

1954

(SECOND SESSION)

PARLIAMENT OF NEW SOUTH WALES

REPORT OF THE TRUSTEES
OF THE
AUSTRALIAN MUSEUM
FOR THE
Year ended 30th June, 1954

BY COMMAND

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ANNUAL REPORT

OF THE TRUSTEES OF THE AUSTRALIAN MUSEUM

FOR THE YEAR ENDED 30TH JUNE, 1954

TO HIS EXCELLENCY THE GOVERNOR,

The Trustees of the Australian Museum have the honour to submit to Your Excellency their one-hundredth Annual Report for the year ending 30th June, 1954.

1. Trustees.

In December, 1953, Mr. H. B. Mathews was unanimously elected President for the year 1954.

During the year the Trustees lost the services of Mr. D. S. Mulley, an Official Trustee, on his retirement from the office of Surveyor-General. Mr. Mulley took an active interest in the affairs of the Museum while he was a Trustee and the Trustees placed on record their appreciation of his service.

Mr. G. W. Vincent became an Official Trustee on his appointment of Surveyor-General in succession to Mr. Mulley.

Leave of absence for periods during the year was granted to Professor A. N. Burditt and Mr. F. B. Spencer on account of their absence abroad.

The list of Trustees as at 30th June, 1954, is shown in Appendix A.

2. Staff.

The Director was awarded the medal of the Royal Society of New South Wales for 1953 in recognition of his contribution to the organization of Science in Australia and his researches in Palaeobotany. He also received an invitation to be President d'Honneur of a Palaeobotany Section at the Eighth International Botanical Congress to be held in Paris in July, 1954. He was elected Chairman of the Australian Unesco Committee for Museums, and represented that Committee as a member of the Australian National Advisory Committee for Unesco. Dr. Walkom reached the statutory retiring age in February, but his services were retained until the appointment of his successor.

The appointment of Dr. John William Evans, Deputy Chief Scientific Officer of the United Kingdom Civil Service, as Director of the Museum, was announced in May by the Acting Minister for Education. Dr. Evans is expected to take up duty about the beginning of November, 1954.

The Director was the delegate of the Museum at the meeting of A.N.Z.A.A.S. held at Canberra in January, 1954, and Messrs. E. Le G. Troughton, F. A. McNeill, G. P. Whitley, H. O. Fletcher, F. D. McCarthy and R. O. Chalmers also attended the meeting.

Mr. J. R. Kinghorn, Assistant to the Director and Curator of Birds and Reptiles, was elected President of the Royal Zoological Society of New South Wales for the fourth time. He also represented the Museum on the State Fauna Protection Panel. Mr. E. Le G. Troughton, Curator of Mammals, was also a member of the Fauna Protection Panel, representing the group of scientific societies interested in the fauna who appoint one member of the Panel.

Miss Joyce Allan, Curator of Shells, was abroad from March, 1954; she visited many European Museums and studied the shell collection at the British Museum (Natural History).

Mr. F. D. McCarthy, Curator of Anthropology, was appointed a Councillor, representing Australia and Melanesia, of the Far Eastern Prehistory Association.

Miss E. C. Pope, Assistant Curator of Crustacea and Lower Invertebrates, was abroad on leave for six months of the year, and visited many Museums in Europe where she took the opportunity of studying collections of Cirripedia (barnacles) in connection with her research work on Australian members of that group. She was elected a Corresponding Member of the Zoological Society of London.

Messrs. J. A. Keast, Assistant Curator of Birds and Reptiles, J. F. Lovering, Assistant Curator of Minerals and Rocks, and D. F. McMichael, Assistant Curator of Shells, completed a year's study in the United States. Mr. McMichael obtained the degree of M.A. at Harvard University.

Miss Margaret Fraser was appointed Editorial Assistant in place of Miss J. M. McKechnie who had resigned mainly on account of ill-health.

Mr. D. K. McAlpine, Science Trainee, completed the third year of the Science Course at the University of Sydney with Credit in Zoology and is proceeding with the fourth year as an Honours student in Entomology.

Mr. R. B. Donnelly, Science Trainee, completed the first year Science Course at the University of Sydney, gaining High Distinction in Zoology and Botany, and Credit in Physics and Chemistry.

3. Retirement of Dr. A. B. Walkom.

The announcement of the impending retirement of the Director of the Museum, Dr. A. B. Walkom, D.Sc., has been received by the Trustees with considerable regret.

During the fourteen years of Dr. Walkom's Directorship, the Australian Museum has maintained and improved its high standing in the scientific world. The credit for this is due in great measure to the eminence of its Director and leading Scientist, Dr. Walkom.

His high academic attainments supported, as they were, by a diversity of experience, have been of great value to the Museum.

Dr. Walkom has occupied successively the high office of President of a number of learned societies, such as the Royal Society of Queensland, the Linnean Society of N.S.W., the Royal Society of N.S.W., and the Australian and New Zealand Association for the Advancement of Science.

He has devoted a life-time of work to the cause of science through the medium of honorary office in a great range of Australian scientific societies, and also in association with the United Nations as a Member from 1947 to 1954 of the Australian U.N.E.S.C.O. Committee for Museums, and of the Australian National Advisory Committee for U.N.E.S.C.O.

Although he has engaged in a wide variety of research work, Dr. Walkom is best known for his work in relation to the fossil flora and stratigraphy of Upper Palaeozoic and Mesozoic rocks of Australia. His work generally in the field of research has received well-merited recognition by the award to him in 1948 of the Clarke Memorial Medal of the Royal Society of N.S.W., and the Bronze Medal of the Royal Society of N.S.W. in 1953, and by the publication in various scientific journals of a great number of papers containing the results of his research.

Dr. Walkom has enjoyed the high esteem of the Trustees and the staff of the Museum. His beneficial influence on the affairs of the Museum, and his wise counsel have been invaluable.

The Trustees place on record their appreciation and recognition of Dr. Walkom's distinguished service as a Scientist, and as Director of the Museum. They extend their congratulations on the fulfilment of a career of distinction and their good wishes for a long and happy retirement.

4. Appointment of Dr. J. W. Evans as Director.

Dr. John William Evans, Deputy Chief Scientific Officer of the United Kingdom Civil Service, who has been appointed Director of the Australian Museum to succeed the present Director, Dr. A. B. Walkom, graduated B.A. at Cambridge in 1926 and took his M.A. in 1931. He was awarded the degree of D.Sc. by the University of Tasmania in 1939, and Sc.D. by the University of Cambridge in 1949.

After graduating at Cambridge he came to Australia in 1926 and joined the staff of the Council for Scientific and Industrial Research. In 1927, on the recommendation of Professor S. M. Wadham, he was awarded a Science and Industry Endowment Fund Studentship for training in Applied Entomology, to study at the Cawthron Institute, Nelson, N.Z., under the late Dr. R. J. Tillyard. In 1928 he visited entomological research laboratories in Canada and the United States, and in 1928-29 worked under Dr. W. R. Thompson, in the parasite laboratory of the Imperial Institute of Entomology at Farnham Royal, England. From 1929 to 1934 he was Entomologist in the Council for Scientific and Industrial Research, working at the Plant Research Laboratory, Melbourne, the Waite Agricultural Research Institute, Adelaide, and the headquarters of the Council at Canberra. In 1934 he spent three months in England visiting research laboratories and the British Museum. In 1935 he was appointed Entomologist to the Department of Agriculture, Hobart, and at a later date was given administrative charge of the entomological and plant pathological sections of the Department, with the title Chief Biologist. While he was in Tasmania he was a member of the University Council, the State Committee of C.S.I.R., and the National Park Board, a councillor of the Royal Society of Tasmania, and a Trustee of the Tasmanian Museum.

In 1944 he went to London as Senior Entomologist of the Commonwealth Institute of Entomology, and spent five years working at the British Museum. From 1948 to 1952 he was Assistant Director of the Infestation Control Division of the Ministry of Agriculture and Fisheries, and in 1952 was appointed to his present position. In England he took an active part in the work of scientific bodies, serving on the Councils of the Institute of Biology, the Biological Council, the Royal Entomological Society, the Ray Society, the Systematics Association, and the Association of Applied Biologists. He was also a member of the Home Office Wild Birds Protection Advisory Committee, and the Colonial Office Research Subcommittee.

Dr. Evans has had a wide scientific and administrative experience, and has visited Museums in the United States, India, France, Holland, Sweden and Germany, as well as in the United Kingdom. Though his employment has been mainly as an applied entomologist his interests, as shown by his forty or so papers published in scientific journals, have been chiefly in the realm of taxonomy, comparative morphology and ecology.

5. Field Work.

Mr. J. R. Kinghorn paid several visits to Jenolan Caves to study seasonal changes in the bird population.

Mr. H. O. Fletcher visited Wellington Caves to advise Mr. J. Mahoney, a research student of Sydney University, on collecting the Pleistocene cave fauna; Durras Waters, in the vicinity of Bateman's Bay, to examine a previously unrecorded occurrence of *Eurydesma*; Port Kembla-Ulladulla district examining fossil occurrences; and Wombeyan Caves (accompanying Professor R. A. Stirton, of California) to inspect the locality from which vertebrate remains were recorded in 1896.

Mr. F. D. McCarthy spent a week in the Mangrove Creek area recording groups of aboriginal rock engravings.

Mr. R. O. Chalmers visited Prospect Quarry several times, and also visited quarries at Wollongong, Port Kembla and Kiama, collecting minerals and rocks.

Arrangements were also completed for Mr. E. Le G. Troughton to pay a collecting visit to Mt. Hagen in July-August, 1954.

6. Gallery Exhibits.

In the Australian Section of the Anthropology Gallery, two of the projected series of six large wall paintings were completed and installed. One depicts a fishing group on the shores of Port Jackson, the other a Kangaroo hunt in the vicinity of Ayer's Rock, Central Australia. In the Annex to this Gallery a new exhibit of the Races of Man in Oceania was installed, consisting of models of five races (a sixth is yet to be added) and appropriate illustrative background material.

In the Fish Gallery casts of Herbst's Shark and the Thresher Shark were placed on exhibition.

In the Invertebrate Gallery a new exhibit showing the corals of the south-west Pacific was completed.

In the Skeleton Gallery, the skeleton of the Giant Sloth was recoloured in a natural bone colour, a very considerable improvement on the former red-brown colour.

During the installation of fluorescent lighting in the Australian Anthropology Gallery and the Mineral Gallery, and of a new floor in the Fossil Gallery, practically all the exhibits had to be removed from the cases. Advantages was taken of this opportunity to repaint the backgrounds, make some rearrangement of the exhibits, and bronze some of the woodwork of the cases.

Further projected improvements in the galleries for which preparations are well in hand include the rebuilding of cases in the Skeleton Gallery in order to house the Giraffe skeleton, building cases to house carved trees and an aboriginal axe-grinding stone in the Anthropology Gallery, and exhibits of coral island crustaceans and marine fouling organisms in the Invertebrate Gallery.

7. Library.

Sixty-four bound volumes were added to the Library during the year. Of these 59 were presented, 4 purchased and 1 obtained by exchange. In addition, 1,584 periodical parts were presented or received as exchanges and 318 were purchased. Of necessity, due to the limited funds for binding, the bulk of these periodicals remain housed in groups of single copies in the basement—an unsatisfactory arrangement from many angles.

Apart from assistance given daily to the Museum's scientific workers, the Library staff has met regular requests for loans, and copies of literature, from universities, hospitals and government departments throughout Australia and New Zealand.

Correspondence received from individuals on general matters relating to books is not heavy but frequently considerable time is absorbed in obtaining the information sought.

Research workers, students, and members of the public continue to make good use of the Library for reference and study purposes.

The Library Supervisor (as Editorial Assistant) has assisted in the editing and preparation of the Museum's publications.

8. Publications.

During the year Volume XI, parts 3-5 of the *Australian Museum Magazine* were issued and part 6 was completed ready for issue early in July; Volume XXIII, Nos. 3 and 4 of the *Records* were also published.

The Guide to the Museum for which there is a steady sale, was reprinted, in an edition of 10,000 copies.

9. Lectures.

The series of Popular Science Lectures delivered by visiting lecturers and some members of the staff again attracted satisfactory audiences, though the numbers were not as large as in the previous year. Twelve lectures were delivered, the attendance being 1,270 (average 106) as compared with 1,817 (average 151) for 1952-53.

10. Buildings and Equipment.

The urgent need for improved and adequate storage accommodation was constantly in the minds of the Trustees and they again stress the importance of this aspect of the care of the national collections. In response to representations made, we were informed that provision for the commencement of additions to the Museum building was one of the items on the proposed works programme for 1954-55, and it is sincerely hoped that funds will actually be made available for this urgently needed work.

A number of improvements and repairs to the building were made in the past year: new flooring of asphalt tiles was laid in the Bird and Fossil Galleries; the stairway leading up from the entrance gallery was improved by the provision of rubber treads; fluorescent lighting was installed in exhibit cases in the Anthropology Gallery; a new incinerator was installed; the roofs of the storage sheds were renewed or repaired.

New equipment obtained included a sawbench in the workshop, a "Palee" flash unit for the photographic studio, and an additional ten steel cabinets for storage of specimens.

The Museum was one of the Government buildings illuminated for the period of the Royal Visit.

11. Finance.

Expenditure from Consolidated Revenue for the year (excluding Statutory Endowment of £1,000) was £48,314 9s. compared with £47,976 6s. 6d. last year. Net expenditure from Trustees' Account Funds (including Statutory Endowment) was £3,264 17s. 6d., compared with £3,009 7s. 2d. for 1952-3.

The cash balance in the Trustees' Account at 30th June, 1954, was £581 18s. 6d. Trustees' invested funds at 30th June, 1954, were Commonwealth Inscribed Stock, £5,350; Sydney County Council Inscribed Stock, £1,000; Metropolitan Water, Sewerage and Drainage Board Inscribed Stock, £1,500; Commonwealth Savings Bank, £316 3s. 6d.

Statement of Receipts and Expenditure for the year is contained in Appendix "B".

12. Public Attendances.

Statistics of Attendances for the years 1949-50 to 1953-54 are as follows:—

Year.	Week-days.	Sundays.	Total.
1949-50	154,211	70,890	225,101
1950-51	167,675	72,194	239,869
1951-52	169,787	77,317	247,104
1952-53	211,544	78,148	289,692
1953-54	188,354	71,419	259,773

13. Publicity.

The practice of lending specimens to commercial firms for window displays or exhibitions has been continued, and provides a means of giving publicity to the Museum. A notable example was the loan of a collection of corals and shells to the Sydney office of the Queensland Tourist Bureau. This exhibit was set up in the Bureau's office for about twelve months and the manager estimated that more than 30,000 people viewed it during that period.

The exhibit at the Royal Agricultural Show was of similar type to that made in 1953, and consisted mainly of a display of native birds in a farmyard setting.

14. Screening of Educational Films.

Educational work with school children is an important part of the Museum's activities. Screening of educational films plays an important part in this work, in association with the visits of school classes, as well as during the school vacations. The programme of films screened during vacations attracted very large audiences of children and adults.

The screening of interesting films twice a month during the lunch hour has been continued.

15. Educational Seminars.

The Museum was represented at two educational seminars arranged by the Australian National Advisory Committee for Unesco. The Director and the Education Officer attended the Seminar on "The Role of Museums in Education" at Melbourne in September, 1953. It is hoped that the recommendations made at this Seminar will result in the extension of Museum services to the schools and increased co-operation between Museums and Education Departments in considering the place that Museums can take in the school curriculum. Mr. McCarthy attended the Seminar on "The Role of Art in Education" held in Melbourne in June, 1954, as official representative of the Art Galleries and Museums Association of Australia and New Zealand.

16. The Collections and Scientific Work.

The collections have been inspected regularly and are in good order and condition. During the year some trace of borer infestation was found in some of the softwood spears and advice was sought from the Division of Wood Technology as to the best means of dealing with it and of preventing any further infestation. The bulk of the spear collection has now been treated in accordance with the advice received.

Much of the time of the scientific staff was, as usual, taken up in preparing replies to the very numerous requests for information received from the general public, Commonwealth and State Scientific Departments and research workers, not only in New South Wales but also in other States and abroad.

Members of the staff prepared articles for the *Australian Museum Magazine*, and abstracts of current scientific literature for *Australian Science Abstracts*. A number of them have also contributed appropriate sections of the edition of the *Australian Encyclopaedia* about to be published. Some of the members also, from time to time, deliver voluntary lectures to societies and groups interested in natural history, and contribute news broadcasts on items of topical interest as they arise.

A small collection of specially selected specimens was lent to the B.B.C. for use in a television session, similar to previous sessions for which museums in Britain and the United States had provided material. The session was reported to have been one of the most interesting of the series—perhaps on account of the fact that some of the unique Australian specimens were actually seen by viewers for the first time.

An interesting and profitable exchange of specimens was made with the Übersee Museum, Bremen, by which we received a series of musical instruments used by natives in East Asia and Africa in return for an Australian canoe and some objects from Fiji.

The exhibition featuring the life and culture of the Australian aborigines, referred to in the last Annual Report, had a very favourable reception in the United States, and Unesco authorities have received requests for it to be exhibited later in Canada, Malaya and New Zealand.

Birds, Reptiles and Batrachians. (J. R. Kinghorn, Curator; J. A. Keast, M.Sc., Assistant Curator).

More than 200 birds were added to the registered collection many of them from the material collected by the North-west Australia Expedition. Thirty-three specimens of reptiles and batrachians were registered and added to the collections. Many specimens of birds and reptiles were also received for identification and report.

Advice concerning the economic status of species of birds has been given to officers of the Department of Agriculture, Pastures Protection Boards, and the Chief Secretary's Department. Officers in charge of electricity sub-stations have been given advice in connection with disruption of services caused by the short circuiting of switches by green tree-frogs. Problems associated with starlings, pigeons and sparrows as pests on buildings have been discussed with Civic Authorities.

Assistance was also given to a large number of visiting interstate and overseas workers, as well as to many local ornithologists, and correspondence was kept up with research workers overseas.

Research has been carried out on the genus *Pseudechis* and some types were examined in the National Museum, Melbourne. Some interesting discoveries have been made concerning the bones of the skull of *Furina*, and the dentition of *Oxyuranus* in relation to *Pseudechis* and the Indian genus *Naja*, whilst the

concluding work on *Rhynchoelaps* has been set aside pending receipt of further specimens from Queensland and Central Australia.

Mr. Kinghorn made several short visits of the Jenolan Caves area to study variations in the bird population. This population has been adversely affected by the depredations of cats, but these are being gradually exterminated and a better picture of the bird life should be obtainable in the Spring when the nomadic species return. In June the mid-winter population was unexpectedly small.

As representative of the Museum, Mr. Kinghorn took an active part in the work of the Fauna Protection Panel, which discussed such questions as sanctuaries, fauna reservations and primitive areas—the main areas considered including the Kosciusko National Park, Morton Primitive area, and Macquarie Marshes. He also attended an interstate Fauna Conference held in Melbourne.

Mr. Keast was absent on leave for the whole year, studying at Harvard University. As part of his programme he is working on bird material taken from Australia for the purpose, and he is also taking the opportunity to examine types of Australian species housed in the United States.

Mammals and Skeletons. (E. Le G. Troughton, Curator; R. B. Donnelly, Science Trainee).

Part of the marsupial display was re-arranged, and consideration was given to some re-arrangement of the skeleton display and the recasing of the giraffe skeleton within the wall case series of skeletons.

Facilities and advice regarding their research on marsupial and cranial collections were afforded to Professor R. A. Stirton and Mr. Tedford, of the University of California, on two visits to Australia. Assistance was also given to Dr. H. C. Reynolds, research fellow of the University of California, in his study of the reproductive cycle of Marsupialia; to Professor P. R. Morrison, of the University of Wisconsin; to Mr. W. B. Swanson, a visiting Fulbright Research Scholar; and to Messrs. K. E. Stager and J. B. Davidson of the Los Angeles Museum, who are collecting in New South Wales and Queensland for their Museum. Information was prepared for the Gordon Craig Laboratory and the Departments of Zoology and Veterinary Science at the University of Sydney; for Professor Bodenheimer, of the University at Jerusalem, regarding the ecology of our desert fauna; for Mr. Anton de Vos, of Ontario Agricultural College, as to the effect of deer and other exotic fauna on conservation in Australia; and for the Oxford University Museum regarding the cranial characters of the family Macropodidae.

The Natural History Society at Cairns was assisted with identifications, and the Departments of Agriculture and Public Health were advised on various problems.

Mr. Troughton rendered assistance to the Premier's Department as a member of a special committee which reported on the question of alleged cruelty regarding the housing and treatment of circus animals.

Preparations were completed for Mr. Troughton to carry out field work for about two months in the Mt. Hagen district in New Guinea, in association with Mr. N. B. Blood of the New Guinea Administration. During this expedition it is hoped that representatives will be obtained of species collected by British, United States, and Swedish expeditions which have previously collected under the guidance of Mr. Blood.

A report on "The Preservation of Indigenous Fauna and Flora" was prepared for inclusion in the discussions of the Second Pan-Indian Ocean Science Congress to be held in August, 1954, and one on a similar subject for the meeting of A.N.Z.A.A.S. held at Canberra in January, 1954.

The text of School Leaflets on the platypus and the Spiny Ant-Eater were supervised, the manuscript of the Mammal section of a Bushwalkers' Manual was revised, and mammal sections of the Australian Encyclopaedia (except the "Whales") were completed.

Fishes. (G. P. Whitley, Curator.)

About four hundred fishes were received during the year. They came from all the States and from Papua-New Guinea, New Caledonia, Fiji, Japan and Formosa. A selection of puffer-fishes was received from Dr. T. Abe, of Tokyo. The largest collection, made by Mr. K. Godfrey of C.S.I.R.O. Division of Fisheries, from north-west Australia included one new species and several new State records. By exchange a valuable assortment of tropical fishes was received from the Queensland Department of Harbours and Marine. Mr. F. A. McNeill, collecting with Colonel J. K. Howard along the Queensland coast, obtained several shore fishes new to Queensland and one new species. Fishes from the Northern Territory were received from the Commonwealth Fisheries Office.

A new exhibit of Thresher and Herbst's Sharks was installed in the gallery.

Technical information and assistance was provided for a very large number of inquirers. Included amongst these were Royal Tour Officials (concerning catering for H.M. the Queen), Viscount Althorp (preserving a striped marlin), colleagues in the Universities of Travancore (re shark), Hawaii (taxonomy of Teuthidae and *Othos*), Stanford, California (particulars of co-type of Indian shark), and Sydney (fishes suitable for physiological experiments), Dr. D. C. Arnold, Oxford (Carapidae), Health Dept., Los Angeles (poisonous fishes), American Museum of Natural History and angling bodies in U.S.A. and Australia (marlins), C.S.I.R.O. Division of Fisheries (bibliographical data and references), Fisheries Branch, Chief Secretary's Department (identifications of commercial fishes, and re bass cultivation), Health Department (identifications of tinned and filleted fish sold under misleading names), Department of Harbours and Marine, Queensland (barramundi data and names of small fishes from Gulf of Carpentaria), Mr. E. O. G. Scott, Launceston (data on pipefishes), Mr. T. C. Roughley (a new Dory and North Australian catfishes), and Mr. D. H. Graham, Lower Hutt, N.Z. (revised matter for second edition of "Treasury of New Zealand Fishes").

The preparation of information in response to inquiries and the routine work of the Department left little time for research. In the course of identifying material, some new or interesting species came to light and some of them have been described. The gudgeons were overhauled and some "old collection" specimens identified and catalogued. Work is proceeding on "Fishes of Australia" and a proposed popular handbook on freshwater fishes. Two papers ("Fishes collected by the Australian Museum Expedition, 1952" and "Studies in Ichthyology No. 16") were published in the *Records*, one ("More new fish names and records") in the *Australian Zoologist*, and one ("New locality records for some Australian fishes") in the *Proceedings of the Royal Zoological Society of N.S.W.* Two other papers have been completed for publication, and a paper on the food of Trout, by the late K. C. McKeown, was prepared for publication.

An illustration of a reconstruction of a fossil fish (*Uarbyrichthys*) was prepared for the Royal Society of N.S.W., and a drawing (by Joyce Allan and G. P. Whitley) of the fish, *Bassogigas*, taken by the "Galathea" from the greatest depth from which any fish has been caught, was published in the *Geographical Journal*, London.

Insects and Arachnids. (A. Musgrave, Curator; D. K. McAlpine, Science Trainee; Nancy B. Adams, Assistant.)

The number of inquiries received in this Department is greater than in any other department, and the time of the present limited staff is largely taken up in the preparation of the information sought. Amongst visitors inspecting collections and consulting literature were Messrs. T. G. Campbell, E. F. Riek, K. Taylor and Dr. P. B. Carne, of C.S.I.R.O. Division of Entomology; E. S. Brown (Dept. of Agriculture, Honiara, Solomon Is.); J. D. Bradley (British Museum); Dr. F. H. Hull (University of Mississippi); A. J. Parrott (Cawthron Institute, N.Z.); A. M. Douglas (Western Australian Museum); A. Neboiss (Dept. of Lands, Melbourne); B. Wicksteed (London); S. Angel (Hobart); H. Womersley (Adelaide); in addition to many local entomologists.

Work done on the collections included revision of the Apoidea (Bees) and Scoliidae (Hairy Flower Wasps). The Australian Curculionidae (Weevils), the largest group of Australian beetles, comprising between 3,000 and 4,000 species, was completely revised, as were also the allied families Bruchidae, Anthribidae, Brentidae, Scolytidae and Platypodidae. Miss Adams assisted in these revisions, and also spent some time dealing with specimens received, and labelling moths in the Middleton Collection.

Crustacea and Lower Invertebrates. (F. A. McNeill, Curator; Elizabeth C. Pope, M.Sc., Assistant Curator.)

More than five hundred specimens of Crustacea were added to the registered collections, the outstanding acquisitions being (1) additional named Stomatopoda (Mantis shrimps) from Professor W. Stephenson, University of Queensland; (2) Decapoda Crustacea collected by Mr. McNeill from the Great Barrier Reef; (3) named Parastacidae (freshwater crayfish) and Atyidae (freshwater shrimps) from Mr. E. F. Riek, Canberra; and (4) American species of Penaeidae (commercial and related prawns) from Dr. Kellogg, U.S. National Museum, Washington.

The extensive collections of invertebrates made by Mr. McNeill during his visit to the Great Barrier Reef with Col. J. K. Howard were sorted and labelled. Representative Australian species of the rare marine worm *Arenicola* were sent for study to Dr. Wells, University College, London.

Assistance was rendered to the Queensland University Science Students' Association (naming of a collection of Decapoda); Wild Life Section of C.S.I.R.O., Griffith (examination of crustacean remains from the crops of ducks); Wild Life Preservation Society of Australia (revision of manuscript on local

marine life); Professor W. Stephenson, University of Queensland (study of Queensland crabs of the family Portunidae); and Mr. A. Longhurst, Bedford College, London (data concerning Australian Phyllopoda—freshwater shield and fairy shrimps).

The gallery exhibit showing corals of the South-west Pacific was completed, and material collected for further new exhibits illustrating coral island crustaceans and marine fouling organisms.

A manuscript was completed in collaboration with Professor W. Stephenson on "The Australian Stomatopoda (Crustacea) in the collections of the Australian Museum, with a Check List and Key to the known Australian species". Some further progress was made with the examination of the Decapoda collected by the British Great Barrier Reef Expedition.

Miss Pope did further work on Western Australian and Queensland Cirripedia (barnacles). She was abroad on leave from the beginning of January and while in Europe took advantage of opportunities to examine museum collections, especially of Cirripedia.

Shells. (Joyce Allan, Curator; D. F. McMichael, M.A., B.Sc., Assistant Curator.)

Miss Allan was abroad on long service leave until November. During this period she attended the XIV International Zoological Congress and also the International Colloquium on Zoological Nomenclature at Copenhagen and visited a number of museums in Britain. She also worked for a period at the British Museum (Natural History), concentrating on type material and rare shells of interest in connection with Australian conchology.

After her return she dealt with accumulated routine matters, and with collections of shells submitted for identification. Many of the inquiries accompanying these collections are of importance in connection with research work at various institutions, e.g., University of Sydney, School of Public Health and Tropical Medicine, C.S.I.R.O. Division of Fisheries, and State and Commonwealth Fisheries Departments. Other inquiries have come from the press, commercial houses and oil companies.

A "Reference List of Shells of New South Wales" has been compiled and typed from manuscript prepared by Mr. T. Iredale while he was Curator, and since kept up to date by Mr. Iredale and Miss Allan. Miss Allan is preparing a short paper on some Nudibranchia and is continuing a revision of the families Cypracidae and Conidae, families of importance in the Molluscan fauna of Australia.

Mr. McMichael was absent for almost the whole year working at Harvard University. He spent a little time en route at the British Museum examining type material of freshwater mussels, the main subject of his studies at Harvard. He completed his year's work and obtained the degree of Master of Arts at Harvard.

Fossils. (H. O. Fletcher, Curator.)

Accessions, totalling 213 specimens, included a series of well-preserved plants from Triassic rocks near Warialda Creek, presented by Dr. J. Rade; specimens of *Glossopteris amplia* from the Permian Upper Coal Measures at the Aberdare Colliery near Cessnock, presented by Mr. H. E. Myers; graptolites from Ordovician rocks of Southern New South Wales, from the Geological Survey of New South Wales; and marsupial remains from the cave-breccia at Wombeyan Caves, collected by Mr. Fletcher and Professor R. A. Stirton. A complete skull of the Sabre-toothed Tiger, *Smilodon californicus*, from the Rancho La Brea tar pit at Hollywood, California, was received on indefinite loan from Professor Stirton of the University of California. During the year further fossil specimens were transferred from the Mining Museum to the Australian Museum collections, including Permian and Carboniferous specimens from United States of America representing mostly genera which occur in Australian rocks; a collection of types and co-types of New South Wales Ordovician graptolites; and a series of Palaeozoic corals, many of which will probably prove to be type specimens.

Work is proceeding on the cataloguing of the fossil collections and at the same time search is made for type material which has been recorded in literature as being in the collection of the Mining Museum or the Australian Museum. A list of the types of Anthozoa in the collection is being prepared and a number of types, supposed to be missing, have been located.

Many specimens were received for identification, including collections sent by members of the Geological Survey for report by Mr. Fletcher in his capacity as Honorary Palaeontologist to that Department. Assistance given to institutions and individuals included identification of a collection of vertebrate remains from Abererombie Caves (for the Department of Tourist Activities); provision of photographs of fossils for publication in the Australian Encyclopaedia (Messrs. Angus and Robertson) and in a new edition of the Children's Encyclopaedia

(Messrs. George Newnes, Ltd.); photograph of *Thylacoele carnifex* for a research paper and information as to the occurrence of *Diprotodon minor* in New South Wales (Mr. E. D. Gill, National Museum, Melbourne); information regarding type Corals (Dr. Dorothy Hill, University of Queensland); and facilities to examine material given to Professor R. A. Stirton (University of California) and Mr. W. Swanson (University of Chicago). A small collection of unregistered duplicate fossils was provided for use in Pakistan universities.

Field work included visits to Wellington Caves to advise Mr. J. Mahoney, of the University of Sydney, regarding collection of vertebrate fossils; to Durras Waters, near Bateman's Bay, to investigate a report on an unrecorded occurrence of *Eurydesma* in rocks of the Upper Marine Series (*Eurydesma* was previously only known in the Lower Marine Series); Port Kembla and Ulladulla districts investigating mineral and fossil occurrences; and Wombeyan Caves where vertebrate material was collected at the locality from which the late Robert Broom recorded vertebrate remains in 1896.

Research included further work on reptilian footprints from the Hawkesbury Sandstone at Berowra, and on new species of bivalves and gastropods from the Permian rocks of New South Wales. A paper on "Graptolite Localities of the Snowy Mountains" was completed.

Lapidary work has proceeded satisfactorily and the micro-sections, mainly from rock specimens, prepared are of high standard.

Minerals and Rocks. (R. O. Chalmers, A.S.T.C., Curator; J. F. Lovering, M.Sc., Assistant Curator; Frida Sachs, Assistant).

Twelve rocks and 285 minerals were added to the registered collection. They included a hitherto unrecorded acrolite ploughed up at Coolamon about thirty years ago by Mr. G. A. Eisenhauer who presented it; minerals from Prospect and from the Dunmore Quarry, near Kiama, collected by Mr. R. O. Chalmers; minerals from the Broken Hill district, collected by Messrs. R. O. Chalmers and J. F. Lovering; a small collection of rare minerals, some recently noted for the first time from New South Wales, presented by Drs. A. B. Edwards and J. McAndrew of C.S.I.R.O. Mineragraphic Section; and a small collection of chromite specimens presented by M. R. Pomeyrol, oil geologist in New Caledonia.

A record number (268) of inquiries was dealt with, including many on uranium minerals and gemstones. Increasing use is being made of the facilities of the Department for identification and valuation of gemstones and ornamental stones. Serpentinized dolerites were examined for M. R. Pomeyrol in connection with oil search in New Caledonia. Specimens were lent for research purposes to the Mineragraphic Section and the Division of Building Research, C.S.I.R.O. Assistance was given to Mrs. Beatrice Grant, widow of the late Patrick Grant, in making arrangements for disposal of the Grant Collection on gemstones which had been on loan to the Museum for many years.

The exhibition of meteorites was replanned and in the space gained it is proposed to instal an exhibit of the minerals collected during recent years from the Prospect quarries.

Mr. W. Cassidy, a Fulbright scholar from the University of New Mexico, spent some time examining the collection of tektites, and he sent us a number of specimens of weathered meteorite fragments from the Wolf Creek Crater.

Research activities include preliminary examination of many of the minerals collected at Prospect; sending of clay and chlorite minerals from Prospect and Euriovie to Mr. W. F. Cole, C.S.I.R.O. Building Research Division, for examination by X-ray and differential thermal analytic methods; work on stony meteorites taken by Mr. J. F. Lovering to the California Institute of Technology. Before leaving for California, Mr. Lovering completed for publication two papers on his work on the Wianamatta Group.

The preparation of thin sections continued steadily, but a number now await examination, as a result of the absence of Mr. Lovering abroad. The geographical index of the rock collection is approaching completion.

Visitors who examined portions of the collections included Professor C. O. Hutton, Stanford, U.S.A., Dr. B. Mason, American Museum of Natural History, Dr. A. B. Edwards and Dr. J. McAndrew, C.S.I.R.O. Mineragraphic Section, and Mr. R. C. Sprigg, formerly of Geological Survey of South Australia.

Assistance was received from the Defence Research Laboratories in connection with the slicing of meteorites for research purposes, etc.

Mr. Lovering left in September to spend a year studying at the California Institute of Technology. Miss Sachs was absent for five months as the result of an accident.

During the year an arrangement was completed with the Joint Coal Board, under which a modern petrological microscope and accessory equipment was made available on loan to the Museum and in return it was agreed that officers of the Department of Minerals and Rocks would undertake research on some of the problems of sedimentary petrology associated with rocks of the coal measures, in addition to affording assistance to the Joint Coal Board in problems which might arise from time to time.

Anthropology and Numismatics. (F. D. McCarthy, Dip. Anthr., Curator; G. C. Heyde, Hon. Numismatist.)

A total of 1,322 specimens was added to the registered collection, 1,165 of them being material collected by the Australian-American Arnhem Land Expedition. Donations included twelve hafted axes, weapons and wood carvings from New Guinea and the Solomons (late Dr. L. D. Brennan); New Guinea bow (Master R. Bann); Human-hair helmet, Central New Guinea (Mr. E. G. Mylne); ram's horn trumpet, 150 years old, used in a synagogue in Jerusalem (Mr. B. Baris); model of a Toradja House, Celebes (Commander T. F. Knox); examples of weaving, Gilbert Is. and Celebes, and basket work, Vancouver Is. (late Mrs. A. B. Cotter); Eskimo needle-case in the form of a carved ivory seal, Greenland (Mrs. H. F. B. Castle); carved stool, Trobriand Is. (Mrs. Poole); 3 bronze arrow-points, Egypt (Mr. W. Patterson); 19 wood carvings, weapons, etc., New Guinea and Pacific Islands (Miss E. Barkley); rare shell money from Rossel Is. (Rev. H. Robinson); 4 bark paintings, Sepik R. district, New Guinea (Mr. Colin Simpson); Masai weapons, East Africa (Mr. E. G. Donkin); an old club, Merriwa, and a hand-axe, Tambo, Q. (Miss E. M. Allan); a pair of Kuraitja shoes worn by sorcerers in central Australia (Mr. A. Poignant); sacred boards and a hafted axe, Kimberleys (Mr. E. G. Donkin); woman's stringybark cover, Groote Eylandt (late Rev. H. E. Warren); a gnarl container, the only specimen known from New South Wales, found in a rock shelter on the upper Mangrove Creek, Hawkesbury River (Marilyn and John Usher); stone axes from Gum Lake (Mr. M. E. Stannard); Thirroul Beach (Mr. L. Turner), Tarana (Mr. R. H. F. Fletcher), Moss Vale (Mr. H. Dubi), Gwydir R. (Mrs. R. W. Baldwinson), and New Guinea (Mr. W. Allan); a stone knife, Northern Territory (Mr. K. Colley); two large Worimi cleavers, Nangram Lagoon, Condamine R., Q. (Mr. J. M. Clift). A series of 69 musical instruments and other specimens was received by exchange from the Uebersee Museums, Bremen, Germany; and two uniface stone implements of Palaeolithic age from France, from M. L. Gary.

A number of visitors examined portions of the collections: Mr. P. Worsley of the Australian National University (the Groote Eylandt collections); Mr. D. J. Tugby, of the National Museum, Melbourne (hand axes in the stone implement collection); Dr. Koyman, Leyden Museum (New Guinea collection); Dr. H. Petri, Frankfurt Museum (specimens from north-western Australia). Mr. and Mrs. Weebenga, of Hawaii, made inquiries about aboriginal rock engravings and paintings. The Directors of three New Zealand Museums (Dr. G. Archey, Auckland; Dr. R. Duff, Christchurch; and Dr. H. D. Skinner, Dunedin) inspected the collection of Maori greenstone objects. Mme. Girard, Curator of Oceanic Anthropology, Musée de l'Homme, Paris, inspected the Pacific Collections. Mr. A. B. Lewis, Chicago, examined the collection of New Ireland Malangan carvings.

Information was prepared for Mr. K. Elik-Larsson, Goteborg, Sweden (on shell trumpets), Dr. Focken, Melbourne (on boomerangs), Dr. Tolstoy, University of Mexico (on bark-cloth beaters), Dr. Desmond Clark, Rhodes-Livingstone Museum, South Africa (on Australian club-grips and digging sticks), and others.

A new exhibit on the Races of Man in Oceania was installed in the gallery and two of the large wall paintings illustrating the life of the Australian Aborigines were completed and hung.

Mr. McCarthy spent two weeks in the Mangrove Creek area recording six groups of rock engravings. This completed the recording of some five hundred figures in a dozen groups on one ridge about ten miles long.

Three manuscripts for the report of the Arnhem Land expedition were finally completed, viz., The Cave Paintings of Groote and Chasm Islands; Archaeology of Arnhem Land (with F. M. Setzler); and "The String Figures of North-eastern Arnhem Land" (referred to in the previous Annual Report).

The text was completed of a paper begun by the late Professor D. S. Davidson on "The Distributions and Chronology of some important Types of Stone Implements in Western Australia". Notes made during the past fifteen years on groups of rock engravings recorded in the Sydney-Hawkesbury district were prepared in nine papers for future publication. An article on "Rock Engravings beside our National Highways" was published in "Main Roads" issued by the Main Roads Department. Two papers on Stone Arrangements on Groote Eylandt, referred to in last year's Report, appeared in the "Records".

A number of specimens was lent to firms for various types of display: Messrs. Angus and Robertson Ltd., Farmer & Co. Ltd., Marcus Clark and Co. Ltd., Murray & Co. Ltd., and Anthony Hordern's Ltd., for window displays; David Jones, Ltd., in connection with a display of pottery; and Chauvel Films in connection with the film "Jedda".

Numismatics.—Mr. G. C. Heyde continued to render valuable assistance in the identification and valuation of coins, medals and tokens submitted by the public for report. The collection of medals awarded by Australian scientific societies was placed on permanent display in the coin cabinets.

Department of Preparation. (J. Kingsley, Officer-in-Charge; H. D. Hughes, A.R.P.S., R. D. Mackay, and F. J. S. Beeman, Assistant Preparators.)

The gallery cases and exhibits were inspected at regular intervals and maintained in good order.

Work carried out during the year included the following: Mammal and bird skins prepared or mounted, 36; mammal, bird and skeleton exhibits reconditioned, 246; crab exhibit prepared, 1; skulls prepared or reconditioned, 31; disarticulated bones prepared, 65; sharks' jaws prepared, 2; negatives, photographic prints and lantern slides prepared, 1,905; photo, prints mounted, 253; films projected, 394; preparation of moulds (20), plaster casts (3); acrylic resin casts (1), phenolic resin casts (14); mounting of 4 casts; colouring of 31 casts; mural paintings, 2; drawings prepared, 115 (29 colour and wash); colouring of fish eye, accessories, mounted exhibits and sharks' jaws, 45; mounting of 14 coral specimens; and repair of 4 fossil and 6 mineral specimens.

The Giant Sloth skeleton exhibit was recoloured in a natural bone colour in place of the red-brown. The work of installing the redesigned coral exhibit in the invertebrate gallery was completed.

The installation of fluorescent lighting in the Anthropology and Mineral Galleries and of a new floor in the Fossil Gallery involved the Department of Preparation in the removal of all specimens from the cases and their subsequent replacement. Advantage was taken of the opportunity to recolour the backgrounds in most of the cases and also to rearrange some of the exhibits.

Advice was obtained from the Division of Wood Technology as to the best method of treatment of softwood and bamboo shafts of spears against borers (which had appeared in some specimens) and more than one thousand specimens have been treated.

An exhibit showing farm birds, etc., was prepared for the Royal Agricultural Show; a platypus was reconditioned and remounted for the Department of the Navy; and casts of three human mandibles are being prepared for the Anatomy Department of the University to be sent to Professor R. A. Dart of Johannesburg.

Education Officer. (Miss P. McDonald, B.Sc., Dip. Ed.)

The number of children visiting the Museum in classes is still increasing. During the year, 6,472 children attended in 167 class visits, an increase of 537 over the previous year.

A programme of lessons has now been arranged for classes which visit the Museum regularly, and at present thirteen classes are following set programmes on Natural Science or Social Studies. The attendance of children for the April-June quarter, 1954, was 2,883, an increase of 903 over the corresponding quarter of 1953.

The screening of natural history films during school vacations continues to attract increasing numbers of children. The total attendance for the three vacations was 13,861, compared with 10,982 for the year 1952-53.

Four leaflets in the series on Australian Mammals were completed. They deal with the Spiny Ant-Eater, Possums, Platypus, and Koala. Preparation of a new leaflet on "Australian Aborigines" has been commenced. New question sheets have been prepared on Australian Snakes and Lizards, Marsupials, Skeletons, Beginnings of Life on the Earth, Fish, Australian Mammals, Insects, Races of the Pacific, Limestone Caves, Australian Birds, and Pearling.

Assistance has been requested, in preparation for production of film strips, by Australian Instructional Films, and the Visual Education Centre.

Help has been given during weekend excursions to the Hornsby Girls' High School, studying the marine rock platform at Long Reef, and to the Zoology Department of the University of Sydney, studying the fauna of freshwater creeks and of the marine rock platform.

An exhibition of posters prepared by children on the material they have studied at the Museum was displayed during the summer vacation. This was very successful and attracted much attention. Arrangements have been made for a similar exhibition in August, 1954, as a contribution to Education Week.

The Education Officer attended a Unesco Seminar on "The Role of Museums in Education" held in Melbourne in September, 1953, when many aspects of the value of Museums in the school education system were discussed.

Accessions for the year 1953-54 totalled:—

Vertebrata	733
Invertebrata	1,830
Geological	551
Ethnological, etc.	1,338
Miscellaneous	511
	<hr/>
	4,963

Papers and articles published during the year totalled:—

Records of the Australian Museum	5
Australian Museum Magazine	29
Other Publications	4

The Common Seal of the Trustees of the Australian Museum was hereunto affixed by Order of the Board this fourteenth day of September, 1954.

H. B. MATHEWS, President.

A. B. WALKOM, Director.

APPENDIX A.

Trustees of the Australian Museum at 30th June, 1954.

Crown Trustee:—

H. B. Mathews, B.A.

Statutory:—

The Hon. the Chief Justice.
The Hon. the Colonial Secretary.
The Hon. the Attorney-General.
The Hon. the Colonial Treasurer.
The Auditor-General.
The President of the Medical Board.

Appointed:—

The Hon. the President of the Legislative Council.
The Crown Solicitor.
The Surveyor-General and Chief Surveyor.

The Hon. the Minister for Works.
The Hon. the Minister for Education.

Elective:—

Professor A. N. St. G. Burkitt, M.B., B.Sc.
Frank B. Spencer.
O. G. Vickery, B.E., M.I.E. (Aust.)
Wallace C. Wurth, C.M.G., LL.B.
Professor A. P. Elkin, M.A., Ph.D.
F. McDowell.
R. J. Noble, M.Sc., B.Sc.Agr., Ph.D.
E. J. Kenny, M.Aust.I.M.M.
F. L. S. Bell, M.A., F.R.A.I.
Frank W. Hill.
G. A. Johnson.
Professor P. D. F. Murray, M.A., D.Sc.