MSc, PhD; A. E. Greer, BA, PhD (Head of Department) (on leave after 1.4.82).

TECHNICAL OFFICER — D. Stewart (to 10-12-81).

TECHNICAL ASSISTANT — R. Sadlier (Acting Head of Department).

ACTING TECHNICAL OFFICER — D. Kent (from 11.12.81).

Ichthyology

CURATORS — D. F. Hoese, BA, PhD (Head of Department from 1.1.82); J. R. Paxton, MSc, PhD (Head of Department to 31.12.81).

VISITING CURATOR — P. J. Castle, PhD (from 1.12.81 to 31.3.82).

TECHNICAL OFFICERS — D. Blake, BA, DipEd; D. Brown-Fletcher, BA; H. K. Larson, MSc (to 30.9.81); M. McGrouther (from 12.3.81); D. Rennis, MSc (from 1.10.81).

RESEARCH FELLOW — J. Leis, BA, PhD.

RESEARCH ASSISTANT — J. Gates, BA; P. Harrison (from 22.3.82).

ASSISTANT — A. Thomas (from 1.3.82 to 16.4.82).

Malacology

CURATORS — W. F. Ponder, MSc, PhD; W. B. Rudman, MSc, PhD (Head of Department).

TECHNICAL OFFICER — I. W. Loch.

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RESEARCH ASSISTANTS — G. J. Avern, BScDipEd; J. Hall, BA, BSc(Hons); B. Jenkins.

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ASSISTANT — J. Hoey.

Marine Ecology

ASSISTANT CURATOR — A. R. Jones, MSc, PhD (Head of Department).

TECHNICAL ASSISTANT — C. Watson-Russell (to 1.3.82).

TECHNICAL OFFICER — A. Murray, BSc.

Marine Invertebrates — Crustacea and Coelenterates

CURATOR — J. K. Lowry, MA, PhD (Head of Department).

VISITING CURATOR — B. F. Kensley, MSc, PhD.

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TECHNICAL OFFICER — R. T. Springthorpe, BSc.

Marine Invertebrates — Echinoderms

CURATOR — F. W. E. Rowe, BSc, PhD, MIBiol, FLS (Head of Department).

TECHNICAL OFFICER — L. Vail, BSc, MSc.

RESEARCH ASSISTANT — V. Harriot, BSc (part-time until 20.11.81); A. Hoggett, BSc (from 5.1.82).

Marine Invertebrates — Worms

CURATOR — P. A. Hutchings, BSc(Hons), PhD.

ASSISTANT — K. Handley.

RESEARCH ASSISTANTS — P. Guilhaus, BSc (until 23.6.82); F. Bayers, BSc (from 28.6.82); P. Turvey, BSc, MSc (until 10.2.82); D. Randall, BSc (from 18.5.82); C. Glasby (part-time 31.8.81; 1.3.82 to 6.5.82; from 7.5.82).

Mineralogy and Petrology

CURATOR — F. L. Sutherland, MSc, PhD.

TECHNICAL OFFICER — J. E. Hingley, BAppSc, FGAA.

TECHNICAL ASSISTANT — R. E. Pogson, BAppSc(Hons).

Ornithology

CURATOR — Vacant.

TECHNICAL OFFICER — W. E. Boles, BSE (Acting Head of Department) (on leave until 10.8.81).

TECHNICAL OFFICER — A. D. Bishop, BSc (part-time from 13.4.82).

TECHNICAL ASSISTANTS — N. W. Longmore (to 2.4.82); D. N. Eades (to 10.8.81).

Palaeontology

CURATOR — A. Ritchie, BSc, PhD.

ASSISTANT CURATOR — M.E. White, MSc (part-time).

TECHNICAL OFFICER — R. K. Jones, BSc.

ASSISTANT — D. Jones.

Vertebrate Ecology

CURATOR — H. F. Recher, BSc, PhD.

TECHNICAL OFFICER — G. Gowing, BSc(Hons).

RESEARCH FELLOW — G. Pyke, BSc(Hons), PhD.

QUEEN ELIZABETH II FELLOW — D. Paton, BSc(Hons), PhD.

TECHNICAL ASSISTANT — D. Allen, BSc.

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TECHNICAL OFFICER — G. Serkowski.

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SENIOR CLERK/ACCOUNTANT — K. Todd.

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STAFF BRANCH — Staff Clerk — V. Lee (from 23.9.81); J. Garbutt (to 14.8.81); Clerks — E. Hart; G. Tyson (from 23.11.81).

TEMPORARY EMPLOYEES — During the year the Museum was able to participate in the State Youth Employment Training Programme. The following persons were employed under the scheme. A. Campbell (from 10.7.81 to 5.11.81); D. Wharton (from 6.7.81 to 30.10.81).

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PUBLICITY OFFICER — S. White.

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EDUCATION OFFICER (SPECIAL PROJECT) — A. Saunders, BA, DipEd.

EDUCATION OFFICERS (MUSEUM TRAIN) — S. O. Main, BA, DipEd (from 12.10.81); T. G. Quinn, BSc, DipEd (to 4.9.81); K. S. Weeks, BSc, MA.

PREPARATORS — R. C. Inder; D. B. Millar; H. White, DipIndDes.

TYPISTS — F. Coleman (from 7.12.81); A. Karayan; E. McPhee; S. Westerway (27.7.81 to 23.11.81).

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EXHIBITIONS OFFICERS — J. Freeman, BSc(Arch), AIDIA: R. Ross-Wilson; R. Sim, DipFineArt (Industrial Design).

SENIOR ARTIST — K. Gregg.

ARTISTS — B. Matzick, DipDesign(Display); S. Robinson, ASTC, DipDesign(Painting); G. Ferguson, STA, DipArtEd.

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TYPIST/ASSISTANT — L. Sullivan-Brown.

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PREPARATORS — W. Bell (to 24.5.82); M. Dingley; J. Hood; O. Keywan; R. Lossin; E. McLeod; T. Ralph; R. Scott-Child; R. Witchard.

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ARTIFICERS — T. Land; K. Forster; H. Magor.

Library

LIBRARIAN — G. Baker, ALAA.

LIBRARY OFFICERS — N. Bain; A. M. McConochie (from 16.3.82).

TYPIST — H. Spitzer.

CLERICAL ASSISTANT — C. M. Pyne.

Materials Conservation Section

HEAD — S. Walston, DipInstArch.

ASSISTANT CURATOR — P. Casey, BScAg(Hons), PhD.

TECHNICAL OFFICER — S. Phillips, BSc.

CONSERVATORS — D. Horton-James, BSc; K. Coote, BA, BSc(Hons) (from 17.8.81).

TEMPORARY STAFF — G. Hinton (30.11.81 to 28.5.82); D. Midwinter (from 30.11.81); T. Peacock (7.12.81 to 26.2.82); J. Rae (31.12.81 to 15.1.82).

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PHOTOGRAPHER — J. Fields.

PHOTOGRAPHIC OPERATOR — H. McLennan (to 4.9.81); C. Lowe (from 21.12.81).

National Photographic Index of Australian Wildlife

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ARCHIVIST/CLERICAL ASSISTANT — M. R. Gordon.

CLERICAL ASSISTANT — D. Greig.

Attendants and Security

SUPERVISOR — J. Lewis (to 30.10.81), W. Claessen

SENIOR ATTENDANT — W. Claessen (to 30.10.81).

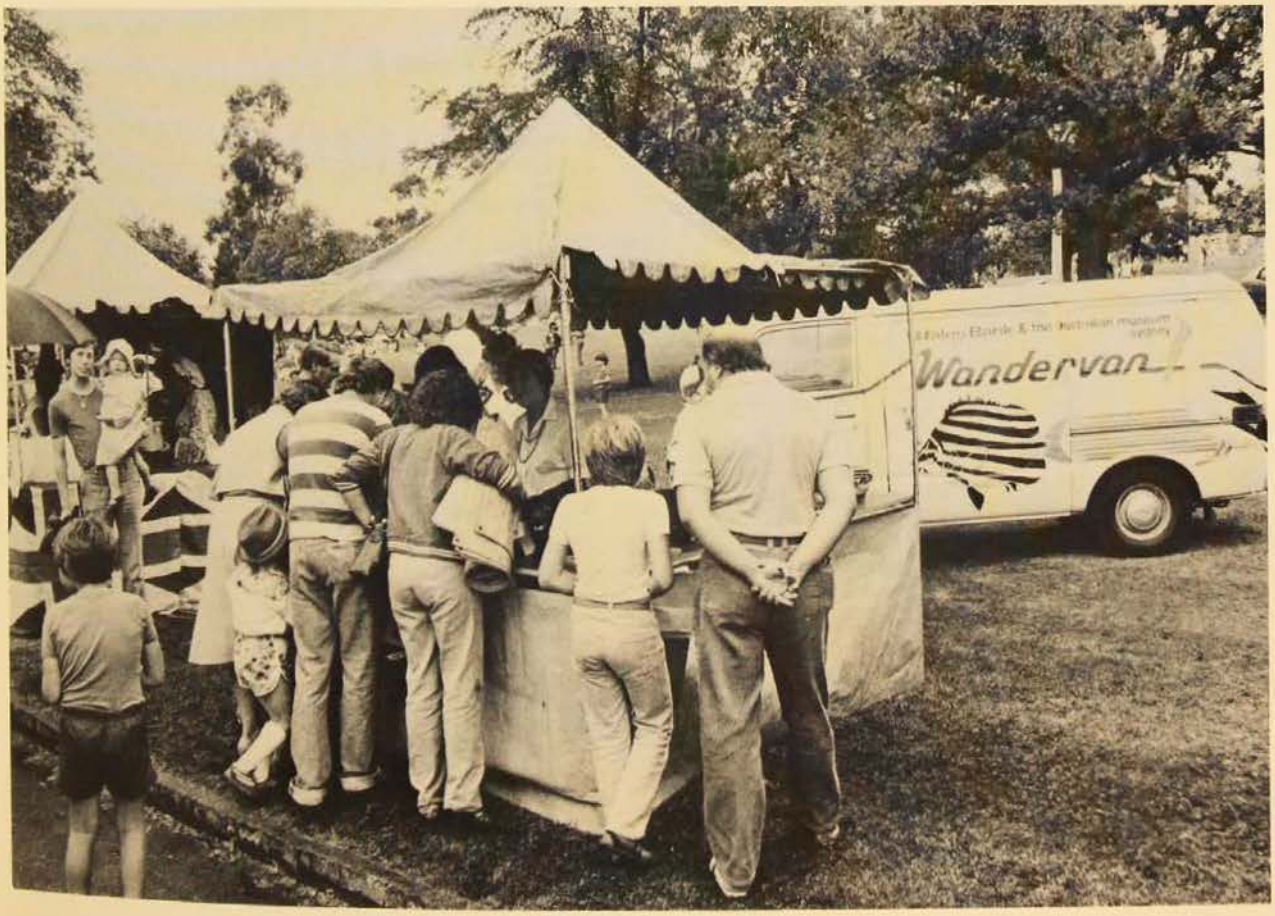
ATTENDANTS — C. Baldwin; S. Folkes; K. Randall; R. Stubbington; J. Laughton; B. Walsh; R. Davies; E. Mair; C. Adcock; A. Lomas; B. Payne; R. Scott; D. Waldon; H. Barrows; B. Griffiths; A. Denman; J. McGrath; I. Murray.

SECURITY OFFICERS — H. Ward; H. Pierson; D. Patterson; S. Landy; W. Jones; E. Martin.

CLEANERS — E. Drakoulaki; J. Fernandez; J. Gerzina; J. Casey; J. Elias; C. Minio (from 4.1.82).

On Sunday, 28 March, booths were set up in Parramatta Park as part of Heritage Week. Education Officers and the Wandervan were there to help the public find out more about the Museum.

Photo: J. Wade.



Appendix F

The Australian Museum Society Volunteers

Anthropology
A. Charlesworth
B. Conyers
F. Duncan
M. Kelly
D. Lautrec
A. Mann
C. McGrath
R. Momson
M. Nash
J. Owen

Arachnology
E. Balmer
G. Copp
L. Hopwood
E. Sheridan

Entomology
S. Burns
C. Chadwick
M. Holmes
D. Scrambler
R. Simon

Herpetology
A. Cocks
M. Savage

Ichthyology
A. Daniel
J. Hayllett

Malacology
S. Bull
G. Clark
J. Cullen
J. Davis
J. Dean
J. Doyle
T. Garrard
H. Haneman
P. Howarth
N. Ireland
T. Ireland
J. Kerslake
A. Leroi
S. McGeachy
F. Mobbs
D. Pearson
D. Steggles
H. Steggles
G. Thornley
R. Williams
J. Wise
P. Zylstra

Marine Ecology
L. Barber
A. Bradley
L. Evans
P. Hanley
D. Jenkins
C. Lemam

Marine Invertebrates — Crustacea/Coelenterates
F. Allen
L. Baron
L. Cantrelle
S. Dunlap
S. Reader
E. Silk
H. Smith
M. Whiles

Marine Invertebrates — Echinoderms
H. Broughton
J. Hartman
B. Marshall
M. Rowe

Marine Invertebrates — Worms
C. Glasby

Mineralogy and Petrology
A. Chapman
D. Chapman
B. Clark
B. England
L. Gibson
B. Jenkins
J. Jenkins
P. Jenkins
J. Keen
N. O'Shea
J. Pixley
N. Primrose
N. Robinson
G. Rowlands
J. Sexton
S. Sexton
J. Shearin
F. Smith
G. Stolarski
G. Sutherland
K. Underwood
F. Whitham
I. Whitham

Ornithology
M. Allen
M. de Jose
L. Haines
M. Hirst
H. King
T. Lindsey
W. Longmore

Palaeontology
S. Crouch
C. Jones
R. Rowe

Terrestrial Invertebrate Ecology
R. Marsh

Vertebrate Ecology
D. Bushell
R. Edelstein
L. Evans
J. Madgwick
L. Notley

Community Relations
G. Catchpool
P. Cooper
W. Deal
E. Hepburn
R. Lee
B. Whitewick

Education
S. Anderson
M. Copp
J. Debenham
J. Drew
E. Evans
J. Farquhar
C. Frasca
N. Gill
G. Giopoulos
K. Head
A. Joedicke
S. Kelly
B. Lassig
K. Liddiard
S. Lord
G. Lowe
J. Moore
L. Norrie
L. Oakes
J. O'Donnell
M. Pahlou
S. Pidcock
R. Porter
A. Rudkin
G. Selikowitz
D. Stokes
A. Tyrie
B. Weekes
M. Zarmarian

Exhibitions
D. Beck
R. Cohen
J. Giffen
O. Hasler
P. White

Library
C. Cantrell

Materials Conservation
H. Joynes
N. Turner

Photography
A. Brown
B. Lawson
B. Pulsford

National Photographic Index on Australian Wildlife
T. Carthew

The Australian Museum Society
G. Bishop
J. Cocks
G. Copp
E. Rench
H. Glover
R. Hodgson
B. Huff-Johnson
K. Ireland
M. Jones
M. Lee
R. Lee
D. Mobbs
C. Van Raalte
M. Roberts
H. Verge
C. Williams
T. Williams