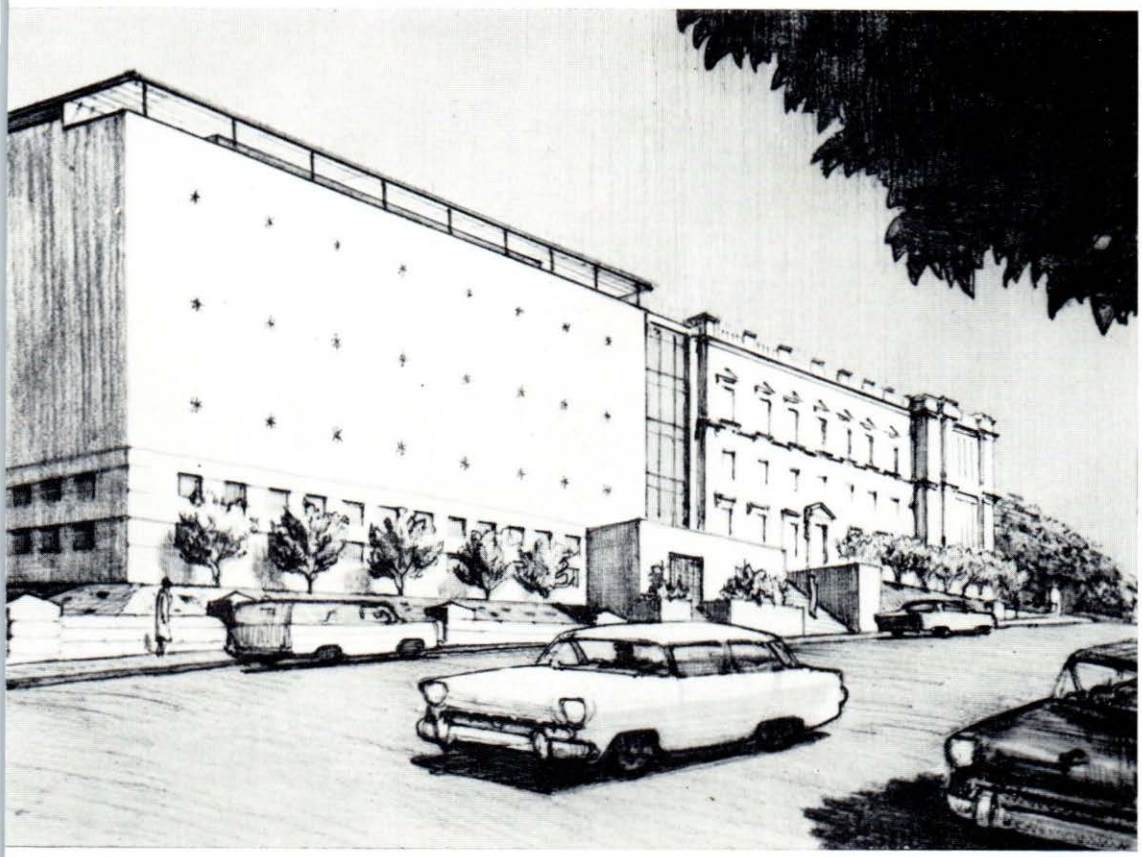
AUSTRALIAN NATURAL HISTORY



PUBLISHED BY
THE AUSTRALIAN MUSEUM
SYDNEY

Registered at the General Post Office, Sydney, for transmission by post as a periodical

DECEMBER 15, 1962
VOL. XIV, No. 4
PRICE, THREE SHILLINGS

THE AUSTRALIAN MUSEUM

HYDE PARK, SYDNEY

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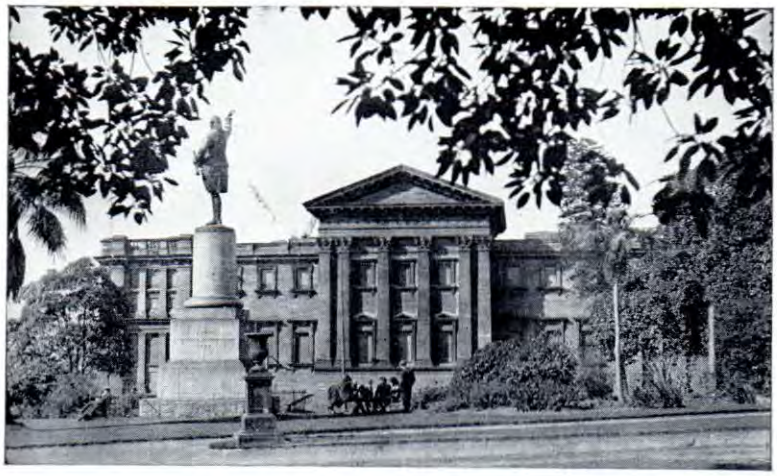


This issue is devoted entirely to the Australian Museum and its activities.

CONTENTS

(Photography, unless otherwise stated, is by Howard Hughes.)

● **FRONT COVER: The Australian Museum, with its new seven-storey wing at left. The fine new building will house staff, collections, exhibits and a restaurant for the visiting public. The drawing is by David Rae, of the Museum's Exhibition Department.**

VOL. XIV, NO. 4 DECEMBER 15, 1962

AUSTRALIAN NATURAL HISTORY

Published Quarterly by the Australian Museum - - - College Street, Sydney

Editor: J. W. Evans, Sc.D. Annual Subscription, Posted, 14/-

VOL. XIV, No. 4 DECEMBER 15, 1962

The Theme of the Australian Museum

THIS issue of *Australian Natural History* commemorates an event of the greatest importance in the long history of Australia's oldest and largest natural history museum.

This event is the completion of a new wing, which is described elsewhere in these pages, and which is the first major addition to be made to the Museum in over half a century.

It will be seen from the pages which follow that, although the Museum is old, it is active and progressive. Moreover, it is concerned with matters of the very greatest importance as affecting the future welfare of mankind.

Recently there has been installed in the entrance hall a large notice which welcomes visitors. On one side information is given of some of the Museum's functions—in particular, those having to do with study collections, education and research.

The text on the other side of this notice reads as follows:—

The Theme of this Museum is
The Inter-relationship of all Living Things.

Its Message:
Conserve, Don't Destroy.

The Animals and Plants of Australia are our heritage to be held in trust for future generations.

They represent the culmination of hundreds of millions of years of evolutionary development.

As well as being related to each other, all plants and animals, including Man, the most abundant large mammal, are interdependent.

Unless these well established scientific FACTS come to be widely understood and their significance appreciated so that MAN CAN LEARN TO LIVE IN BALANCE WITH HIS ENVIRONMENT, there is a very real danger that growth of human populations, accompanied by the misuse of the limited resources of our planet, will threaten the continued existence, not only of our own species, but also that of most other animals and plants.

One of the scientific laboratories in the Museum's new wing.

THE NEW WING

By J. W. EVANS

IN the Annual Report of the Trustees of the Museum for the year 1911, it was stated that plans had been prepared for an expansion of the main building to provide much needed accommodation for the library, scientific work-rooms and offices.

These plans were not implemented, and in reports for the consecutive years 1917, 1918 and 1919, the following statement was repeated:—

"Every portion of the building is now occupied, either for exhibition, administration, bibliographic or storage purposes, and as a result of this the affairs of the Institution are hampered and in some respects brought to a standstill. No degree of re-arrangement can alter this state of affairs. The only relief possible is to considerably extend the building".

Forty years were to pass before such relief was granted and now, at long last, the Museum has room for expansion.

The new wing which is a continuation of the north and oldest part of the Museum, has seven storeys. The two lowest provide up-to-date laboratory accommodation for the greater part of the scientific staff and, as well, storage accommodation for some of the Museum's study collections. They also house the Art and Design Department.

Each of the remaining floors, with the exception of the top one, will be used, in part, for exhibition purposes and, in part, for storage.

The top one, whence there is a magnificent view over the city of Sydney, has been equipped as a restaurant for the use of the visiting public.

There has been much comment on the lack of windows in four of the floors of the new building. The reason for this lack is that most effective museum display is achieved with the aid of artificial light and,

over the past few years, as light has been installed in an ever-increasing number of exhibits so have the windows in the old building been progressively obscured.

Ethnological And Geological Exhibits

Modern museum displays take much time to plan and prepare, hence it will be several years before the whole of the new galleries are open to the public.

First priority is being given to a floor which will be devoted to ethnological exhibits, and these will be displayed with the emphasis on good design. Next to receive attention will be the fossil floor, and the preparation of miniature dioramas, illustrating the life of former geological ages, is already in hand.

Not only is new storage accommodation now available for part of the museum's study collections but much needed library extension has also become possible.

The space which has been made available as a result of transfer of staff to the new wing is being put to good use. For example, in some vacated rooms which have high ceilings, mezzanine floors have been installed and these are used for storage purposes. A new photographic studio is being equipped in another vacated room, and a new office for the library staff and a reading room in two others. Then, added space has made it possible to assemble together collections belonging to the several departments, and many of these formerly were widely scattered.

In regard to more immediate benefits to the visiting public, the New Guinea gallery, which for several years has had to be used as a store, will shortly be re-opened.

In conclusion, mention should be made of the lecture theatre and some adjoining rooms. A few years ago, through the generosity of Sir Edward Hallstrom, the theatre was reconditioned and brought up-to-date and it is now known as the "Hallstrom Theatre". The adjacent rooms, formerly used for storage purposes, have recently been equipped as offices and laboratory accommodation for the Museum's education officers; this will enable increased attention to be given to children's activities.

Part of an exhibition of children's natural history work held at the Museum during Education Week, 1962. The entries, for which the Museum Trustees awarded prizes, were from schools which visit the Museum regularly as part of their class work.

EXPEDITION TO SWAIN REEFS

The Australian Museum's expedition to the Swain Reefs, Queensland, which was sponsored by David Jones, Ltd., returned to Sydney at the end of October with large collections of corals, shells, fishes, crabs, echinoderms and other groups. Among the scientifically valuable material were dredgings from a depth of 40 fathoms, taken in the channels between the coral reefs. These are rich in small shells, bryozoa and foraminifera, and should yield many interesting specimens when sorted. The largest animals obtained were several sharks, one of which was a female Tiger Shark, 11 ft. 4 in. long and weighing about 500 lb. An article on the expedition will appear in a future issue of "Australian Natural History".

THE TRUSTEES

By EMERITUS PROFESSOR A. P. ELKIN
President of the Museum's Board of Trustees

THOUSANDS of persons, adults and children, visit the Australian Museum every week. They are interested in displays illustrating the natural history and anthropology of Australia and the Pacific. They are often fascinated by the "genealogical trees" of living forms, and by route-maps of the migrations of man and animal, of bird and insect. But, quite understandably, they are unaware of the administration, research and technical work required to maintain the Museum's activities.

The list of positions and names on the inside of the front cover of this magazine shows that the organization is twofold. There is a Director with a scientific, technical and administrative staff, whose task is to carry out research in the field and in the laboratory; to collect and preserve specimens of natural history and anthropology; and to pass on knowledge to the public by displays, lectures and publications, by classes for school pupils, and by answering questions from hundreds of inquirers.

But behind all this activity is the Board of 24 Trustees, a corporate body established by Act of Parliament. Eleven of these, the Official Trustees, hold office by virtue of a particular Cabinet or other prescribed position which they fill. In general, however, only one or two of these take an active part in Museum affairs. Of the remaining 13, one is appointed by the Crown and the others elected, as vacancies arise, by the remaining Trustees in special meetings.

In practice, the Trustees' work is performed by these 13. They are responsible for the Museum's general policy, for the care of its property and collections, and for the expenditure of the Government's appropriations for the Museum's activities and of any moneys which may be entrusted to them.

With regard to policy, the Trustees are concerned with the balanced development

The President for 1962 of the Australian Museum's Board of Trustees, Emeritus Professor A. P. Elkin, has been a Trustee for 16 years. He is a Fellow of the Senate of the University of Sydney and was head of the Department of Anthropology in that University for 23½ years. He has been honorary editor of the anthropological journal *Oceania* for 30 years. Positions Professor Elkin has held in scientific societies include Chairman of the State Division of the Australian National Research Council for 10 years and the Council's Chairman, 1954-55; President of the Pan-Indian Ocean Science Association, 1954-57; and Australian member of the Council of the Pacific Science Association, 1946-58, of which Association he is an Honorary Life Fellow. Professor Elkin is Chairman of the Australian Committee on Road and Traffic Signs of the Standards Association of Australia, has been Vice-chairman of the Aborigines' Welfare Board since 1942, and was Honorary Secretary of the Jubilee Congress of the Australian and New Zealand Association for the Advancement of Science held this year. Professor Elkin is the author of several books on anthropology and history. He has been awarded the Medal of the Royal Society of New South Wales, the Mueller Medal by A.N.Z.A.A.S., and the James Cook Medal for "outstanding contributions to science and human welfare in the Southern Hemisphere," and was, in 1961, the first recipient of the Herbert E. Gregory Medal for distinguished services to science in the Pacific. [Photo: The Wynyard Studio, Sydney.]

of research, collections, display and education. They are also concerned with the relations between the Museum on the one hand, and the Government and the public on the other; with the extension and improvement of the buildings; with provision of adequate facilities for the staff to do their varied work; and indirectly with recruiting, and especially with holding, staff of high calibre. In such matters, the Trustees make representations to the appropriate authorities.

In all their deliberations and work, the Trustees collaborate with the Director, on whose reports they rely and whose advice and opinion they respect. Their aim is to support him and the staff in implementing the policies and programmes they have mutually agreed upon.

The Elective Trustees, by custom, include city businessmen, university scientists, and persons with administrative responsibility in Government Departments or other organizations. In this way, the Museum draws on a varied pool of expertness in the fields of finance, of official and public relations, and of science. All, however, are especially concerned with maintaining and advancing the Museum's basic functions, that is, with increasing our knowledge of natural history and passing that knowledge on.

The Trustees, with only occasional exceptions, are very busy persons, being directors of companies, heads of Government Departments or of semi-Government instrumentalities, and university professors. They are leaders in their respective fields. But they gladly devote time, thought and energy to the Australian Museum as a voluntary, but very important, service to the State and nation. The Board meets monthly and so does the standing committee, while other special committees meet frequently, and individual Trustees are called on from time to time to help in various ways.

Donations are sometimes made to the Museum by citizens and business firms to improve its equipment or to enable a particular piece of research or collecting to be carried out. These donations are much appreciated; but over the years they are few in number and small in total amount for a city such as Sydney and for the State of New South Wales. The probable reason for this is that the needs of the Museum are not known. But, as President, I can assure all readers that the Trustees and staff would be much encouraged and helped by such donations for the fundamental work of the Museum.

The Australian Museum is a "top-line" investment by Government and people, bearing dividends in the acquisition and dissemination of knowledge. The Trustees act for the investors, that is, for the taxpayers, the Government, and all contributors, ensuring that those dividends are as high as possible and that the capital of knowledge never ceases to grow.

"LIFE THROUGH THE AGES"

A second edition of "Life Through the Ages", a coloured chart showing the progress of life through geological time, has been published by the Australian Museum.

The chart (34 *in.* x 24 *in.*) *relies on illustrations more than on wording, and is designed for hanging in schools so that it may be seen by all children, whether they are studying the biological sciences or not. It can also be used as an aid in the teaching of science, and will be of value to lay people interested in biological subjects.*

The chart illustrates the kinds of life that have existed from the primitive invertebrates of more than 800 *million years ago to the present. It shows the geological periods and their durations.*

It is on sale at the Museum, price 6/- (6/9 *posted*).

The reaction of visitors to a Museum exhibit of a Red Kangaroo which they can touch is shown in this series of unposed photos. The kangaroo is displayed without a glass case so that visitors may examine it closely, and their interest in it proves the educational value of open exhibits. Many adults seem to be puzzled at first by the absence of a "Do Not Touch" notice, but the response of children is delightfully uninhibited.

Hyde Park, looking east, soon after the first Australian Museum building (the north wing of the present building), seen at top right, was completed. [From a photo., in the Mitchell Library, of part of a panorama painted by John Rae about the middle of last century.]

The First Hundred Years

By G. P. WHITLEY

IN 1827, Ralph Darling, Governor of New South Wales, was informed by the Colonial Office that £200 a year had been granted to establish and maintain a museum in Sydney, and Alexander Macleay, Colonial Secretary at the time, was probably responsible for its institution.

The erection of a suitable building was not considered at that stage and the early collections of the "Colonial Museum", as it was then known, were housed at various times in many buildings. These included the "Judge Advocate's Old Office", Loftus Street, the "Old Post Office", Bent Street, the home of Chief Justice Forbes in Bridge Street, and the "New Court House, in Woolloomooloo" (now Darlinghurst).

The first custodian of the Museum was William Holmes, who was appointed "Colonial Zoologist" with a salary of £130 a year. Holmes was accidentally shot while collecting specimens in 1830, and following his death the Museum for several years was "In a State of Orphanage". From about 1834 to 1841 the collections were in the charge of John Roach, a ticket-of-leave man who received the title of "Collector and Preserver" or "Collector and Bird-stuffer". He received 1s. 9d. per day in lieu of rations and clothing and was assisted part of the time by a parliamentary messenger, William Galvin.

In the *Sydney Herald* for January 28, 1836, it was stated, "We understand that the Colonial Museum in Macquarie Street, is now open under the direction of George Bennett, Esq. The Museum contains a number of specimens in Natural History, collected by Major Mitchell, on his last trip, and heretofore unknown. . . ."

In 1836, the Estimates for the Museum amounted to £200. This included £10 for

the man in charge, £31 18s. 9d. for a second employee and a sum of £158 1s. 3d. for providing specimens and incidental expenses.

In its early days the Museum was managed by a committee, the rolls of whose members, as well as the lists of Trustees from the 1850's to modern times, embrace many names famous in Australian history.

The first Museum committee of 1836 consisted of the Hon. Alexander Macleay, Sir John Jamison, Phillip Parker King, William Macarthur (youngest son of John and Elizabeth Macarthur), J. V. Thompson, Charles Sturt, Edward Deas Thomson, George Porter, R. A. Wauch and George Macleay, a distinguished array of men of whom many are immortal in the history of Australia. Later committeemen or Trustees were the Rev. W. B. Clarke, "Father of Australian Geology", Dr. George Bennett, Sir William Denison (Governor-General and a keen marine biologist), Archibald Liversidge (a distinguished chemist), Professor T. W. Edgeworth David, Sir William Macleay, Rev. J. E. Tenison-Woods, Sir Alfred Stephen and many other eminent citizens.

First Museum Director

In 1845, Dr. George Bennett was styled Director of the Museum. He was a widely travelled surgeon-naturalist and had been honorary secretary to the Museum's committee between 1836 and 1838. Besides his duties as Director, Dr. Bennett, in his capacity as surgeon, had to attend hangings, and the Museum exhibited casts of the heads of malefactors, the earliest known cast specimens in Australia.

Dr. Bennett was friendly with Richard Owen in England, who was influential in obtaining books and specimens for the Museum and in recommending staff. Bennett had several official titles during his term of office, and it is to his efforts that we are grateful for the honoured place the Museum was to occupy so soon in the scientific world.

The first Museum publication was *A Catalogue of the Specimens of Natural History and Miscellaneous Curiosities Deposited in the Australian Museum*, 1837, by Dr. George Bennett. This was the forerunner of more than 200 Catalogues, Records, Memoirs, Reports, Magazines and Leaflets in which the treasures of the Museum have been described, information made public, or scientific discoveries announced. Some of the specimens listed in the Catalogue of 1837 had been collected on Major T. L. Mitchell's expedition, and some of them are still in the Museum collections.

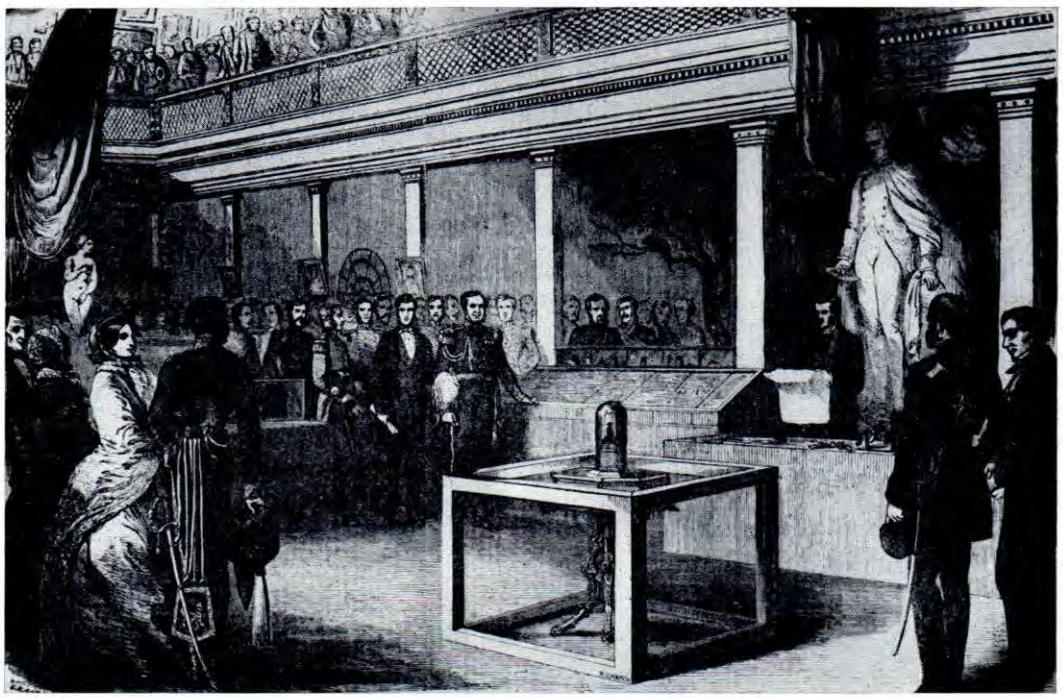
The Macleay family was connected with Museum affairs over a long period. The Hon. Alexander Macleay, appointed Colonial Secretary of New South Wales, arrived in Sydney in January, 1826. He has been termed the founder of the Australian Museum, but that title might be more properly bestowed on the third Earl Bathurst, who, in 1827, authorized its establishment. Macleay, however, presided over the infant Museum's destinies, becoming chairman of the early committee.

Sir William Macleay, a nephew of the Hon. Alexander Macleay, joined the Board of Trustees in 1861, taking over the chair from the Governor, Sir William Denison, who had left for Madras. Sir William Macleay had a large private zoological collection, the later nucleus of the Macleay Museum at the University of Sydney. Sir William was keen on dredging, and through his endeavours many marine novelties were discovered in Sydney Harbour. He personally compiled a basic *Descriptive Catalogue of Australian Fishes*.

An English gardener, George Masters, who had collected insects for Sir William Macleay was, in 1864, appointed collector to the Australian Museum. He travelled extensively in western New South Wales, Queensland, South Australia, Western Australia and Lord Howe Island. At Maryborough, Queensland, he obtained specimens of the newly discovered Queensland Lungfish, and somewhere or other he secured the "preserved skin of a Black Gin". When Macleay's collections were transferred to the University of Sydney he looked after them until his death in 1912.

The erection of the first Museum building, the north wing of the present building,

Above: The arrival of the Governor-General, Sir Charles Fitzroy, to open the Museum's first exhibition at its present site, in 1854. The exhibition was in what is now the fossil gallery. Below: The scene at the opening. [Contemporary woodcuts, Mitchell Library, Sydney.]



on the corner of College and William Streets, was not commenced until 1846. On September 8, 1849, the famous architect Edmund Thomas Blacket inspected and reported on the work so far done under the supervision of M. W. Lewis, the Colonial Architect. At that time it consisted of the part around the William Street entrance, which was flanked by two pillars that were later transferred to Centennial Park. The site at that time was "high ground that had a creek running along one side of it, where boys fished for eels". The appearance of the building can be seen from the old illustrations accompanying this article. It contained a basement and two floors, utilized for offices, residential quarters of the staff and an exhibition hall (now the fossil gallery).

The Curator of the Museum at this time was W. S. Wall. He had been in office from the early 1840's and was succeeded by S. R. Pittard, who had come from England in 1860 to take charge of the Museum. Pittard died after being in office for less than a year, and the next appointment was Gerard Krefft, a German naturalist, who remained in office until 1874. The annual salary of the early Directors was very little even for those early days. Wall received £100 a year, Bennett £200, while Pittard's salary was £500.

The first exhibition in the large hall of the newly erected Museum building was of articles, illustrative of the resources of the colony, which were intended for the French Government's Universal Exhibition in Paris in 1855. The Governor-General, Sir Charles Fitzroy, escorted by troops, arrived to open the exhibition and two of the large woodcuts in the *Illustrated Sydney News* of November and December, 1854, (reproduced here by courtesy of the Mitchell Library, Sydney) depict the scene.

In 1853, an Act to Incorporate and Endow the Australian Museum was passed by the Government and 24 Trustees were duly appointed as custodians.

Disputes At Museum

In 1860, Gerard Krefft was Acting Curator of the Museum. He used to correspond with Darwin, was a specialist on reptiles and fishes, and was the first to name one of the greatest zoological discoveries in Australia, the Queensland Lungfish.

Krefft had an unhappy time endeavouring to administer the Museum and keep harmony with those in authority. A dispute arose as to whether the Trustees of the Museum or the Colonial Secretary had the right to appoint a Curator, and as a result there were several resignations from the Board of Trustees. Krefft stated that none of the Trustees was properly gazetted and had as much legal standing as members of a church synod.

In 1861, the Colonial Secretary, the Hon. Charles Cowper, asked to be informed of the manner in which the vacant position of Curator of the Museum might be advantageously filled. The Trustees in reply stated their intention of taking immediate steps to fill the vacancy. In the Colonial Secretary's reply occurred this significant passage: "You will . . . . . understand that any arrangement proposed will be subject to the approval of the Government". To this letter the Trustees, under date of December 5, replied by quoting the 7th clause of the Act of Incorporation, which gave them power to "appoint all Officers and servants of the Museum", and an argument between the Trustees and the Government ensued. However, on April 28, 1864, there was a complete surrender on the part of the authorities in these words: "The Crown Law Officers, who have been consulted on this point, have advised that the office of Curator should be left in the hands of the Trustees of the Museum".

A considerable amount of friction and disharmony in the Museum continued until, in December, 1873, some gold was stolen from the Museum gallery on a day that the Curator had gone to Botany to obtain a small whale. The gold was never recovered. In 1874, the Trustees found it necessary to remove Gerard Krefft from his position and to close the institution to the public for a short period. In the Museum's Annual Report for 1874 is related the official version of the acrimonious differences between the Trustees and Krefft. Krefft, among other things, accused the Trustees of obliging their friends at the expense of the public by giving away valuable specimens.

Krefft refused to accept his dismissal, barricaded himself in his room and for some

time stood siege. Unable to obtain Crown Authority to eject him, the Trustees procured the services of a "bailiff", who removed Krefft in his chair and placed both in the street. Legal action resulted in a verdict for Krefft for £250, and subsequently Parliament voted £1,000 in satisfaction of his claims.

The unhappy events of the Museum during Gerard Krefft's time must have been discouraging to those who had the scientific interests of the institution at heart but better times and then bad again were to follow in succession.

In 1874, Edward P. Ramsay was appointed Curator of the Museum. But a disaster occurred in 1882, when the Museum's ethnographical collections and many other important specimens were lost when the Garden Palace in the Botanic Gardens was destroyed by fire.

Period Of Great Progress

Ramsay was a keen and energetic curator and he had built up the collections to a marked extent, being responsible for 17,600 bird skins alone being added. When in London, he acquired Francis Day's collection of Indian fishes, one of the first of its kind and rich in type specimens. Ramsay inaugurated the *Records of the Australian Museum*, which for 70 years have published much of the research work of the staff and studies by others on the Museum's collections.

Problems of space to house the growing collections were a continual worry to Ramsay and the Trustees at that time, even though the west wing, opened in 1868, had provided a considerable amount of additional space. Ramsay was instrumental in having a further hall added to the Museum building in 1886. This hall is now the Hallstrom Theatre. Two years later, Ramsay and his family had to vacate their residential quarters (now the librarian's office and new periodicals room) so that additional space could be obtained for the storage of specimens.

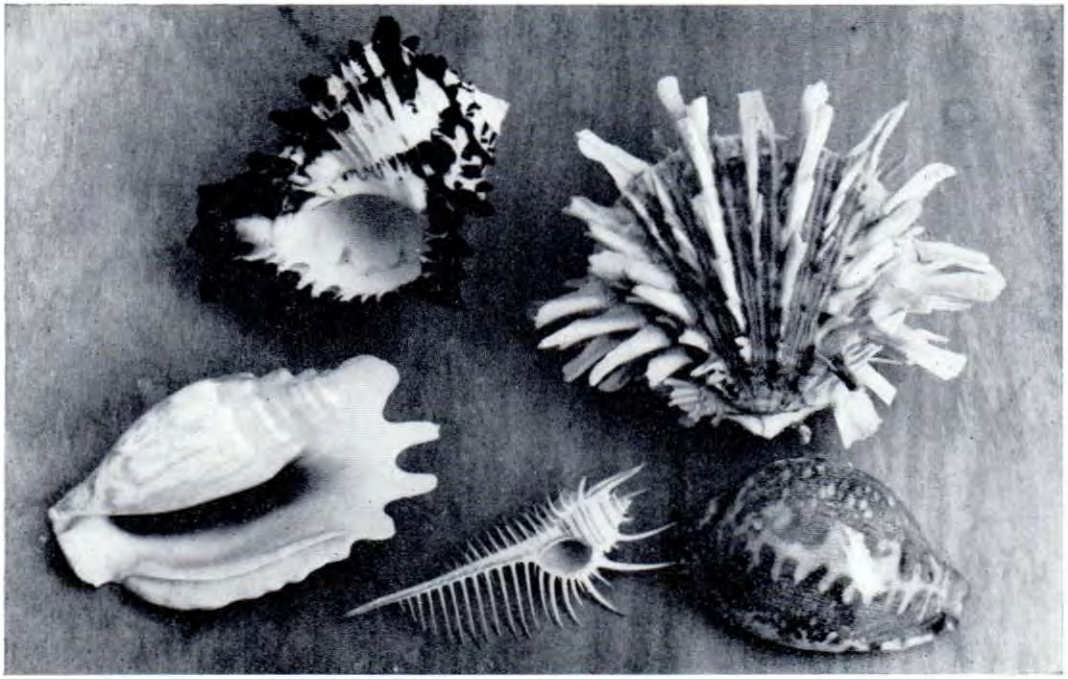
The prestige of the Museum was at this time very high. The collections and library were rapidly expanding, fruitful contacts had been made in all parts of the world, and publications were numerous. In 1893, however, an economic depression hit the State, 12 members of the staff were retrenched, and severe reductions made in expenditure. For some time work was done by honorary scientists and volunteer assistants, who were impressed with the fact that theirs was gentlemen's work and they should not expect much emolument.

In 1894 it was reported that "the Government retrenchment scheme has caused the Museum to suffer severely"; nevertheless, in 1896, £6,000 was voted by Parliament for further building extensions. In spite of this appropriation the Museum was not at that time receiving adequate financial support, and in a review of the Annual Report in *The Surveyor* for November 7, 1896, it was stated that the Report was "sad reading". "For in a new country rapidly becoming settled", commented the writer, "and where the many species of mammals, reptiles, fish, insects, etc., are necessarily being either changed by the introduction of foreign species or entirely exterminated in the altered conditions of their habitat, collecting should form one of the largest items in the Annual Report of a Museum."

This report was published a year after the appointment of Robert Etheridge, Jnr., as Curator. He had been palaeontologist at the Museum since June, 1887, and when he took over his new duties he continued and encouraged scientific research. Etheridge, during his long term of office, completed a great deal of important research on Australian fossils. He was also instrumental in the building up of the national collections and in having the south wing added to the Museum building. It was completed in 1910, and now houses the anthropological and skeleton exhibits and, on the ground floor, workshops and storage-space for collections.

The First World War then intervened. Various members of the Museum staff served overseas, and the activities of the institution were forced to remain static during the war years and the following period of economic recovery.

Robert Etheridge, Jnr., died early in 1920 after 33 years' association with the Museum. Dr. Charles Anderson was appointed Director in February, 1921, just six years before the centenary of the Museum.



Some of the many beautiful shells in the Waterhouse collection, presented to the Museum. Top (from left): Root Murex (*Murex radix*) and Thorny Oyster (*Spondylus princeps*), both from Panama. Bottom: Crested Stromb (*Strombus sinuatus*), Spiny Woodcock or Venus' Comb (*Acupurpura triremis*) and Map Cowry (*Cypraea mappa*), all from the western Pacific islands.

Stories Behind The Museum's Collections

By R. O. CHALMERS

IT is apparent from reading the minutes of committee meetings in 1836, only nine years after the inception of the Australian Museum, that the trustees of the infant establishment were taking their duties seriously and attending to them conscientiously. Among their number were such celebrities of the time as Charles Sturt, Alexander and George MacLeay, Captain Phillip King and Edward Deas Thompson. One reads that it was resolved that communications be sent to the Governors of Van Diemen's Land, Western Australia, King George's Sound and Southern Australia, and to the Commandants of Norfolk Island, Moreton Bay and Port Macquarie, to furnish the Museum with specimens of natural history. It was resolved also that application be made for convict servants to be employed "in stuffing and preserving objects of Natural History for the Museum".

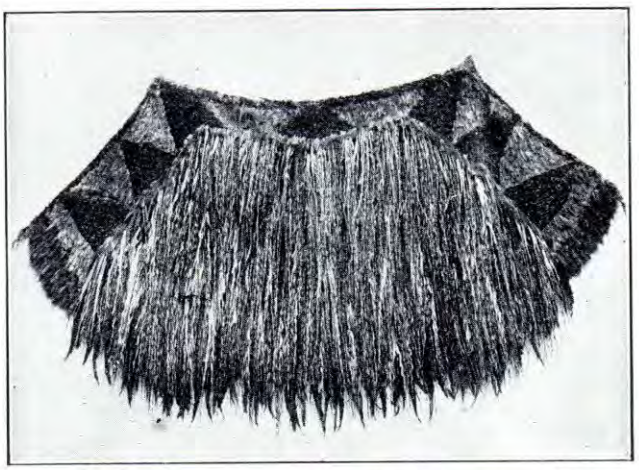
Donations By Famous Explorers

Famous explorers are listed as having given specimens. In the Museum's first publication, *Catalogue of Specimens of Natural History and Miscellaneous Curiosities*, of 1837, we see that Mitchell presented extensive collections of mammals, birds and ethnological specimens obtained on his

expeditions of 1835 and 1836 into the interior. In the Museum archives we find copies of letters written to Mitchell in 1852 thanking him for having presented rocks collected during his surveys of the goldfields beyond Bathurst, and tropical plants collected in 1846. It is interesting to note that in these early days both the Australian Museum and the Botanic Gardens were under the same committee of trustees. In 1847 the secretary reported to the trustees that a number of very interesting objects of natural history, including seeds, had been presented to the Museum by Dr. Liechhardt (sic). In 1848 the explorer Kennedy presented a valuable collection of birds, quadrupeds, insects and reptiles obtained during his expedition. The names of figures of historical significance crop up time without number. The Rev. W. B. Clarke, "Father of Australian Geology", presented rocks and fossils in 1843. Captain Phillip King presented an albatross egg collected on the Antarctic exploration of James Clark Ross in H.M.S. *Erebus*.

Cook and Banks, during their voyages, acquired many Polynesian ethnological specimens, outstanding among which are a chief's feather cloak and a serpentine-type greenstone ornament, presented personally to Cook by a Maori chief. In 1890 the New South Wales Government purchased all these Cook and Banks specimens and presented them to the Museum.

Reverting to the 1850's, in 1851 the secretary was instructed to write to the Colonial Secretary "requesting that his Excellency the Governor would be pleased to instruct Mr. Stutchbury the Colonial Geologist to place himself in communication with the Committee and from time to time transmit specimens properly labelled". Samuel Stutchbury (1797-1858), an Englishman, had been appointed not long before this as the first official geologist in New South Wales. He travelled extensively and did much valuable pioneering geological work. There are records of several consignments of geological specimens having been received from Stutchbury. In acknowledging the receipt of such a consignment,



Two of the specimens collected by Capt. James Cook and Joseph Banks and now in the Museum. Left: A greenstone ornament, 13½ in. long, one of the finest of its type known. It was given to Cook by a Maori chief. The tassel is of reddish-brown flax fibres. Above: A feather cape given to Cook by an Hawaiian chief. The border of red and yellow triangles is made of Honeyeaters' feathers. The long feathers on the back are those of the Tropic or Boatswain Bird, and, probably, the Frigate Bird.

Mr. Wall, the Curator, not being sure of Mr. Stutchbury's exact address, "entrusted his letter to a respectable party proceeding to Bathurst," but, as he mentioned in a letter to the Colonial Secretary, "I now learn with regret that it never reached its destination". At this time Stutchbury probably had no fixed residence since he was engaged in surveying the many gold-fields found since Hargraves' initial discovery at Lewis Ponds in 1851. Stutchbury, however, thought that the Museum was not sufficiently interested to acknowledge receipt, and a certain acrimony developed. All was eventually settled by another letter being sent to Stutchbury which he apparently received. The Colonial Secretary evidently had been drawn into this minor dispute because a letter from the Museum to him ended on this dignified note: "I am further directed to state that no communication or donation to the Trustees of the Museum fails to receive due acknowledgment." Incidentally, the outgoing correspondence of the Museum at this period averaged only from three to five letters a month.

Odd Donations

At this period, too, the public was starting to appreciate the existence of the Museum. From the lists of donations published monthly in *The Sydney Morning Herald* we glean much interesting information. Apparently in those days the Museum gladly accepted anything and everything in addition to the many valuable natural history specimens presented. Among the donations in the mid-1850's we read of a Turkish lanthorn, a Zulu beer-strainer and a portion of a stone desk on which Martin Luther translated the Bible. The Museum was not unknown to foreign scientists, because Descloizeaux, a famous French mineralogist, presented a collection of European minerals. Some of the entries convey the prim mid-Victorian disapproval of native goings-on—for example, "An ancient cava bowl used by the priests in the heathen temples, Vita Levu, Feejees", and "2 heads of idols from Pacific Islands". Boys in Sydney in those days apparently practised the same diversions as they do to-day. From Ryde came a nest of a White-shafted Fantail containing a young cuckoo, presented by Master C. Blaxland. Master J. Buchanan gave us an "iguana" from Lane Cove. Master Wall, perhaps the Curator's son, gave us a blind-worm from the Old Botany Road, and from Master J. Smart came "two fishes caught in Mossman's Bay." One tough young fellow, Master B. Olliffe, gave us a Death Adder. Probably his mother wouldn't let him keep it at home. Objects showing chance resemblances to familiar things attracted the attention of people then as now. We received a "remarkable radish root grown in the form of a human hand" and "a remarkable group of potato tubers grown in the Hawkesbury district." And so it went on: Ned the boatman, whoever he might have been, presented some oysters, Mrs. Johnson gave the "skeleton of a Bengal Tiger in the flesh" (whatever that might mean) and we bought a "sea-serpent" from a sailor for 9/-. Strange freaks of nature found their way into the collections, such as the head of a monster lamb and a live hermaphrodite goat. The register records that the latter was stolen in a very short time (one wonders if it was eaten), so its sexual peculiarities were never studied. Then, as now, care was taken in the registers to record all pertinent information—for example, a bird specimen is recorded as having been found on a lamp-post in Redfern.

Philanthropic Gifts

Turning from the unusual and the quaint, the Museum has been much indebted to the generosity of private donors ever since its beginning. In addition to those already mentioned, such as early explorers, there are many examples in later times. W. H. Hargraves, a son of Hargraves, the discoverer of payable gold in N.S.W. in 1851, was an enthusiastic shell collector. In his day Sydney was frequently visited by island trading vessels, and Hargraves had an arrangement with someone at the Observatory to let him know promptly when such a ship was due. He would row out to it and get first selection of any choice shell specimens they might have. He offered his collection for sale at a greatly reduced price of £800, provided the purchaser presented it to the Museum. Such a public-spirited donor was found in the person of Thomas Walker, of Yaralla, in 1877.

Paraknightia magnifica Evans, from rocks of the upper coal measures (Permian geological age), at Belmont, New South Wales, is one of the many perfectly preserved specimens in the Knight collection of fossil insects, which was presented to the Museum.

Many other philanthropic acts have enriched our collections. In the early days of Broken Hill, James Aldridge, proprietor of the Duke of Cornwall Hotel there, built up a fine collection by the simple expedient of trading drinks for minerals brought in by thirsty miners coming off shift. This collection was purchased by Sir Hugh Dixson, well-known Sydney benefactor in the first decade of this century. Portion of this collection came to the Museum. On numerous occasions he made financial contributions when valuable collections had to be purchased or when expensive habitat groups had to be constructed. The Museum has had other benefactors who have provided funds for Museum expeditions and exhibitions if not actually for the acquiring of specific collections. Members of the Hordern family, Sir Hugh Denison, Orwell and A. E. Phillips, Ernest Wunderlich, Farmer and Co. Ltd., Sir Kelso King, Sir James Burns, T. E. Rofe, Dr. J. R. M. Robertson and George Smith have all donated in this way.

Sir Hugh Dixson's son, Sir William Dixson, was one of the Museum's most notable benefactors. He is known as a public figure principally for having bequeathed his outstanding collection of Australiana to the nation and to house which the N.S.W. State Government built the Dixson wing adjoining the Mitchell wing of the Public Library. Over a period of 30 years before his death in 1952 at an advanced age, he presented some 1,500 Australian and Pacific Island curios to the Museum. Outstanding among these is a magnificent collection of adzes, mere, hei-tiki and other objects made of New Zealand greenstone.

Shell Collections Presented

As in the case of the Dixsons, various members of other families have presented collections. Mrs. M. J. Waterhouse was a noted shell collector. She presented her collection to the Museum, and an outstanding group in it contains 100 cowries collected alive in Sydney Harbour in 1895. These comprised 17 species, nine of which had never been found before in the Harbour. One of her sons who helped in the shell collecting was Dr. G. A. Waterhouse, who subsequently became President of the Board of Trustees. He was a noted lepidopterist, and to-day his fine collection of butterflies enhances our extensive insect collections. Choice ethnological specimens from the Pacific collected by his father, G. J. Waterhouse, who made many trips on island trading vessels, were also presented by the family.

Other examples of notable collections having been presented by individuals who went to great personal trouble, and spent much of their time, come to mind. Surgeon Lieutenant Commander W. E. J. Paradice presented large collections of fishes and marine invertebrate organisms while attached to the Naval survey ship H.M.A.S. *Geranium* in Northern Australian waters in

the mid-1920's. He also collected widely in Port Jackson and other estuaries of the Sydney district. Unfortunately, he was drowned in the *Greycliffe* disaster in Sydney Harbour at the early age of 30.

In the field of palaeontology the individual efforts of four notable collectors—John Mitchell, T. H. Pincombe, Malcolm S. Stanley and O. le M. Knight—at different times over a period of 50 years in the Warner's Bay-Belmont districts of Lake Macquarie, N.S.W., has resulted in the Museum possessing a large and most notable collection of fossil insects of Permian age.

A. D. Combe, a native of Sydney, was a geologist on the Geological Survey of Uganda from about 1920 until his death in 1949. In his younger days in Australia he was such an enthusiastic mineral collector that he worked as a miner at Broken Hill, Mount Lyell, Yerranderie in the Burragorang Valley and Mount Painter in the far north-eastern portion of the Flinders Ranges, and collected very discriminatingly. He kept adding to his collection when he went to Africa and also when he visited other countries on furlough. Thus, he acquired a superb collection of some 900 specimens, particularly rich in African minerals and Australian minerals that are either no longer obtainable or occurred at mining centres which have long since ceased to work. The Museum had stored his collection on loan for him for some time for safe-keeping, and only a year before his death he came to Sydney and said simply, "How's that collection of mine going? I think you'd better keep it."

One could keep writing about the many other generous donations, such as the magnificent minerals that formed the official collection of the Broken Hill Proprietary Block 14 Ltd., the opals from Percy Marks, the fine mineral collection from the family of W. H. Yates, archaeological specimens, particularly Egyptian, from Ernest Wunderlich, former President of the Board of Trustees, the C. C. Towle Aboriginal artefacts, the stamp collection from Miss A. A. Vickery, and meteorites, those objects of rarity and great scientific interest, from various individual donors who have usually found them or seen them falling on their properties in the country.

It should not be thought that such donations have ceased to come to the Museum. While this article was being written a retired shearer, Mr. Percy Gresser, presented his collection of 6,000 Aboriginal artefacts collected while working in various parts of eastern Australia over the past 45 years.

This article deals only with outstanding donations and acquisition of collections by philanthropic acts. The story of the many collections obtained by purchase and exchange and by the unceasing and painstaking collection by Museum scientific and preparatorial staff must await another occasion.

BOOK REVIEW

Marine Molluscs of Victoria, by J. Hope Macpherson and C. J. Gabriel. Melbourne University Press in association with the National Museum of Victoria, 1962. Pp. I-XV, 1-475, 486 text figures. Price, £3 3s.

This book is without doubt one of the most important steps in the study of Australian Mollusca which has occurred this century. In any science, it is necessary that, from time to time, handbooks summarizing present knowledge should be published in order to keep those not directly involved in the particular field of research up-to-date with developments. Unfortunately, the science of malacology has not been over-supplied with good, well illustrated books to keep pace with systematic research, and thus it is a matter of considerable satisfaction that the present volume is a first-class example of its kind.

The authors have described in detail the commoner shells of the Victorian coastline, giving typical localities at which they may be found, habitat notes, average sizes and excellent line drawings by G. J. Browning which ensure recognition. In addition, the species known from Victoria which are not illustrated are at least listed, with their localities and diagnostic characters briefly indicated as a rule. Original references are not given, but all authors' names and dates of introduction are cited, while the reference list will lead the scientific worker back to original sources for the most part.

There is little to criticize, apart from a few mis-spellings and, perhaps, the inadequacy of the reference list, which should have included at least those papers cited in the text. However, this is of little importance and the book's main purpose i.e., to provide a well illustrated and simply described account of the Victorian sea-shells, is achieved admirably. It should be a boon to all collectors and scientists interested in the Australian Mollusca.—D. F. McM.

Behind the Scenes

In the Museum's Exhibition Department, where exhibits are prepared for display to the public. Above: The preparators' studio, where taxidermy, articulation, painting, modelling and mock-up work are carried out. Below: In the artists' studio exhibits are designed and drawn and their layouts prepared, labels are draughted and murals are painted.

An expedition, in which an Australian Museum scientist took part, on Lake Murray in the Fly River area of Papua. [Photo: Frank Hurley.]

FIELD EXPEDITIONS

By H. O. FLETCHER

THE national collections of the Australian Museum include vast series of natural history, geological and anthropological specimens. These at present total almost two million in number. They have been assembled during the past and present century, and are being continually added to as gifts, purchases and exchanges from other museums. In addition, many specimens are obtained as the result of field collecting expeditions. Field expeditions are an important and essential part of a museum's activities. These are planned as visits to areas of particular interest, where the specimens collected will not only add to the study value of the national collections of the Museum but will, at the same time, enable members of the scientific staff to study particular animal groups in their natural environment.

Every part of the world is a potential treasure house for Museum collectors and there are few places into which they have not penetrated and returned with large and important collections, including many forms new to science.

Museum collecting is to-day made comparatively easy as a result of the use of aeroplanes, helicopters, four-wheel-drive vehicles and radio communication. In the past, however, the history of field expeditions and of individual collectors has been one of adventure, courage, hard toil and hazard even to life to bring back specimens which have made it possible to reach our present knowledge of the plants and animals of the world. Even on the early voyages of discovery, scientists usually accompanied the expeditions and endured all the accompanying hardships. This enabled large collections to be made. When Sir Joseph Banks accompanied Captain Cook on his first voyage around the world, he returned with

An Australian Museum expedition in the Northern Territory met with this sign-post (and bottle!) on the road between Tanami and Gordon Downs.

more than 20,000 species of plants. These are still preserved in the collection of the British Museum of Natural History.

The amazing size of some of the collections of natural-history specimens made almost a century ago and acquired by the British Museum is of considerable interest. One intrepid collector, travelling on foot and by canoe through what was at that time "unknown" Africa, brought back thousands of specimens of mammals and birds, including 60 new species. It was during this one-man field expedition that the gorilla was discovered in West African forests, but the collector's vivid reports on this creature were for a long time disbelieved. Allan Hume, a devoted collector and observer of birds, gathered together in India, about the time of the Indian Mutiny, a collection of 80,000 birds and eggs and 400 mammals which he later presented to the British Museum. Other notable collections include the Pascoe Collection of 49,000 beetles; the James Stephens Collection of 90,000 British insects; 275,000 centipedes and millipedes from Guatemala; 50,000 birds from the Arctic and the tropics, and 50,000 foraminifera (single-celled protozoans visible only under the microscope). More than a century ago a famous collector named Hugh Cuming spent almost the whole of his life in collecting shells along coasts of the Pacific and the Philippine Islands. His collection is still considered to be the largest and most important ever gathered. It was later purchased by the British Museum for £6,000, and still forms the main basis of its huge collection of shells.

The planning of field expeditions by the Australian Museum is determined largely by the finance made available for this purpose. With only limited funds it is impossible to organize large expeditions to cover wide areas of country and to remain in the field for any considerable length of time. On occasions, however, public-spirited men have provided finance for fairly large-scale expeditions. One of these was the Australian Museum Expedition to north-west Australia in 1952. This expedition was organized for general collecting and also to visit and collect fossils of Permian geological age from a little-known geological horizon near the Port Keats Mission about 135 miles south of Darwin. A party of five, travelling in two vehicles, traversed central Australia, the Northern Territory, north-west Australia and Queensland, covering more than 12,000 miles during the journey. Many natural-history specimens, including species of rare mammals, were collected, together with a large series of marine fossils

Above: Australian Museum scientists, watched by bystanders, collecting specimens of marine life between tidemarks at Shellharbour, New South Wales. Right: An Australian Museum expedition's camp in a Queensland coastal forest.

from Port Keats. This area is accessible only by sailing lugger or aeroplane, and it was necessary for the expedition to charter a plane so that members could be flown in and later picked up with their collections. Numerous colour photographs were taken and a considerable footage of film exposed on various aspects of the expedition's work; later a 30-minute film, in sound and colour, was produced and added to the Museum's film library.

Expedition to Swain Reefs

An Australian Museum expedition visited Swain Reefs, situated approximately 150 miles north-east of Gladstone, on the Queensland coast, last October. This was financed by a leading Sydney business firm, David Jones Ltd. These reefs, which have never previously been visited by scientists, are situated on the outer Great Barrier Reef. They are therefore free from continental sedimentation and, consequently, subject to true oceanic conditions. Collections of marine life were made and individual specimens were photographed in colour, as far as possible in their natural environment, and deep-sea photography and skin-diving were undertaken with air-tanks. It is planned to reconstruct a portion of a coral-reef in a Museum gallery, using information and specimens obtained by the expedition.

Apart from such large field expeditions, much field work is done by parties of two or three, and even by individual scientists, who may travel to selected areas to prosecute a research project. For example, in order to complete a study of bird speciation, a Museum biologist visited many parts of Australia to investigate the natural barriers which tend to isolate bird population and enable speciation to take place. In the furtherance of this project visits were made to central Queensland, Bass Strait Islands, the Kimberleys, coastal Northern Territory, north Queensland, Victoria, central Australia, south-eastern South Australia, western New South Wales, including the mallee regions, south-western Australia and the Barlee Range in mid-western Australia. During these expeditions specimens were collected and at the same time distributional limits of bird species, their degree of attachment to particular habitats, and aspects of their seasonal movements were studied.

Sucking Bugs

On another occasion a Museum scientist made visits to New Caledonia and Lord Howe Island to determine the possible distribution of an interesting group of primitive sucking bugs known as the Peloridiidae. These insects, which live in saturated moss, have been recorded from Chile, New Zealand, Tasmania and certain other localities on the Australian mainland, such as the Macpherson Ranges, where remnants of the cold, wet southern fauna and flora persist. These sucking bugs cannot fly, as they lack hind-wings, and they provide a link in the chain of evidence which suggests that at one time the southern continents, including Antarctica, were joined to each other. A search for the insects in New Caledonia proved unsuccessful, but on Lord Howe Island, where more than 30 years ago a single immature specimen had been found, they were located on the top of Mount Gower, 1,800 ft. above sea-level. The specimens collected, comprising two species new to science, furnished important conclusions bearing on the probable former association of Lord Howe Island with other land areas.

Many localities in central Australia and the Northern Territory have been visited in past years by a number of Museum field expeditions. As a result the collections have been enriched by large series of specimens, which represent interesting and characteristic types found only in the interior of Australia. At the same time the general ecology of this vast area was studied, particularly in regard to the reptilian fauna, and many basic factors governing the distribution and radiation of desert species of reptiles have been recorded. Some of the more important and better known localities where collections have been made include the Musgrave Ranges, Mt. Connor, Mt. Olga, Ayer's Rock, the McDonnell Ranges, Coniston Station, The Granites and Tanami goldfields, and the Barclay Tableland. On these expeditions it has been found that the Aborigines can materially assist in the collection of small reptiles and mammals, but at times the results may be disappointing. One reputed hunter, on his return from a day's search and after covering many miles of country, very proudly handed over as his contribution a small bird's nest containing two eggs.

The Cape York Peninsula has also been visited by a Museum expedition, which travelled as far north as Coen district. The material collected on that occasion included 2,000 insects, of which several were new to science. In addition, many new records for the area were obtained. The mammals obtained comprised some 20 species, including specimens of marsupial mice not previously represented in the Museum collection and, as well, an interesting series of forest-living rodents.

Collections Of Marine Life

During field expeditions to various parts of the eastern coast of Australia, large collections of marine life have been obtained. On these occasions Museum scientists have carried out ecological studies to determine the factors governing the zonation of intertidal organisms.

Sometimes Museum scientists have been invited to accompany survey ships of the Royal Australian Navy on cruises to the Great Barrier Reef and outlying reefs and

cays, and collectors have also made regular trips on trawlers to various fishing grounds off the New South Wales and Victorian coasts. The specimens obtained have increased our knowledge of the deeper-water marine fauna.

Field expeditions have also been carried out in New Guinea. One staff member spent a total of six months in the field during two visits to the island to complete a study of freshwater mollusca of Australia and New Guinea. He visited 31 localities in various parts of both Australian and Dutch New Guinea and returned with a comprehensive collection of specimens. These had been obtained only after much arduous and, at times, hazardous work. Travel was by plane, "jeep" and canoe, and on foot into the surrounding mountains, rain-forests and jungles.

Antarctic Expedition

Sometimes members of the scientific staff are invited to accompany and take an active part in private and officially organized collecting expeditions. One, for example, was selected to accompany the British, Australian and New Zealand Antarctic Research Expedition, which, during the years 1929 to 1931, visited the Antarctic Continent and many sub-antarctic islands under the leadership of the late Sir Douglas Mawson. Although the work of this expedition was primarily one of exploration, its programme of scientific work was a large and ambitious one. Oceanographical work was carried out regularly while at sea and during the working of stations many fascinating forms of marine life were obtained from the ocean depths and from varying levels to the surface. Dredgings of the sea-floor, carried out in shallower waters but occasionally at considerable depths, produced tons of material which was sorted, tentatively classified, preserved and packed. Following the dredgings and the working of oceanographical stations the scientists of the expedition worked as many as 16 hours a day to complete the sorting of the specimens and be ready for the next catch. Landings were made on Kerguelen, Heard, Macquarie and Crozet Islands to collect representatives of the interesting island faunas and, on one occasion, scientists were marooned on Heard Island for eight days because of gale-strength winds which forced the ship from her anchorage and into the safety of the open sea.

The specimens obtained on expeditions such as this are usually kept intact as a single official collection. Later the material is critically examined and sorted into animal groups, and these are sent to specialists for study. The results of their research are published in special scientific reports of the expeditions concerned and in many cases these fill numerous volumes.

Simpson Desert Expedition

One Museum scientist was chosen as second-in-command of the Simpson Desert Expedition, which, in 1939, under the leadership of the late Dr. C. T. Madigan, spent three months in the field and was the first party to successfully cross the Simpson Desert. Camels were used for riding and the transport of equipment during the 427 miles crossing of the desert to Birdsville and the 400 miles return journey through the Lake Eyre country to Marree in South Australia. The Simpson Desert largely occupies the south-eastern corner of the Northern Territory, but also extends eastward into the south-western corner of Queensland and south into South Australia as far as northern Lake Eyre. The desert is famed for its fixed and high sand-dunes (many more than 100 ft. in height) extending in a more or less north and south direction for about 200 miles. In the course of the expedition 754 sandridges, spaced about four to the mile, were crossed.

During the expedition it was found that the desert fauna was restricted in number and variety. Nevertheless, the specimens collected later proved to be of considerable interest. Difficulty was experienced in collecting the smaller types of mammals which at night emerge from their underground nests and frequent the crests of the sand-dunes. Numerous traps were set, but when caught the mammals were quickly removed by dingoes which through the day constantly followed the camel train in packs and at night surrounded the camp.

A descriptive display in the new mammal gallery which shows the main groups of Australian mammals and the history of their arrival in this country. On the right, a further display illustrates the biology of the monotremes and compares the life-histories of marsupials and placental mammals.

BEAUTY AND THE BEASTS

Reorganization of the Museum's Mammal Galleries

By B. J. MARLOW

THE mental image that was normally evoked in the past by the word "museum", was, for the general public, a rather dark musty place in which it was possible to kill an hour or so on a wet Sunday afternoon.

As may be seen from modern advertising, the art of selling has become "big business" in which attractive and up-to-date materials and methods are employed. Museums throughout the world are beginning to appreciate the need for this modern approach which will attract customers, for museums, too, have a commodity to sell, or rather to give, to the public. This commodity is Education.

At last the antiquated type of museum, with its dull exhibits and unimaginative display techniques, is being replaced by the modern museum with its bright and attractive exhibition halls.

Such a transformation is occuring at the Australian Museum, where the mammal gallery has recently undergone extensive renovation.

Functions Of A Museum Of Natural History

The work that is carried out in a museum of natural history involves education in its broadest sense, and may be considered

under three main headings—Display, Collections and Research. The functions and methods of modern display are the main subject of this article, and will be dealt with in greater detail later. There are in museums, in addition to the specimens on view to the general public, large reference collections which are available to students for study. At the same time, research into various problems is carried out both by the staff and by visiting scientists.

The Aims Of Museum Display

Any attempts that are made to learn a new subject will be rendered either impossible or extremely irksome unless an initial stimulation of interest has been achieved. It is in this field that the main educational qualities of the public galleries of a museum lie, for it is there that the first interest in natural history may be awakened. Once this stage has been passed, the galleries fulfil their second function, that of imparting information on the subject to the visitor. Once again, the initial interest must be maintained at this stage, so that facts must again be presented in a stimulating manner. The visual impact of a specimen in a museum will frequently supplement information obtained from other sources, such as textbooks, while the nature of the collections permits the exhibition of specimens which are not readily available in other educational institutions.

Specimens in a museum gallery may thus involve the whole spectrum of education from the stimulation of initial interest to advanced studies at university. Under these circumstances, it is imperative that the displays be arranged so that they will appeal to visitors in all categories; they must not be too technical for the untrained visitor, nor so elementary that they lack appeal for students at university level. The subject matter of labels must also be adjusted to conform to the degree of knowledge and age-level of the visitor, and care must be taken that abstention from technical terms does not introduce ambiguity or error.

Types Of Museum Display

Museum displays may be classified into the following categories: Dioramas, systematic exhibits and descriptive exhibits.

Dioramas portray a mounted animal or series of animals exhibited in a natural setting. Such exhibits are aesthetically pleasing, but impart relatively little information about the animal apart from indicating its habitat. All additional information has to be incorporated in a label. Dioramas are costly both in materials and time taken for installation, so that they possess an element of permanence which is not always desirable.

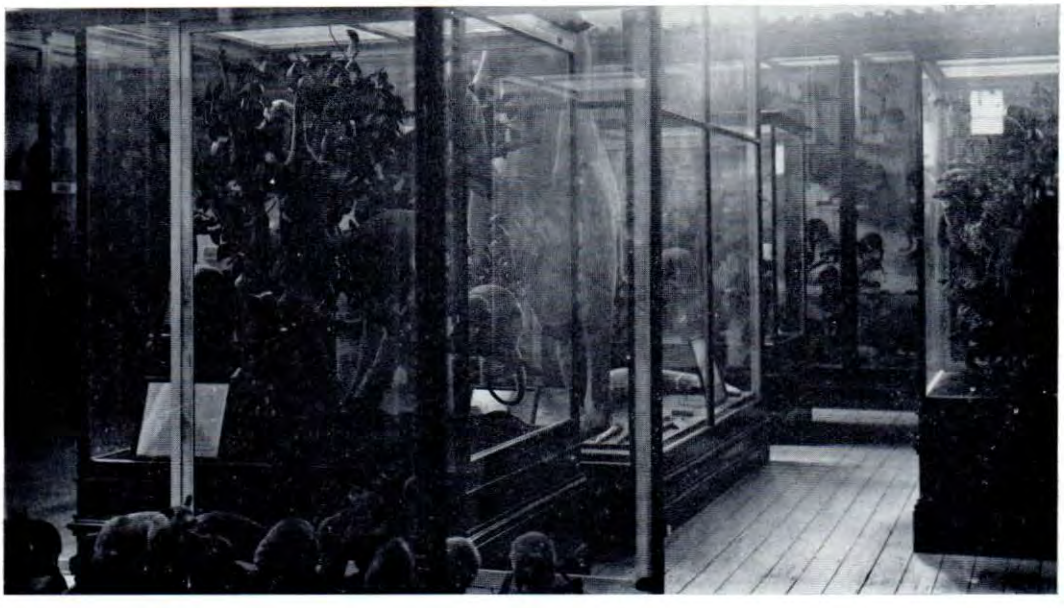
Systematic exhibits show a series of related animals to indicate the variations in structure which may exist between them. In former times, the specimens were crowded closely together in unlit cases, while the explanatory labels were long, technical and in small print. Attempts were often made to exhibit every species within the group on display. The modern trend is a drastic reduction in the number of specimens shown, combined with the use of large clear labels and bright colours and lighting. Additional information on the specimens may often be given by the use of distribution maps and habitat photographs. A comparison of the old and new types of display in the mammal gallery of the Australian Museum is shown in the photographs on the next page.

In recent times there has been an increasing use of descriptive exhibits in the galleries of natural history museums. In these exhibits many fascinating aspects of biology are portrayed with the use of models, photographs and specimens, so that a better understanding of general biological principles may be obtained. Such displays can range from a discussion of the major diagnostic features of mammals to a comparison of the life histories of marsupials and placental mammals. Like the systematic exhibit, descriptive displays teach a great deal more about the biology of animals and do not have the element of cost and permanance that is so characteristic of dioramas.

Methods Of Modern Display

A great many people on the Museum staff are involved in the production of attractive modern displays, and it is only through continuous co-operation and liaison between them that good display can be

Right: In this modern systematic display in the new mammal gallery the specimens are widely spaced and the explanatory labels are large and clear. An additional technique is the use of a map in the background showing where the animals occur. Below: The old-fashioned type of display, in which specimens were crowded together in unlit cases. In this past scene in the mammal gallery the cases were too close together and the descriptive labels were small and difficult to read.



achieved. Included among them are artificers, who are concerned with the carpentry and painting of backgrounds in show-cases, preparators, who mount specimens, artists and modellers, photographers, ticket-writers who prepare labels, and many others. Once a particular display has been selected, the curator of the group concerned explains to the designer the type of information that he wishes to portray, and a discussion ensues regarding the most effective way of presenting it. Plans are then drawn up and submitted to the Director for approval. Once this has been obtained, installation of the new exhibit begins. The designer supervises the work of the many technicians involved and controls the development of the whole project. The labels are composed by the curator and are submitted to the Education Officer for comment. Throughout the construction of the exhibit, close liaison is effected between the designer and curator; this is essential for successful display.

Special Problems In Mammal Display

When compared with display of other groups of animals, certain problems which are peculiar to mammal display require special consideration. The large size of many mammals makes their preparation as mounted specimens a matter of some difficulty and cost. In addition, these large mammals require a great deal of room in the gallery and in storage space once they have been withdrawn from exhibition. As far as Australia is concerned, an additional problem of availability of specimens also presents itself. Here, many species of native mammals are now extremely rare and specimens for the galleries are often difficult to obtain. Similarly, Australia's unique mammal fauna lacks many orders of placental mammals which are quite common overseas, and these can only be obtained by exchange with other institutions abroad. Such specimens are needed urgently to complete the

This modern descriptive display in the new mammal gallery explains the convergence of marsupials and placental mammals by means of mounted specimens in stylized habitats.

over-all picture of the scope and range of the whole class of mammals.

The problems of large size and lack of specimens described above are not easy to overcome, but they can at times be solved by the use of models or figures. While it is appreciated that members of the public may wish to see a mounted specimen of the real animal, this is not always possible, and occasionally models are used instead. It frequently happens that a well constructed model of an animal has a more pleasing appearance than a decrepit mounted specimen that cannot be replaced. Wherever possible, mounted specimens are used in the galleries.

The New Australian Mammal Gallery

The new Australian mammal gallery at the Museum combines all the major types of display which have been considered above. The introductory exhibits are in the form of a series of descriptive displays in which several topics of mammalian biology are discussed. The first panel shows the major features of mammals and compares them with reptiles, the class of vertebrates from which mammals evolved. The visitor is then shown examples of the orders of living mammals, and this classification is combined with an evolutionary history of the class. A series of models then depicts the orders of mammals which are found in Australia, while the history of their arrival and isolation here is discussed with the use of large model globes. There are two theories concerning the arrival of marsupials in Australia, and both of these are presented. The monotremes or primitive egg-laying mammals, such as the Platypus and Spiny Anteaters, are displayed in an exhibit which combines features of both a systematic and descriptive type, since an account is given of the major characteristics of the order, while, at the same time, information is given about the appearance and biology of these species.

Much space in the gallery is devoted to the marsupials, which are the major element in the Australian mammal fauna, and, in addition to a systematic display of the order, there are also descriptive exhibits which compare the life histories of marsupials and placental mammals and which show the remarkable convergence that has occured between these two groups. A diorama which depicts Common Wombats in their natural habitat has been retained from the old display.

The remainder of the new mammal gallery is concerned with display of the placental mammals of Australia. In one of these exhibits, a systematic account is given of the rodents and bats of Australia, while the marine mammals, such as seals, whales and dugongs, are illustrated with models. Finally, a descriptive exhibit on whales and whaling has been installed, which contains excellent scale models of whales and also a large model of a pelagic factory ship engaged in commercial whaling.

Plans For The Future

Although much work has already been done in the reorganization of the Australian mammal gallery in the old wing of the Museum, it is hoped that it will be possible to install further exhibits in one of the galleries in the new wing. It is envisaged that these new exhibits will include descriptive displays, one of which will deal with adaptations in mammals and other organisms to life in a variety of habitats. The techniques which will be involved here will be a combination of stylized diorama and normal descriptive display.

The problem of a systematic account of the mammals in other parts of the world will be solved by the introduction of an exhibit which will illustrate the geographical distribution of mammals on a comparative basis. It will thus be possible to compare the mammals of Africa with those of the Orient, and also those of North America with those of northern Eurasia, since their faunas have much in common. Other countries, such as South America and Madagascar, which do not make for easy zoogeographic comparison, will be dealt with separately. In this way, it will be possible to show visitors the variety of mammals which exists overseas, and, at the same time, to introduce them to the fascinating subject of zoogeography, which is of great evolutionary significance. Displays dealing with the vital subjects of ecology and conservation will also be prepared.

In this present technological age, it is essential that everyone who would consider that he has had a reasonable education should have a working knowledge of the various disciplines of science. This applies particularly to biology, since we ourselves are living organisms. Perhaps the two most important aspects of biology that can be learnt in a museum of natural history are the inter-relationship of all living organisms through the process of evolution, and the complex inter-dependance that organisms have, one for another, through the principles of ecology. Unless humans learn to appreciate these principles and begin to conserve the dwindling natural resources of this planet and to use them wisely, the future existence of humanity, whose numbers are increasing at an alarming rate, will be precarious indeed. The greatest threat to the continued survival of man on this planet is, paradoxically, the numbers of man himself.

If, through the galleries of this Museum, this most important lesson can be learnt before it is too late, the work that was involved will not have been in vain.

OBITUARY—WILLIAM BARNES

A 90-year period of service to the Australian Museum by members of one family was ended by the death of William Barnes in California, U.S.A., at the age of 76, on September 30, 1962.

William Barnes was appointed to the Museum's staff on February 11, 1907, and became an attendant; he was transferred to the taxidermy department in 1922.

A man of warm personality, "Billy" Barnes had a great interest in the social side of staff affairs. He loved his work, in the old craftsman style, whether it was mounting specimens, making cases for them or combating such museum enemies as mould, dust and decay, and he had a flair for putting them away in orderly fashion, whether skins, birds' eggs or bottles of fishes. A portrait of him, holding an eel, appeared in the *Australian Museum Magazine*, June 1, 1946, page 63.

William Barnes' enthusiasm was communicated to collectors who visited the Museum; for example, his friendship with Captain Ned Blood resulted in our receiving some fine collections from almost unexplored regions of New Guinea.

A Bird of Paradise (*Astrarchia barnesi*) and a deep-sea Lantern Fish (*Gonichthys barnesi*) were named in honour of William Barnes.

There was a tradition that "there will always be a Barnes at the Australian Museum". It began in 1860, when Henry Barnes was appointed to the Museum staff; he was articulator, modeller and photographer until 1897. His brother, Robert, was appointed in 1866; he was artificer, carpenter and smith, and he died in 1906. Henry Barnes, Jnr., who joined the staff in 1878, took over his late father's duties in 1897; he died in 1913. A cousin of Henry Barnes, Jnr., Mr. Arthur Barnes, a labourer in 1897, became First Attendant, and retired in October, 1926. A portrait of him, seated beside a *Diprotodon* skeleton, appeared in the *Australian Museum Magazine*, October-December, 1924, page 114. A second cousin of Arthur Barnes, Miss Grace Barnes, was Woman Attendant in the 1920's and 1930's and sister of the subject of this notice, William R. Barnes, who retired in January, 1950, and went to live in Santa Monica, California, not far from where his son and grandson live at Bel Air, Hollywood.

The Australian Museum owes much to the patient work over the years of William Barnes and his forerunners.—G.P.W.

Part of the Museum Library's reading room, showing a display rack for current issues of periodicals. The library is regarded as the best natural-history library in Australia. It contains 40,000 volumes and a great number of unbound periodicals. It is constantly used by the staff of the Museum and students, and books are sent on loan to research workers in other parts of Australia.

NOTES AND NEWS

FILMS AT THE MUSEUM

Natural history films, mostly in colour, will be screened for children, parents and teachers in the Hallstrom Theatre at the Museum at 2.30 p.m. on week-days from January 7 to January 25. Each programme will last about 30 minutes. Admission will be free. Subjects of the films will include: seashells, the Spiny Ant-eater, the Black Swan, the dances of the Brolga, insect-collecting, animals and plants in northern Canada, the life of the Aborigines in central Australia, Aboriginal cave paintings in western New South Wales, native village life in the Pacific Islands, the locomotion of snakes, camouflage in nature.

INSECT COLLECTIONS

During A.N.Z.A.A.S. Congress week, 1962, several visiting entomologists took the opportunity to come to the Australian Museum's Entomology Department to look at the collections, the new insect storage cabinets and the expanding collection of spirit-preserved material. Mr. L. Koch, Curator of Insects at the Western Australian Museum, was interested in the collection arrangements. Mr. R. Taylor, who is at present working at Harvard University, U.S.A., on the Australian ant fauna, referred to the Museum's ant collection in connection with his work, and Dr. B. Moore, of the C.S.I.R.O., Canberra, referred to our collection of Carabid beetles. Dr. Moore is undertaking revisionary work of the Australian members of this large beetle family, and was particularly interested in studying some of our older type specimens.

JAPANESE VISITOR

Professor Itiro Tomiyama, Director of the Misaki Marine Biological Station, Japan, visited the Australian Museum in August. He had previously spent some time in Sarawak classifying fishes and came to Sydney to examine certain Australian and Indian fishes for comparison.

SHARK ATTACKS

Dr. Perry Gilbert, Professor of Zoology, Cornell University, and Chairman of the United States Shark Research Panel, visited the Australian Museum in August and showed a coloured film and slides to illustrate his lecture on "Shark Attacks and Shark Repellents" in the Hallstrom Theatre. The lecture was given under the auspices of the Post-Graduate Medical Foundation University of Sydney.

School-children Sue and Mark Turner studying a live lizard in the Museum's Children's Room, which, during school vacations, provides special facilities for those interested in natural history.

EDUCATION SERVICES

By PATRICIA M. McDONALD

WHILE the education services organized at the Australian Museum are many and varied, they are all based on, and directed by, fundamental educational aims. The first of these is to create interest in the subject matter being studied, either to awaken a new interest in the mind of the visitor or to develop an already present inclination into fresh and fruitful channels. Leading from this creation of interest, it is hoped, will come not only an increase in factual knowledge useful to the student, but also a source of enjoyment for leisure-time activities both now and in later life. As this Museum is primarily concerned with Australian natural history, it is hoped that visitors will gain some understanding of our unique fauna and that this will stimulate a more intelligent appreciation of its scientific and intrinsic worth and the necessity for its conservation.

The Museum exhibits are threaded together by the underlying theme of the evolution of all living things, from the first beginnings of life to the complexities of the later forms. Through its education programme, the Museum hopes that this evolutionary concept of life will be understood and accepted by its visitors, thus giving them a better understanding of man's place in the natural world and his responsibilities towards all living things.

Groups from many different sections of the community are catered for by the Museum education services—not only schools, but adult groups, teachers' colleges and university students, Scouts and Guides, playcentres and many others. However, as one would expect, the greater number come from the primary and secondary schools.

Trained education staff are available to assist teachers and pupils and this assistance begins with advance planning of the visit. Teachers are advised that previous experience has shown it is best to have some specific purpose in visiting the Museum, such as some particular topic to be studied or a problem to be solved arising out of their class work. Such objectives serve to focus the attention of the pupils, thus making their visit more interesting and informative than merely touring the galleries in aimless fashion.

During such a planned visit, the pupils usually begin in the Hallstrom Theatre, where specimens relating to their chosen topic are available for study and handling. Discussion arising from these may be illustrated by films and then followed by a visit to the appropriate gallery. Here the pupils may pursue further the points raised in the discussion, find the answers to their original problem or be given more formal question sheets, which are designed to direct their attention to the more important and relevant exhibits. After correction, these sheets are retained by the pupils and provide both a permanent record of the visit and a basis for follow-up work

Some classes make regular monthly visits, each following their own individual programme, which is correlated by the teachers with their normal class work. Others make a series of two or three visits, or perhaps once in each of the three school terms. Where possible, the Museum education staff take classes in the field; these field excursions are usually associated with a preparatory visit to the Museum.

Visits by education staff to schools are also made, but unfortunately lack of time prevents many visits of this kind This is regrettable not only because the Museum cannot provide a service of this nature, but also because it is an opportunity lost to maintain closer contact with actual conditions within the classroom. The more the Museum knows of teachers' needs the better the chance of providing adequate services for them.

A special effort is made in the case of teachers' colleges, where lectures on the use of the educational services are given to graduating students. It is felt that these

Young and old alike enjoy the natural-history films for children shown at the Museum. Free screenings are held on week-days during school holidays.

Visits to the Museum to study venomous animals are a regular part of the training course for men of the New South Wales Ambulance Transport Service.

lectures not only acquaint future teachers with what is available for them at the Museum, but will also enable them to make more intelligent use of the services.

Loan Collections

Because of the large size of the State of New South Wales and the difficulties of transport within the city of Sydney itself, it is obvious that the majority of schools cannot visit the Museum to take part in these planned visits. For this reason, a loan collection of specimens and photographs has been assembled and these are available free to schools for periods up to three weeks. While the collection is very small at present, it is anticipated that additional finance and staff will be provided to enlarge this most important and necessary service.

In many overseas museums, loan collections have been a popular feature of their education services for many years. The latest trend is now to provide sets of material, so that a teacher may borrow a complete lesson unit comprising specimens, photographs, coloured slides, wall charts, information booklets, etc., and make these visual aids the basis of a lesson. It is intended that the loan collection here will be organized along these lines.

During the three long vacations of each school year, free film programmes for children are shown in the Hallstrom Theatre. While the content of the films is varied, the policy adopted when choosing films is to correlate, as far as possible, the subject matter of the films with the exhibits in the Museum galleries. In this way the audience, having seen the film, may follow this up with a study of the actual specimens.

Before inclusion in a programme, all films are previewed to ascertain their scientific accuracy and technical standard and, above all, their appeal to children. The success of this procedure is evidenced by the large number of both children and adults who attend and, further, by those who return year after year.

A more recent vacation service is the opening of the Children's Room. In this room some specimens are exhibited, particularly live exhibits such as lizards and frogs, and materials for activities such as drawing, painting and modelling are available for young visitors. One of the most popular exhibits was a pair of Aboriginal grinding stones; the youngsters could use these to grind seeds into flour, which they very proudly took home with them.

However, the main purpose of the room was envisaged as a meeting place for children already interested in natural history. Here, under the guidance of the Museum staff, and using the library and equipment provided, they would be encouraged to pursue their interest in whatever direction was most meaningful to them.

The Australian Museum

The Museum is open free, daily, at the following times : Tuesday to Saturday, and public holidays, 10 a.m. to 5 p.m.; Mondays, 12 noon to 5 p.m. (during school holidays 10 a.m. to 5 p.m.); Sundays, 2 to 5 p.m. It is closed on Good Friday and Christmas Day.

To students and pupils of schools and colleges special facilities for study will be afforded if the Director is previously advised of intended visits. A trained teacher is available for advice and assistance.

Gifts of even the commonest specimens of natural history (if in good condition), and specimens of minerals, fossils, and native handiwork, are always welcome.

The office is open from 9.30 a.m. to 1 p.m. and 2 to 4.30 p.m. (Monday to Friday), and visitors applying for information there will receive every attention from the Museum officials.

College St., Hyde Park, Sydney

Wholly set up and printed in Australia for the proprietors, The Trustees of the Australian Museum, by V. C. N. Blight, Government Printer, Sydney, N.S.W.