

1968

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PARLIAMENT OF NEW SOUTH WALES

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REPORT  
OF THE  
TRUSTEES OF THE AUSTRALIAN  
MUSEUM  
FOR THE  
Year ended 30 June, 1967

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*Ordered to be printed, 4 April, 1968*

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\* Deceased 9th February, 1967.

† Resigned 16th August, 1966.





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Susan M. Hewitt, Assistant.

#### Palaeontology

H. O. Fletcher, M.Sc., Curator (to 25th  
February, 1967).  
Dorothy Jones, Assistant.

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\* Deceased August, 1966.

† Deceased September, 1966.

‡ Deceased December, 1966.



# ANNUAL REPORT

## OF THE TRUSTEES OF THE AUSTRALIAN MUSEUM

For the Year ended 30th June, 1967

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To His Excellency The Governor:

The Trustees of the Australian Museum have the honour to submit their 113th Report, for the year ended 30th June, 1967.

Emeritus Professor A. P. Elkin was re-elected President of the Board of Trustees at the Annual Meeting.

The Trustees suffered a great loss by the death on 9th February, 1967, of Mr E. J. Kenny, who had served on the Board for 20 years, and at the time of his death was Chairman of the Standing Committee. Mr G. Hermon Slade resigned in August, 1966, after 5 years' service on the Board. Dr K. L. Sutherland, D.Sc., F.A.A., Director of Research for the Colonial Sugar Refining Company Limited, and Professor A. H. Voisey, D.Sc., Head of the School of Earth Sciences at Macquarie University, were appointed to the Board on the 18th October, 1966, and 21st March, 1967, respectively. One of the Trustees, Mr Frank McDowell, was made Knight Bachelor in the Queen's Birthday Honours List.

The Trustees express their appreciation of the work of the Director and of the scientific and administrative staff. The Museum has run smoothly and efficiently and valuable contributions have been made to scientific knowledge both in the field and in the laboratory and there have been striking advances in display and educational activities.

The Museum is now recognized as a significant scientific and educational institution—serving not only science in general but also the public, school pupils and university students.

The Trustees appreciate the support given by the Government, especially the Premier and Treasurer, the Deputy Premier and Minister for Education, and the Minister for Public Works. The Trustees also thank the members of the Public Service Board for the sympathetic understanding and help given to the Director and themselves in staff matters.

### INTRODUCTION

#### The Museum and School Children

For some years the requests for school classes to visit the Museum have been increasing markedly. The demand has become so great that over the past year some hundreds of classes have been refused help due to lack of staff and classrooms. The visiting classes are of two types—those that come monthly and follow a particular course of study and those that make one, or a few visits. Whatever the preference of the school, the Museum is playing a very special educational role that cannot be filled as well by the school itself—that is, allowing children to handle and study a wide variety of natural history materials from its own rich stores.

As our cities grow, the urban child inevitably knows less of the broader environment of which he is a part. He is only aware of it when there is want, when water restrictions are imposed after drought, or when there is less money for school buildings because of an agricultural disaster. Yet man, with all his ability to manipulate and control, is ultimately as dependent on his environment as any other animal. It is now popular to talk of the ecology of man and the human environment. The expansion of human populations and the concomitant increasing pressure on land usage is forcing us to think in these terms.

In his museum the city child can become aware of this environment, of its geology and structure, its fossil record, human prehistory, and fauna and flora. The use of museum display halls and study rooms—though merely an introduction to a deeper knowledge—is to the city child a sharp new experience, and one which may help in the process of shaping him to become an adult with some knowledge of his environment, and some understanding of his place within it.



## GALLERY DEVELOPMENTS

During the year the first of the halls in the new East Wing, the Hall of Fossils, was completed and was opened by the Hon. Mr R. W. Askin, Premier of New South Wales, on 14th November, 1966. This Hall has been a major part of display activity for the past few years, and great care and energy have gone into its design and construction.

A display of ethnographic material is well under way for the next hall in the East Wing. This will exhibit some of the Museum's rich collection of New Guinea and Oceania material, much of it acquired early in the Museum's history, and now irreplaceable.

The Entrance Hall with its new displays dealing with the Antarctic, New Guinea and the Races of Man is now approaching completion.

Two exhibits of special interest, the Coelacanth fish and the Glory of the Seas Cone Shell, were put on display during the year.

## UNESCO SEMINAR

A UNESCO seminar on "The Role of Museums in Education" was held at the Museum from 26th to 29th September, 1966. It was organized by Miss P. McDonald, Education Officer, and Mr J. Willis, Director of the Museum of Applied Arts and Sciences, in conjunction with the Commonwealth Office of Education. The President of the Board of Trustees, Professor A. P. Elkin, welcomed those attending the Seminar on behalf of the Trustees. About ninety persons attended including Mr T. A. Hume, Director of the City of Liverpool Museum, and Dr R. O. Cooper, Botanist at the Auckland Institute and Museum. The Seminar was officially opened by the Minister for Justice, the Hon. Mr J. C. Maddison, and a report of the proceedings has been published by the Commonwealth Office of Education.

## RESEARCH AND FIELDWORK

The Australian Museum has always pursued an active programme of fieldwork and its scientists have been active in research both on living animals in the field as well as on specimens brought back to the Museum. The past year has seen this tradition continued and the following are examples of the research and field work programme which give an indication of its scope: a long term archaeological survey of the Hunter Valley, involving field excavations of aboriginal sites; studies on migration of butterflies involving a co-operative programme of marking and recapturing butterfly over much of southeastern Australia; studies of the ecology of a small dragon lizard in Western New South Wales; surveys of the reptiles and amphibia of Lord Howe Island, and the Coburg Peninsula, Northern Territory; long term studies on the ecology of coral reefs and the organisms associated with them, especially fishes and molluscs; a study of the distribution of a new species of beach worm; studies of social and reproductive behaviour of sea lions (*Neophoca cinerea*) in South Australian waters.

Numerous field trips primarily for collection of specimens were undertaken. Among the places visited and the kinds of specimens collected were the following: East Dorrig, N.S.W., Cairns-Atherton area, Queensland and Victoria (Insects); Coburg Peninsula, Northern Territory and Kosciusko State Park, N.S.W. (Reptiles); One Tree Island, Queensland (Fishes, Molluscs, Corals and other marine invertebrates); Nadgee Fauna Reserve, N.S.W. (Fishes and marine invertebrates); Grafton, N.S.W., Merimbula District, N.S.W. (Crustaceans); Fiji (marine invertebrates); Chowilla Dam Site, Victoria (Mammals); northeastern South Australia (Tektites) and the north coast of New South Wales (Birds). Fuller details of research and fieldwork are included under Departmental Reports.

## COLLECTIONS

The collections continue to grow each year both in volume and in scientific importance. The former is indicated by the difficulties experienced by almost every Department in storing material properly, and it has become very important that the proposed new storage block be constructed as soon as possible to prevent deterioration and to allow research on some groups to continue unimpeded. The latter is indicated by the increasing number of visiting scientists using the collections, and the increasing number of requests from scientists throughout the world for loan of specimens, or the provision of information on them.

This increasing importance is gratifying but throws additional responsibility on to the Museum to provide the facilities in both space and staff to meet its obligations to international science. It is extremely urgent, for the proper conservation of these priceless materials of science, that they be properly housed and cared for.

Among the notable acquisitions during the year was a unique specimen of native silver, weighing 22 lb and measuring 10 in x 7 in x 2½ in from a newly discovered vein at Broken Hill. This was generously presented to the Museum by Broken Hill South Ltd, and is now on exhibition.

Another valued acquisition was a collection of several hundred negatives of bird photographs, presented by Honorary Associate Mr K. A. Hindwood.



## STAFF

The Deputy Director, Mr H. O. Fletcher, who had served the Museum for 48 years, retired on the 25th February, 1967. It is fitting that a few months before his retirement he should complete the Hall of Fossils. Following his retirement Mr Fletcher was elected an Honorary Associate, and continues to work on the fossil collections. Dr D. F. McMichael, Curator of Molluscs, was appointed as Deputy Director to succeed him.

The Director spent 2 weeks in January at the United Nations Food and Agricultural Organization in Rome serving on a fisheries panel. He also visited the British Museum (Natural History) London and the Zoologisk Museum, Copenhagen.

Dr D. F. McMichael attended the 11th Pacific Science congress in Tokyo during September, where he participated in two symposia and acted as Chairman of the Standing Committee on Insular Faunas.

Dr D. F. McMichael continued to represent the Museum on the Council of the National Trust of Australia (N.S.W.) and was elected a member of the Executive and Chairman of the Conservation and Landscape Committee.

Miss P. McDonald and Mr D. R. Moore represented the Museum at the Congress of the Australian and New Zealand Association for the Advancement of Science in Melbourne in January.

Mr H. G. Cogger was given permission to do post-graduate study for 2 years at Macquarie University on a research fellowship.

Mr R. O. Chalmers attended the International Mineralogy Conference in Cambridge, England, in August-September and the International Gemmology Conference in Barcelona in October.

Mr H. J. de S. Disney attended the 14th International Ornithological Congress in Oxford, England from 24th to 30th July.

Mr H. G. Cogger went to the United States in June and July, spent some time at the California Academy of Sciences in San Francisco, the Field Museum of Natural History in Chicago, made a field trip in the Mojave Desert, and read a paper at the Annual Meeting of the American Society of Ichthyologists and Herpetologists.

Mr B. Goldman and Mr F. J. Beeman participated in a cruise to the Swain Reefs in a vessel chartered by the Queensland Department of Harbours and Marine to search for infestations of the Crown of Thorns starfish, *Acanthaster planci*.

Mr H. Hughes spent one month on a tour sponsored by Agfa Gevaert to the world's largest photography exhibition, the Photo Kina, in Cologne. Mr Hughes also inspected Agfa Gevaert factories and studied photographic applications in Museums in Europe, England and New York.

## HONORARY STAFF

The deaths of three Honorary Associates of the Museum occurred during the year. Mrs H. W. Kirkpatrick (Joyce Allen), former Curator of Molluscs, died on the 31st August, 1966, after many years of devoted service to the Museum. Mr Melbourne Ward, a noted carcinologist, died in September, 1966, having been associated with the Museum for many years. Mr J. Wassell, an enthusiastic and gifted collector, died in December, 1966.

Mrs Vera Gregg, who for the past 3 years has worked on funnel web spiders (*Atrax* spp.) and is working in conjunction with the Department of Entomology and Arachnology; Professor N. W. G. McIntosh, Challis Professor of Anatomy at the University of Sydney; Mr P. M. G. Woodhead, Director of the Great Barrier Reef Committee's Heron Island Research Station; Dr Rene Catala, Director of the Noumea Aquarium, New Caledonia, and Mr H. O. Fletcher, previously Deputy Director and Curator of Fossils at the Australian Museum, were elected Honorary Associates during the year. Together with other Honorary Associates they gave considerable help to the Museum in many ways and the Trustees wish to record their appreciation.

## ACKNOWLEDGMENTS OF CO-OPERATION

Many organizations and individuals aided the work of the Museum in a variety of ways during the year. They are listed under Departmental Reports, but the following are deserving of special thanks:

The Science and Industry Endowment Fund; The British Council; The Californian Academy of Sciences; The Australian Institute of Aboriginal Studies; The Pacific Science Association; N.S.W. State Fisheries; CSIRO Division of Fisheries and Oceanography; Caltex Oil (Aust.) Pty Limited; Imperial Chemical Industries of Aust. & N.Z. Limited; The Great Barrier Reef Committee and Director of the Heron Island Research Station; The Smithsonian Institution; The Department of Shipping and Transport, South Australia; Mr Robert Poulson, Heron Island; The New South Wales Police Diving Squad; Group Color Pty Limited.



## DEPARTMENTAL REPORTS

**Department of Anthropology:** (D. R. MOORE, M.A., Dip. Anthropol., Curator; KATHLEEN POPE, Assistant).

During the year the Department has continued its archaeological survey of the Hunter Valley, supported by a grant from the Australian Institute of Aboriginal Studies. A rock shelter at Milbrodale was excavated by a Museum party and produced an industry comparable in implement types with the material previously excavated at Sandy Hollow and Singleton. A burial was also excavated in an adjacent rock shelter. Subsequently attention was turned to the Mudgee-Ulan-Cassilis area on the western side of the Great Dividing Range. After an interesting and productive reconnaissance, a rock shelter on private property near the source of the Goulburn River was excavated during three field trips and produced a very extensive industry which can be compared with the material from the Upper Hunter. A number of minor field trips were also undertaken, including one to excavate a burial at the entrance to Lake Illawarra and two to Royal National Park to investigate various aboriginal sites reported by the public. A number of sites on the South Coast were inspected. Altogether four major field trips and four shorter trips were undertaken during the year.

It has not been possible to carry out any major reorganization of the collections, on account of the serious shortage of storage space, but all specimens received during the year have been registered, with the exception of several large stone collections.

The preparation of new Pacific anthropological exhibits in the Entrance Hall has been completed. Preparations have been made for the exhibition on the third floor of the new East Wing and specimens selected for display. The first exhibition in this gallery will be devoted to the art of Papua and New Guinea.

A number of small loan exhibits were prepared and assistance given in the preparation of exhibits for the Captain Cook Museum at Kurnell.

During the year the Curator has been active on various committees of the Australian Institute of Aboriginal Studies and participated in the Institute's conference on material culture at the end of the ANZAAS Congress in Melbourne. He is also a member of the Conservation Committee of the National Trust. The Committee, appointed by the Minister for Lands to advise him on Aboriginal Relics in New South Wales, has been active in preparing draft legislation and in taking steps to protect and preserve aboriginal sites. This committee is at present based at the Australian Museum; Professor Elkin is Chairman and the Curator is Honorary Secretary. The Department has continued to be active in the Foundation for Aboriginal Affairs, the Curator being a Vice Chairman. He is also Honorary Secretary of the Anthropological Society of New South Wales.

The Curator attended the ANZAAS Congress in January, 1967, and contributed a paper to a session on Anthropology in Museums. During his annual leave he was able to visit the South Australian and Western Australian Museums and made profitable contact with staff members.

Kathleen Pope, Assistant to the Department, has continued her research on the material culture of North Queensland, with particular reference to the Roth Collection, and her thesis on this subject is nearing completion.

During the year the collections were studied by a considerable number of persons from Australian Universities and other institutions. Visitors from overseas included Dr Yoshimura Sinoto, Bishop Museum, Hawaii; Dr Edward Zaino of New York; Professor Philip Dark of Illinois; Mr C. Kaufman of Basel Museum; Mr Ernest Dodge, Peabody Museum, Salem and Dr S. M. Bard of Hong Kong. Dr Bard, during 6 months' sabbatical leave, worked in the Department on an honorary basis and carried out valuable archaeological research.

Thanks for donations during the year are due to Mr A. E. Blumson of Rabaul; Mrs Aylmer; Mr J. G. Brown; Mrs M. D. Mitchell; Mr P. Coutts; Mr R. Lampert; Mr H. Warner; Dr L. Dyall and Mrs M. Baldwin.

Purchases include specimens collected in Malaita by Dr W. Dawbin and in the New Hebrides by Mr G. Brown; also wood carvings from the Congo from Mrs Hentze.

**Department of Entomology:** (C. N. SMITHERS, M.Sc., Curator; D. K. MCALPINE, M.Sc., Assistant Curator; JANET WALSH, Laboratory Assistant (until 24th February, 1967); G. A. HOLLOWAY, Technical Assistant; KLARA C. KOTA, Museum Assistant; ROBYN L. PETTETT (from 6th March, 1967) Museum Assistant).

The Curator has continued research on the taxonomy of the African and Australian Psocoptera and work is well advanced on a revision of the New Zealand Psocoptera. General revisionary work on this order at the generic level is continuing as a long-term project. The synonymic world list of species of Psocoptera was completed and published. This is a large paper for which data has been compiled over the past 14 years.

The life history study of *Orgyia anartoides* was completed and the results published. Life history studies on Psocoptera have continued.



Work has continued on migration of butterflies and populations of *Danaus plexippus* have been studied at Camden using the mark-release-recapture method. This has been done on a scale larger than ever before, on the overwintering populations, with the samples involving in most cases several hundreds of specimens. The number of co-operators in the migration study project has increased considerably and now forms a network of observers, particularly in eastern Australia and South Australia. Several school teachers are assisting in the work and are using the butterfly marking scheme as a practical exercise for pupils.

The Assistant Curator has continued taxonomic work on Australian Diptera, especially Platystomatidae and Heleomyzidae and biological work on an aberrant fly associated with wild arums.

Much field work was carried out during the year. Thirty day-trips were made for collecting and in connection with migration studies. Longer trips were made to Wilson River and East Dorriggo (6 days), North Queensland (Cairns-Atherton-Tully area, 27 days), Upper Allyn (3 days) and Victoria (14 days). Both the Curator and Assistant Curator visited Adelaide for field work and to study the collections of the South Australian Museum. The Assistant Curator studied the National Insect collection at Canberra.

Twelve thousand nine hundred and sixty-nine specimens were added to the collections, mainly through the collecting efforts of the staff. One hundred and fifty-three type specimens were registered. The task of sorting, rearranging and rehousing the collections has continued to the limit of available time and storage space.

In the *dry collection* the available new cabinets have been filled with moths and with the rapidly expanding Diptera collections. The spirit collections have been increased and have been now mostly sorted to at least family level so that material is available and easily accessible for study; a considerable amount of identification work remains to be done on the dry and spirit collections. Sorting and rehousing the slide collection has continued; the slides are now mostly accessible and available for study.

Material in the following groups has been despatched to specialists in various parts of the world for study. About four thousand specimens are involved: Tipulidae (Dr N. Dobrotworsky, University of Melbourne); Ixodidae (Dr N. Wilson, Hawaii); Nycteribiidae (Dr T. Maa, Hawaii); Ephydriidae, Canaceidae (Dr W. W. Wirth, Washington); Sciomyzidae (Mr G. Steyskal, Washington); Ephydriidae (Dr B. H. Cogan, London); Streblidae (Dr T. Maa, Hawaii); Acarina (Dr R. Domrow, Brisbane); Coccinellidae (Dr Ching Sing Li, Darwin); Apoidae (Miss E. Exley, Brisbane); Notonectidae, Corixidae (Mr J. Lansbury, London); Lonchaeidae (Dr J. McAlpine, Ottawa); Carabidae (Dr H. Ross, Illinois); Diptera (Dr D. Colless, CSIRO, Canberra); Coleoptera (Dr E. Britton, CSIRO, Canberra); Pentatomidae (Dr F. McDonald, Sydney University); Scarabaeidae (Dr M. Bacchus, London).

Material of the following groups, involving about five hundred specimens, has been returned from study loan and reincorporated in the collections; Syrphidae (Dr J. Vockeroth, Ottawa); Tachinidae (Dr R. Crosskey); Pedilidae (Dr Mahommed Abdullah, Reading, England); Elateridae (Dr A. Neboiss, National Museum, Victoria); Rhagionidae (Dr B. Stuckenberg, Natal Museum, South Africa); Formicidae (Mr T. Greaves, CSIRO, Canberra); Agromyzidae (Mr G. Griffiths, London); Platypzeidae (Dr J. McAlpine, Ottawa); Pseudocaciliidae (Dr L. S. Seong, Malaya); Odonata (Dr J. Watson, CSIRO, Canberra).

Material collected by members of the University of Sydney Biological Society has been received for identification; this will be distributed to specialists for study.

During the year several thousands of public inquiries were dealt with. Handling these inquiries occupies a considerable proportion of the time of the Technical Assistant. Just over half of the inquiries concerned spiders and other arachnids, whilst a little less than half concerned insects. The number of public inquiries is increasing year by year and the service provided by the Department is being more and more appreciated by the public.

The Curator attended the Congress of the Australian and New Zealand Association for the Advancement of Science in Melbourne and the First Annual General Meeting of the Australian Entomological Society which was held in conjunction with it. He has served on the Council of the Royal Zoological Society of New South Wales and has represented that Society on the Council of the Australian Entomological Society as well as serving on the Library Committee of that Society. He edited the News Bulletin of the Entomological Society and is serving on the organizing committee for the Second Annual General Meeting. He also served on a special sub-committee of the UNESCO Committee for Museums which considered the many aspects of the import and export of cultural materials.

The Curator acted as external examiner for a Ph.D. thesis presented to the University of Malaya and has been asked to act as referee for several manuscripts; he has also reviewed two books.

The Technical Assistant gave a talk on spiders to the Entomology Section of the Royal Zoological Society of New South Wales. The same body was addressed by the Assistant Curator on "Insects" and by the Curator on "Insect Migration". The Curator also gave lectures to the Museum Discoverers' Club, the Illawarra Naturalists and the Pittwater Fauna and Flora Society. He visited Canberra to lead a CSIRO seminar on "Insect Migration".



Mrs V. C. Gregg and Mr L. Courtney-Haines have continued to visit the Museum regularly to assist with work on the collections and carry out research on spiders and moths respectively.

The following visitors have studied the collections in connection with their research and have used Museum facilities in their work: Dr N. Dobroworsky, University of Melbourne (Tipulidae); Mr K. Taylor, CSIRO, Canberra (Psyllidae); Mr C. Frazier, New England University (Neuroptera); Mr P. Johns, University of Canterbury, New Zealand (Millipedes); Dr D. Colless, CSIRO, Canberra (Diptera); Miss Speed, University of Queensland (Neuroptera); Dr Clark, Washington (Microlepidoptera); Mr K. Campbell, Forestry Commission (Forest Insects); Dr E. Mockford, Illinois (Psocoptera); Mr O. Theischunji, Coogee (Odonata); Dr G. Gartside, Victoria (*Atrax*); Dr J. A. Watson, CSIRO, Canberra (Thysanura and Odonata); Mrs H. Darby, Christchurch, New Zealand (*Latrodectus*); Dr E. Britton, CSIRO, Canberra (Coleoptera); Mr M. Moulds, Glen Innes (*Delias* spp.); Mr J. V. Peters, Ryde (Lepidoptera); Mr I. F. B. Common, CSIRO, Canberra (Lepidoptera); Dr J. W. Evans, Bellevue Hill (Homoptera); Dr R. Domrow, Brisbane (Acarina); Miss E. Exley, Brisbane (Apoidea); Mr T. Greaves, CSIRO, Canberra (Formicidae); Dr L. Gressitt, Hawaii (Coleoptera); Dr and Mrs Blackith, CSIRO, Canberra (Orthoptera and Calliphoridae); Dr N. Sibatani, CSIRO, Sydney (Lycaenidae); Dr F. McDonald, Sydney (Pentatomidae); Rev. Lowery, Sydney (Formicidae); Mr D. Sands, Sydney (Lepidoptera).

In addition to the above visitors Dr J. Szent-Ivany visited the Department in connection with his preparation of a Bibliography of Pacific Entomology; Dr W. McDougall, Department of Primary Industries, Brisbane, called to discuss fauna protection; Mr P. Colman discussed New Guinea entomology; Dr D. Annecke called to discuss parasitic Hymenoptera, biological control and consult literature; Mr E. Hamilton-Smith discussed the survey of cave insects being conducted by him in association with the South Australian Museum.

During the University vacations the services of a student were again obtained for several weeks. This was extremely useful and beneficial from both the Museum's and the student's point of view and this type of association is to be encouraged.

Identification of material in connection with research have been carried out for the Division of Entomology, CSIRO, Macquarie University, Forestry Commission and the University of New South Wales. The Curator studied cave-inhabiting insects in connection with the South Australian Museum's survey and has undertaken the task of checking references for the Textbook of Entomology being prepared by the CSIRO.

Appreciation is here recorded of the great assistance given by the some two hundred voluntary co-operators in the insect migration study project. Work on this subject could not be carried out effectively without their aid.

#### Department of Herpetology: (H. G. COGGER, M.Sc., Curator, ROBYN D. SPALWIT, Assistant).

Six hundred and sixty-two specimens of reptiles and frogs were registered during the year.

Work continued on the systematics of the herpetofauna of New Guinea. A brief report on the reptiles of Lord Howe Island was prepared for publication, resulting from fieldwork carried out on the island in June, 1967.

As a result of preliminary proposals to undertake research towards a Ph.D. at Macquarie University, a major field survey of the distribution of the agamid lizard *Amphibolurus maculatus* in western New South Wales was undertaken, and a study area selected (with the approval of the Chief Guardian of Fauna) in the Round Hill Fauna Reserve near Euabalong. An area of 10 acres was surveyed and several censuses were made of the lizard fauna of the area.

At the request of the Division of Wildlife Research in Canberra the Curator undertook to prepare a report on the reptiles and amphibians of the Coburg Peninsula, in the northwestern corner of Arnhem Land. This work is being carried out jointly with Mr D. Lindner of the Animal Industry Branch of the Northern Territory Administration.

Preliminary keys to the reptiles and amphibians of Australia have been prepared and have been made available for testing to interested members of the Australian Society of Herpetologists. Check-lists of the families Gekkonidae, Pygopodidae, and Elapidae have been completed and are currently being prepared for publication.

Three visits, each of about a week's duration, were made to western New South Wales to study agamid lizards.

September, 1966, was spent at Port Essington, in Arnhem Land, in the company of Mr David Lindner, where reptiles and frogs were collected as part of a faunal survey of the Coburg Peninsula. Mr Lindner, who is resident at Port Essington, is continuing the collections.

Through the courtesy of the Kosciusko State Park Trust the Curator spent a week in the Park collecting alpine lizards and frogs in December, 1966.



As has been pointed out in previous annual reports the research collections are so congested that they can no longer be utilized effectively. Reorganization and the incorporation of new material has almost ceased. This situation is reflected in the number of acquisitions during the current year. This number (662) is the lowest since this Curator took over the Department of Reptiles 9 years ago. It is only 20 per cent of the material acquired 2 years ago and is less than half of that acquired last year. Unless we obtain immediate alleviation of our present storage problems there is every likelihood that our rate of acquisition of new material will continue to fall. It must be stressed that while the rate of growth of our herpetological collection is declining rapidly, those in other Australian museums with herpetological departments are growing.

As usual, numerous inquiries were received from the public and press, most concerning the identification of specimens. Considerable assistance was given to the *Readers Digest* in the preparation of articles on reptiles.

The following individuals visited the Department during the year to discuss matters of mutual interest, obtain assistance or work on our collections: Professor B. Brattstrom, University of California; Dr R. Bulmer, University of Auckland; Mr A. Burbridge, University of Western Australia; Professor F. Cagle, Tulane University, Florida; Professor C. H. Campbell, University of Sydney; Mr D. Horton, University of Melbourne; Mr D. Howe, Animal Industry Branch, Northern Territory Administration; Dr A. K. Lee, Monash University; Mr D. Lindner, Animal Industry Branch, Northern Territory Administration; Mr R. D. Mackay, Museum of Papua and New Guinea; Professor M. R. Miller, University of California; Lt T. Norris, Royal Navy; Dr E. Pianka, Princeton University; Dr N. Stephenson, University of Sydney; Mr D. Stammer, Mount Isa, Queensland; Dr I. Straughan, University College of Townsville; Mr D. Woodruff, University of Melbourne.

Collections of particular interest were received from the following: Mr A. Burbidge (tortoises from Western Australia); Dr W. Dawbin (reptiles and frogs from the Solomon Islands); Miss D. Levitt (reptiles and frogs from Groote Eylandt); Mr D. Lindner (reptiles and frogs from the Northern Territory); Mr W. McReddie (reptiles and frogs from Mount Isa, Queensland); Mr A. Throne (reptiles from the Nullabor Plain).

Loan and/or donations of reptiles and frogs have been made to the British Museum (Natural History), London; Department of Zoology, University of Western Australia; Western Australian Museum, Perth; Rijksmuseum of Natural History, Leiden; Museum of Comparative Zoology, Harvard; South Australian Museum, Adelaide; American Museum of Natural History.

**Department of Ichthyology:** (Curator: Vacant; BARRY GOLDMAN, B.A., Research Assistant (from 1st March, 1967); SONdra BERESFORD, Assistant).

Dr F. H. Talbot acted as Head of the Department of Ichthyology for the year. Mr G. P. Whitley, Honorary Associate, worked in the Department during the year, and thanks are due to him for aid with inquiries. Mr B. Goldman, Research Assistant, aided greatly with inquiries.

Dr Victor G. Springer of the Division of Fishes, U.S. National Museum, Smithsonian Institution, accompanied the Australian Museum field party on One Tree Island and facilities were shared. This collaboration was found to be extremely fruitful and it is hoped such joint field work may be achieved again.

Research work included a field study of the fishes on sheltered and exposed coral reefs of One Tree Island reef, at the southern end of the Great Barrier Reef off Gladstone. A study of fish biomass and food relationships in various coral areas is being undertaken. Work continued on a revision of the genus *Lutjanus*, with the aid of Mr B. Goldman, Research Assistant. Excellent *Lutjanus* collections were loaned from the Smithsonian Institution Oceanographic Sorting Center, and the Academy of Natural Sciences, Philadelphia.

Fishes were collected from Nadgee Nature Reserve, on the Victorian border, during a survey of estuarine, littoral and sub-littoral fauna.

Useful collections of fishes were obtained during the year from field trips by Miss E. Pope and Mr R. Williams in Darwin; and by Mr B. Goldman and Mr G. Harrison from the Swain Reefs. Interesting material was also collected by Mr G. Coates, Townsville, from the Great Barrier Reef; Dr W. Dawbin, University of Sydney, from Malaita, Solomon Islands; and by Mr H. Kami, from Orote Point in Guam.

Material was donated during the year by Dr R. Catala, Noumea Aquarium, New Caledonia; Mr G. Goadby, Marineland, Sydney; Mr G. Biddle, Grafton; Mrs G. Ellem, Maclean and the Newcastle Underwater Research group.

Local collecting was carried out along the Sydney beaches with Mr J. Moreland, Dominion Museum, Wellington.

Thanks for assistance are due to the CSIRO Division of Fisheries and Oceanography; the New South Wales Department of Fisheries; Mr and Mrs P. M. J. Woodhead and Mr Frank Hallett of the Great Barrier Reef Committee's Heron Island Marine Station; Mr R. Poulson, Proprietor of Heron Island Guest House, and his staff; the Department of Harbours and Marine, Brisbane; Caltex Oil, Australia, Pty Ltd; and Imperial Chemical Industries of Australia and New Zealand Ltd.



Visitors to the Department included Dr V. Springer, Smithsonian Institution, Washington, D.C.; Mr J. Paxton, University of Southern California, Los Angeles; Professor C. Hubbs, Scripps Institute of Oceanography, San Diego; Mr H. Kojima, Kyoto University Maisuru; Mr H. Choat, University of Queensland, Brisbane; Mr J. Glover, South Australian Museum, Adelaide; Mr N. Kemp, Melbourne University, Melbourne.

**Department of Invertebrates (Crustaceans and Coelenterates):** (J. C. YALDWYN, M.Sc., Ph.D., Curator; D. J. G. GRIFFIN, M.Sc., Ph.D., Assistant Curator; KATHERINE A. TROUTT, Assistant until 18th January; JANET WALSH, Laboratory Assistant, from 24th February, 1967).

Research work was continued by the Curator on the long-term revision of the Crustacea Decapoda Natantia (shrimps and prawns) of New Zealand and their relationship to the Australian fauna. Two papers dealing with aspects of this major project were published during the year. Progress was made on other research projects, such as the systematics of subantarctic decapods; the latitudinal distribution of eastern Australian decapods, and the systematics and distribution of oceanic shrimps.

The Assistant Curator has continued his research on the taxonomy of Indopacific Brachyura (crabs) and a number of reports are in preparation or in press. About half of the collections of Brachyura obtained on the Australian continental shelf by the Dr Th. Mortensen Expedition, 1914-16, and the Galathea Expedition, 1950-52, has been studied in detail and work on the remainder is in progress. This interesting material is on loan from the Copenhagen Museum, Denmark.

The Curator spent 5 weeks in November and December on One Tree Island in the Capricorn Group at the southern end of the Great Barrier Reef. As well as taking part in the general ecological survey of the reef and lagoon, extensive collections of Crustacea and corals were made and brought back to the Museum. Shorter field trips were made by the Curator in April to the coast near Grafton, N.S.W., for general invertebrate collecting, and in May to the Merimbula area to continue the survey of the freshwater crayfish of southeastern New South Wales. Several days were spent in January working on the collections at the Dominion Museum, Wellington, while the Curator was on leave in New Zealand.

With the aid of funds from the CSIRO Science and Industry Endowment Fund, the Assistant Curator visited the Queensland Museum to study collections of Marine Brachyura in December. He also visited the National Museum of Victoria and the South Australian Museum, Adelaide, in June to study collections of southern Australian Brachyura and particularly the types of species described by W. H. Baker in 1905-07.

Important acquisitions during the year include collections of freshwater crayfish and other Crustacea, including many type specimens (Mr E. F. Riek, CSIRO, Canberra); a large series of type ostracods commensal on Australian freshwater crayfish (Drs C. W. and D. G. Hart, Academy of Natural Sciences of Philadelphia); extensive material of local corals taken by skindivers in the Sydney area (Mr D. Wilson, Mr C. Lawler and other members of the Underwater Research group of New South Wales) and a series of shore crabs from the beaches of north Queensland (Dr D. R. Fielder, University College of Townsville).

Honorary Associates Anthony Healy and Keith Gillett continued to help this Department with photographs of unusual marine invertebrates both for research and publication. The continued and enthusiastic assistance of these two keen photographers is of great help.

During the year information was given to several individuals on the distribution and abundance of antipatharian black coral in Australian waters. Various local firms are interested in cutting the stems into semi-precious jewellery as is done in Hawaii. Aid was given to the following: Dr A. A. Racek of the University of Sydney (penaeid prawn literature); Professor W. Stephenson, University of Queensland (swimming crab literature, identification of Moreton Bay survey decapods); Mr T. S. Hailstone, University of Queensland (identification of Brisbane River survey decapods); Mr P. M. J. Woodhead, Heron Island Marine Biological Station (coral literature); Dr R. J. MacIntyre, CSIRO, Division of Fisheries and Oceanography (decapod structure and biology); Dr Daniele Guinot, Museum National de d' Histoire Naturelle, Paris (information on type crabs); Professor E. Jurjanova, Zoological Institute of Academy of Sciences, Leningrad (amphipod literature and types); Mr C. Chadwick, Entomology Branch, N.S.W. Department of Agriculture (identification of exotic imported isopods); Fisheries Branch, Chief Secretary's Department, N.S.W. (identification of crabs and shrimps). Loans of various groups of Crustacea and Broyzoa were made for research purposes to 15 workers in Australia, United Kingdom, France, Canada, U.S.A. and Singapore.

The Assistant Curator attended a 3-week course of diving instruction with the N.S.W. Police Department Diving Section in April, and later the same month took part in a 5-day staff training field trip to the Nadgee Faunal Reserve in southern New South Wales.

Four papers were published during the year (listed elsewhere in this Report) and two manuscripts were submitted for publication. These manuscripts in press are an account of the grapsid crabs of Tasmania by the Assistant Curator and new Australasian records of the Banded Coral Shrimp *Stenopus* by the Curator. Two articles were written for *Australian Natural History*, one on hermit crabs by the Assistant Curator and the other on some striking inhabitants of the Barrier Reef by the Curator.



The following visitors worked on the collections and literature in the Department during the year: Dr J. P. Harding, British Museum (Natural History)—entomostracan Crustacea; Mr E. F. Riek, CSIRO Entomology Division—freshwater crayfish; Dr D. R. Fielder, University College of Townsville—crab ecology and behaviour; Dr A. J. Bruce, CSIRO Division of Fisheries and Oceanography—Pontonine shrimps; Mr J. S. Lucas, University of Western Australia—hymenosomid crabs; Mr K. Walker, Monash University—hymenosomid crabs; Mrs R. S. K. Barnes, University of Queensland—xanthid crabs; Dr I. Vigeland, Zoological Museum, University of Oslo—bryozoans.

**Department of Invertebrates: (Worms, Echinoderms, Ascidians and Sponges):** (ELIZABETH C. POPE, M.Sc., Curator; CHRISTINE PRIGGE, Assistant from 25th August, 1966).

Research has been concentrated chiefly on the naming of the extensive collections made by the Curator at Darwin in 1965 so that the report on the intertidal zonation there can be completed for publication. Help in taxonomic work by outside experts has greatly forwarded this project. The following groups have already been dealt with: Ascidians (by Mrs Mather, nee Pat Kott) and her paper has already appeared in Queensland University Press' Papers in Zoology; Sponges (Dr Pat Bergquist) and her paper is in press and should shortly appear in *Melanesica*; Serpulid Worms (Dr Dale Straughan) the account of which has been submitted to the *Australian Zoologist*; Alcyonaria (Dr Huzio Utinomi) which he intends to report on and hopes to submit his paper to the Records of the Australian Museum; and Bryozoa (Dr Imm. Vigeland) the account of which will be written up with other tropical collections made by that author. These workers record a number of new species and records of species new to Australia. Drs Yaldwyn and Griffin have identified crabs and other decapods and the remaining groups have been identified by the Curator. Only the extensive collections of corals and molluscs remain to be named before the written report can be completed.

Also in train is a revision of the barnacle genus *Tetraclita* and a large and representative collection has been assembled and prepared for detailed microscopic checking. Some evidence of an interesting intergrading of what, until now, have been accepted as two well differentiated species is apparent in the Australia material.

A collection of starfish from Fiji, submitted for identification by Loiset Marsh has proved very interesting as little has been published on the group in these islands. After consultation with the Director of the Fiji Museum and with Mrs Marsh, it has been decided to prepare a short report on them, jointly with Mrs Marsh, and to submit it for publication. This project is well advanced.

Fieldwork undertaken included a field trip to Camden Haven, Arrawarra and Minnie Waters in northern New South Wales to collect and record the habitat and geographical range of a new species of beach worm (*Onuphis*). During the trip a stopover of 2 days was made at the research station of New England University and a course on marine zoology was given to senior students. Continued supervision and routine visits during weekends have been made with a group of members of the Underwater Research Group of New South Wales (leader Mr C. J. Lawler) to various favoured local collecting places—Little Turriel Point, Glaisher Point, Bare Island and Camp Cove—where subtidal surveys are being made. Much information as to habitat, colour in life, seasonal variations is resulting from this work on lesser known groups like sponges and ascidians and valuable material is being collected.

Reefs in Fiji were examined during a recent visit and further starfishes were obtained along with a representative collection of Fijian barnacles.

Christine Prigge accompanied a museum party which spent 5 days during April surveying the marine life of the Nadgee Faunal Reserve and on several occasions has taken part in skin-diving surveys with the Department of Fishes.

Exigencies of space preclude any major plans to add significantly to our research collections at the present time since there is literally no room in the spirit collections. Curatorial work has therefore been focused chiefly on attempts to reduce the collections and rid them of any surplus material. However, valuable material still continues to accumulate more rapidly than it can be accommodated, as a result of gifts from other institutions (chiefly CSIRO Fisheries and Oceanography Section), scientists and skin divers.

Type material has been received from the following: Ascidians (Mrs W. Mather); Sponges (a topotype from A. A. Racek); material collected at Darwin by the Curator and Antarctic material from Dr Little of California; 3 holothurians (Dr Pawson); Acrothoracic barnacles (3 holotypes and 6 paratypes from J. Tomlinson of California); 3 Flatworms (A. J. Bearup, M. R. L. Johnston and M. Howell); an echiurid worm and an acanthocephalid (Dr S. Edmonds). Other noteworthy additions to the collection included a rare crinoid from Townsville; a third collection of mixed echinoderms from the Abrolhos Islands in Western Australia from St Aquinas College; Echinoderms from the British Solomon Islands (Dr W. Dawbin), Fiji (Mrs Marsh) and New Caledonia (Dr R. Catala). Worms, Ascidians and Echinoderms from the benthos taken during the CSIRO survey off Cronulla have added several genera and species not previously represented in our collections.

Routine curatorial work has included the following activities—*Sponges*: the transfer of the extensive microslide collection to modern storage has commenced. Many are types or figured specimens and necessary catalogue adjustments have been made. *Nematoda*: a revision of the collection of nematodes is in progress to bring the classification and catalogue into line with recent



revisions. *Annelida*: Dr D. Griffin (Assistant-Curator in Charge of Annelids) reports that he has reorganized the catalogue of specimens to bring it into line with current classifications and has set up a literature catalogue. He plans to continue the reorganization of the collections in the coming year. *Ascidians and Echinoderms*: have received only routine attention, but valuable additions have been made to the collections.

Enquiries from the press and general public have followed the normal pattern but owing to the new arrangement, whereby the three Invertebrate Department scientists are rostered for duty only one week in three, the actual number of enquiries has been slightly reduced to some 175—apart from telephoned ones not recorded. The more technical enquiries from other State Departments—notably Departments of Health, Agriculture and the Maritime Services Board—have increased. More requests for help in providing literature references have come from librarians and the CSIRO and University departments of zoology and veterinary science and one request came from the Department of External Affairs in Canberra for recommendations of Australian books on Marine Science to be included in a gift to the Emperor of Japan.

A significant period of research time was spent in identifying ascidians, worms, sponges, echinoderms and barnacles taken during Dr MacIntyre's benthic survey off Cronulla, also for the University of New South Wales Zoology Department to establish the identity of sea urchins and other bottom fauna being used in experimental ecological work.

Two groups of technicians have sought detailed information on preservation techniques for invertebrates used in this department. The collected techniques, accumulated over 30 years, were brought together and typed and given to the Biology Department of Macquarie University and to a group of Ghanaians from New England Teachers College (led by Mr Asante).

Many overseas and local research workers have been helped by supplying identifications, ecological notes, geographical ranges or help with literature references and this, together with the handling of loan collections being worked by them, occupies about one fifth of official working time, since much of it is done by correspondence.

A successful and well attended symposium was arranged by the Curator for the Linnean Society of New South Wales in which recent marine researches in the neighbourhood of Sydney were reviewed by the leaders of the various research programmes.

Talks have been given to the Linnean Society of New South Wales, the Zoological Society, Castle Cove School Parent's and Citizens Ladies Committee, the N.S.W. Police Divers School, and sundry women's organizations on various aspects of marine zoology. A popular lecture was given to the New England University students one evening during their course and a talk in Grafton to a local naturalist group under the auspices of Dr L. R. Richardson.

Twelve loan collections have been sent to workers overseas or in other States during the year and some involve major revisions of groups.

The Curator has served as a Councillor and Vice-President of the Linnean Society during the year, as Chairman of the Warrah Sanctuary Trust, as Councillor of the Australian Marine Science Association and as editor of the AMSA quarterly Newsletter.

Visitors to the department have been numerous, the more interesting ones were, Dr J. P. Harding, of the British Museum (Natural History); Dr Bruce Halstead (World Life Research Institute, California); Dr Hedigar (Zurich) who sought information on possibility of keeping giant earthworms alive; Dr Immanuel Vigeland (Norway); Dr R. Catala (New Caledonia); Dr Weber (Pennsylvania State College) following up a correspondence on geochemistry and biochemistry of echinoderms, and His Honour, the Administrator of the Northern Territory, Mr Roger Dean.

The Department gratefully acknowledges gifts of photographs of specimens or of help in collecting or identifying animals from Mr K. Gillett, Dr L. R. Richardson, Mr Geoff Biddle and members of the Underwater Research Group of New South Wales team led by Mr C. Lawler.

**Department of Malacology:** (D. F. McMICHAEL, M.A., Ph.D., Curator; JANICE E. CAVE, Assistant).

Research on taxonomy of various molluscan groups was continued as time permitted. The acquisition of modern equipment for thin-layer chromatography has enabled this work to proceed further, and during field work in Queensland, additional tissue samples were obtained. Mr Garrard continued his compilation of a new check-list of the Queensland mollusca and Mr Voorwinde continued to study the classification of the superfamily Rissoacea. A start was made on a long term study of the growth and pigment pattern of the common reef clam, *Tridacna maxima*. This involved the identification, numbering and measuring of some 500 individuals at One Tree Island, and the description of their pigment patterns.

Six weeks were spent on the field trip to One Tree Island. Additional short visits were made to Montagu Island, Nadgee Fauna Reserve, and various localities in the Sydney district.

The valuable sea-shell known as the Glory of the Seas (*Conus gloriamaris*) was placed on display in a specially designed thief-proof case, where it is contrasted with the common Cloth of Gold Cone (*Conus textile*) which is often mistaken for the Glory of the Seas. Labels in the shell display have been fixed in position by the Exhibitions Department.



Following the retirement of the Deputy Director, Mr H. O. Fletcher, in February, the Curator of Molluscs, Dr D. F. McMichael, was appointed to the position.

The Curator represented the Museum on the Council of the National Trust of Australia (N.S.W.) and was elected a member of the Executive, and Chairman of the Conservation and Landscape Committee and the Montagu Island Committee.

Miss Cave was elected to the Central Council of the Public Service Association as a General Division representative.

The former Curator of Molluscs and Honorary Associate since her retirement, Joyce Allan, died in August after a long illness. Messrs Garrard, Voorwinde, Iredale continued their regular work at the Museum throughout the year and again contributed greatly to the work of the Department.

Articles were published in the magazine *Australian Natural History*, and a paper illustrating previously unfigured New South Wales marine molluscs. Museum Associates Garrard and Voorwinde also published papers based on their work in the Department during the year.

Several additional manuscripts await publication, and preparation of these has continued throughout the year. They include the Ure-Smith publication *A Treasury of Australian Wildlife* due to be published in the latter half of 1967, and a biography of John Brazier, first Australian Museum conchologist, to be published in the Australian Dictionary of Biography.

Acquisitions during the year have included material collected on field trips, especially at One Tree Island, and additional specimens from many Australian and overseas collectors. Mr Garrard has continued to bring into the Museum and incorporate into the collection, his shell collection which was given last year. Curatorial work has continued as time permitted and with the completion of the new molluscan spirit store, the whole of the preserved molluscan collections have been transferred to the Department where they are readily accessible. The dredging and shell-grit collection has been catalogued and properly arranged, and is available for study when required.

The Curator attended the 11th Pacific Science Congress in Tokyo where he presented a paper on the Evolution of the family Volutidae, and afterwards attended the Marine Parks Symposium in which he was invited to participate, by presenting a paper on the Marine National Parks of Australia—Present Developments and Future Needs. Following the Symposium, he was invited to write a Handbook on Marine Parks and Reserves for the I.U.C.N.

The Curator has also been active in conservation of fauna and flora through the National Trust of Australia (N.S.W.). He has also continued to serve as Honorary Secretary/Treasurer of the Malacological Society of Australia and as editor of its Journal. He also serves as Handbooks Editor of the Australian Marine Sciences Association and was elected to the Council of the Australian Society for Limnology.

The final editing and arrangement of the Ure-Smith publication, now entitled *A Treasury of Australian Wildlife* has taken considerable time during the year. This book is now with the publishers and should be published shortly.

Inquiries and visitors continued at much the same level as in previous years. Visitors of note included Dr Yoahio Kondo of the Bernice P. Bishop Museum; Dr J. B. Burch of the Museum of Zoology, University of Michigan; Dr J. Rosewater of the U.S. National Museum; Dr I. D. Hiscock of Monash University; Dr Brian Smith of the National Museum of Victoria; Dr Noel Vawser of the Commonwealth Department of Health, Darwin; Mr and Mrs Crawford Cate of Los Angeles, California.

Several popular science lectures were given to various naturalists and malacological groups. Preparation of lectures and practical classes in Zoology at Macquarie University has commenced and will be given shortly.

The Curator attended and successfully completed the course in skin-diving given by the N.S.W. Police Diving Squad.

The Curator devoted considerable time to the duties of the Deputy-Director following his appointment to that position in February.

The Curator submitted his resignation in June to take effect from October, 1967, in order to accept the position of Director of the Australian Conservation Foundation.

**Department of Mammalogy:** (B. J. MARLOW, B.Sc., Curator; Janet L. A. O'HARE, Assistant).

Further work has been carried out during the year on the initial stages of the long term research project on the social and reproductive behaviour of the poorly known Australian sea lion *Neophoca cinerea*.

Considerable assistance was obtained from the Department of Shipping and Transport in Adelaide and the Curator was invited to make a 3-week trip during October on the lighthouse tender M.V. *Cape Pillar*, which visits many uninhabited islands in South Australian waters. It was thus possible to investigate the distribution of seal colonies and select one which would make an adequate study area. Of all the sites visited, a small rocky island, Dangerous Reef, in Spencer's Gulf, South Australia, gave the greatest indication of being an important breeding area and plans were made to make a 2-month stay there during the next breeding season in August, 1967.



Application for financial assistance was made to the Science and Industry Endowment Fund of CSIRO who allotted \$500 for this project. This money allowed the purchase of material for living quarters which were generously erected on Dangerous Reef by the crew of the *Cape Pillar* and the remainder of the money was used for the purchase of tags to mark seal pups and other important equipment.

In addition to the field trip in South Australian waters on the *Cape Pillar*, a short visit was made in April to the Murray River district between Mildura and Renmark to investigate the fauna in the proposed Chowilla Dam area. This investigation was carried out by representatives from the Australian Museum, Fauna Protection Panel of N.S.W. and the Department of Fisheries and Wildlife of Victoria. In spite of 14 days intensive mammal collecting by a team of 10 experienced field workers, few species of indigenous mammals were discovered except for kangaroos, both reds and greys, brushtailed possums and water rats. Some introduced species, such as rabbits, foxes, feral cats and house mice were abundant in the area.

Some of the more interesting acquisitions to the Department of Mammalogy during the year included a skin and skull of the small New Guinea dasyurid *Myoictis melas* which was previously not represented in the collection. This specimen was donated by Mr Hobart Van Deusen of the Archbold Expeditions of the American Museum of Natural History. Two young elephant seals, *Mirounga leonina*, were donated by the Antarctic Division of the Department of External affairs.

A series of skulls of the sea lion *Neophoca cinerea* was collected from islands off the coast of South Australia during the trip on the *Cape Pillar*.

Work has continued during the year on the re-bottling and reorganization of the spirit collection. All the skeletal material of mammals was transferred from the Batten cellar to the storage space on the second floor of the New Wing.

The general storage facilities for the mammal collections are still sub-standard, particularly the Mammal Room which is extremely cold and damp. Some of the skulls are still infested with mould which is most resistant to all attempts to remove it. The installation of fans and heaters would help in combating this problem. It is intended to move the whole mammal collection into the proposed new building when the latter has been built.

The following visitors worked on the collections during the year or discussed problems of interest in mammalogy: Dr J. Nelson, Monash University—bats; Mr M. Plane, Bureau of Mineral Resources—fossil marsupials; Dr W. Dawbin, Sydney University—whales; Dr D. Ride, Western Australian Museum—marsupials; Mr D. Howe, Animal Industry Branch, N.T.—marsupial moles; Mr J. Mahoney, Sydney University—rodents; Mr D. McKenzie, Mawson Institute, Adelaide—seals; Dr E. Manchester, Sydney Hospital—mammal femora; Mr T. Kirkpatrick, Department of Primary Industries, Brisbane—kangaroos.

Overseas visitors included Dr Bernard Stonehouse, University of Canterbury, N.Z.; Professor C. Hubbs, Scripps Oceanographic Institute; Dr A. Keast, Queens University, Canada; Dr R. Bulmer, University of Auckland, N.Z.; Miss Judith King, British Museum (Natural History) who is on study leave from London and is working both at Sydney University and the Australian Museum on the collection of skeletons of fur seals (*Arctocephalus*) in connection with her studies on the systematics of this genus.

During August, 1966, the Curator attended a Symposium in Canberra on the applications of Telemetry to Biological Problems. Some most useful contacts and ideas were obtained at this time and it is hoped that these techniques may be applied to the current research problem on seals at a later stage.

The Curator also attended the ANZAAS Congress in Melbourne and the meeting of the Australian Mammal Society which preceded it.

In September, 1966, the Curator was elected President of the Royal Zoological Society of New South Wales.

**Department of Mineralogy and Petrology:** (R. O. CHALMERS, A.S.T.C., Curator; Mrs J. NAUGHTON, Laboratory Assistant).

Two months were spent in the northeast of South Australia in association with Messrs H. J. de S. Disney and R. Lossin. Field occurrence of australites in new areas was studied. Although unseasonable rain hampered progress and prevented visits being made to some likely areas, about 400 specimens were collected in hitherto unvisited areas between the Birdsville Track and Lake Eyre. Great assistance was given in collecting not only from Messrs Disney and Lossin but also from Messrs H. O. Fletcher, A. A. and D. F. Walker, and P. Robinson, who accompanied the Museum party for the entire trip in another vehicle.

Nearly 5 months from July to December, 1966, was spent on an overseas visit in which meteorite and tektite collections particularly, were studied in a number of the world's leading Museums, research institutions in the United States and Europe. Field observations on tektites were made in Czechoslovakia and in Thailand.



The number of minerals at 30th June is 41,813, an increase of 48. The principal donations were two superb specimens of rock crystal (the gemstone variety of quartz) from Kingsgate, N.S.W., left to the Museum from the estate of the late Miss F. S. Sachs, formerly employed as a Museum Assistant, and specimens of amethyst from a new find in Western Australia from J. H. Lord, Chief Government Geologist, Geological Survey of Western Australia. The remaining registrations are minerals from foreign localities obtained by exchange from Mr Martin Ehrmann, a mineral dealer from the U.S.A. These include gem varieties of spadamene, aquamarine, tourmaline and titanite from Brazil, wolframite and apatite from Portugal and large crystals of vivianite from Cameroun, Africa.

The number of rocks at 30th June is 8,785, an increase of 1,587 specimens. These are mainly tektites grouped as follows:

- (i) a collection of several hundred from Mulgaria and Witchellina, on the northeast edge of Lake Torrens. These were collected in 1964, but were the subject of study in the U.S.A. for some considerable time by the National Aeronautics and Space Administration in California and the Smithsonian Institution.
- (ii) A collection of several hundred collected on the Nullabor Plain, in 1965.
- (iii) A collection of several hundred collected in 1966 in two new areas in the Lake Torrens region of South Australia.
- (iv) A collection from the extreme northwestern corner of South Australia presented by J. E. Johnson.
- (v) Collections from Thailand and the Philippines exchanged with N.A.S.A., California.
- (vi) Specimens from the Khonkaen-Chompae district, central Thailand, Laos, South Vietnam, the extreme southern portion of mainland China, and Czechoslovakia either collected, presented by or obtained in exchange from various Museums and other institutions visited during the Curator's overseas visit.

A number of specimens were obtained by exchange with private collectors on a visit to Broken Hill made at the conclusion of the field trip in australite areas in South Australia. Representations made to Broken Hill South Ltd, during the visit has resulted in the General Manager, Mr D. F. Fairweather presenting a magnificent specimen of native silver. The vein from which this specimen came has only been discovered in the last few months. It is a unique specimen. It weighs 22 lb and measures 10 in x 7 in x  $2\frac{1}{2}$  in. In silver value alone it is worth nearly \$500. The specimen value is many times greater. These Broken Hill specimens have not yet been registered.

Several specimens of minerals were stolen from the fluorescent exhibit. A more secure locking system has been installed.

The transfer of the mineral collection from the basement passageway in the old wing to the mineral store in the south wing is proceeding.

The remaining steel cabinets of minerals in the basement passageway have been temporarily stored in the innermost cellar of the basement. Material for research purposes has been either given or lent to the following: Professor J. Wasson, University of California, Los Angeles; Professor L. Caldwell, University of Northern Illinois, U.S.A.; Dr Dean Chapman, N.A.S.A., Ames Research Centre, California, U.S.A.; Dr Bigg, CSIRO, Radioastronomy; Dr Ray Binns, University of New England; Dr Ian Threadgold, University of Sydney; Mr D. Craig and P. Bayliss, both of the University of New South Wales; Professor R. Aitchison, University of Sydney.

As in past years about 250 enquiries were received. The principal requests were for specimens of minerals, rocks and gemstones to be identified, but also a good deal of information was sought on the general geology of various areas, and mineral and mining localities where specimens might be collected. Some enquiries on the cause of deterioration of building stones were also received.

Professor Kalervo Rankama of the University of Helsinki, Finland, has been examining our Precambrian rock collections. He will be travelling in Australia for a considerable period, and from time to time will make the Museum his headquarters.

A lapidary group of 40 people from the U.S.A., mainly Alaska, visited the Museum and were given a conducted tour.

Others who visited the Department included: Drs B. H. Mason and E. P. Henderson, Smithsonian Institution; Professor Loren Caldwell, University of Northern Illinois; Martin Ehrmann, Mineral Dealer, Los Angeles; Dr F. W. Whitehouse, consulting geologist, Brisbane; D. A. Brown, Professor of Geology, School of General Studies, A.N.U., Canberra; Dr D. W. P. Corbett, Curator of Minerals, South Australian Museum; Dr Kaset Pitakpaivan, Chief of the Geological Section, Department of Mineral Resources, Thailand.

Articles were written on "The Tektite Problem" for *Australian Natural History* and on the proceedings of the International Gemmological Conference in Barcelona for the *Australian Gemmologist*. This latter was reprinted in the *Lapidary Journal* published in the U.S.A.

A lecture on "Gemmological Aspects of an Overseas Visit" was given to the Gem Club of the Gemmological Association of Australia.



**Department of Ornithology:** (H. J. DE S. DISNEY, M.A., Curator; ROBIN D. HAUENSTEIN, Assistant until 13th October, 1966; SUSAN M. HEWITT, Assistant from 17th October, 1966).

Analysis of the previous work done at the study area near Nowra continued and a short paper on part of this work was given at the XIVth International Ornithological Congress at Oxford.

Two short papers on two more species of birds were published on the main research project of the study of the taxonomic morphological and anatomical relationship of the sex and age differences of Australian birds with particular regard to moult.

In December a week was spent on the north coast of New South Wales banding and collecting in coastal semi-rainforest. An interesting series of Regent Bower birds of various ages and plumages was collected.

A week was spent in March, 1 year after the last visit and 2 years after the bush fires, at Tianjara Creek near Nowra to continue records on how the bush was regenerating and how the birds were re-establishing themselves. Several birds were retrapped which had been banded before the fires in the same place. The museum work boat was used to cross over to Lion Island in Broken Bay at the mouth of the Hawkesbury River to help local members of the Bird Banding Association to continue their records and observations on the colony of Mutton Birds. These records have been kept for the past 8 years for the Fauna Protection Panel. In December many nests had eggs, but in March there had been heavy predation and only three live young and one dead one was found. This is thought to be due to rats.

In May and June an 8-week field trip was undertaken together with the Mineralogist, Mr Chalmers, to northwestern New South Wales and up the Birdsville track in South Australia. Originally it had been intended to visit the area on the Macumba, north of Lake Eyre, but unfortunately it was not possible to do this part of the trip due to the loss of nearly 2 weeks in time from holdups caused by the heavy rains and to breakdown of the vehicle. New parts and a mechanic had to be brought from 300 miles away. Despite the difficulties, a good collection of birds with well documented data was collected; specimens of insects, invertebrates, reptiles and mammals were also collected.

East of the Birdsville Track, at the request of the Director of the Botanical Gardens, Adelaide, plants were collected which the recent rains had caused to appear and flower, so that he could compare them with plants collected by him in the same area when it was dry.

Assisted by a grant from the CSIRO Science and Industry Endowment Fund, the Curator was overseas for 3 months from 14th July attending the XIVth International Ornithological Congress at Oxford in England. At the Congress he gave a short paper on Australian Honeyeaters. After the Congress he visited various Museums and research centres in Europe and America. Much useful discussion and information was exchanged with other workers which has benefited work here. Several collections of Australian birds were also examined.

Two hundred and eighty-three specimens were registered during the year, of these one hundred and eighty-seven had been collected by museum staff and ninety-six donated. Amongst these were a few specimens of birds collected in the Simpson Desert by Mr Keith Davis when he crossed it with a party in Landrovers. He also presented us with a copy of his very full and useful notes and observations on the birds.

Work has continued on the labelling of the specimens in the drawers of the public gallery, and labelling of the large birds in the basement store has been completed.

Requests for loans of study material were received from other State Museums, the Dominion Museum, Wellington, New Zealand; the British Museum (Natural History); New England University, Armidale and the Division of Wildlife Research, CSIRO, Canberra.

An exhibit of Antarctic birds was completed in the front hall of the Museum.

Over 200 inquiries were received from the public and institutions and other Government Departments.

The Curator was president of the Bird Banders Association of Australia for the year ending December, 1966, and continued on the Committee as Assistant Editor of their journal.

Two "Bird in the Hand" articles, and one on sexing passerine birds externally, were published in the Australian Bird Banders Association. This journal was started in December, 1962, and has now become the recognized journal throughout the world on banding and allied subjects in Australia.

Mr K. A. Hindwood, Honorary Associate, had published by A. H. and A. W. Reed, the book, *Australian Birds in Colour* which gives much useful information which is not readily obtained elsewhere.

The following visitors came to examine the collection or discuss problems: Capt. K. Ozawa, University of Fisheries and Marine, Antarctic Research Expedition from Japan; Lt Cmdr A. Y. Norris R.N., British Combined Services Expedition to Central Australia; Dr H. E. Elliott McClure, Migratory Animal Pathological Survey, S.E. Asia American armed forces; Mr P. Watters, Department of Zoology, New England University, Armidale; Miss J. Waite, Monash University; Mr P. Strong, Education Department; Mr J. Forshaw and Dr D. L. Serventy, CSIRO Wildlife Division; Dr F. Radcliffe, CSIRO Entomology Division.



Mr K. A. Hindwood, Honorary Associate, has as usual visited the Museum regularly and greatly assisted the Department, particularly when the Curator was overseas and on field trips.

The Science and Industry Endowment Fund provided the return fare for the Curator to visit research centres and Museums in Europe and America and to attend the XIVth International Ornithological Congress at Oxford.

Help towards living expenses on this trip was received in England from the British Council and in America from the Frank M. Chapman Memorial Fund.

**Department of Palaeontology:** (H. O. FLETCHER, M.Sc., Curator and Deputy Director; Miss DOROTHY JONES, Assistant.)

Mr Fletcher retired on the 26th February, 1967, but his services are temporarily retained for 2 days a week in the Department until a new Curator is appointed.

Registrations during the year numbered 290 and these 224 were presented.

Donations of interest have included an exceptionally fine collection of Ordovician graptolites from various localities in New South Wales. The material includes many holotypes (Mrs K. Sherrard); two mandibles (syntypes) of an extinct kangaroo, *Macropus wombeyensis* Broom, originally in the Anatomical Museum, Edinburgh (Dr W. D. L. Ride); plaster casts of leg-bones and mandibles of extinct Eocene and Miocene horses (Professor R. Stirton); a large collection of named Upper Triassic plants from Natal, South Africa, and Jurassic plants from New Zealand (Dr J. A. Townrow); a series of well preserved semi-recent crabs dredged from Gladstone Harbour, Queensland (Miss E. Bradley); several very well preserved lepidendroid plant stems from Upper Devonian rocks at the Wolf Creek Crater, near Hall's Creek, Western Australia (Dr F. Quodling); a large collection of Permian marine fossils from various localities in New South Wales (Museum of Applied Arts and Sciences, Sydney).

The rearrangement, final sorting and cataloguing of the fossil collections continued during the year as time permitted. The invertebrate, vertebrate and plant collections are now in good order with the exception of two invertebrate groups, brachiopods and pelecypods, which are being arranged. A start has been made to transfer the vertebrate fossils to storage space at the rear of the Hall of Fossils to allow room for expansion in the future of the invertebrate and plant collections.

Specimens made available on loan have included Lower Devonian corals and brachiopods (Dr A. Pedder, New England University); type specimens of *Favosites* (Professor D. Hill, University of Queensland); Permian brachiopods and pelecypods (Dr B. Runnegar, University of Queensland); specimens of *Paraconularia* and sponges (Dr J. Pickett, Mining and Geological Museum, Sydney); a Lower Cretaceous pelecypod, *Fissilunula clarkei* Moore (Mr P. Fleming, Geological Survey, Queensland); Permian brachiopods (Professor B. Waterhouse, University of Toronto); Cambrian trilobites (Dr B. Dailey, University of Adelaide); Permian brachiopods (Mr J. Armstrong, University of Queensland); Lower Cretaceous pelecypods (Dr R. W. Day, Australian National University); Jurassic fish (Professor D. Davis, Monash University); brachiopods, crinoids, fish and a trilobite (Dr K. Campbell, Australian National University); vertebrate material (Mr J. Mahoney, University of Sydney); Cretaceous fish (Mr A. Bartholomai, Queensland Museum); mandibles of *Macropus wombeyensis* Broom (Dr W. D. L. Ride, Western Australian Museum); plaster cast of *Thylacoleo* skull (Mr D. Merrilee, Western Australian Museum); lower mandible of *Thylacoleo* (Mr M. Plane, Bureau of Mineral Resources, Canberra).

Material made available to other institutions has included photographs of type micro-sections of two species of *Favosites* (Professor D. Hill, University of Queensland); plaster cast of the holotype of *Cactocrinus brownei* (Dr K. Campbell, Australian National University).

During the year there was a noticeable increase in the number of inquiries on palaeontological subjects and particularly in the number of fossil specimens left for identification. The collections were examined by a number of workers in palaeontology from other States.

At the request of Dr W. D. L. Ride (Western Australian Museum), Mr J. Mahoney (University of Sydney) has spent a considerable amount of time at the Museum checking the type material of fossil marsupials. The results of this work will be made available in the preparation of a complete list of types of the collections.

Much work was done in completing the new Hall of Fossils which was officially opened by the Premier, the Hon. R. W. Askin, M.L.A., on the 14th November, 1966.

The preparation of a complete list of type fossils in the Museum collections is nearing completion. Several thousand have already been listed and it is hoped that the work will be finalized and ready for publication within the next few months.

**Education Service:** (PATRICIA M. McDONALD, B.Sc., M.Ed., Education Officer-in-Charge; STELLA B. H. MAGUIRE, B.A., ZELMA M. HARKNESS, SHEILA M. RING, B.Sc., Assistant Education Officers; RODGER C. INDER, Technical Assistant).

This has been an extremely busy year, with our educational facilities in constant demand by many organizations. The service is limited by the staff and space available and until these are increased no further expansion is possible. The work has been greatly hampered by the alterations to the main entrance over the past 2 years and it is hoped that these will be completed in as short a time as possible.



A seminar on "The Role of Museums in Education" was held at the Australian Museum from 26th to 29th September, 1966, under the auspices of the Australian National Advisory Committee for UNESCO. The purpose of the seminar was to provide an opportunity for discussions on the present and future role of museums in education and to demonstrate to educational authorities at all levels the contribution which museums can make to educational programmes. Over 90 delegates attended. As host museum, a great deal of time and energy was devoted by the Education staff to ensuring the smooth running of the seminar.

Mrs S. M. Ring, B.Sc. (St Andrews) joined the staff on 14th November, 1966, as Assistant Education Officer.

Miss McDonald attended the ANZAAS Conference in Melbourne in January on behalf of the Museum.

The total number of children attending the museum classes organized by the Education staff was 23,705, comprising 524 visits. Of these, 48 classes visited the Museum regularly once a month, each following an individual course, and several others made a series of visits. Our facilities were as usual taxed to the utmost and while some classes could be given limited assistance in the galleries, many others had to be refused because of lack of staff and space. Only one group was taken on a field trip and other requests had to be refused due to lack of time. Increasing numbers of senior secondary school pupils are visiting the Museum, particularly since the opening of the Hall of Fossils; these exhibits supplement their prescribed work on evolution.

Several groups of handicapped children were given special instruction; these included two schools for blind children, two schools for mentally retarded children (one of which made a series of visits through the year), the Spastic Centre and Stewart House Preventorium.

With the continuing alterations to the main entrance, it was not possible to keep a record of the classes visiting the Museum to study the exhibits with the help of their teachers but from the numbers observed in the galleries, the total could possibly be higher than in previous years.

Groups of students from the three Teachers Colleges in Sydney and from Newcastle Teachers College were given lectures on the museum education service and some groups watched demonstration lessons. Trainees from the N.S.W. Ambulance Transport Services Board continued their series of visits.

A total of 236 collections of specimens, photographs and travelling cases was lent to schools and other educational organizations during the year. Nine new travelling cases on Molluscs have been completed, each with a "lift-out" collection of shells for student handling. Designs are in hand for nine cases, dealing with the Australian Aborigines and over 60 photographic enlargements have been mounted and labelled; colour transparencies have been selected and duplicated. Preliminary plans have been made for cases on "How Animals Move".

A special study kit on marine biology was prepared for the Correspondence Schools. This kit contains specimens for dissection as well as study specimens, photographs, film strips and notes. Replacement specimens were also provided.

Arrangements have been put in hand to obtain embedded specimens from the service laboratory of the New South Wales Department of Education.

The entire collection of some 250 enlarged photographs was overhauled, cleaned and relabelled by Mrs Harkness. Repairs and renovations to the loan specimens and teaching material were carried out by Mr Inder; these included repainting and mounting fish casts, mending and cleaning mounted birds and mammals, repairs to anthropological material and preparing display material for the Children's Room exhibitions.

Attendance at the school vacation film screenings was as follows: September, 1966—2,603; January, 1967—3,234; May, 1967—1,765; total 7,602. Many of the Play Centres organized by the New South Wales Department of Education attended the film screenings during the January vacation.

The Children's Room was closed for most of the September, 1966, school vacation due to the removal of the flooring in the main entrance hall, thus preventing access to the Room. During the other vacations, nearly 8,000 people visited the Room, the average daily attendance being 300 persons. The special displays were "The Great Barrier Reef" in January and "Animal Migrations" in May, 1967.

Museum Walkabout quizzes were completed by 936 children and 26 qualified for membership to the Discoverer's Club, bringing the total membership to 36. The Club was taken on a field trip to Bottle and Glass rocks in April and subsequently prepared reports on the area.

The Education Week Exhibition of children's project books, models, posters and other material was shown in the galleries and as usual attracted great interest from visitors. Prizes were awarded by the Trustees of the Museum for the best work in the various sections.

Nearly every label was checked before being exhibited; with the preparation of the Hall of Fossils, this entailed many hours of work. Surveys of visitor attendance in the galleries are continuing.



Sets of the free Museum leaflets were sent to 76 school libraries, municipal libraries and Rotary Exchange students and a further 1,022 letters requesting information were handled during the year. Numerous enquiries were answered, covering a wide range of topics, for example setting up a school museum (Malabar Public School), organizing a Junior Naturalist Competition (Wild Life Preservation Society) and a Conservation Competition for Secondary Schools (A joint National Trust of Australia, N.S.W. and Australian Museum projects), selecting films for the ANZAAS Film Exhibition, the preparation of a script for a film on the evolution of man (ABC Television), the co-ordination of material for natural science text-books (Angus and Robertson Ltd) and testing Girl Guides in order to qualify for a special badge.

Visitors from the Education staffs of other Museums were Miss Phyllis Bond (Haslemere Museum, Surrey), Mr Hodge (Queensland Museum) and Mr H. Mincham (South Australian Museum). Other visitors seeking information on our education services were Mr Flack, Scientific Information Service of the N.S.W. Geological Survey, Mr Asante and Mr Botchey from Ghana and Mr Batson from Barbados, and 20 Africans who came under the auspices of the Commonwealth Office of Education.

Several one-day trips were made to collect material for teaching and loan purposes. In June, 1967, Miss McDonald visited Perth and Adelaide to study educational activities in the museums of those cities.

A lecture, film programme and tour of the galleries were arranged for the Sydney Bushwalkers' Club and Mrs Maguire gave a lecture on minerals to the Western Suburbs Lapidary Club. An ABC radio broadcast on the Museum was given for Correspondence School pupils.

Group Color Pty Ltd, presented 18 large colour prints for use in the school loan travelling cases and the Department of Territories made colour transparencies available for this purpose also. Associates Mr Justice Myers and Mr A. Healy continued to supply colour transparencies for teaching purposes and Mr L. A. Howes and Mr A. Sinclair also donated slides for our use.

**Exhibitions Department:** (F. J. BEEMAN, Officer-in-Charge).

*Art and Design Section:* (D. RAE, B. BERTRAM, Exhibition Officers; ELVIE BROWN, Ticket Writer; HELEN ASHTON, BEVERLEY CREW, Production Assistants; ANNE WEGNER, Typist).

*Preparators' Section:* (R. WITCHARD, R. LOSSIN, K. GREGG, LORRAINE ZIRKZEE, M. CAMERON, P. FLUKE, J. MOIR).

Miss B. Crew was appointed on the 27th October, 1966, as a Production Assistant and Mr P. Fluke as a Cadet Preparator on 5th December, 1966.

Mr J. Moir was seconded from the Department of Technical Education. His period of work at the Museum was extended from 8th December, 1966, to 30th June, 1967. On the 1st July, 1966, Miss Wegner was attached to the Museum as a typist for a period of six months which was extended to 30th September, 1967.

This first half of the period covered by this report was mainly devoted to the completion of the Hall of Fossils. After the opening of this hall in November, both sections of this department had to spend a considerable amount of time on a systematic programme of gallery maintenance which was curtailed during the period of work on the Hall of Fossils. This Hall contains 47 exhibits and 12 dioramas. There are still 5 miniature dioramas to be completed.

As part of the re-planning of the Main Entrance the Antarctic, Pacific and New Guinea Gallery was designed to show Australia's neighbours. This hall is now finished with the exception of some spotlights on the "Races of the Pacific" map.

The Department of Public Works have almost completed the remodelling of the Main Entrance. These alterations include a new travertine floor, stairs and landing, automatic glass doors and a shop.

The Department of Public Works called tenders for the construction of cases for the proposed Ethnology Gallery on the third floor of the New Wing. The contract was let to Sparks and Colquhoun Pty Ltd, to be finished by 18th August, 1967.

Other work on the galleries has included the redesigning and installation of the Coral Exhibit, the cleaning and bleaching of the Whale Skeleton. The Coelacanth has been placed on exhibition in the Vestibule of the Ground Floor.

Last year an exhibit of the Cook Relics was prepared; this was later lent to the Endeavour Trust and displayed in the Head Office of the Bank of New South Wales. It has now been placed on permanent display in the cases near the Hallstrom Theatre.

Assistance has been given to almost every scientific department in their field work. A collapsible hut was built for Mr Marlow for the Dangerous Reef Expedition.

Arrangements were made with the Water Police to train members of the Museum staff in skin diving. F. J. Beeman and M. B. Cameron, from this department, attended the first course.

Assistance was given to a number of small museums including the Captain Cook Museum at Kurnell, the Hunter's Hill Historical Museum and the Orientation Centre, Kosciusko.



**Library:** (MARY G. E. DAVIES, B.Sc., A.L.A.A., Librarian; LEONIE E. TAGGART, Library Assistant; JESSICA E. WATSON, Clerical Assistant).

During the year 276 volumes were added to the Library, of which 142 were books, the rest being periodicals and parts of series. Of these volumes 142 were received on exchange or given to us, including a book by the Emperor Hirohito of Japan on the Hydroids of the family Clathrozonidae which was presented to us by the Japanese Embassy, Canberra. One hundred and thirty-two volumes were bound during the year of which 100 were new binding, the rest being repairs or rebinding.

Seven hundred and eighty-one loans were made to libraries all over Australia, both government and private. Many photocopies are now being supplied instead of loans, particularly for overseas requests, mainly from New Zealand and Papua-New Guinea. We have had to refuse several requests because the material is too old and valuable to lend or the article is too long. Our copying machine is too awkward and slow to copy long articles, so that we could not offer photocopies instead. The Museum borrowed 70 items from other libraries and other requests were supplied as photocopies or xerox copies. Visiting and local scientists and research workers have made use of the library as have members of the general public.

Recataloguing and new cataloguing have continued; 303 books and 328 periodicals were catalogued and classified during the year. Two hundred and forty-five old cards were withdrawn from the catalogue and 3,791 new cards made of which 2,120 were for a new catalogue covering the contents of the New Wing Stack. The duplicate catalogue being made for the New Wing is to replace the rough filing list that has been in use. The duplicate catalogue will save a trip to the library office when staff are working outside normal hours. The periodicals in the New Wing have now been classified and catalogued except for some which have been moved in recently and which are not yet completely sorted and checked. Two hundred and ninety-eight card have been made for the "Union Catalogue of Monographs in Australian Libraries" and sent to the National Library, Canberra. The checking of entries in "Scientific Serials in Australian Libraries" (S.S.A.L.) has now been completed, with a further 331 cards of amendments and new entries being despatched to Melbourne, including entries for new periodicals received during the year.

**Photography and Visual Aids Section:** (H. D. HUGHES, A.I.A.P., A.R.P.S., Photographer and Visual Aids Officer; C. V. TURNER, Assistant).

Work for the year included over 1,451 photographic prints of all sizes, 340 negatives 5 in x 4 in in size, 419 rolls of 35 mm, 121 monochrome slides, 189 colour slides and 111 large positive transparencies and a number of plates prepared for publication.

It is not always practical to keep details of the final destination of an illustration but an interesting breakdown of work is as follows:

	Per cent
Museum use for record purposes or research .. .. .	19½
Museum use for publication .. .. .	15
Museum use for School Travel cases .. .. .	2½
Museum use for galleries .. .. .	12½
Museum use for sundry uses .. .. .	19½
Uses other than Museum, in Australia .. .. .	12½
Uses other than Museum, Overseas .. .. .	18½

Further work has included the exposing and processing of special colour films, mainly for school travel cases and the preparation of large transparencies for silk screen printing of gallery labels and line illustrations.

Over 60 enlargements varying up to 6 feet by 4 feet have been prepared for an "Exhibition of Natural History Photography" to be displayed during August. Additional prints, smaller in size, are to be made to complete the display.

Photographic illustrations in colour and monochrome have been prepared for the joint Museum and Ure-Smith publication *A Treasury of Australian Wildlife* and for a book on Minerals by R. O. Chalmers. Both publications are using Museum colour photographs on the covers.

The acquisition of special camera lenses has improved the photography of minute specimens. This work carried out by Mr Turner has produced excellent enlargements of miniature molluscs and fossils for research and publication.

Work on the film dealing with the Museum was completed to a stage ready for the preparation of a sound track. A composer has been engaged to provide original music and, with the help of Mr David Moore, an experimental dialogue commentary has been made.

During April, time was spent in the field with Mr C. N. Smithers in northwestern Victoria. Here valuable cine film and still photographs were obtained of the Mallee Fowl at its mound and Pelican rookeries were filmed. These scenes, with recordings made at the same time, will be useful additions to films under production dealing with adaptations of animals to environment.



Through the generosity of the Public Service Board last September-October Mr Hughes joined a tour sponsored by the large German photographic manufacturing firm of Agfa Gevaert. The world famous Photo Kina in Cologne was visited and all the firm's major European factories were inspected. Some Museums on the Continent, London, New York and Honolulu were visited. In London, special inquiries were made into the printing of colour cine films and application of educational closed circuit television. Valuable contacts were made in both fields.

Arrangements are in hand to accompany Mr Marlow to Dangerous Reef at the entrance to Spencer Gulf, South Australia. It is intended to photograph and film the breeding habits of seals, to make sound recordings and a sound commentary if possible.

Visitors included Mr N. Carter of the Capt. Cook's Landing Place Trust Museum to whom much photographic advice and assistance was given. Mr Turner has acted as Honorary Photographer to the Trust.

Mr Turner completed the final year of his course in Photography at the School of Graphic Arts, Sydney. He has been advised that he had the highest pass in the Stage III final examination and won the Kodak Award.

Registration and cataloguing of photographs has been interrupted by pressure of other work and the need for some assistance in this work is becoming very apparent.

Sales of colour slides on sale at the Main Entrance have been satisfactory.

School vacation film screenings occupied a large proportion of the Section's time.

Projection equipment has been maintained and serviced regularly and is in satisfactory condition.

Messrs A. J. Gibson of Lismore, N.S.W., A. Sinclair and L. Howes donated large numbers of photographs which were passed on to the Education Service for its use.

#### **Editorial Assistant and Public Relations Officer: (P. F. COLLIS).**

A feature of the year's publishing activities was the publication of a new Memoir, *The Leafhoppers and Froghoppers of Australia and New Zealand*, by J. W. Evans, and a new booklet, *Australian Aboriginal Stone Implements*, by F. D. McCarthy. Full details of the year's publications appear in this Report under the heading "Publications".

The Museum received valuable publicity in the newspapers and on television and radio. Events which were particularly publicized were the opening of the Hall of Fossils, the lectures on evolution by Mr Ronald Strahan, Director of Taronga Park Zoo, and the installation of the coelacanth exhibition.

Advertising of the Museum and its publications and film screenings was continued in Sydney newspapers, and regular newspaper advertising of the Museum's cafeteria was begun.

Coloured posters publicizing the Museum were printed and placed in metropolitan trains.

The Public Relations Officer answered many inquiries from the public and newspapers.

### **ATTENDANCE**

Owing to reconstruction of the Main Entrance to the galleries of the Museum, the counting devices were removed in August, 1966, so that no precise details of attendance are available for the year. Approximately 24,000 school children visited the Museum in organized classes and an unknown number of other children came with their own teachers. They were estimated to be at least as many as in the previous year (over 40,000). The attendance at school vacation film screenings and at the Children's Room were slightly less than in previous years, but the Children's Room was closed through the September vacation while the flooring in the Entrance was replaced.

### **MUSEUM BUILDINGS**

The Main Entrance Hall to the Museum was completely renovated by the Public Works Department and a new travertine floor laid. The Entrance Hall is now much improved. The administrative area has also been renovated and construction of new laboratories and staff facilities in the basement of the north wing is under way. The old building has been roofed with copper in certain areas to prevent deterioration.

### **FINANCE**

Expenditure from Consolidated Revenue for the year (excluding Statutory Endowment of \$2,000) was \$284,771.06 compared with \$236,741.84 last year. Net income for Trustees' Funds (including Statutory Endowment) was \$18,302.16 compared with \$15,764.29 for 1965-66, while net expenditure amounted to \$19,882.72 compared with \$14,774.12 for 1965-66.

The cash balance in the Trustees' Account at 30th June, 1967, was \$3,521.56. Trustees' Invested Funds at 30th June, 1967, were: Fixed Deposit \$6,000; Commonwealth Inscribed Stock \$8,730; Commonwealth Special Bonds \$5,200; Metropolitan Water, Sewerage and Drainage Board Inscribed Stock \$5,000. A Statement of Receipts and Expenditure for the year is contained in Appendix.



## PUBLICATIONS

Four parts of Volume 27 of *The Records of the Australian Museum* were published during the year—Nos. 3, 4, 5, and 8. Nos. 6, 7, 9, and 10 are with the Government Printer. The Index to Volume 26 was published.

Nos. 7, 8, 9, and 10 of Volume 15 of the quarterly magazine *Australian Natural History* were published. No. 8 was a special and enlarged issue, devoted to the natural history of the Great Barrier Reef of Australia.

Australian Museum Memoir No. XII, *The Leafhoppers and Froghoppers of Australia and New Zealand*, by J. W. Evans, former Director of the Australian Museum, was published, as was the booklet *Australian Aboriginal Stone Implements*, by Frederick D. McCarthy, Principal of the Australian Institute of Aboriginal Studies, Canberra, and former Curator of Anthropology at the Australian Museum.

The 7th edition of the booklet *Australian Aboriginal Decorative Art*, by Frederick D. McCarthy, was published; 8,000 copies were printed, an increase of 2,000 over the 6th edition. The 3rd edition of the booklet *Australian Aboriginal Rock Art*, by the same author, was in the process of publication.

A new free natural history leaflet, *Early Man*, is in process of production. Seventeen existing leaflets were reprinted and eight are being reprinted. Increased public demand for the leaflets resulted in the number of copies printed being increased by about 70 per cent.

Two thousand coloured posters publicizing the Museum were printed by the Government Printing Office and placed in metropolitan trains by the Department of Railways.

Thirteen articles published in the magazine were reprinted or are in process of reprinting for their authors.

As well as articles contributed to the magazine, the following scientific papers by members of the staff were published during the year:

Chalmers, R. O.—

The Eleventh International Gemmology Conference. Barcelona. October, 1966. *Aust. Gemmol.* No. 66, Dec. 1966, 10–12.

Cogger, H. G.—

The Status of the "Elapid" Snake *Tropidechis dunensis* De Vis. *Copeia*, No. 4, pp. 893–894.

In McDowell, S. B., 1967—*Aspidomorphus*, a genus of New Guinea snakes of the Family Elapidae, with notes on related genera. *J. Zool., Lond.* 151: 497–543.

Disney, H. J. de S.—

Bird in the Hand—The House Sparrow (*Passer domesticus*). *Aust. Bird Bander* 4 (3): 60.

Bird in the Hand—The Spotted Pardalote (*Pardalotus punctatus*). *Aust. Bird Bander* 5 (2): 35.

Sexing Passerines by Cloaca Examination. *Aust. Bird Bander* 5 (2): 36–37.

McAlpine, D. K.—

Description and biology of an Australian species of Cypselosomatidae (Diptera) with a discussion of family relationships. *Aust. J. Zool.* 14: 673–685.

McMichael, D. F. and Voorwinde, J.—

Illustrations of Unfigured New South Wales Marine Molluscs. Part 1. *J. Malac. Soc. Aust.*, 10: 13–20, pls. 2, 3.

Marlow, B. J.—

Mating Behaviour in the Leopard Seal, *Hydrurga leptonyx* (Mammalia: Phocidae), in captivity. *Aust. J. Zool.* 1967, Volume 15, pages 1–5.

Pope, Elizabeth C.—

Port Phillip Survey 1957–63 Sessile Barnacles, Thoracica Cirripedia. *Mem. Nat. Mus. Victoria* 27: 179–182.

Smithers, C. N.—

A note on *Orgyia anartoides* (Walk.) (Lepidoptera, Lymantriidae). *Aust. Zool.* 13: 394–398.

A catalogue of the Psocoptera of the World. *Aust. Zool.* 14: 1–145.

Talbot, F. H.—

With R. S. Schomura, D. Menasveta and A. Suda,—Present Status of Fisheries and assessment of potential resources of the Indian Ocean and Adjacent seas. *Food and Agricultural Organisation of the United Nations*. pp. 1–40 (Multigraphed).

Yaldwyn, J. C.—

Copulation in the New Zealand Grapsid Crab *Hemigrapsus crenulatus*. *Pacific Science* XX (3): 384–385.

With R. G. Wear—Studies on Thalassinid Crustacea (Decapoda, Macrura Reptantia) with a Description of a New *Jaxea* from New Zealand and an Account of its larval Development. *Zoology Publ. Victoria University* 41, 27 pp., 5 figs.

Notes on the Behaviour in Captivity of a Pair of Banded Coral Shrimps, *Stenopus hispidus* (Olivier). *Aust. Zool.* XIII (4): 377–389, pls. XXV–XXVII.

With Garth, J. S. and Haig, J.—The Decapod Crustacea of the Royal Society Expedition to Southern Chile, 1958–1959. *Trans. Roy. Soc. N.Z. Zool.* 8 (16): 169–186.

A. P. ELKIN,  
President.

F. H. TALBOT,  
Director.



## RECEIPTS

## PAYMENTS

PAYMENTS									
Appropriation Account—									
Salaries, etc.	..	..	..	..	..	..	..	..	253,976.88
Tea Money	..	..	..	..	..	..	..	..	87.60
Rates	..	..	..	..	..	..	..	..	209.70
Insurance on Buildings	..	..	..	..	..	..	..	..	100.00
Travelling and Subsistence Expenses	..	..	..	..	..	..	..	..	3,100.00
Freight and Cartage	..	..	..	..	..	..	..	..	449.47
Maintenance of Motor Vehicles	..	..	..	..	..	..	..	..	699.97
Books, Periodicals and Papers	..	..	..	..	..	..	..	..	4,500.00
Fees, Commissions, etc.	..	..	..	..	..	..	..	..	100.00
Laundry Expenses	..	..	..	..	..	..	..	..	280.00
Postal and Telegraphic	..	..	..	..	..	..	..	..	800.00
Other Insurances	..	..	..	..	..	..	..	..	1,866.03
Stores, Plant and Equipment	..	..	..	..	..	..	..	..	11,000.45
Minor Expenses	..	..	..	..	..	..	..	..	.96
Grant towards Museum requirements	..	..	..	..	..	..	..	..	4,000.00
Storage equipment	..	..	..	..	..	..	..	..	3,600.00
									284,771.06
Trustees' Account—									
Museum Publications—Cost	..	..	..	..	..	..	..	..	6,399.86
Stock for Museum Shop	..	..	..	..	..	..	..	..	117.34
Stores, Plant and Equipment	..	..	..	..	..	..	..	..	8,355.16
Publication Sales Receipts paid to Treasury	..	..	..	..	..	..	..	..	417.61
Postage Receipts paid to Treasury	..	..	..	..	..	..	..	..	564.31
Travelling Expenses	..	..	..	..	..	..	..	..	2,465.52
Museum Specimens	..	..	..	..	..	..	..	..	709.89
Entertainment	..	..	..	..	..	..	..	..	555.19
Miscellaneous Expenditure	..	..	..	..	..	..	..	..	147.85
Grant to Great Barrier Reef Committee	..	..	..	..	..	..	..	..	150.00
									19,882.73
Balance as at 30th June, 1967—									
Cash at Bank and in hand	..	..	..	..	..	..	..	..	3,521.56
Investments	..	..	..	..	..	..	..	..	24,930.00
									28,451.56
									\$333,105.35