1971

PARLIAMENT OF NEW SOUTH WALES

REPORT

OF THE

TRUSTEES OF THE AUSTRALIAN MUSEUM

FOR THE

Year ended 30 June, 1970

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* Deceased 17th August, 1969.

† Deceased January, 1970.

ANNUAL REPORT

OF THE TRUSTEES OF THE AUSTRALIAN MUSEUM

For the Year ended 30th June, 1970

To His Excellency The Governor:

The Trustees of The Australian Museum have the honour to submit their 116th Report for the year ended 30th June, 1970.

Mr W. H. Maze, M.Sc., was elected President of the Board of Trustees at the Annual Meeting.

Close co-operation with Taronga Zoo, the National Parks and Wildlife Service, Macquarie University, and the N.S.W. State Fisheries has continued.

The strong support by the Government, which has enabled the Museum to become a sound research and educational institution of international standing has continued during the year and the Trustees thank the Premier and Treasurer, the Deputy Premier and the Minister for Education and Science, and the Minister for Public Works for their help. The Public Service Board has continued to support the Museum in staff matters.

INTRODUCTION

MUSEUMS AND ENVIRONMENTAL EDUCATION

FRANK HAMILTON TALBOT, Director

There is at present an upsurge of interest in museums, the reasons for which are not quite clear. The Australian Museum will pass through its displays some 500,000 people this year, some 25 per cent of the population of Sydney. The number of visitors is increasing faster than the population increase. The same has occurred in Great Britain. During a recent exhibition over 1,200 children a day came to the Australian Museum in classes during school time. We now have 5 teachers who give formal classes to some 30,000–40,000 children a year and about 100,000 children visit the museum with their own teachers.

If we look at the total picture in Australia, with nine State museums of technology and of natural science, we see a system handling the equivalent of 30 per cent of the population each year. It is quite clear we have an educational force of real potential. In addition in all the museums there is direct contact with hundreds of thousands of citizens through inquiries—one of the Australian Museum departments alone has 4,000 inquiries a year.

Although the purpose of these rather strange institutions is rigorously educational, their method is one of encouragement of interests through aesthetic enjoyment and stimulation.

Traditionally natural museums have concentrated on the environment—its biology and geology, and the natural history of primitive man. In the biological and geological fields they have concentrated on diversity of form and pattern, and have dealt with the history of life and the evolutionary process. More recently they have widened their approach and functional aspects of animal biology are receiving greater emphasis.

On the research side the scientists have worked on the large reference collections—but now more and more field study is being done. It is now considered quite acceptable to appoint ecologists or comparative behaviourists to museums. We, in the Australian Museum, for instance, are at present setting up a physiology laboratory to be shared by four departments.

There is little place in a modern museum for the kind of natural historian who collected animals like stamps. The traditional idea of a curator as a kindly little man with a long beard poring over dusty beetles is quite invalid. A typical curator in Australia now would be a 30-year-old with a research degree, excellent research promise, and a working knowledge of computer techniques (the latter becoming essential for storage and retrieval of data relating to collections).

Only well-trained biologists have the breadth of understanding of their subject necessary to supervise imaginative display programmes on modern biology—and it is essential that a more informed public should be presented with up-to-date, accurate information.

With this new museum outlook, and with (in some cases) new departments of environmental science, the stage is now set for a response to the new and urgent need for a clearer understanding by every man, woman, and child of our environment and our place in it.

When Australian museums started, close on 150 years ago, Australians were learning about their new environment, and museums aided this understanding. Now, 200 years after Cook, we face, not a move to a new environment, but a new environment developing around us—developing through the impact of the technological age on our natural resource. There seems little doubt that museums have a responsibility to show and interpret these changes, to document the processes we have set in train, to look at man as part of his biological and physical environment, and to show when he is breaking the ecological ground rules necessary for continued existence.

Museums should now clearly and unequivocally show to the citizen that his way of life is out of balance with his earth. Museums have a traditional educational purpose in interpreting the environment, their staff members possess the scientific capacity and training. It could be said that they have a moral responsibility to recognize, study, explain, and expound the crisis.

ON MUSEUM EXHIBITION

AN OPINION

BRIAN BERTRAM, Officer-in-Charge, Exhibitions Department

It is generally accepted at this institution that a museum has a tripartite structure consisting of research, collection and preservation of material, and education.

That museum exhibition forms a part of the educative function of the museum is easily agreed upon; the nature of this part less so. This is a matter of basic policy—a matter of determining which groups of people the museum should value now and in the future, to what degree each is to be valued and how the museum is to try to interract with these groups. There seems to be a lack of fundamental exhibition policies within museums generally; policies are seldom examined and are in consequence often undeveloped or underdeveloped. Exhibitions are commonly mounted without reference to a declared policy, simple because no policy has ever been formally defined. Where a policy is declared it must *per se* be built largely on faith, experience, and instinct; on a prediction of the growth and direction of the museum as a whole, and in the lack of a body of knowledge on the subject.

This, then, is my personal appraisal of the function of museum exhibition within The Australian Museum, at this time, in the absence of a wide interchange of ideas. Where I write of "museum" I refer only to the educative function of The Australian Museum.

Let me first preface the following remarks by declaring that I believe the community has a need for museums and that the museum in part caters for that need now. This appraisal is therefore aimed only at the enhancement of our purpose. Thus the motivation that I am seeking here is prime motivation; not the totality of the exhibition policy, but its bias.

I believe that a museum can no longer rely on being taken on trust. If it is necessary for a museum to grow to exist, and if that museum is a public institution relying on public funds, then it may well be that the social climate is coming to favour institutions which can readily demonstrate a contemporary value. In developing a policy of exhibition we also declare the museum's social attitude. This raises a number of questions. How deeply should we become actively involved in current social problems? To depart from the museum's traditional role and espouse a political life will involve us in fashion. Should we try directly to influence our man-made environment or merely record the disappearing natural one? We can still choose between our historical role or a commital to change, by a reassessment of our basic motives, but if we choose to be merely historians, will we be allowed extended existence?

An indication of the museum's direction exists in the current importance being given to environmental matters in the museum's scientific capacity, but in museum exhibition a direction must finally be taken from an evaluation of our present visitor structure. We are all aware of museum's humble beginnings as rich men's curio cabinets; of the advance to systematization and its growth, the subsequent urge for modernization, didacticism, and diversification of display as desirable ends in themselves. We have followed these leads and have gained life from them, but they are no longer viable. We must seek other ends to make the means cohesive.

Let us consider our present position. There is little knowledge of the ages, backgrounds, and interests of the five hundred thousand or so who enter our halls each year; it is, however, reasonable to say that a lot of them are children, that some are parents, some are interstate or overseas visitors, a few are amateur naturalists and that an increasing number are students of various ages in like-motivated groups attending for a particulat reason associated with their education. How should we value these and other groupings, whose compositions are largely unknown? It is quite reasonable to assume the greatest visitor-growth-rate is in the younger age groups. When an education service increases fourfold in 10 years and must still refuse many children each year, a growth of need can be assumed. This is the only obvious increase in our importance. What is more it is easy to get universal agreement on our being an educational institution. There also seems a widespread tacit acceptance of the child as our most important visitor. This was demonstrated to me at a fairly recent seminar given on the function, viability, and future of this museum, where, during the address and the following discussion every speaker skirted this important thought without definining it. The form of speech used was almost conventionalized. Each point that was presented as affecting visitor considerations was secondarily and unconsciously qualified by a statement relegating the status of the visitor to that of a child. This approval must become overt. We must recognize that our motivation lies with the young: from the young child to the undergraduate.

A museum director once asked a taxidriver whether he had been to the museum. The cabby answered yes, he had been twice, once when he was brought as a child, once when he brought his own children. A museum gains little by motivation towards such adult visitors. This museum has no justification in directing itself towards tourists either, or to the amateur naturalist, or to the entertainment-seeker. These are part of our public, should be retained and increased where possible, but we would be foolish to direct ourselves primarily towards these groups.

I believe that this museum will grow in stature only in proportion to the increase of its importance to the education of the children of this State: that it will be maintaining its optimum size when it accommodates the needs of all the school children of this State who have recourse only to this museum. A corollary to this is that extension services to schools must increase greatly.

I believe that justification for this museum's expanded existance must come through the extension of its teaching activities. We must recognize our dependence on the student who comes as a part of his training; who makes use of exhibits prepared with him in mind. We must teach.

I believe that the policy of this museum should be to cater primarily for students in organized groups. All other exhibition considerations are inferior to this.

What does this mean from a purely pragmatic viewpoint? After all, we must hang our continued existence on our policy. It means that we must rely for our continued existence on three things: One, that we so influence the children of today that their actions after a generation has passed will ensure our continued existence. The children of today are the policy-making adults of a generation hence; they will judge us: we live at a generation's lapse. Two, that the adults today recognize that we are valuable to the education of their children today; for our immediate justification. Three, that we offer additional services to the adults of today, apart from the service to their children.

In physical terms, what is involved in a policy slanted along these lines? In display it would not show much superficial difference. The difference would show in the positioning of didactic exhibits to allow group appreciation; in more care being used in the planning of traffic routes, so that they can comfortably handle groups instead of individuals; in the biasing of the luncheon facilities; in the provision of greatly expanded lecture rooms and informal discussion areas and many more in-museum teachers, in the provision of assembling areas and bus parking facilities, etc., etc. Most of the obvious changes would be in the realm of "people handling". When one is circumscribed by existing walls it is almost impossible to implement any such modifications. Policy must, however, play a very large part in the design of future building expansion programmes.

Can one museum simultaneously cope with many classes of children at various levels of advancement and still provide a service to casual visitors? Careful attention to the physical siting of exhibits can provide pleasant areas apart from those in use for formal study. Again, most casual visitors come at weekends, whereas most organized classes attend during weekdays. It should not be impossible to serve both functions. However, it must also be recognized that a loss of adult visitors could easily occur, if the student-orientated museum becomes an undesirable adult environment—a possibility.

What the museum should provide for the adult community is: an almost formal teaching institute for their children; a museum that, although not specifically designed for them, they can use for their own education or recreation; a meeting ground for special-interest groups; a specimen identification service and a pool of expert consultant knowledge on natural history which is also available for communication media use.

Already the museum carries out most of the functions I have outlined in fact, although not in degree. The bias should change, and this should be through a conscious and deliberate policy decision.

I believe that the policy of this museum should be to accommodate itself to the needs of children of school age in controlled groups.

DISPLAY PLANNING

Planning of the Hall of Life is reaching final stages and construction will commence in the next financial year. Temporary exhibitions planned for next year include: the National Photographic Index of Australian Birds, which will be located in the Long Gallery; a showing of N.A.S.A. slides, and a display of recently acquired anthropological material from New Guinea. The Long Gallery was redeveloped for the Cook-Banks exhibition and for the Museum Shop.

HONORARY STAFF

Mr R. Strahan, M.Sc., F.L.S.; and Mr C. J. Lawler were appointed Honorary Associates of the Museum.

Mrs V. Gregg and Mr L. Haines have continued to assist the Entomology Department in research and collection work.

Mr Gilbert Whitley continued his association with the Museum, and helped the Ichthyology Department in many ways.

Mr J. Voorwinde has continued to sort samples of minute molluscs; Miss G. Thornley has assisted with labelling and sorting; Mr T. Garrard has assisted the collection and identification and Mr T. Healy has photographed living molluscs for the Malacology Department.

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Mr K. Hindwood has given great assistance to the Ornithology Department.

Mr H. O. Fletcher, the former Curator of Fossils has completed the list of fossil type material. Mr Fletcher, Mr J. Mahoney, and Dr A. Howie have assisted the Palaeontology Department in many ways during the year.

It is with regret that the death of Mr A. A. Wirth on 17th August, 1969, is noted. Mr Wirth, well-known Sydney gem merchant, was an Honorary Associate of the Museum.

Mr Alex Holmes died in January, 1970. Mr Holmes whose help to the Museum was largely centred in the field of Herpetology, had for many years collected material for the collections and provided valuable assistance on field expeditions.

STAFF

In his capacity as Chairman of the UNESCO Australian National Museums Committee, the Director visited Singapore from 10th to 14th November, 1969, to take part in the UNESCO Museums Committee conference. He also took part in the National Science Foundation's "Alpha Helix" expedition to New Guinea.

Dr C. N. Smithers, Deputy Director and Curator of Insects was awarded the degree of Ph.D., from Rhodes University.

Mr D. R. Moore, Curator of Anthropology, returned from his Churchill Fellowship study tour of Asia, America, and Europe.

Dr D. K. McAlpine, Assistant Curator of Insects, was awarded the degree of Ph.D., from the University of London, and the Diploma of the Imperial College.

Dr H. G. Cogger, Curator of Reptiles was awarded the degree of Ph.D., from Macquarie University. From July, 1969, Dr Cogger took part in the "Alpha Helix" Expedition to New Guinea studying the comparative biochemistry of vertebrate proteins. In June, 1970, he visited Fiji to collect herpetological specimens.

Dr J. R. Paxton, Curator of Fishes, spent six weeks in New Guinea as a member of the "Alpha Helix" Expedition studying deep sea fishes.

Dr D. J. G. Griffin, Curator of Marine Invertebrates (Crustaceans and Coelenterates), went overseas in January, 1970, to take up a Postdoctoral Visiting Research Associateship in the Invertebrate Zoology Department, Smithsonian Institution.

Miss E. Pope, Curator of Marine Invertebrates (Worms and Echinoderms) visited New Caledonia during 1970 where she obtained a giant starfish related to the genus *Mithrodia*.

Dr W. F. Ponder, Curator of Molluscs, was leader of the joint Museum Expedition to Papua-New Guinea for nearly 6 weeks in May-June, 1970.

Mr H. J. de S. Disney, Curator of Birds, visited Lord Howe Island for 2 weeks with Dr C. N. Smithers, to survey the land birds. Mr Disney was elected vice-president of the Royal Zoological Society of New South Wales.

OVERSEAS VISITORS

Overseas visitors to the Museum during this year included: Professor R. D. Alexander, University of Michigan; Professor D. Otte, University of Texas; Dr H. E. Evans, Museum of Comparative Zoology, Harvard University; Mr T. Davies, California Academy of Sciences; Dr R. Forster, Director, Christchurch Museum, New Zealand; Dr J. Sedlacek, Bernice P. Bishop Museum, Hawaii; Dr R. Binchsbaum; Professor Studitsky, Institute of Evolutionary Morphology, Academy of Sciences, Moscow; Dr K. Westerkov, Otago University and Professor R. W. Storer, University of Michigan; Dr R. Dell, Dominion Museum, Wellington, New Zealand; Mr G. Turbott, Director, Auckland Museum and Institute, New Zealand; Mr Choi, Staff Inspector of Science Teaching, South Korea.

ACKNOWLEDGMENT OF CO-OPERATION

The Museum has pleasure in acknowledging the assistance of the following individuals and organizations:

The Administrator, Official Secretary and Council of Norfolk Island; the Norfolk Island Fauna and Flora Society; the Lord Howe Island Board and their employees; Mr B. Palmer and Mr F. Clunie, of the Fiji Museum, gave valuable assistance to Museum staff working in these areas.

The National Parks and Wildlife Service of N.S.W.; The Royal Botanic Gardens; The State Forestry Commission; The Rutile and Zircon Development Association; Mineral Deposits Ltd; "Alpha Helix" 1969 Expedition to New Guinea; Australian Research Grants Committee; Dept of Agriculture; Stock and Fisheries, T.P.N.G.; Dept of Fisheries, N.S.W.; Royal Australian Navy; Technical Committee on Oceanography; Underwater Research Group of N.S.W.; Burmah Oil Company of Australia; Bureau of Mineral Resources, Canberra; University of N.S.W. Zoology Dept; Defence Standards Laboratories; Stones and Findings of Australia Pty Ltd; Utah Development Company, Blackwater, Qld; Rutile and Zircon Mines (Newcastle) and Dillingham Signal Rutile and Zircon have all given generous aid to the Museum and members of staff.

The Museum is indebted to the following persons, for assistance they have rendered to the institution in the fields of research, collections, and field expeditions: Mr M. Moulds, Mr G. Daniels, Mr D. Hope, Mr G. Willock, Mr R. Thomas, Mr J. A. Mahoney, Mr G. George, Mr H. Fletcher, Dr A. Howie, Mr H. Evans, Mr J. Everleigh, Mr F. O'Keefe, Mr J. Polsen, Mr V. Kinnear, Mr J. Kinnear, Dr J. Chronic, Mr G. Middleton, Dr S. Band, Mr D. Geering, and Mr Soeharjo Prodjodipoero.

LECTURES

Members of the Museum continued their association with the Invertebrate and Vertebrate Zoology and Earth Sciences courses at Macquarie University and a considerable number of lectures were given to various organizations by members of the staff.

EXHIBITIONS

"COOK, BANKS AND AUSTRALIA"

The highlight of the year was undoubtedly the Cook-Banks Bi-Centenary Exhibition, opened by H.R.H. The Duke of Edinburgh, on 1st April, 1970. The exhibition was mounted jointly by The Australian Museum and The British Council, and sponsored by *The Australian* newspaper. *The Australian* covered a large proportion of the costs involved, as well as producing the book, *To The South There Is A Great Land*, written by Mr Hugh Paget, Representative in Australia of The British Council. Financial support was also forthcoming from the Commonwealth Government and The British Council. Qantas undertook to transport the exhibition material free of cost.

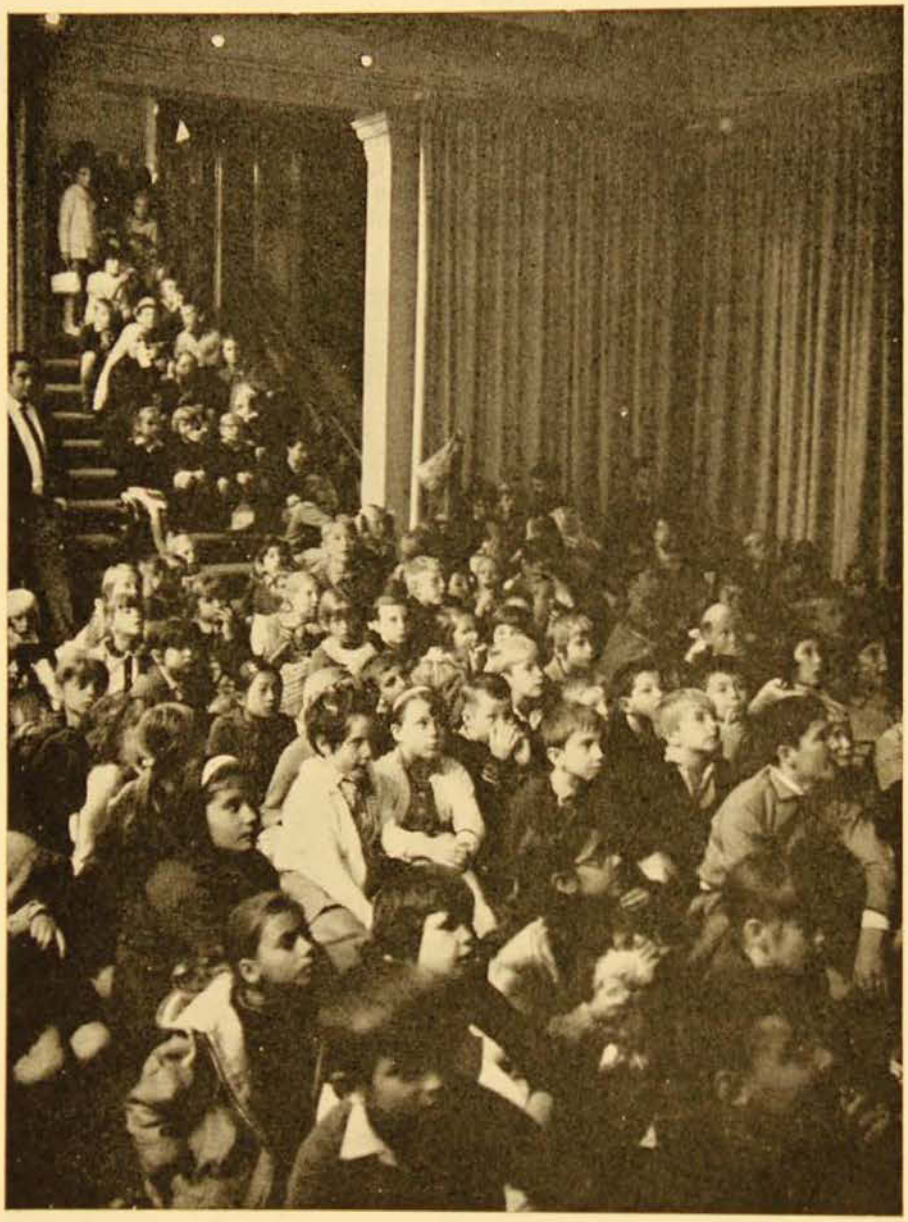
H.R.H. The Prince of Wales and H.R.H. The Duke of Edinburgh show interest in the restored Endeavour cannon, which formed part of the display for the Cook-Banks Bi-Centenary Exhibition at the Museum in April

Photo by courtesy of *The Australian*

Items exhibited were classified as follows: Cook's Voyages; Life of Sir Joseph Banks, Navigational Instruments; Ethnographic Material (covering Australia, New Zealand, Tahiti, Marquesas, Hawaii, and Tonga); Botanical Material; Zoological Material; The First Settlement at Port Jackson; and Westall Drawings.

Institutions which contributed material were: The Australian Museum; Royal Botanic Gardens, Sydney British Museum; British Museum, Natural History; Commonwealth Government of Australia; Royal Botanic Gardens, Kew; Mitchell Library, Sydney; National Library of Australia, Canberra; National Maritime Museum, Greenwich; Public Records Office, U.K.; and The Royal Society, London.

An audio-visual display integrated with the exhibition proved reliable and interesting. This exhibition proved a considerable success; on one exceptional day, organized groups of children from seventy different schools attended the exhibition, taxing the Museum's accommodation beyond capacity. A total of approximately 100,000 members of the public attended the exhibition, which, after showing at this Museum, was transferred to the National Museum, Melbourne, and then commenced a tour of Hobart, Brisbane, Adelaide, and Perth.



A study in concentration. This photograph of a group of school children was taken during the Cook-Banks Bi-Centenary Exhibition

Photo by C. V. Turner, *The Australian Museum*

GENERAL EXHIBITIONS

The beginning of the year was marked by the resignation of John Beeman from the position of Officer-in-Charge. He had held this position since the department's inception.

New quarters in the Spirit Block were occupied in August by the Design and Art Section and the office of the Exhibitions Department. A new metal workshop, spray booth and maceration room are also contained in the Spirit Block. The latter two areas are well-equipped with new machinery. The Preparation Section received a freeze-drying unit to aid in the preparation of reptiles and amphibians, but an evaluation of its performance is not yet complete, due to pressure of temporary exhibitions and a seasonal shortage of specimens.

There have been some alterations to the permanent exhibitions, but the main work of the year has been on temporary exhibitions. Work on permanent exhibitions consisted mainly of improvements to the skeleton gallery, including two didactic exhibits on the function and nature of skeletons and the pentadactyl limb, and continuance in the planning of the projected Hall of Life.

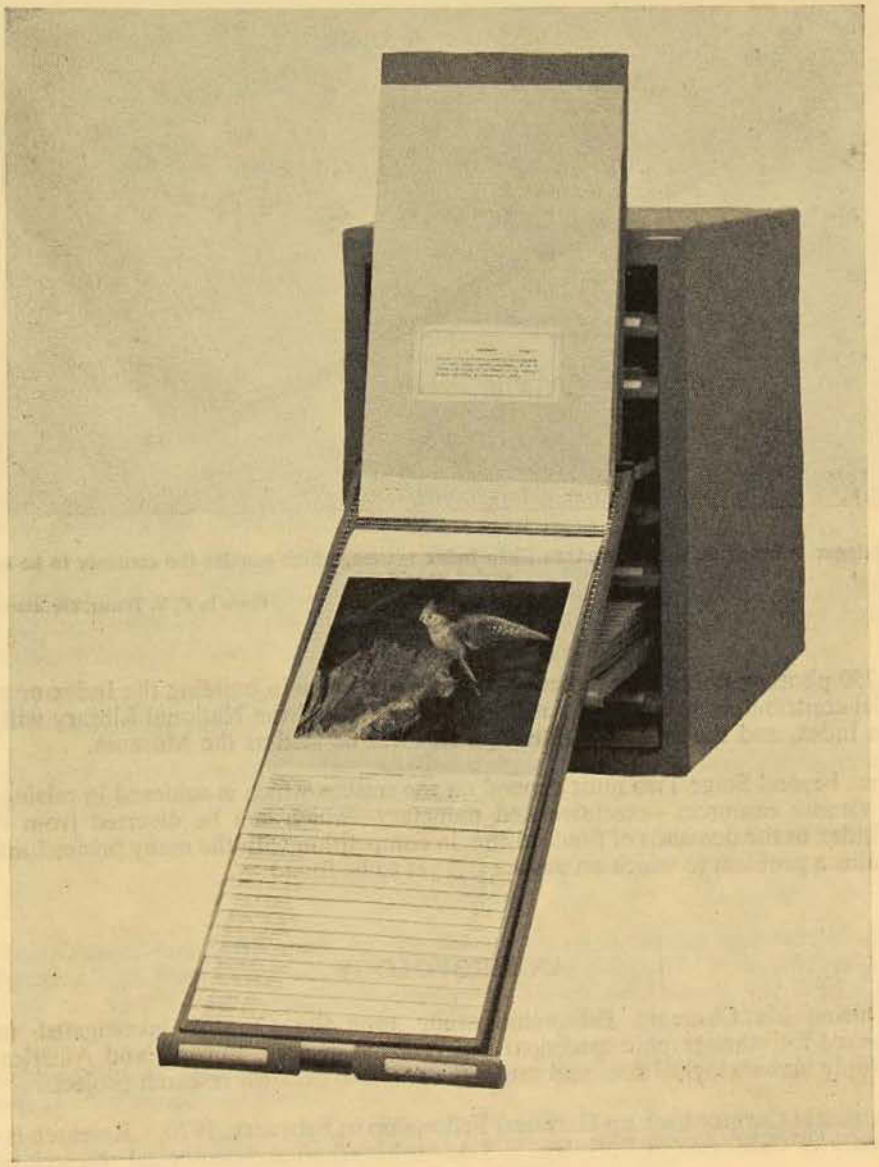
The first temporary exhibition of the year was the Conservation Week exhibition, entitled "It all began in Eden". This exhibition received considerable notice and has a strong appeal to a rather limited stratum of the public. The Wildlife Preservation Society of Queensland requested a loan of some of our exhibition material to use in a Conservation Exhibition for 1970. Five wool bales of assorted rubbish were despatched.

A later temporary exhibition featured a sample of Moon rock, collected by astronauts of Apollo XI. This sample was made available by N.A.S.A.

NATIONAL PHOTOGRAPHIC INDEX OF AUSTRALIAN BIRDS

It has been decided to launch this project on a stage-by-stage basis, according to the funds available and assume a progressive fund raising commitment. At the close of the year under review, the first full year of operations, moneys received and pledged totalled approximately $40,000. This amount is sufficient to finance the first two stages of the project, and to cover routine expenditure until the end of 1970.

Stage One of the project was to lay the nucleus of the Index, centred on the parrot family, and mount an exhibition based on the best works presented. Stage Two—based on the Order of Perching Birds, was commenced at the end of the year under review.

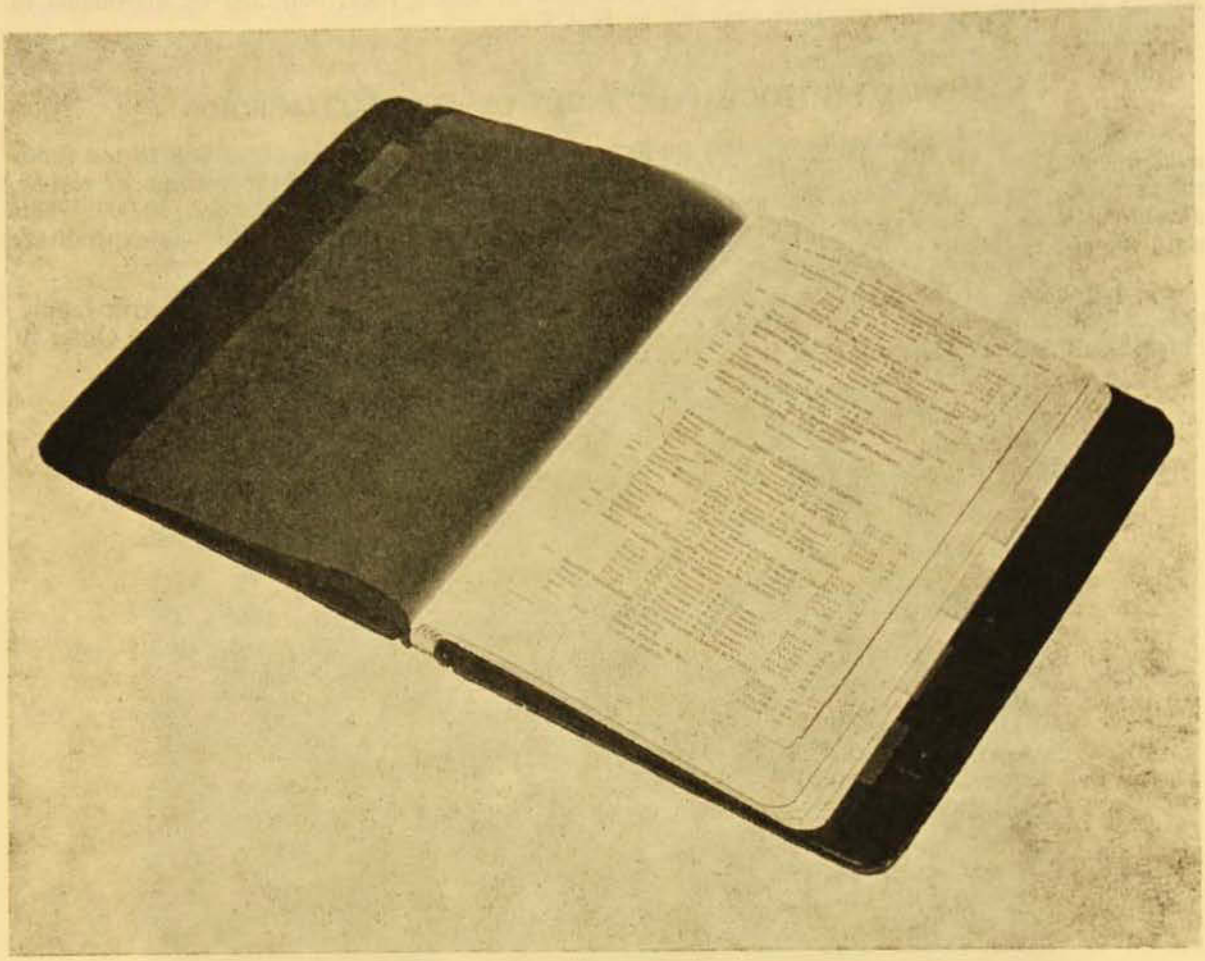


A photographic unit of the National Photographic Index of Australian Birds. The prints are housed in a modified Roneodex lockable cabinet fitted with 10 visible-edge trays. Each tray carries 18 items, each mounted under a protective acetate sheath

Photo by C. V. Turner, *The Australian Museum*

The Stage One exhibition, "Australia's Parrots", was inaugurated at the National Library, Canberra, by His Excellency, the Governor General, Sir Paul Hasluck, on 19th March, 1970; where it remained for 6 weeks. It was next shown at the National Gallery of Victoria, where it was opened by Dame Hilda Stevenson on 2nd March. Work was in hand at the end of June to mount the exhibition at The Australian Museum on the conclusion of the Cook-Banks Exhibition.

During the year, Professor A. H. Voisey resigned from the Index Trust and was replaced, as the representative of the Museum's Board of Trustees, by Mr R. C. Richard. The Trust was enlarged to ten members with the additions of Sir Harold Wyndham, C.B.E., and the Hon. Sir Vernon Treatt, K.B.E., M.M., Q.C.



The Index Catalogue is based on the Kalamazoo Strip Index system, which enables the contents to be expanded and varied at will

Photo by C. V. Turner, *The Australian Museum*

Over 250 photographers have either offered to participate in building the Index or are thought to be potential contributors to it. The Australian Museum and the National Library will house and catalogue the Index, and the matrix of internegatives will be held at the Museum.

Progress beyond Stage Two must depend on the success which is achieved in raising additional funds. The slender resources—executive and monetary—which can be diverted from the task of building the Index to the demands of fund raising, in competition with the many professionally-backed appeals, remains a problem to which an answer has yet to be found.

ANTHROPOLOGY

Research. During his Churchill Fellowship study tour the Curator investigated methods of conservation used for ethnographic specimens and rock art in Asia, Europe, and America. He was also able to study archaeological sites and artifacts related to his own research projects.

The Assistant Curator took up Harkness Fellowship in February, 1970. Research is continuing at the University of California at Berkeley, U.S.A. on his ethno-archaeological research project.

Field Work. Continuation of the Curator's Hunter Valley archaeological survey having shown almost total destruction of sites on the lower Hunter, it has been decided to concentrate the survey on the areas between the Hunter and the Hawkesbury Rivers. Further excavations were carried out at the Balls Head site, previously investigated by the Museum in 1965.

A view of the Melanesian Gallery, which is located in the New Wing. The Gallery features Melanesian Art Forms

Photo by C. V. Turner, *The Australian Museum*

Collections. The relabelling, cataloguing, and storing of the Melanesian and Foreign collections was completed. The checking and restoring of the Australian collections was begun. An extensive collection made by Mr B. Craig, on the Upper Sepik River, New Guinea, under the joint auspices of the Australian Museum; the Museum für Völkerkünde, Berlin; the Museum Voor Volkenkune, Leiden, and the Public Museum and Art Gallery of Papua and New Guinea, Port Moresby, was sorted and documented for distribution to the museums concerned. A small collection of artifacts from the Asmat district of West Irian was purchased from Mr J. Hoggerbrugge, and a series of eleven aboriginal bark paintings was purchased from Mrs S. Holmes.

While in London, the Curator selected material at the British Museum to be sent to Australia on loan for the Cook-Banks Exhibition. Framed bark paintings and other aboriginal art objects were loaned to the Newcastle Art Gallery for a temporary exhibition and two New Ireland figures were despatched on loan to Expo 70.

Information and Services. The volume of requests for information from the public and from research workers in Australia and overseas is increasing each year.

The Curator and Assistant Curator continued their close association with various institutes and committees in New South Wales and Australia.

ENTOMOLOGY

Research. The Curator continued work on the Psocoptera of Australia and Africa. Preliminary work on collections from New Caledonia was carried out with Professor I. W. B. Thornton. Reviews of the status of taxonomic studies in the Psocoptera in both New Zealand and South Africa were prepared.

Work proceeded on insect migration and analysis of data is continuing. Results of work on *Vanessa kershawi* were written up for publication.

Since resuming duty at the Museum after his 2 years in London, the Assistant Curator's work has been concerned with the systemics and biology of Acalypterate flies.

Mr Gray has undertaken the study of the diplurine genera *Stanwellia* and *Aname* and of the family Gradungulidae, in the Eastern Highlands. Collections of Diplurinae and *Atrax* were examined at the National Museum of Victoria. A study of the protein variation in relation to behavioural types is also being undertaken by Mr Gray.

Field Work. The Curator spent the period 17th November to 1st December, 1969, on Lord Howe Island, and the period 9th March to 6th April, 1970, in New Caledonia. Psocoptera, butterflies and other insects were collected on these trips. Butterflies collected included species not previously recorded from these areas.

Periodic visits were made to Camden, to observe the breeding and overwintering population of *Danaus plexippus* and to continue the marking and release programme.

Dr McAlpine spent 28 days in the field in the Sydney and Canberra areas and Mr Gray concentrated his work in the Eastern Highlands.

Collections. All spirit-preserved material was moved to the new Spirit Block. About 15,500 specimens have been added to the collections, 373 specimens being Types.

Mr Peters has continued rehousing the Australian and some foreign butterflies. Dr McAlpine and Mr Holloway have rehoused some sections of the Diptera and Hymenoptera.

A Wanderer Butterfly being tagged for migrational studies conducted by the Department of Entomology

Photo by C. V. Turner, *The Australian Museum*

One thousand and fifty specimens have been despatched to specialists for study, and 4,263 specimens have been returned from loans.

Information and Services. Three thousand seven hundred inquiries were received and many others from research workers and institutions. As the result of a visit to Norfolk Island, a boundary for the proposed National Park was determined; previous work (with Mr Disney) on the island, resulted in a new Bird Protection Ordinance being issued.

Material was provided for various educational and institutional needs.

The Curator continued to be actively connected with learned societies and at present is acting in the capacity of Organizing Secretary of the 14th International Congress of Entomology.

ENVIRONMENTAL STUDIES

Research. The Curator continued research on the ecology and behaviour of Australian Honeyeaters; on the foraging behaviour and ecology of the Reef Heron; on the relation between habitat structure and fish species diversity and on the population dynamics of small mammal populations. The research on the Reef Heron and on fish species diversity was completed. The Assistant Curator has initiated studies on the regeneration of coastal vegetation following beach sand mining activities.

Field Work. The Curator spent 2 weeks on Heron Island finalizing work on fish and Reef Herons. Trips totalling 9 weeks were made to Nadgee Nature Reserve in connection with studies on small mammal populations. Short trips were made to the Brisbane Waters National Park and the Windsor region, where work is progressing on honeyeater ecology; and the north coast of New South Wales, in conjunction with biological survey work for the Scientific Committee on Parks and Reserves.

Mr Clark made trips of a total of 5 weeks to the North Coast on his regeneration studies. Other trips were made to the North and Central Coast in conjunction with biological survey work. Mr Posamentier spent 6 weeks assisting at the Nadgee Nature Reserve.

Information and Services. Dr Recher and Mr Clark co-operated in biological survey work for the Scientific Committee on Parks and Reserves and the National Parks and Wildlife Service. Dr Recher was appointed a member of the Scientific Committee on Parks and Reserves; he has also been made a member of the Executive Council of the Conservation Society of New South Wales. Assistance was given to a number of conservation organizations and the press.

HERPETOLOGY

Research. The Curator completed his programme of research at Macquarie University in July, 1969, and at that time submitted a thesis entitled "A study of the ecology and biology of the Mallee Dragon (*Amphibolurus fordi*) and the adaptations to survival in an arid environment". This thesis led to the award of the degree of Doctor of Philosophy in November, 1969.

Although several research projects were continued during the year, notably the ecological studies of the agamid lizard *Amphibolurus fordi* in western New South Wales, the preparation of a checklist and keys to Australian reptiles and amphibians and the development of automatic data processing techniques to museum curatorial problems, most of the Curator's time was concerned with the reorganization of the research collections in their new quarters.

Field Work. From July, 1969, at the invitation of Dr Charles Sibley of the Peabody Museum, the Curator spent nearly 3 months as a member of Programme B of the National Science Foundation/ University of California "Alpha Helix" expedition to New Guinea. This programme was concerned with studying the comparative biochemistry of vertebrate proteins.

In January, 1970, a further visit was made to Round Hill Fauna Reserve to continue studies on agamid lizards, whilst in June, 1970 the Curator visited the Fijian islands of Viti Levu, Ovalau and Kadavu to collect much-needed material for the herpetological collections.

Collections. With the completion of the new Spirit Block in 1969, the critical congestion in the herpetological collections came to an end. The bulk of these collections have now been moved to the new storage area and work on their reorganization has begun. The amphibian collections have now been checked, specimen by specimen, for the first time in their history, so that the present status of these collections is now known with accuracy. Work is soon to begin on the lizard collections. Such checking is considered a first step in the long task of making the collections and their associated data readily accessible to all workers.

It is intended to place all records of the herpetological collections on to punch cards for the ultimate production of a tape-based collection record to be assessed by computer. To this end, trial data has been prepared and pilot programmes developed and tested. It is hoped that such studies, based on the relatively small and discrete herpetological collections, will provide the information needed to eventually computerize other collections in the museum.

Two thousand six hundred and eleven specimens were registered during the year.

Information and Services. Apart from large numbers of public inquiries, most being concerned with the identification of specimens, the Department continued to provide a wide range of advice and identification services to other scientific institutions, government departments, hospitals, etc.

ICHTHYOLOGY

Research. The Curator's research on Australian midwater fishes has continued. Work on the midwater fishes of New Guinea was begun during the year, and a generic revision of the family Myctophidae was completed.

Field Work. The Curator spent 6 weeks in New Guinea with the Alpha Helix Expedition, studying deepsea fishes and luminescent behaviour in fishes. A general collecting trip of 3 weeks to Adelaide and Perth was completed. A collecting cruise on the RAN vessel *Kimbla* and museum work in Melbourne and Brisbane were also conducted during the year.

Collections. In addition to the specimens resulting from the above field work, substantial fish collections were received from the Director's work on One Tree Island and in New Guinea. During the year the bulk of the fish collection was completely reorganized and moved to the new Spirit House. Only the larger specimens in tanks and bins remain to be moved.

More than 1,700 specimens were registered during the year, bringing the present day total of specimens in the fish collection to 71,000.

Information and Services. Public inquiries continued at a high rate; most requested specimen identification or literature references. A total of 13 overseas visitors worked in the Department during the year, including Dr B. B. Collette, who spent 8 months sabbatical leave in the Museum. Loans of specimens exceeded the previous year.

MARINE INVERTEBRATES

CRUSTACEANS AND COELENTERATES

Research. Up to the time of his departure for the U.S.A., on study leave in January, 1970, the Curator continued his studies on the systematics of a number of families of Australian Brachyura. With Dr P. J. Stanbury, Curator of the Macleay Museum in Sydney University, Dr Griffin completed a paper on type crustacea housed in the Macleay Museum. A report was also prepared on the Brachyura collected in Australia by Dr Th. Mortensen's Pacific Expedition 1914–6 and by the Danish Galathea Expedition of 1950–2.

In January, Dr Griffin went overseas to take up a Postdoctoral Visiting Research Associateship in the Invertebrate Zoology Department of the Smithsonian Institution, Washington, D.C. There he has worked on the spider crabs (Majidae) collected by the International Indian Ocean Expedition and a general revision of the Indo-west Pacific representatives of this family. He is also exploring computer techniques as applied to systematics.

The Curater of Marine Invertebrates (Worms and Echinoderms), Miss Elizabeth Pope, proudly displays a giant Starfish which was collected in New Caledonia this year. This Starfish is related to genus Mithrodia

Photo by courtesy of *The Sydney Morning Herald*

Field Work. No major field trips were undertaken before the Curator's departure overseas, but he attended the Conference of the Australian Marine Sciences Association, on Kangaroo Island, South Australia. Dr Griffin is Treasurer of this Association. The Curator also attended the ANZAAS Conference in Adelaide, and he was A.M.S.A. delegate to the ANZAAS Council.

Collections. In all, 311 registrations have been added to the Crustacean collections. This includes 45 type specimens.

A major operation has been the moving of all wet and some dry reference collections from their former storage sites to their new location in the Spirit Block, First Floor. Catalogues have had to be altered and checked, and this major job is still in progress.

The collection of Pycnogonids has been lodged with the collections of Arachnida, Department of Entomology, as being a more logical zoological arrangement. Many loan collections are being worked on by scientists in various parts of the world . . . especially in New Zealand and in other areas of Australia.

Information and Services. Public inquiries have continued at a high rate asking for information and identifications. Also many requests for information are made by other scientific institutions. Most frequent inquiries are about crayfish and the prawn industry. Research workers both from Australia and overseas worked in the department, using both the collections and reference library.

MARINE INVERTEBRATES

WORMS AND ECHINODERMS

Research. Work has continued on the identification and naming of the collection of starfishes made and being worked jointly with Mrs Loisette Marsh. The Curator collected a giant starfish related to the genus *Mithrodia* in New Caledonia and a manuscript describing it is in preparation. Biogeographical studies have been continued in the north of Western Australia. Research time has been greatly reduced, owing to administrative duties and the supervision of the Department of Crustaceans and Coelenterates during Dr Griffin's absence abroad on study leave.

Field Work. In addition to several local field trips, the Curator made a major field trip to Port Hedland and Broome, W.A., and Darwin, N.T., in order to record the patterns of intertidal zonation in continuance of biogeographical studies of the intertidal zone. This trip extended into July, 1970.

Collections. All the wet-preserved specimens belonging to the department have been moved to their new location in the Spirit Block, Ground Floor. The "little Spirit House" was vacated by March, 1970. During the move the opportunity was taken to revise and update the arrangement of the collections according to the latest zoological research. The barnacle collection, formerly in this department's charge, was transferred to its correct position in the Crustacean collection.

The following additions have been made to the collections:

Worms, 92 registrations including 2 holotypes and 3 paratypes.

Echinoderms, 57 registrations including material from Cocos Keeling Is., the Estate of the late Melbourne Ward, and one giant starfish from New Caledonia.

Ascidians. A most valuable collection comprising recent American Antarctic collections reported upon by Dr Patricia Kott, B.A.N.Z.A.R.E. Material and local collections, from near Sydney, and from the Gulf of Carpentaria, have been incorporated in the collections. It includes type material, in press. These total 271.

Sponges. Following the publication of Dr Racek's work on freshwater sponges, it was possible to process the large collections he donated to us. These totalled 494 registrations, including 5 Australian types and one paratype and 53 "duplicate" pieces of types of sponges from all over the world. They thus comprise one of the most important collections of freshwater sponges in the world. Eighty-two local species collected by the Underwater Research Group of N.S.W. (c.o. C. J. Lawler) and named by Dr P. Berquist were included in the collections.

Information and Services. The demand for identifications and scientific information has continued at a high level and has ranged from more than 100 requests for information on the Crown-of-thorns starfish plague to requests from other scientists and Government departments. The following are among the more important inquirers:

Maritime Services Board of N.S.W.; Department of Customs; Glenfield Research Station; Department of Agriculture, Hobart; Electricity Commission of N.S.W.; The South Pacific Commission; Mainline Tourist Guides; and Hooker-Rex;

and the Zoology Departments of the following universities:

Amsterdam (Holland); Captain Cook University of North Queensland; and University of Western Australia.

Help was also given to research workers as follows:

Mr Alan Dartnall (Hobart Museum)—starfishes; Dr Brian Smith (National Museum of Victoria)—serpulid worms; Dr E. P. Hodgkin (W.A.)—starfishes and barnacles; Dr Judge Gooding—sea urchins; Dr K. Serafy (U.S.A.)—echinoderms; Dr R. George of W.A. Museum and Mrs Marsh of W.A. Museum—help with specimens and bibliographies.

MALACOLOGY

Research. Much of the Curator's potential research time is taken up by preliminary sorting, this problem being made more acute by the rapid accumulation of additional samples from sources outside the museum. However, work is continuing on certain genera of Australian micromollusca, but is hampered by inadequate material. Some preliminary work on electrophoresis of foot muscle protein of the Genus *Varohadra* has been done.

Preliminary work has been done towards the revision of leptonanean bivalves; as this will involve an examination of living material of many species, it is anticiapted that the revision will take several years. A new species of commensal bivalve living with a species of the coelenterate *Cerianthus* was discovered at Stradbroke Island; this association and the bivalve have been described.

Field Work. The Curator visited Queensland in July, where he collected terrestrial molluscs and made littoral collections in Keppel Bay. In December, the Curator and Technical Assistant spent 4 days collecting on Stradbroke Island.

A very successful combined terrestrial-littoral collecting expedition, by the Curator and the Technical Assistant, in January, covered areas in southern New South Wales and eastern Victoria. The Curator spent 4 days dredging off the eastern Tasmanian coast, and terrestrial and littoral collections were also made during a further 9 days in Tasmania.

Mr Colman participated in an expedition to the Arafura Sea in October-November, during which many benthic samples were obtained. The Curator led a joint Museums expedition to Papua-New Guinea for nearly 6 weeks in May-June. Extensive molluscan collections were made from Madang, the Trobriands and Port Moresby.

Collections. The very large and excellent collection of the late Lee Woolacott was donated to the Museum by her daughter, Mrs L. Harford. The Trustees purchased the A. Marsh cone collection; this collection forms the basis for a book on world-wide species of the family Conidae. A small but significant collection, that of N. Jackson, was also purchased by the Trustees. Four thousand five hundred lots have been registered during the year.

The Tertiary Mollusca have been moved to a room off the fossil gallery for easy accessibility. The refurbishing of the collection is progressing very slowly, due to staff and storage space problems.

Information and Services. Public inquiries and identifications were numerous and came from many sources. The appointment of Mr P. H. Colman as Technical Assistant has meant that this department can more effectively deal with the numerous public inquiries and identifications.

The Curator has been actively involved with the Malacological Society of Australia. Assistance is being given to the Captain Cook Museum in arranging a shell display.

MAMMALOGY

Research. Studies have continued on the behaviour of the Australian Sea-Lion, *Neophoca cinera* at Dangerous Reef, South Australia. Excellent footage of behaviour was obtained on film and a programme of marking newly-born pups was initiated.

Field Work. A field trip extending from 2nd November to 23rd December was undertaken to Dangerous Reef in connection with research on the behaviour of sea-lions.

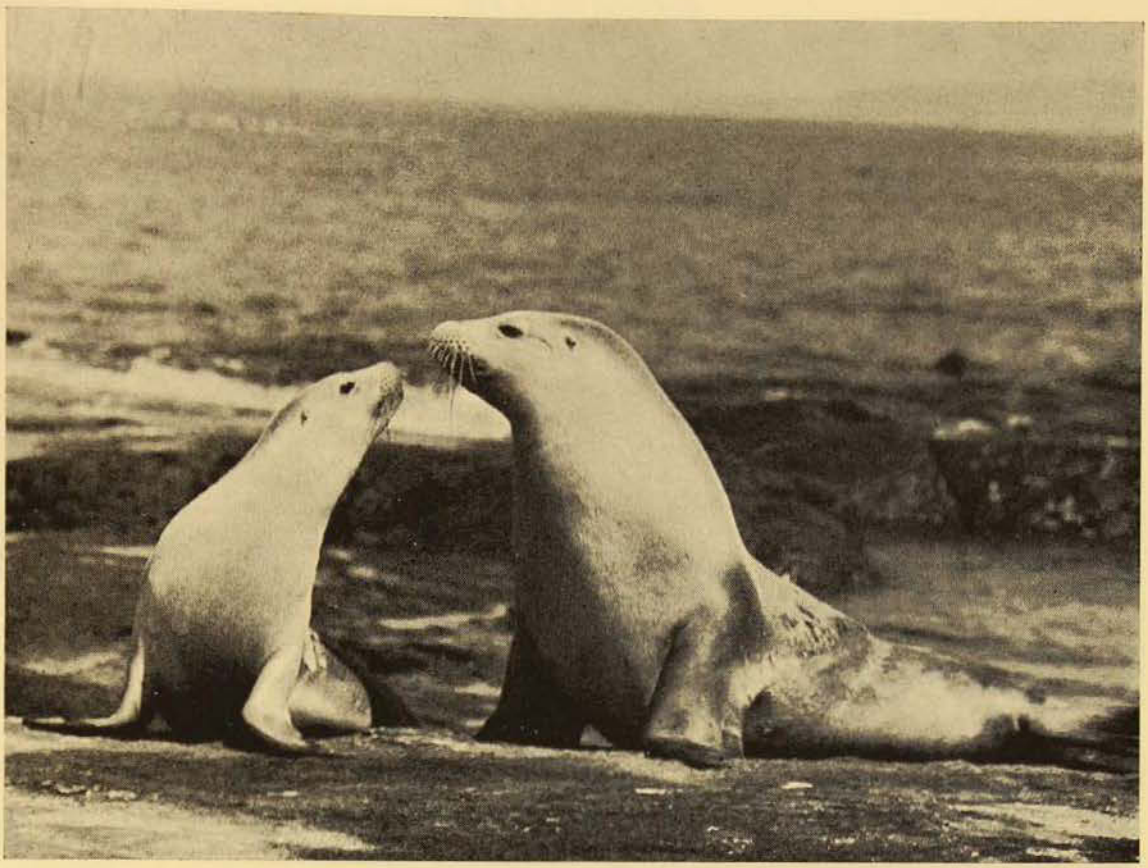
A short field trip was made to Seal Rocks near Bulahdelah, New South Wales, on the 1st and 2nd July, 1969, to investigate the beaching of about six pilot whales, *Globicephala melaena*.

Between 8th and 12th May, 1970, a party of about twenty students from Macquarie University was accompanied on a field trip to Upper Allyn and Smith's Lake in connection with practical instruction in Vertebrate Zoology.

Collections. A series of seal skulls, including harp seals, *Pargophilus groenlandicus*, and hooded seals, *Cystophora cristata*, was received from Dr Torger Oritsland of Bergen, Norway. A small series of skulls of European mammals including moles, *Talpa europea*, and weasels, *Mustela nivalis*, was received from Miss Joke Voorbach of The Hague, Holland.

A series of bats collected in Indonesia was donated by Mr David Nicholls of CSIRO.

A series of six further specimens of the New Holland Mouse, *Pseudomys novaehollandiae*, from Royal National Park was donated by the National Parks and Wildlife Service.



Australian Sea-Lions, *Neophoca cinera* photographed at Dangerous Reef, South Australia, during an expedition from the Department of Mammalogy

Photo by H. Hughes, *The Australian Museum*

Work has begun on the installation of cabinets to house the collection of mammal skins and skulls on the Compactus trolleys in the New Spirit Building. A large quantity of osteological material and mounted specimens has been removed from the 2nd floor of the New Wing to a new storage area at Rushcutters Bay. The 2nd floor of the New Wing is being cleared in preparation for the installation of a new Hall of Biology.

Information and Services. Loans of materials were made to the following institutions and workers: Dr C. A. Repenning, U.S. Department of Interior—Seal Skulls; Dr J. Bannister, W.A. Museum, Perth—Small dasyurids; Mr J. E. Hill, British Museum (Natural History)—Bats; Miss Joan Dixon, National Museum, Victoria—Bandicoots; Mr P. Aitken, S.A. Museum, Adelaide—Small dasyurids.

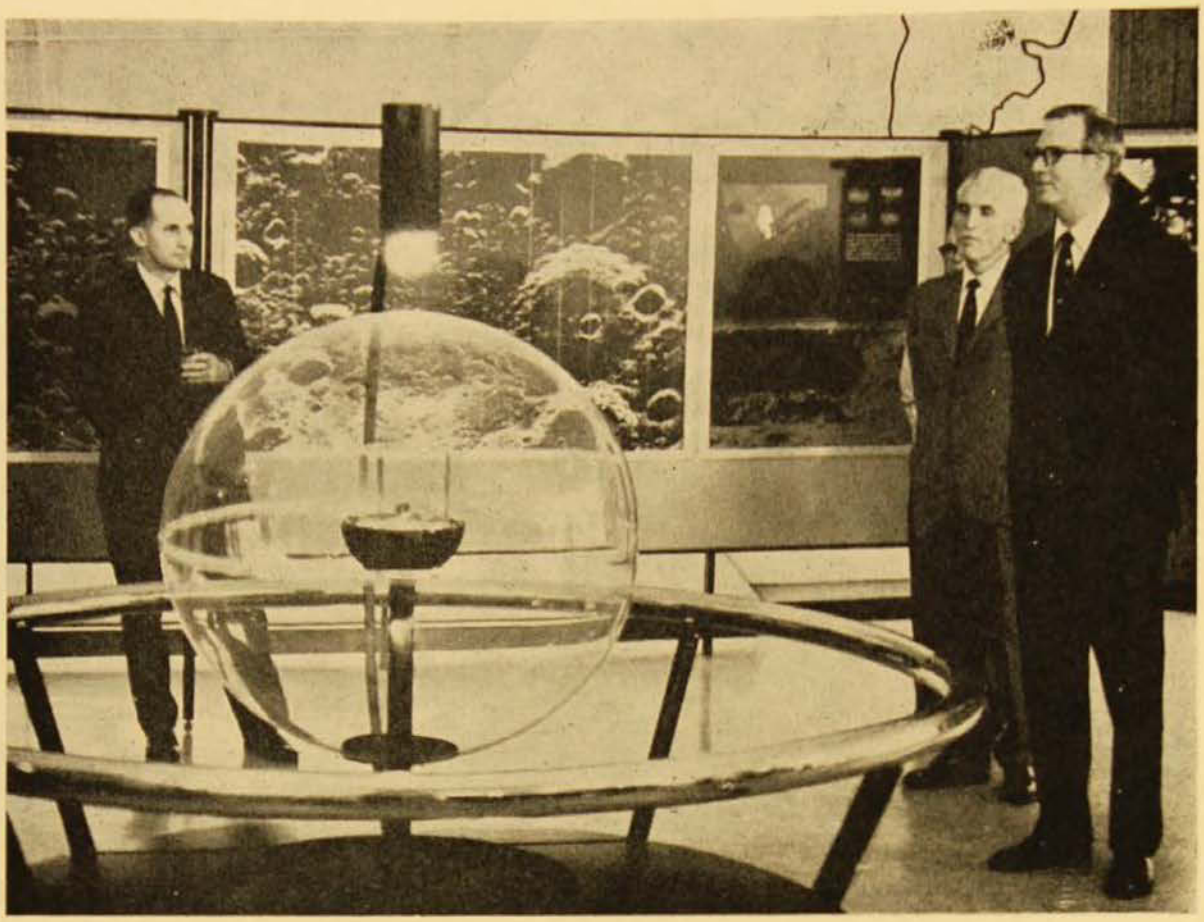
MINERALOGY

Research. Work has proceeded on the joint paper on Field Occurrence, Physical Properties, and Morphology of Australites from New Australian Localities, by Chalmers, Mason, and Henderson.

Field Work. Two short field trips were made to Murchison, in Victoria to collect specimens from the shower of meteorites that was seen to fall in September, 1969. These meteorites are of the rare carbonaceous chondrite type. The only institutions to take part officially in the search for specimens of the Murchison meteorite were this Museum and the Department of Geology, University of Melbourne.

Collections. The number of minerals is 42,343, an increase of 218; the number of rocks, meteorites and tektites is 9,054, an increase of 75. Murchison carbonaceous chondrite specimens in the Museum collection now number 54. Two fine complete stones of the Allende carbonaceous chondrite which fell in Mexico in February, 1969, were obtained from the United States National Museum.

Information and Services. Rock and mineral inquiries totalled 271; another 117 inquiries dealt specifically with gem and ornamental minerals. Some of the inquiries received were from newly established mining companies, especially those exploring for gem minerals.



N.A.S.A. officials and W. H. Maze, President of the Trustees of The Australian Museum, with the sample of Moon rock collected by the crew of Apollo XI

Photo by H. Hughes, *The Australian Museum*

A temporary display of a specimen of moon rock collected on the Apollo 11 Moon Landing was displayed from the 23rd to the 31st of March. The specimen and the display unit were provided by the United States Information Service. The Curator gave press, radio, and television interviews in connection with the display of moon rock.

Work has progressed towards finality in writing a book, *Gem Minerals of Australia*, to be published by the Trustees.

ORNITHOLOGY

Research. A survey of the indigenous birds was made on Lord Howe Island with Dr C. N. Smithers and a paper on the results is being prepared and a comparison made with our previous work on Norfolk Island.

The main research on the sex and age differences of Australian birds has continued and three papers published. This research is being recognized overseas as being very valuable and it has been suggested that it would be very valuable if other countries had similar information available.

Field Work. A fortnight's visit was made to Lord Howe Island with Dr C. N. Smithers to survey the land birds. Two nights were spent on the top of Mt Gower, looking into the population of the endemic flightless Lord Howe Island Woodhen.

A week was spent with Dr Cogger at our study area in the mallee at Round Hill Fauna Reserve.

Six days were spent at Leura studying the Satin Bowerbirds with Mr and Mrs Vellenger, who have individually colour banded over 800 birds. Information was obtained on how to age and sex the green males and females and all the information published.

To help obtain further data on where the Superb Lyrebird should be classified a male and female were collected for anatomical examination by experts in their particular fields.

Collections. A total of 506 specimens were registered during the year; of these 335 were donated and 171 collected by Museum staff. The donations included several uncommon sea birds washed up on the beaches.

Information and Services. The Curator gave information and answered about 350 inquiries from the public and Government Departments. Loans of specimens were also made to other departments and museums here and overseas.

PALAEONTOLOGY

Research. The Curator continued research on the Devonian vertebrate faunas of eastern Australia and commenced study of Devonian material from Victoria Land, Antarctica. Preparation of the Mulga Downs fauna from western New South Wales is almost complete. The comparative collections of Devonian vertebrates have been greatly increased both by field work and by exchange.

Field Work. In July, 1969, Lower Devonian arthrodires were collected near Wee Jasper, and Upper Devonian antiarchs from south of Braidwood, both New South Wales. The Curator and Mr K. Gregg accompanied by Dr Anne Howie, University of Sydney, and Mr A Bartholomai, Director, Queensland Museum, worked on various localities in eastern central Queensland, from late August to early October, 1969. Numerous reptile and amphibian remains, some of which were of articulated specimens, were recovered from the Lower Triassic Rewan Formation. The material will be divided between the two Museums. The largest and best-preserved collection of Permian fish ever found in Australia was recovered from a coalmine south of Blackwater. The fish, all actinopterygians, appear to include new genera. On the return journey, the Sydney party collected Pleistocene fish, reptile, and marsupial remains along the Darling River between Bourke and Louth, and Pliocene fish at Bugaldie, near Coonabarabran, New South Wales.

Diprotodon remains, discovered at Kinchega National Park in November, 1969, were collected by the Curator, and in December a new bone-bearing cave at Jenolan was examined. In February, 1970, a new cave discovered near Chillagoe, Cape York, Queensland, was reported to contain a fossil wombat. The Curator accompanied by a student, and Dr John Chronic, Department of Geology, Boulder, Colorado, U.S.A., flew to the area to extract the specimen. The specimen, a lower jaw of *Phascolonus*, the giant extinct wombat, had to be drilled out of the roof of the cave, but was recovered without damage. This specimen was found several hundred miles to the north of previously recorded finds.

In May, 1970, the Curator collected from the fossil reef complexes of Upper Devonian age in the Kimberleys, Western Australia. The fauna includes the best-preserved Devonian fish material in the world: antiarchs, arthrodires, palaeoniscids, lungfish, rhipidistians, and a coelacanth, together with a rich assortment of phyllocarid crustaceans and assorted invertebrates. From a site 70 miles south of Alice Springs, early vertebrate material has been recovered. If, as seems certain, the sediments are of Upper Ordovician age, this ostracodern fauna will be the first in Australia and amongst the earliest known in the world.

Collections. Around 250 fossil inquiries were answered last year and 370 specimens were registered during the year, 42 specimens being donated. The card index of the invertebrates is being brought up to date.

The Curator presented talks on his research to the ANZAAS Conference in Adelaide, and to the Geology Department of Victoria University, Wellington, New Zealand.

EDUCATION SERVICE

School Visits to the Museum. The total number of children attending the Museum classes organized by the Education staff was 32,734, comprising 750 visits. As usual, our available lesson time for the whole year was completely booked by the middle of first term. For some that were turned away it was possible to fit in a short film between morning and afternoon classes and for others questions sheets were supplied but the majority were not able to obtain any help. No definite record of requests for assistance has been kept, but they came in at the rate of two or three per day, by telephone or letter. It is obvious that we have found it impossible to provide assistance for the majority of classes who visit, or wish to visit, the Museum. This situation will not improve until there is another lecture theatre and more education officers to staff it.

Six classes were taken on field trips to study marine ecology. Several groups of handicapped children—spastic, deaf, blind, mentally handicapped and children's hospital—were given special lessons suited to their disability and one lesson was given in a hospital school.

Visits of Tertiary Students. Demonstration lessons, and lectures on the Museum's educational services were given to various groups of trainee teachers from Sydney, Balmain, and Alexander Mackie Teachers Colleges, and from St Joseph's Catholic Teachers College. Education students from Macquarie University were also helped with their course work and arrangements were made for a Sydney Technical College group studying museum techniques to visit the Education Section workroom and other areas of the Museum.

Trainees and permanent staff from the N.S.W. Ambulance Transport Service Board continued their series of visits to study venomous animals.

Loan Services. A total of 194 loans was made during the year comprising 72 collections of specimens and photographs and 122 travelling cases. Six new travelling cases on Aboriginal String Objects were completed, but the production of these cases is not keeping pace with the demand for them, particularly for the mammal case.

Renovations and repairs were carried out continuously on the loan items, but some specimens had to be withdrawn and the remaining mammals and birds are all in poor condition. New mounted specimens are urgently needed to bring the collection up to standard.

School Vacation Activities. Attendance at the school vacation film screenings were as follows:

Spring, 1969	2,390
January, 1970	3,451
May, 1970	1,379
Total	7,220

Many of the Play Centres organized by the N.S.W. Department of Education attended these film screenings as well as visitors to the Museum.

The Children's Room was visited by a total of approximately 10,374 people during the three school vacations, an average daily attendance of 360. Different displays and activities were arranged in the Room for each vacation: "Young Animals Starting Life" in September, "Animals in Verse" in January, and "Captain Cook: Scientific Discoveries in the Pacific" in May.

Museum Walkabout quizzes were completed by 600 children.

Museum Discoverers Club. Twenty-two children qualified for membership during the year, bringing the total active membership to 100. Meetings of the club were held in school vacations and members were taken on field trips to Cronulla to study sand dune ecology and to Royal National Park to study insects and learn collecting techniques. The club edited the first issue of its new journal—*Discovery*.

A Senior Discoverers' Club was formed in June, 1970, to cater for those who had left school and were therefore no longer able to attend regularly. There were 16 members present at the inaugural meeting, and plans were made for future lectures, field trips, and other activities.

Seven members of the club assisted in the curatorial departments of the Museum for 3 weeks in the January school vacation, the Trustees providing an honorarium of 60 dollars.

Information and Services. Sets of free Museum leaflets were sent to 48 school libraries, including those in other States and the Territory of Papua and New Guinea. Sydney, Armidale, and Bathurst Teachers Colleges collected sets of leaflets for their final year students. A further 700 letters from teachers and pupils requesting information were answered.

Boy Scouts and Girl Guides were tested for their Australian Aborigines' and Naturalists' Badges.

Many of the Museum leaflets were revised before being reprinted.

A publicity segment on the activities of the Museum was given on Channel 4, Wollongong, and a lecture on the same subject was given to the Business and Professional Women's Club of N.S.W.

Advice on Museum educational work was given to W. D. Scott and Co., who were preparing a survey for the proposed Australiana Park at Windsor.

Discussions were held with the N.S.W. Department of Education on the preparation of a railway carriage as a travelling museum, to carry exhibits on Captain Cook to country towns and schools. This exhibition began operation in April, 1970, and when the Cook Bi-Centenary Celebrations are completed at the end of the year, it is hoped this carriage will be made available to The Australian Museum.

Display. All gallery labels were checked and many revised before their inclusion in new exhibits. Labelling for the new exhibits on Skeletons and Primates was prepared.

Three special displays were prepared and mounted in the Children's Room (see School Vacation Activities) and an exhibition of children's projects was arranged for Education Week.

Publications. Information on museum education services in Australia prepared and published in ICOM Education Annual 1969.

LIBRARY

Growth of the Museum Library has continued, especially in the new field of Environmental Studies. The demand on the library increases each year, which to a certain extent is shown in the loan statistics, and the amount of Xerox copies provided to overseas and local institutions.

During the year 338 volumes were added to the library, 256 being books, the remainder being serial publications. Of these volumes, 169 were received on exchange or given to the Museum, either for review or as private donations. Currently the Museum receives 1,800 periodical titles, of which we subscribe to 212; the rest are received on exchange or are given to us. Because of the staff problem very little preparation for binding has been done, one lot being sent to the Government Printer. This consists of 51 volumes of new binding and 15 volumes for rebinding.

Nine hundred and ten loans were made to libraries in all Australian States, both Government, university and private. Two hundred and sixteen lots of Xerox copies were supplied, both to Australian and overseas libraries, especially to New Zealand and New Guinea. These Xerox copies amounted to 5,223 sheets. Some of the Xerox copies were made in answer to requests to the Linnean Society of New South Wales. The Museum borrowed 113 items from other libraries.

The list of scientific works left to the Museum in the bequest of Mr Melbourne Ward was completed and the books are to be valued for insurance purposes.

Three hundred and fifty-eight books and 147 serials have been classified and catalogued. During the coming year the library should be completely reorganized. Most of the periodicals will be moved to the New Wing Stacks and rearranged. The present Office and Reading Room will be vacated, and the Old Wing Stacks will become the new Office and Reading Room.

PHOTOGRAPHER AND VISUAL AIDS

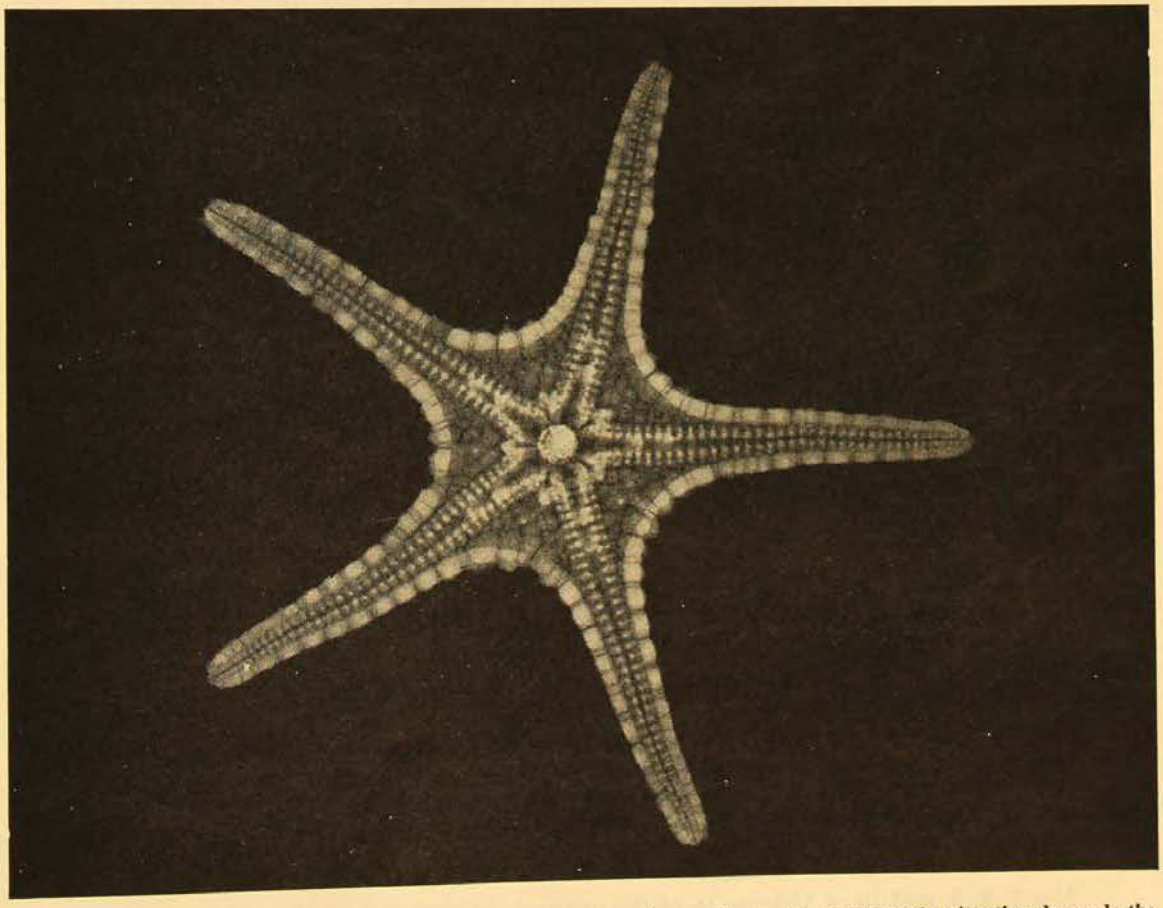
Field Work. Mr H. Hughes accompanied Mr B. J. Marlow (Curator of Mammals) to Dangerous Reef, South Australia during November-December, where a large number of still photographs were exposed as well as over 2,000 feet of cine film. This work was to record activities of bird life and the sea-lion *Neophoca cinerea.*

A number of short excursions were made to photograph Wanderer Butterfly tagging operations and various other film sequences.

Collections. Over 300 negatives have been registered and catalogued.

Information and Services. A display of Museum photographs prepared in conjunction with Kodak (Australia) Pty Ltd, was exhibited at Kodak stores throughout Australia. Publicity was gained for the Cook-Banks Bi-Centenary Exhibition by the large monochrome and colour prints prepared in this Museum.

Photographs were prepared for publication, display, record and research. Not less than 854 monochrome prints, 140 monochrome slides, 708 colour slides, 314 negatives enlarged format, 442 35 mm and various colour prints and transparencies were made.



Radiography is used in the comparative study of the bones and tissues of a specimen where the situation demands the specimen remain undamaged. Photograph shows a Starfish

Photo by C. V. Turner, *The Australian Museum*

The department has continued to produce films for exhibition outside the Museum. A film entitled *Carnarvon*, won an award for "Excellence of Production" at the 17th Annual Columbus Film Festival in the U.S.A. A colour documentary, entitled *Classic Old . . . Exciting New*, was completed this year; a contract has been signed for television release through the Australian Broadcasting Commission. The production shows some of the many activities of the Museum.

Following approaches made to them, the Broken Hill Proprietary Limited have offered $25,000 to sponsor, initially, four films, with an option to finance an extra nine films on similar terms. Work has commenced on these four films and the planning of others.

General. Improved facilities are needed for cine work and storage of cine film as well as better studio space for filming and photographing live animal subjects, some of which need to be kept in photographic cages for some periods of time.

MUSEUM BUILDINGS

During the year, the Long Gallery, the oldest Museum Gallery in Australia, was redecorated. The floor and stairs were carpeted and the columns covered with long drapes, in preparation for the Cook-Banks Exhibition, and later the National Photographic Index of Australian Birds.

A section of the Long Gallery was utilized to build a Museum Shop. The area is well-lit and carpeted, and features a display of many publications, post cards and slides on aspects of Natural History. The shop can be partitioned off from the rest of the Long Gallery by a protective grille.

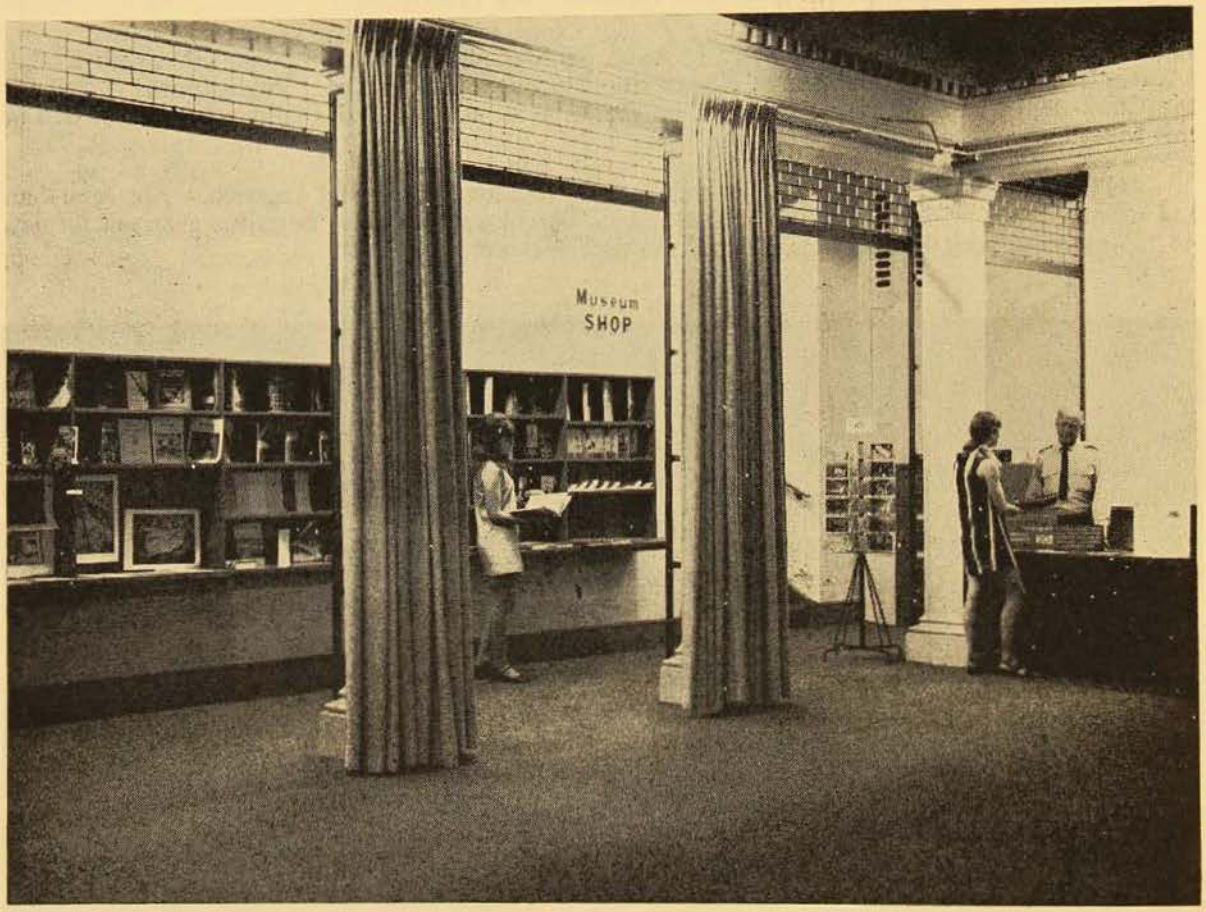


Photo by C. V. Turner, *The Australian Museum*

PUBLISHING AND ADVERTISING

Because of a very big increase in printing costs, the selling price of the quarterly magazine *Australian Natural History* was increased, as from the December, 1969 issue, from 30c to 50c per copy and from $1.40 to $2.20 (posted) for an annual subscription. It is expected that this will offset the rise in printing costs. The sending of circulars to schools in all States, with a view to enrolling them as subscribers to the magazine, was continued.

Nos 7, 8, 9, and 10 of Volume 16 of the quarterly magazine *Australian Natural History* were published during the year, and the articles for No. 11 were sent to the Government Printing Office. No. 8 (December, 1969) was a special issue, devoted to Captain James Cook and his voyage to Australia. It contained 16 extra pages.

One part (No. 1) of Volume 28 of the *Records of the Australian Museum* was published, and Nos 2, 3, and 4 were in process of printing. The Index to Volume 27 was published.

The manuscript of No. 13 of the *Memoirs of the Australian Museum*—"Catalogue of Type Specimens of Fossils in the Australian Museum, Sydney", by H. O. Fletcher—was sent to the Government Printing Office. Preliminary work began on the reprinting of the booklet, *Australian Aborigines.*

A new free natural history leaflet, *Guide for Collectors*, and new editions of sixteen existing leaflets were published. Another new leaflet, *Melanesia*, and new editions of two existing leaflets, were in process of printing.

Three articles published in *Australian Natural History* were reprinted for their authors, and one "Captain Cook's Role in Natural History", was reprinted for use by the Museum's Education Service.

Fifteen thousand folders giving information about the Museum and its publications and containing subscription forms for *Australian Natural History* were printed.

Advertising of the Museum and its exhibits, cafeteria, and film screenings was continued in Sydney newspapers, and *Australian Natural History* was again advertised in newspapers in Sydney and the other capital cities. The Museum and its exhibits, publications, and cafeteria were also advertised in Sydney newspapers' education supplements and in the *Sydney Tourist Guide.* In addition, the Captain Cook and Joseph Banks Exhibition, the moon rock exhibit, and the public lecture on "The Conservation of Antiquities" by Dr A. E. Werner, Keeper of British Museum Research Laboratory, were advertised in Sydney newspapers.

The Museum received much publicity in the newspapers and on television and radio. Matters particularly publicised in this way included the Captain Cook and Joseph Banks Exhibition, the moon rock and Conservation Week exhibits, the Director's forthcoming participation in the American Tektite II underwater research programme, and the fossil discoveries in central Queensland.

The Assistant Editor continued to act as Public Relations Officer.

In addition to articles contributed to *Australian Natural History*, the following papers and books by members of the staff were published during the year:

Cogger, H. G. (with Lindner, D.), 1969—
Marine Turtles in Northern Australia. *Aust. Zool.* 15 (2): 150–159.

Disney, H. J. de S., 1969—
The Tanami Hornbill, *Acanthiza tanami*, Mathews—A New Examination of the Type. *Emu* 69 (4): 237–238.

Disney, H. J. de S., 1969—
Stubble Quail Ageing. *Aust. Bird Bander* 7 (4): 87–89.

Disney, H. J. de S., 1970—
Satin Bower. *Aust. Bird Bander* 8 (1): 12–13.

Disney, H. J. de S., 1970—
Genus Tyto. *Aust. Bird Bander* 8 (2): 38–40.

Griffin, D. J. G. (with Yaldwyn, J. C.), 1970—
Giant colonies of Pelagic tunicates (*Pyrosoma spinosum*) from S.E. Australia and New Zealand. *Nature.* 226, p. 464, May, 1970.

Griffin, D. J. G. (With Stanbury, P. J.), 1970—
"Type Specimens in the Macleay Museum, University of Sydney. V, Decapod Crustaceans". *Proc. Linn. Soc. N.S.W.* Vol. 95 (in press).

McAlpine, D. K., 1969—
Life in the Rain Forest. *Mind Alive* (Marshall Cavendish, London), 97: 2697–2700.

McAlpine, D. K., (with Colless, C. H.), 1970—
Chapter 34, Diptera, in The Insects of Australia (CSIRO), pp. 656–740.

Marlow, B. J., 1970—
"A Record of the Mastiff Bat, *Tadarida plicata*, from the Cocos Keeling Islands". *Mammalia* Paris (as yet unpublished).

Moore, D. R., 1970—
"Conservation Problems—Museum and Archaeological: informal notes on a Churchill Fellowship Study Tour, May-October, 1969." *A.I.A.S. Newsletter*, 2 (12): 38–40.

Moore, D. R., 1970—
"Conservation of Ethnographic Collections and Archaeological Sites: Report on a Churchill Fellowship Study Tour, 16th May to 31st October, 1969." Roneoed. 35 pages.

Moore, D. R. (with Baglin, D.), 1970—
The Dark Australians. Weatherhill, Tokyo. 136 pages.

Peters, J. V., 1969—
Notes on the distribution of Australian Hesperioidea and Papilionoidea (Lepidoptera). *Aust. Zool.* 15 (2): 178–184.

Peters, J. V., and Smithers, C. N., 1969—
The Butterflies of Norfolk, Philip, and Nepean Islands. *Aust. Zool.* 15 (2): 185–187.

Ponder, W. F. (with Beau, A. G.; Dell, R. K.; Fleming, C. A.; Marwick, J.; Maxwell, P. A.; Powell, A. W. B.) 1969—
Requests for rulings on works on New Zealand Mollusca by R. S. Allan and H. J. Finlay. *Bull. Zool. Nomencl.* 26 (1): 42–50.

Ponder, W. F., 1969—
Notes on two neoleptonid bivalve molluscs. *N.Z.J. Mar. Fresw. Res.* 3 (2): 262–272.

Ponder, W. F., 1970—
A new archibenthal species of the Fasciolariidae from New Zealand. *J. Malac. Soc. Aust.* 2 (1).

Ponder, W. F., 1970—
A new aplacophoran from New Zealand. *J. Malac. Soc. Aust.* 2 (1).

Ponder, W. F., 1970—
Some aspects of the morphology of four species of the neogastropod family Marginellidae, with a discussion on the evolution of the toxoglossan poison gland. *J. Malac. Soc. Aust.* 2 (1).

Recher, H. F. (with Recher, J. A.), 1969—
Some Aspects of the Ecology of Migrant Shorebirds. II, Aggression. Wilson Bulletin 81 (2): 140–154.

Recher, H. F., 1969—
Aspects of Fauna Conservation on the North Coast of New South Wales. *National Parks Journal (N.S.W.).*

Recher, H. F., 1970—
Conservation of Coastal Habitats—An Ecological Perspective. *The Living Earth* 14 (1): 2–5.

Recher, H. F. (with Abbot, I. J.), 1970—
The Possible ecological Significance of Hawking by Honeyeaters and its relation to Nectar Feeding. *Emu* 70 (2).

Ritchie, A., 1970—
Glimpses of Australia's Distant Past. *Hemisphere* 14, 2–8.

Smithers, C. N., 1969—
On a Small Collection of Psocoptera from Britain. *Ent. mon. Mag.* 105–54.

Smithers, C. N., 1969—

A note on migrations of *Vanessa kershawi* (McCoy), (Lepidoptera: Nymphalidae) in Australia, 1963–1968. *Aust. Zool.* 15 (2): 188–194, 1 fig.

Smithers, C. N., 1969—

The Psocoptera of New Zealand. *Rec. Canterbury Mus.* 8 (4): 259–344, 211 figs.

Smithers, C. N. (and Disney, H. J. de S.), 1969—

The distribution of terrestrial and freshwater birds on Norfolk Island. *Aust. Zool.* 15 (2): 127–140.

Smithers, C.N., 1970—

In: The Insects of Australia. i–xiv, 1029 pp., frontis, pls 1–8, Melbourne. (Zoraptera: Chap. 17, pp. 302–303, fig. 17. 1–17. 2.)

Smithers, C. N., 1970—

In: The Insects of Australia. i–xiv, 1029 pp., frontis, pls 1–8. Melbourne. (Psocoptera: Chap. 24, pp. 367–375, fig. 24. 1–24. 6.)

Smithers, C. N., 1970—

A note on the seasonal occurrence of some Norfolk Island butterflies. *Proc. R. Zool. Soc. N.S.W.* 1969–1969: 46–47.

Smithers, C. N., 1970—

Knowledge of New Zealand Psocoptera. *N.Z. Ent.* 4 (3): 71.

Smithers, C. N., 1970—

Some thoughts on Trans-Tasman relationships in the Psocoptera. *N.Z. Ent.* 4 (3): 79–85.

Smithers, C. N. (with McArtnay, I. B.), 1970—

Record of a migration of the Chequered Swallowtail (*Papilio demoleus sthenelus* Macleay (Lepidoptera: Papilionidae)). *Nth Qd. Nat.* 37: 8.

Talbot, F. H., 1969—

The future of the Great Barrier Reef. Summation of Symposium. *Australian Conservation Foundation. Special Publication.* No. 3: 65–69.

Talbot, F. H., 1970—

The South-East Asian Area as a Centre of Marine Speciation: An Ecological Analysis of Causes. *In:* Symposium on Marine Sciences *Ed.* R. J. Walsh. *Repts. Australian Academy of Sciences.* No. 12: 43–50.

White, J. P., 1969—

"Rock paintings from the Strickland River, Western Highlands, New Guinea." *Papua and New Guinea Scientific Society, Transactions.* 1969: 1–7.

Yaldwyn, J. C. (with Gillett, K.), 1970—

"*Australian Seashores in Colour.*"

ATTENDANCE

The total number of visitors this year was 500,954, the Cook-Banks exhibit was responsible for nearly 100,000 visitors. The attendance at film screenings during the school holidays was again over 7,000.

DONATIONS

The following donations of important material are gratefully acknowledged: Mr S. Prodjodipoero and Mr I. C. Glover (Indonesian material); Mr O. K. McCaw (insects from Western District of Papua); Mr C. Monier, of Paris (Insects from New Guinea, Panama and other localities); Mr G. Daniels (Hymenoptera and numerous other insects and spiders); Dr St L. Moss (insects from Cocos Island); Miss L. Levitt (a collection from Groote Eylandt); Mr W. McReaddie (reptiles and frogs from New South Wales and Central Australia); Mr F. Parker (reptiles from Charleville, Queensland); Mrs J. Hope (frogs and lizards from New Guinea); Mr J. Smith (lizards from Ball's Pyramid, Lord Howe Island); Mr G. Coates (fish); Dr H. Choat (fish); Mr J. Smith (fish); Mr H. Blackburn (molluscs); Mr and Mrs J. Cameron (molluscs); Mr T. A. Garrard (molluscs); Mr W. Gibbons (molluscs); Mr W. Hancey (molluscs); Mrs L. Harford (molluscs); Mr I. Loch (molluscs); Mrs S. McKay (molluscs); Mr L. Moore (molluscs); Mr T. Nielsen (molluscs); Mr N. Coleman (molluscs); Electrolytic Zinc Co. (A/sia) Ltd (specimens of willemite and other minerals); Mrs M. Wirth (cut synthetic gemstones); Mr V. S. Daddow (cordierite); Mr D. F. Walker (crystals of tourmaline variety dravite); Prof. T. G. Vallance (portion of Wynella stony meteorite); Mrs D. Castle, Mr P. J. Gillick, Mrs E. Gillick, Master P. Gillick, Mr J. Buchan, Mr J. F. Ewart, Mr R. Mawson, and Mr R. Matthey (specimens of Murchison meteorite-carbonaceous chondrite type); Mr O. Fenzi (samples of two rare copper minerals, papogoite and ajoite); Taronga Zoo (birds), National Parks and Wildlife Service (birds); Victoria University, Wellington, N.Z. (Devonian vertebrate remains), Conzinc Riotinto of Australia (Bosch jackhammer and generator, on permanent loan). Mr Justice Myers (colour transparencies), The Managing Director of Time-Life International (Aust.) Pty Ltd (24 copies of Life Nature Books), The Children's Book Council (books), The Navosti Press Agency (photographs of Captain Cook material).

FINANCE

Expenditure from Consolidated Revenue for the year (excluding Statutory Endowment of $2,000) was $432,513.18 compared with $357,791.04 last year.

Net income for Trustees' Funds (including Statutory Endowment) was $74,854.27 compared with $48,098.59 for 1968–9.

The cash balance in the Trustees' Accounts at 30th June, 1970, was $17,181.64, including Grants of $10,520.43 for special purposes. Trustees' Invested Funds at 30th June, 1970, were: Commonwealth Inscribed Stock, $7,330, Metropolitan Water, Sewerage and Drainage Board Inscribed Stock, $5,000.

A statement of Receipts and Expenditure for the year is contained in the Appendix.

Appendix

THE AUSTRALIAN MUSEUM—SUMMARIZED STATEMENT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 30TH JUNE, 1970

RECEIPTS

	$	$
Appropriation Account—		
Treasury Appropriation		432,513.18
Trustees' Account—		
General Funds—		
Statutory Endowment	2,000.00	
Grant Towards Museum Requirements	9,000.00	
Museum Shop Sales	11,043.47	
Australian Natural History Magazine Sales—Museum Shop	616.89	
Donations	319.32	
Subsidy from Sydney County Council	2,000.00	
Sale of Cine Film	1,626.06	
Interest	983.32	
Postage Receipts	273.60	
Rental for Cafeteria	165.00	
Royalties and Copyrights	1,202.36	
Grant for "Hall of Life"	10,000.00	
Australian National University Grant to publish "White Thesis"	600.00	
Sale of Outboard Motors	800.00	
British Council Grant toward Cook-Banks Exhibition	1,070.00	
British Museum and others contribution to joint New Guinea Exp.	1,023.20	
Miscellaneous Receipts	917.00	
		43,640.22
Grants—		
Australian Research Grants Committee—Director	115.00	
Australian Research Grants Committee—Ichthyology	1,965.00	
Rural Credits Development Fund—Director	1,820.00	
National Parks and Wildlife Service	2,500.00	
Prime Minister's Department—Grant for Training Aboriginal Preparator	5,000.00	
National Photographic Index of Australian Birds—		
Donations	18,798.05	
Photographic Sales	1,016.00	
		31,214.05
Balance as at 1st July, 1969—		
Cash at Bank and in Hand—	$	
Trustees' Funds	9,010.13	
Investments	12,330.00	
	21,340.13	
Grants—		
Australian Institute of Aboriginal Studies	299.20	
National Parks and Wildlife Service	194.43	
Rural Credits Development Fund	130.40	
Australian Research Grants Committee—Director	4,084.42	
Australian Research Grants Committee—Anthropology	283.68	
Australian Research Grants Committee—Ichthyology	2,943.38	
National Photographic Index of Australian Birds	667.30	
		29,942.94
		$537,310.39

Appendix—*continued*

PAYMENTS

	$	$
Appropriation Account—		
Salaries, etc.	343,971.40	
Tea Money	335.40	
Rates, Tent, etc.	3,249.64	
Insurance of Buildings	100.00	
Travelling and Subsistence Expenses	7,622.69	
Motor Vehicles Running Costs	2,199.16	
Freight and Cartage	1,058.51	
Postal and Telegraphic Expenses	2,295.50	
Books, Periodicals and Papers	3,351.77	
Other Insurances	4,480.31	
Stores and Equipment	25,000.00	
Fees and Commissions	1,970.00	
Laundry Expenses	248.45	
Minor Expenses	3.85	
Grant Towards Museum Requirements	9,000.00	
Storage Equipment	24,127.21	
Printing	3,499.29	
		432,513.18
Trustees' Account—		
Cost of Publishing Magazine	1,415.53	
Stock for Museum Shop	4,878.81	
Stores, Plant, and Equipment	11,357.77	
Travelling Expenses	3,833.29	
Museum Specimens	5,265.92	
Entertainment	1,314.86	
Freight	460.43	
Miscellaneous Expenditure	647.45	
Royalties and Copyrights	50.84	
Cine Film Production	1,483.68	
Combined Upper Sepik Expedition	200.00	
Research Grants	1,230.00	
Grant to Great Barrier Reef Committee	150.00	
Teaching Aids for Education Section	126.20	
Cafeteria Equipment and Fittings	1,589.66	
Joint Museum's Expedition—New Guinea	1,297.87	
Cataloguing Library—"Melbourne Ward"	665.00	
		35,967.31
Grants—		
Australian Research Grants Committee—Director—	$	
Refund Salaries to Dept of Education	1,548.93	
Stores and Equipment	498.08	
Salaries for Research Assistants	320.00	
	2,367.01	
Australian Research Grants Committee—Ichthyology—		
Freight	0.35	
Stores and Equipment	2,794.85	
	2,795.20	
Rural Credits Development Fund—Director—		
Stores and Equipment	1,727.57	
Travelling Expenses	150.00	
	1,877.57	
National Parks and Wildlife Service—		
Stores and Equipment	861.96	
Travelling Expenses	589.94	
Miscellaneous Expenses	18.39	
	1,470.29	
Australian Research Grants Committee—Anthropology—		
Stores and Equipment	246.49	
Travelling Expenses	13.37	
Freight	10.35	
Miscellaneous Expenses	13.47	
	283.68	
Australian Institute of Aboriginal Studies—		
Travelling Expenses	43.26	
	43.26	
National Photographic Index of Australian Birds—		
Subsistence and Travel	9,157.43	
Photography and Equipment	4,406.10	
Printing	1,410.02	
Clerical Assistance and Postage	1,120.33	
Miscellaneous Expenses	49.21	
	16.143.09	
		24,980.10
Balance as at 30th June, 1970—		
Trustees' Funds—		
Cash at Bank and in Hand	6,661.21	
Investments	22,330.00	
	28,991.21	
Australian Institute of Aboriginal Studies	255.94	
National Parks and Wildlife Service	1,246.07	
Rural Credits Development Fund	72.83	
Australian Research Grants Committee—Director	1,832.41	
Auatralian Research Grants Committee—Ichthyology	2,113.18	
Prime Minister's Department Grant for Training Aboriginal Preparator	5,000.00	
National Photographic Index of Australian Birds	4,338.16	
		43,849.80
		$537,310.39