annual report

australian museum

1988/89

The Trust and staff of the Australian Museum have pleasure in thanking the following organisations and individuals who provided financial assistance through research grant or donations. Benefactors are classed as companies or individuals who have donated more than $15,000.

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Front cover
Entertainers at the Rituals Opening, in November, included the performance group "Kulini", drama students from the University of Western Sydney

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Tel. (02) 339 8111
Open 7 days 10 am-5pm

This totem pole from British Columbia, Canada, was made specially for Expo '88 and given to the Museum in exchange for two nineteenth century totems held in the Museum since 1912.
Photo by Anthony Farr

Minister's Message

NEW SOUTH WALES

Minister for the Arts

New South Wales, the state with the oldest and richest cultural heritage, is served by a first class Museum charged with the task of acting as ambassador for our natural environment. My thanks to the Trustees and Staff for all their dedication and hard work which have made this such a successful year.

The Australian Museum has played an important role in the portfolio, being active in research, education and publication. The Museum has hosted a number of exciting exhibitions, one of the most outstanding being "Ancient Macedonia".

In a time of economic restraint by Government the Australian Museum has pursued corporate patronage with the establishment of a Foundation in June 1988.

The Australian Museum is an integral part of the Arts Ministry and has my full support as it faces up to the exciting challenges of the year ahead.

Peter Collins, M.P.
Minister for the Arts

Statement of Philosophy

We intend to grow and develop in Sydney as one of the world's leading museums specialising in natural history and human studies. We want visitors and the wider community to have easy access to our accumulated knowledge and opportunities for enjoyable learning experiences.

We will use exhibitions, education programs, publications and other effective media to communicate with people throughout New South Wales, other parts of Australia and tourists. We want the Museum's public environment to be pleasant in all ways, our staff to be friendly and reliable and to show respect for the interests and needs of those who visit, those with whom we do business and our wider audience.

We want the information we gather and communicate to be accurate and our activities and services to be, and be seen to be, of high quality, supportive of our mission and relevant to the community.

Our research activities will concentrate on Australia and nearby regions. Collections and associated information will be managed for the purposes of research and communications to the public and will be preserved for the benefit of future generations.

The future of our natural environment and cultural heritage is of central concern: we intend to join in public debate and give advice to government, the community and business where we have special knowledge. We will respect the rights and wishes of the peoples whose knowledge and material culture form the basis of our human studies programs. We will consciously abide by legislations and conventions protecting the natural environment, wildlife and cultural heritage.

We believe support for the Museum to be the responsibility of the community, the private sector and government: the Trust and staff will be active in gaining that support. We will seek increasing financial support from the community, especially from those visiting the Museum, mainly by effective merchandising and donations.

We will provide opportunities for staff to contribute to the development of the Museum, realise their own potential and co-operate with others to achieve those ends. It is intended that staff will contribute to a range of Museum programs beyond the discipline in which they work. We will seek new ways to advance the Museum's goals, rather than emphasise traditional roles and procedures. Equality of opportunity in employment, health and safety and staff development will be emphasised.

Resources are focussed on specific programs and projects, especially those which we are in a unique position to undertake and in which we can achieve results of a superior quality. Authority to manage resources is delegated to those in charge of programs. Evaluation of the success of programs, and of staff conducting them, will be a central feature of management.

We will account for the way in which we use the support gained from the community to achieve our objectives. We will be effective financial managers. We will introduce new technology where there is good evidence that it will help to achieve the Museum's goals.

We want the Museum to be an exciting and rewarding place to visit and work in.

Mission

The Australian Museum's mission is to increase and communicate knowledge and encourage understanding of our natural environment and cultural heritage, especially in the Australian region: the conduct of original research and the maintenance and improvement of collections are central to the achievement of the mission.

President's Report

At the beginning of this year I wondered (only for a moment), whether we'd taken on too much. Imagine: opening a new building, filling it immediately with major exhibitions; starting an international scientific speaker project; doubling the size and quality of our sixty year old *Australian Natural History* magazine; reorganising the shops and food services; and maintaining (nay, improving) our regular responsibilities of education, scientific research, display and publishing - all at the same time.

It's a splendid tribute to Dr Des Griffin and his excellent staff that all this was achieved with hardly a hiccup – though a full year of unceasing rainfall didn't help! We also established an Australian Museum Foundation (late in the last financial year) under Reg Watson who chairs the State Bank and which now includes Ken Myer, John O'Neill, Geraldine Paton, Ross Cribb, Telford Conlon and Professor Peter Farrell. They have already raised significant funds.

One of the main projects for which we need substantial investment is a laboratory tower to give our scientists proper research facilities away from the catacombs. This enterprise will be a co-venture with private industry – companies will lease space in the tower. Our scientists will therefore have daily contact with those from other concerns. I'm delighted to say that the Minister for the Arts, Mr Peter Collins, has given his blessing to the scheme.

We have continued to explore many ways to commercialise aspects of the Museum's resources. The halls of both the old and the new buildings are splendid venues for meetings, receptions, lectures and film shows and are being hired as such extensively.

The skills of our scientists are also being used by business and bringing much needed funds to us. At the same time we are at one with the State Government in resisting general entrance charges to the Museum.

Our scientific research and scholarship is, as ever, of world standard. Dr Tim Flannery has published significant discoveries (notably of a new species of tree kangaroo, found in the Highlands of PNG) as well as leading discussions on the ever-present problem of extinction of species in the Pacific region.

Dr Pat Hutchings was awarded a DSc by the University of Newcastle (UK) for her work on annelids. The 10th Conference of Museum Anthropologists was held at the Australian Museum. In fact, the profile of the Museum is growing ever more – the number of positive mentions in the media far exceeds that of any equivalent institution in Australia.

Above all we are telling the public and official bodies that the Australian Museum is a centre for providing scientific information essential for an understanding of the Australian environment. We have been doing this for over 160 years. But, given the realisation in recent times, that the world and Australia, faces such worrying natural changes of which Greenhouse is perhaps the best known, the Trust believes it is vital that the importance of our research in this regard is appreciated. The scientific work of the Australian Museum and the

educational services and lectures we maintain to disseminate it, is the bedrock for appropriate environmental reform in Australia.

To augment this, we have instituted a series of lectures by scientists of world renown. Called the 'Science Super Series', it has already been graced by Professor David Suzuki of Canada (twice), Dr Richard Leakey of Kenya and Academician Sergei Kapitsa (USSR). Professor Paul Ehrlich comes soon and we have indications of willingness from Sir David Attenborough, Professor Carl Sagan, Professor Steven Jay Gould and many more.

Meanwhile the Museum's extraordinarily challenging exhibitions program has been a tremendous success. The attendance for Ancient Macedonia was at least 50% higher than we budgeted for. Now that the Australian Museum's program of displays and activities for the public is clearly doing so well, it must be maintained properly. Access, in other words, must not be diminished.

As for the *Australian Natural History* magazine, a publication produced by the Museum for over 60 years, it has been reborn with more pages, brighter articles and every ingredient to meet the demands of readers in the 1990s. Yet again the magazine has won the Whitley award for best periodical. Congratulations.

And congratulations too, to the Museum Society, TAMS. Their efforts have been beyond praise.

Robyn Williams

Director's Message

There has been a radical change in the profile of our exhibition spaces. No more will we devote all our exhibition efforts to semi-permanent exhibitions on the diversity of the natural World: we have entered the 'blockbuster' business, bringing diverse exhibition experiences from all over the World. And we are devoting much greater attention to interactive exhibitions.

In any society museums embody what we value in our past: what objects, what events, what facts are important, what should be revered or learned or known. Museums therefore are unavoidably linked to our view of ourselves, they convey approved values and attitudes. Unfortunately, many museums are seemingly designed to evoke a reverential attitude to those in power and their values, the officially accepted view. An understanding of different views of why the World is like it is, of where we came from and where we are going may be ignored. The view of the ordinary person is usually ignored. It's like history being the gossip of winners, as Australian author Frank Moorehouse said recently.

Museums used to be seen as places to store the collectibles of the rich. To some they were places where one put stuff that was no longer wanted, like mum's old iron. Some museums in Australia recently have toyed with the idea of removing the word museum from their title altogether. In Europe and America no such thing is thought of. Museums there are strongly supported by the community and, in North America and France for instance, by government.

Social, moral and political issues are inherently a part of museums. But they must address issues of current concern. The Australian Museum has tried to do this in the last few years through its public and research programs. It takes great effort and commitment and requires the cooperation of skilled staff. We do have the knowledge and resources and we are accessible.

The Australian Museum in its 162nd year completed marking the bicentenary of European settlement of Australia by opening the last two of its four special exhibitions. In September, the internationally renowned expert on human evolution, Richard Leakey from Kenya, opened the exhibition "Tracks Through Time: The Story of Human Evolution". In November, the Minister for the Arts, the Hon. Peter Collins, assisted by representatives of Sydney's recent immigrants to Australia, opened "Rituals of the Human Lifecycle", an exposition of human cultural diversity.

There has been a radical change in the profile of our exhibition spaces. No more will we devote all our exhibition efforts to semi-permanent exhibitions on the diversity of the natural world: we have entered the 'blockbuster' business, bringing diverse exhibition experiences from all over the World.

With the closing at the end of March of the exhibition 'Pieces of Paradise', which won the Westpac Museums Association of Australia award for the best museum exhibition in Australia, we staged 'Ancient Macedonia' in our large and modern travelling exhibition space.Toured by the International Cultural Corporation of Australia and supported by the Australian Government, OTC and many other organizations this contained important new finds associated with Philip II and his son Alexander the Great, items of gold, embossed metal ornaments, ceramics and jewellery. It has drawn tens of thousands of people including many from Sydney's Greek community.

Three years ago, we planned a huge set of recreated environments along the western (College St) galleries. With a re-evaluation of other attractions in Sydney, those plans have given way to the expansion of the successful Discovery Room. This hands-on area provides exciting opportunities to find out all kinds of interesting things and learn by doing. We will establish also a resource centre linked to the Discovery Space to give better access to information about what the Museum knows and does. These are unique contributions.

Following Dr Lyn Sutherland's 'boomerang' concept of Australia's volcanic belt last year, further links have been made between our past volcanos and the sources of gemstones. Dr Tim Flannery's book *Mammals of Papua New Guinea* and a report by Dr Jeff Leis and Tom Trnski on Larvae Indo-Pacific Shore Fishes are significant contributions which will assist the countries of our region to manage and conserve their faunas. And a survey of Elizabeth and Middleton Reefs is just one example of biological survey for which this Museum is especially well equipped to undertake.

We gave greater attention to improving our services to the public through regular reviews by senior staff. Development and coordination of our marketing efforts was one of the major aspects of the review of our long term corporate plan.

We also reviewed all major activities of the Museum, existing and potential, to determine what new responses were needed. And we examined the opportunities for the commercialisation of a number of activities: those not needing substantial outlay of capital or investment and likely to yield a good return on effort will proceed immediately. Others will go forward with assistance from consultants as necessary.

A thorough review of the Museum by the Office of Public Management of the NSW Premier's Department assisted us in reviewing our activities.

This year we also looked at how we could respond even more effectively to issues concerning the environment and cultural heritage. There was a huge increase in media coverage of the scientific work of the Museum.

I was able to go this year again, with the encouragement of the Museum Trust and support of the government, to visit museums in north America. At the annual meeting of the American Association of Museums in New Orleans in June 1989, Leland Webber, former director of the Field Museum of Natural History in Chicago was presented with the Distinguished Service to Museums Award. "Museums", Webber said, "exist to encourage and instill the joy of intellectual and aesthetic discovery".

Increasingly, museums seem to be losing sight of this as a major focus. Things are certainly not what they used to be in boardrooms and director's offices.

Managing a museum these days is often seen as requiring first and foremost the raising of funds through corporate sponsorship and commercial activities, understanding financial statements and complying with all the new policies on equal opportunity, accountability, letting in the internal auditors. Nowhere is this shown more starkly in some museums than by the marginalisation of those involved in scholarship and in curatorial functions from mainstream decision making.

Managing museums requires concern for the visitor's satisfaction with the museum's public offerings; it does mean attracting large numbers of visitors who will go away very satisfied, tell others, and return themselves. Most of all it requires an emphasis on creativity, on intellectual leadership, on encouragement of staff.

Marketing continues to be at the forefront of discussion about museums and other not for profit organisations - being responsive to the opportunities museums can bring the public. But too often museums allow others to define reality, including the reality of the marketplace. Museums should be getting into the debate, be at the forefront of setting the agenda, saying what is important.

Of course there are economic problems, of course museums must be efficient, must change, innovate, be more flexible. But economics is a part of life, not life itself, as Australia Council Chairman, Donald Horne, said this year.

As always, I take this opportunity to thank President of the Trust, Robyn Williams AM, and my colleagues who have this year shown themselves seemingly limitless in the energy and resources they are prepared to devote to the Museum.

As the year ended, further restrictions on funding loomed on the horizon. Independent sources of funds will continue to be a consuming concern, almost an obsession. While it is likely that the Museum will survive, one must ask where the concern for the joy of intellectual and aesthetic discovery will fit.

The most important developments will be the progress we make in contributing to understanding of the natural environment and cultural heritage of Australia. Our expanded Discovery Space and managing the new exhibition and education profile will be important. So will scholarship, our contribution to new knowledge.

Visiting a museum should be fun, it should be exciting, it should be entertaining for people of all ages. Equally, thew Museum's future will be determined by how it responds to opportunities to determine the agenda, to influence the thoughts and aspirations of people, of the community. It ought not to be shaped mainly by a concern for managerialism, for accounting, by embracing of monetarism or of notions that great discipline is imposed by free market forces and the cutting of government expenditures.

On January 26, 1989, the *Sydney Morning Herald* in a front page article asserted that concern for the environment and the multicultural nature of Australian society were the most important issues facing Australia. Will the Australian Museum be in the forefront of communicating with the public about those issues in credible and exciting ways? The answer may well be critical.

Long Term Corporate Planning

The Museum's corporate planning system allows us to identify major goals in the short-term and long-term. A central feature of the process is that it is done at several levels. The general plan addresses long-term objectives while the Divisional Plans address objectives most relevant to people in those divisions in the short and medium-terms. The aim is to make these plans the plans of the staff that prepare them. This year the Museum had an extensive review of its corporate plan.

Some of the most significant points in the latest review are to identify and implement new proposals which would put the Museum in a uniquely successful situation; significantly improve services to visitors and public areas; bring eminent scientists from overseas to give public lectures and lead workshops; review the entire extension services offered by the Museum; expand fund-raising and revenue generation; investigate mixed commercial/government building development on Yurong Street frontage; advance fundraising from the business community and explore commercialization of Museum activities.

Management Review

A thorough review of the Museum by the Office of Public Management of the NSW Premier's Department assisted us in reviewing all our activities. The Report is a comprehensive assessment of the Museum's performance in its principal activities, its public profile, cooperation with like agencies and policy formulation and strategic planning.

It recommended further strengthening of longer-term planning, greater

attention to business opportunities, more cooperation with other museums and interested community groups. It stressed the need for a careful review of the integration of public programs - exhibitions, education and other functions - and a formal assessment of community interest in topics presented.

The Report noted that the Museum is productive, produces high quality scientific research which has utility and impact on other scientific work. It has a good track record of competing with other organisations for external research grant funds.

A community survey conducted by the Review Team gave more valuable information on the Museum's audience and perceptions by the community of the Museum and other similar attractions. People expect the Museum to be both educational and entertaining, credible but neither trivial or over serious; we have good 'market-share', to use the jargon, and are conveniently located.

Our new exhibitions, especially the frequently changing travelling ones will make us much more a place for regular visits.

Trustees

Mr Robyn Williams AM has been producer/presenter of the ABC Science Show since 1975. His television experience includes *The Uncertainty Principle* , recently released as a book, and documentaries on Australian wildlife. His most recent book is *Here Come the Philistines.* He has served as a member of the Commission for the Future since its inception and is currently its Deputy Chairman. Until recently he was a member of the National Commission for UNESCO. He has had a number of books published including the Best of the *Science Show* and is a regular contributor to the Museum's magazine, *Australian Natural History.* He joined the Trust in 1984 and was elected President in 1986.

Mr Colin Bull AM, BSc was Managing Director of Johnson and Johnson Pty Ltd 1969–81 and Chairman 1982–85. He is a Director of Manufacturers Mutual Insurance Company and of Clyde Industries. He was a member of the NSW Manufacturing Industry Advisory Council, Chairman of the NSW Innovation Centre, Executive Member of the Grocery Manufacturers of Australia Ltd and was Chairman in 1974 of that group, Council Member of the Chamber of Manufacturers of NSW since 1979 and was President in 1981 and 1982. He joined the Australian Museum Trust in 1985.

Dr Telford James Conlon holds degrees in Chemistry from Sydney University and University College London and a PhD in Biophysics from the University of New South Wales. As well as having been a lecturer at the NSW Institute of Technology, he was on the staff of the Minister for Science in 1973 and was a consultant on science policy to the Royal Commission on Australian Government Administration and the Department of Foreign Affairs. He was a director of the Australian Institute of Political Science for fifteen years and was Chairman from 1979 to 1980. Until recently he was a Research Associate of the Neurobiology Unit at the NSW Institute of Technology. He is now a company director.

Mr Richard Clark, born and educated in Western Australia, is General Manager, Corporate and Public Affairs for Caltex Australia Ltd. He has had assignments in most states including that of State Manager, Queensland and more recently of NSW. He is a Trustee of Young Achievement Australia, NADOW, and the Committee for Economic Development of Australia.

Dr Malvin L Eutick is involved in the evaluation and promotion of commercial opportunities for innovative biomedical and other high technology companies for the Australian venture capital group, Technology Investment Management Limited. Previously, he was the General Manager for the Australian and New Zealand biotechnology operations of the Swedish pharmaceutical company, Pharmacia-LKB. He holds degrees in Biochemistry and Museum Studies. His interests in museums and their administration and management has resulted in his publishing several books including the *New South Wales Museum Yellow Pages* and a guide to the legal problems surrounding the acquisition of museum objects.

Mr John G Fink was born in Melbourne and educated in Sydney. He is currently on the Board of Management and Consultant to Universal Press Pty Ltd, Consultant to Singapore Press Holdings and a director of their Australian company, Times Enterprises (Australia), and Consultant to the New Zealand Broadcasting Corporation. Previously,he was Proprietor and Managing Director of Gregory's Scientific Publications. He has had many senior positions including: Director of Australian Consolidated Press Ltd (ACP), Managing Director of Golden Press Pty Ltd (book publishers), Managing Director Murray Leisure Group Ltd. (magazine publishers, Gregory's Publishing Company and Kosciusko Alpine Resorts), Managing Director Video Tape Corporation, Marketing Director ACP Ltd, Deputy Managing Director Victorian Broadcasting Network, Advertising Director ACP Ltd, National Sales Manager GTV Channel 9 Melbourne.

Professor Alistair Gilmour obtained his Doctorate from Monash University in 1970 for research on an estuarine fish population. While with the Ministry for Conservation in Victoria he led the marine biological component of the Ministry research in the Port Phillip Bay, Western Port Bay and Gippsland Lakes regional environmental studies.In 1980 he was appointed Executive Officer of the Great Barrier Reef Marine Park Authority, based in Townsville, and was involved in all aspects of the activities of the Authority up to 1985, when he was appointed to the Chair in Environmental Studies at Macquarie University. His research interests are in coastal management, marine parks, and in environmental management in general, with special interests in environmental impact assessment and environmental mediation. He was elected a Fellow of the Academy in 1977 and of the Institute of Biology (UK) in 1986.

Dr Jonathan King graduated in Political Science at both the London School of Economics and University of Melbourne, worked as a print and electronic journalist with mainstream newspapers and television stations in Britain and Australia and lectured in Political Science in Britain, USA and Australia, before producing the $11 million First Fleet Re-enactment Expedition for Australia's Bicentennial Celebrations. The author of fifteen books on Australian and American history and politics, Dr King, who also works as a consultant to the environment movement helped produce the 1988 Australian Conservation Foundation's National Environment Conference. In 1989 he was commissioned by the New South Wales Government to write a book on Governor Phillip. A member of the Celebrity Speakers team and director of the Rainforest Foundation he also gives talks to corporate and community groups on history and heritage. He joined the Trust in 1988.

Dr Judy Messer has a sociology degree from Macquarie University and a PhD from the University of New South Wales. Dr Messer has been involved in research, tutoring and lecturing at both the University of NSW and Sydney University. Her PhD thesis dealt with the ecological and sociological implications of structural change in agriculture. Dr Messer is (voluntary) Chairperson of the Nature Conservation Council of New South Wales which is the umbrella body for 79 NSW environmental organisations. She is also a member of the Western Lands Advisory Council. Dr Messer is particularly interested in the maintenance of biological diversity, and the conservation of natural ecosystems and remnant native vegetation.

Dr Richard Walsh is a graduate in arts and medicine from the University of Sydney. He was the founding editor of *OZ* and *Pol* magazines and of the weekly *Nation Review*; he was Chief Executive at Angus and Robertson Publishers for fourteen years and is currently Publisher at Australian Consolidated Press. He is a director of the Australian Australasian Medical Publishing Company, which produces the Medical Journal of Australia, and Chairman of the Australian National Commission for UNESCO.

Trustees are appointed uner the *Australian Museum Trust Act:No 95, 1975*. Appointments are four year terms. Operations and procedures of the Trust are as in the above Act. The Trust meets quarterly; the Director is Secretary to the Trust.

Anthropology

The Division of Anthropology aims to increase and disseminate knowledge about the archaeology and ethnography of Aboriginal Australia, the Pacific and Indonesia. We have large collections from these regions around which our research, publications, exhibitions and other programmes are built. We also support indigenous community cultural projects within these regions, as we are given opportunity to do so.

Highlights

The exhibition, 'Pieces of Paradise', curated by Dr Jim Specht and drawn from our Pacific collections, won the 1988 Westpac Exhibition of the Year Award.

The Division hosted the 10th Annual Conference of Museum Anthropologists. The conference theme was 'Museum Anthropology in Australia. The Past, The Present, The Future'.

Through the exchange program between the Australian Museum and the Canadian Museum of Civilisation in Ottawa we are returning to them part of a very important Kwakiutl Indian collection, obtaining in return some high quality contemporary Kwakiutl material, and funding for priority acquisitions in other areas.

Research

With Dr R Fullagar, Dr R Torrence and N Baker, Jim Specht undertook further field work in the Talasea area of West NewBritain, Papua New Guinea, on the history of obsidian exploitation. Excavation at Bitokara Mission revealed a sequenceof obsidian use over about 4000 years, with a major change in technology about 3500 years ago. The human history of this area is likely to extend back into the late Pleistocene, since Talasea obsidian has been identified at other sites of this age elsewhere in New Britain and on New Ireland.

With Dr C Gosden of La Trobe University, Melbourne, Jim Specht was awarded a three-year grant from the Australian Research Council for an extended program of research involving the Kandrian and Arawe areas of the south coast of New Britain and the obsidian areas of the north coast. Dr Fullagar was also awarded a National Research Fellowship to work on this project for three years.

Lissant Bolton, together with Dr D Lipset and Dr K Barlow,worked in the Lower Sepik region of Papua New Guinea in the second field season of the Sepik Documentation Project. The Lower Sepik, a world of water, is home to a complex network trading objects, foodstuffs and ritual knowledge. The Project team studied howobjects fit into this system, documented the Museum's collections from this region and acquired contemporary artefacts for the collections. Reports and publications deriving from this project are now being produced.

Dr Robin Torrence joined the Division on a Museum Visiting Research Fellowship to study changes in the manufacturing techniques of obsidian-bladed spears from the Admiralty Islands, PNG. These changes reflect the impact of increasing trade with Europeans over the last 100 years. The research raises and addresses questions about how museum collections can be studied in the storerooms.

Betty Meehan spent one month at Maningrida, Arnhem Land working on the Djomi Museum and visiting the Anbarra community who were participating in a Kunapipi ceremony at a site on the banks of the large freshwater billabong, Balpildja. She also worked for a month as part of an archaeological team excavating Allen's Cave on the Nullarbor Plains. Others involved included Dr Scott Cane(Heritage Studies, Hall, ACT) and Rhys Jones (ANU). Collaborative research was carried out with Dr Rhys Jones (ANU) and Mr Tom Loy (ANU) with the aim of dating Aboriginal rock art. Samples taken from cave walls on Laurie Creek, Northern Territory indicated ochres had been fixed with human blood, which can be dated.

Val Attenbrow completed the first fieldwork season for the Port Jackson Archaeological Project. Stage One, funded by the Australian Institute of Aboriginal and Torres Strait Islanders Studies, involved locating and recording Aboriginal archaeological sites around Port Jackson and its tributaries. About 60 sites have been recorded to date. Aboriginal assistant and representative of the Metropolitan Local Aboriginal Lands Council, Ken Cutmore, helped for two months during Stage One.

Kate Khan and Ronald Lampert continued to survey and document changes in material culture in the western desert region of central Australia, at Yuendumu, Papunya and associated outstations. Over 70 artefacts and paintings were collected, with full documentation. Khan continued to document the early collection of Papunya paintings held by the Museum, with the old artists at Papunya, Haasts Bluff and outstations. Khan will be continuing research in the western desert in June/July 1989.

Stan Florek carried out archaeological field work at Hawker Lagoon, South Australia in association with Sydney University, participated in the archaeological excavation of Allen's Cave, Nullarbor Plains, and continued with archaeological fieldwork at Lake Eyre.

Collection Management

The year has been devoted to the move of all the Division's collections into improved storage facilities on and adjacent to the Museum's College Street site. With the closure of the Old Rushcutter's Bay store, the Aboriginal Move Team, directed by Aboriginal Collection Manager, Jane Bible, was responsible for moving the archaeological collections (over 100000 items) into the Yurong Street Annexe. The move of the greater part of the Aboriginal Ethnographic collections was also achieved during the year, even though heavy rain for several months at the beginning of 1989 hampered the proceedings.

Over 40000 individual artefacts, many very fragile, have been inventoried, relabelled, and organised for the move of the Pacific Collection, directed by Lissant Boltan and Sue Tomsett.

Zoe Wakelin-King, Other Areas Collection Manager, effected the move of the American collections into new storage. As part of move preparation, the Asian collection catalogues were entered into a word-processing data base. The Eskimo collections were catalogued in the same way as part of a research cataloging project undertaken by Beth Hise.

The program to photograph the collections also progressed during the year including over 400 objects from Arnhem Land and 500 fragile items from throughout the Pacific collections and 250 Eskimo pieces. Dr Torrence's research facilitated the recording of 300 Admiralty Islands obsidian-bladed spears.

In cooperation with the Library and Photography Sections, the Division initiated a program to register and catalogue the Museum's archival photograph collections. Karen Westmacott, under Nan Goodsell's supervision, processed over 1000 individual images.

Notable additions to the Australian collections have been a King Plate from the Sydney region inscribed "King Jackie, Illawarra", items made by the Timbery family at Huskisson on the NSW south coast, and a complete set of hunting objects and children's toys from the Broken Hill area, by Badger Bates. The major addition to the Pacific collection was a well documented collection of 232 items made in the Lower Sepik during the Sepik Documentation Project fieldwork. The Indonesian collections were also developed during the year with the purchase of a

number of pieces, notably a collection of 22 pairs of earrings from the Eastern Indonesian Islands.

Items from the Pacific collection were loaned to a number of major exhibitions, notably Assemblage of Spirits, organised by the Minneapolis Institute of Arts, USA; 1500 Jahre Kultur der Osterinsel, organised by the Senckenberg Museum, Frankfurt, FDR; and Terra Australis, organised by the Art Gallery of New South Wales.

Public Programs

'Rituals in the Human Lifecycle' opened in November 1988. The exhibition, developed by Dr Diane Losche and Dr Betty Meehan, draws on the Division's collections from many parts of the world.

A small exhibition drawn from the Pre–Columbian Peruvian pot collection has been on display at the University of NSW Library and Waverly Municipal Library.

Jim Specht and Phil Gordon have been involved in planning for the major exhibition, Taonga Maori, a co-operative venture of the National Museum of New Zealand and the Australian Museum, which will open in October 1989.

Members of the Division were involved in a large number of conferences and meetings during the year. We organised the very successsful Tenth Conference of Museum Anthropologists, held at the Museum in November 1988, at which six members of the Division gave papers. Betty Meehan organised a session on demography at the Conference on Hunting and Gathering Societies Dr N White (La Trobe), Dr R Jones (ANU), and Dr L Hiatt (University of Sydney). Betty Meehan alsospoke at the opening of the 4th Symposium of Australian Gastronomy.

Jim Specht presented a paper on the history of Lapita pottery at the Austronesian Design Workshop, held at the Research School of Pacific Studies, ANU. He also co-authored a paper with Fullagar, Torrence and Baker about their West New Britain archaeological research, presented at the Australian Archaeological Association national conference, Specht and Bolton both attended an international symposium on the Ethnography of Oceanic Art at the Baltimore Museum of Art, USA Specht presented the keynote address to the symposium, speaking about the return of objects to their countries of origin. Bolton presented a paper on theoretical approaches to the study of material culture. Specht also presented a paper and poster presentation at a Pacific-wide Cultural Heritage Workshop at the National Museum and Art Gallery, Port Moresby.

The Division ran a tutorial program in museum anthropology for the Museum Studies Unit at the University of Sydney, a number of members of the Division are involved in editorial work including the journal *Australian Archaeology*, papers given at the National Commission for UNESCO Seminar on the protection of moveable cultural heritage and the *Australian Museum Records*.

Jim Specht served as the museum representative on the council of the National Trust (NSW). He also continues as a member of the Oceania Publications Committee. Gordon acted as the museum representative on the Ministerial Task Force set up to examine the impact on Aboriginal communities of NSW heritage legislation.

Staff Changes

The year saw a number of changes in the staffing of the Department. Ron Lampert retired as Senior Research Scientist. Dr Val Attenbrow has joined the department for two years as a Scientific Officer. Phil Gordon has taken a number of years leave to work with the ABC. We are fortunate to have Carol Gartside, seconded from the National Parks and Wildlife Service, to act as Aboriginal Liaison Officer in his stead. A large number of temporary staff are working in the Division at present, employed to assist with the collection moves.

Visitors

Visitors to the Division included:
Mrs Dale Serjeantson from the University of London
Dr Frank Bayham from California State University
Dr. Richard Grant, New Zealand Consul General
Mr Kero Wetere, Minister for Maori Affairs
Dr Bea Medicine, California State University
Dr Athol Chase, Griffith University, Queensland
Mr Gale Sieveking, British Museum
Dr Lars Larsson talked to Betty Meehan about hunter/gatherer use of shellfish and Aboriginal mortuary practices
Ms Betty Ngurraba and Johnson Balangangba from Maningrida, Anabarra - colleagues of Betty Meehan's worked on the Arnhem Land artefacts in the collection
Dr R Torrence, University of Sheffield, UK
Dr C Sands, ORSTOM, Noumea, New Caledonia
Dr D Frimigacci, ORSTOM, Noumea, New Caledonia
Mr K Huffman, National Cultural Centre, Vanuatu
Ms P Swadling, National Museum, Papua New Guinea
Professor D Growe, University of Wisconsin, USA
Dr J Davidson, National Museum of New Zealand
Dr C Chippendale, University of Cambridge, UK
Dr P Tolstoy, Smithsonian Institution, Washington, USA
Mr S Wickler, University of Hawaii
Dr S Bard, Hong Kong
Mr L Bouters, Unesco Regional Office, Western Samoa
Dr G de G. Sieveking, London, UK
Dr S Singh, Anthropological Survey of India, Dehli
Mrs Somlak, Museum of Fine Arts, Bangkok, Thailand
Mr M. Tongia, Cook Islands Museum, Rarotonga

Donations

We gratefully acknowledge donations of artefacts from Ms LM Bolton, Ms N Goodsell and Ms S Thomsett; Mr Curtis, Department of Main Roads, Mr Duncan, Mr AW Hurt, Ms A Kenny, Mrs Kerr, Mr J Magers, Powerhouse Museum, Reserve Bank, Mr LG Sellars, Miss GM Smith, Ms P Try.

Robyn and John Maxwell donated their magnificent regional collection of Indonesian textiles – 97 items including fine quality Javanese batik, ikat and other handwoven textiles from the Eastern Indonesian Islands, Sumatra, Borneo and Sulawesi.

Future Plans

With the completion of the collection and office moves, the Division will be liberated to develop new research and collection management programmes, and to devote more resources to those already implemented. Plans for the future include:

Development of a new field documentation research project for the Pacific collections, following the successful completion of the Sepik Documentation Project.

- Excavation of archaeological sites in the Sydney region in the Port Jackson Archaeological Project.
- Fieldwork in New Britain, PNG by Specht, Torrence, Fullagar and Baker.
- Exhibition of the Maningrida Weaving Collection in the Atrium space during 1990.
- Upgrading of the contemporary section of the Aboriginal Gallery.

Earth Sciences Division

Comprehensive collections of minerals, rocks, meteorites and fossils are managed and made accessible to researchers, educators and the community. Research mainly explores Australia's volcanic rocks, their minerals and gemstones, and Australia's fossils, mainly fish and brachiopods of the Palaeozoic Era and reptiles of the Mesozoic Era. Results are presented to the scientific and general community through lectures, publications and the media.

Australia's geological heritage is of vital concern, involving acquisition of important specimens, monitoring of geological sites and provision of information to the public and organisations.

Highlights

- 'Tracks through Time' Gallery
- bicentenary features on Australian Minerals
- RO Chalmers 'Sixty Years as a Scientist' Symposium

Research

Intriguing links between Australia's past volcanoes and sources of gemstones, such as sapphire, ruby, diamond and zircon are emerging from the latest studies. Joint work between Dr Lin Sutherland and the Australian National University in Canberra harnessed the unique powers of the ion probe to date gem zircons from Queensland to Tasmania. Mrs Gayle Webb and Jane Barron examined pink sapphires and ruby from the Gloucester–Barrington area, measuring their gemmological properties and looking at their surfaces by Scanning Electron Microscope. Mr Ross Pogson identified and photographed secondary uranium minerals from the Northern Territory, using the Electron Microprobe at CSIRO, North Ryde, and the Scanning Electron Microscope.

The volcanic research stimulated much media interest, after Australian Geographic published a small feature on it. This showed Lin Sutherland's concept of 'boomerang' patterns amongst Australia's former volcanoes and was, illustrated in vivid colour. Over thirty newspaper, radio and TV items appeared. It awoke a realisation that Australia is still potentially volcanically active in places like Tasmania.

The palaeontological research gained new impetus. Dr Alex Ritchie and co-workers linked together strange fossil fish that swam the waterways of China and Australia over 350 million years ago. This armoured fish, called Sinolepis in China, had relatives now found in rocks at Grenfell, New South Wales. To study these intercontinental links of Devonian time, Dr Ritchie was joined by two Chinese workers. Dr Zhang Guorui from the Academy of Sciences and Dr Wang Shitao from the Institute of Geology, Beijing, as Visiting Fellows at the Australian Museum and Queensland Museum respectively. The affinities of these fish were further discussed when the trio visited other Australian workers at the Bureau of Mineral Resources and Australian National University in Canberra.

Death throes of dinosaurs, a controversial topic attracting world-wide study from scientists, also received attention. Lin Sutherland reviewed the theories for a catastrophic end to the dinosaurs, either by meteoritic impact or by huge volcanic eruptions. His work suggested much greater global volcanism at the time of the dinosaur disappearance than previously realised. His views will be published as a Presidential address to the Royal Society of New South Wales.

Fieldwork

On the mineral side, Lin Sutherland combined with Alan Robertson, Geological Survey of Queensland, and Larry Cook, BP Minerals, in mid-1989 to study volcanic regions in the Monto-Mackay areas of central-north Queensland. He also visited gemstone sites in northern New South Wales with Ross Pogson and Gayle Webb from the Mineral Section, and on some trips they were accompanied by Drs Julian Hollis and Armstrong Osborne. These trips sampled zircons for age-dating and made magnetic surveys of suspected volcanic pipes.

On the fossil side, Alex Ritchie took the visiting Chinese specialist, Dr Zhang Guorui, and Dr Gavin Young to the Bureau of Mineral Resources around the fossil fish sites in the Grenfell-Cowra region, New South Wales, in April 1989, and in southeastern NSW near Eden, in May 1989. Robert Jones investigated a discovery of concretions that resembled fossilized animal droppings near Port Macquarie in May 1989.

Collections

Gem materials bought for the new Gem Room included colour ranges of cut zircons and garnets from the Harts Range region, Northern Territory. Other unusual cut stones included diaspore, hessonite garnet, prehnite, aragonite, apatite and moldavite (a Czechoslovakian tektite glass). Several crystals and cut stones of sapphire and zircon came from purchases and donations, including a magnificent orange sapphire from New England of 3.4 carats. Another donation provided a range of green, pink, yellow and 'cognac' diamonds and a 'cats–eye' chrysoberyl.

Amongst new overseas minerals, came an exchange of Italian minerals and a purchase of a spectacular piece from India implanted with stilbite 'bowties' and apophyllite crystals. The most important Australian additions were purchases of lead and silver minerals from the Elura Mine, near Cobar, NSW and crystallised sulphide minerals from the new Cadyjebut Mine, Western Australia. A type specimen of the rare sulphide mineral mawsonite, named after Sir Douglas Mawson (the famous Australian mineralogist and Antarctic explorer) was a significant exchange.

The fossil collections gained 3250 specimens, including progressive incorporation of types from the University of New England collection. Amongst nineteen loans of fossil material, one was of display specimens to augment the 'Kadimakara' display at the Newcastle Regional Museum. The plant fossils were extensively examined by the visiting researcher Dr RH Wagner. A teaching collection of fossils and minerals was donated to Connels Point Public School.

A microcomputer was bought to compile a data base for the mineral collection. Entry of the gemstone collection has started. Urgent conservation measures arrested corrosion in the meteorite collection. Susceptible specimens were cleaned and sealed in protective polythene pouches during rearrangement of meteorites into groups of different types. Most of the work was done by a student, Peter Christie.

Plesiosaur Reconstruction

A remarkable opalised skeleton of a fossil Plesiosaur, discovered by miners in 1987 at Cober Pedy, South Australia, came into the Palaeontology section for reconstruction during the year. Privately owned, the thousands of fragments needed piecing together. A student, Paul Willis, supervised by Alex Ritchie and Robert Jones, spent 450 hours of painstaking work extracting, cleaning and reassembling the pieces.

A plesiosaur new to science emerged. Within its rib cage were gizzard stones and tiny fish vertebrae – its last meal of 120 million years ago, before it died and became opalised! Comrealty Limited and its chairman, Mr Sid Londish, owners of the plesiosaur remains are funding further work to complete the reconstruction. This unique and fragile part of Australia's natural heritage will go on public display in the Australian Museum in late 1989.

Exhibits

Dr Alex Ritchie was the scientific officer involved in researching and organising specimens for the layout of 'Tracks through Time: The Story of Human Evolution'. The Exhibit, opened by Dr Richard Leakey from Kenya, has attracted much comment.

The Gem Room in the Planet of Minerals Gallery was designed by Marie Louise Brammer and Gayle Webb, who also organised a team of jewellers to make special fittings for the gemstones.

A special bicentenary display featuring the 'Planet of Minerals' Gallery was assembled and sent to the British Museum (Natural History) in London, for a conference on 'Mineralogy and Museums' in July 1988.

Two small invited displays were taken to the 25th National Gem and Mineral Show in Devonport, Tasmania, in March 1989, by Lin Sutherland and Gayle Webb. The displays showed examples of the Museum's gemstone collection and aspects of the 'Planet of Minerals' Gallery.

Museum and Community Activities

The Museum Open Day Events involved public talks on minerals, volcanoes and fossils given by Drs Lin Sutherland and Alex Ritchie. The Mineralogy and Palaeontology staff also participated in 'Meet the Scientist' programs and other activities in the Discovery Room.

Lin Sutherland served as Geological Editor for the *Records of the Australian Museum* . He gave talks and tours to the Australian Museum Society, Gemmological Association of NSW and the National Mineral and Gem Show in Devonport, Tasmania. Ross Pogson assisted the Materials Conservation and Malacology Sections with X-ray and optical work on crystalline alteration products. He also acted on the 'Planet of Minerals' Project Team. Joan Henley served on that Project Team and on committees for planning the Museum resource centre and new staff area. Gayle Webb replaced Joan Henley on the Planet of Minerals Project Team and demonstrated to the Gemmological Association.

Robert Jones was convenor of the Museum vehicle committee. He gave talks to the Gemmological Association of NSW on opalised fossils from Lightning Ridge and to the Lord Howe Island Museum and Fossil Club of New South Wales on Meiolania, the extinct horned turtle from Lord Howe Island. He demonstrated to dental technician students on fossil skulls and teeth.

Appointments

Dr Lin Sutherland was appointed as an editor for the *Australian Mineralogist* and an Australian representative on the International Mineralogical Association Commission on Museums and Gem Materials. He became a vice president of the Royal Society of New South Wales and was elected a Fellow of the Australian Institute of Geoscience. Ross Pogson sat on the Council of The Mineralogical Society of New South Wales. Gayle Webb was elected to the Council of the Gemmological Association of NSW.

Alex Ritchie continued on the Councils of the Linnean Society of NSW and the Antarctic Society of Australia. Robert Jones was a member of the Geological Sites and Monuments Subcommittee of the Geological Society of Australia and also the Council of the Riversleigh Society.

Conferences

The inaugural International Conference on 'Mineral and Museums' held by the British Museum (Natural History) in July 1988 was attended by Ross Pogson. He also collected minerals from British mining areas on an associated excursion. He followed up with a talk on the minerals of this area to the Mineralogical Society of NSW in March 1989.

A paper was presented at the New England Orogen Conference in Armidale in November 1988 by Lin Sutherland. He also attended a workshop on the Lower Crust at the Bureau of Mineral Resources in July 1988 and the Greenhouse '88 conference in Sydney, November 1988.

Both Alex Ritchie and Robert Jones attended the Conference on Australian Vertebrate Evolution, Palaeontology and Systematics at Terrey Hills, Sydney, in early 1989. Robert Jones went to the 23rd Newcastle Symposium in April 1989.

RO Chalmers Symposium

Oliver Chalmers, a well known identity at the Australian Museum, remained an active Research Associate. He first started in the Mineral Department sixty years ago on June 4th 1929, as a cadet mineralogist and later as Curator of Minerals until his retirement in 1971. He formed many contacts throughout Australia and around the world.

To honour his long association, the Division of Earth Sciences, with the support of the Museum Trust, held a special 'Sixty Years as a Scientist' Symposium on June 5th & 6th, 1989. Scientists associated with the Museum's geological research over the years presented 25 papers on topics related to Oliver Chalmer's interests in Australian minerals, rocks, gemstones, meteorites and landscapes. A social dinner was held on June 5th to toast his achievements.

Bicentennial Publications

Invited contributions to bicentennial publications were printed, though some did not appear until 1989. The Australian issue of *The Mineralogical Record* , had three articles involving Australian Museum staff, Lin Sutherland, Joan Henley and Gayle Webb. The article on zeolite minerals of volcanic rocks of New South Wales by Brian England and Lin Sutherland was awarded 'The Most Outstanding Article to appear in *The Mineralogical Record* in 1988 by The Friends of Mineralogy at the Tucson, Arizona, USA meeting.

The bicentennial volume on the *Geology and Mineral Resources of Tasmania* to commemorate RM Johnston's 1888 Systematic Account was published in March 1989. It has articles on the Tertiary volcanic rocks by Lin Sutherland.

Future Plans

- Establish the Invertebrate Palaeontologist
- Consolidate the newGem Room
- Prepare publications on the Museum's gemstones
- Prepare plans for an analytical geological laboratory
- Develop geological heritage and environment geology
- Promote earth sciences as an essential understanding.

Overseas Visitors

Dr DC Green, Department of Geology, Cambridge shire College, UK (isotope geochemist)
Dr .S Fiske, National Museum of Natural History, Washington, USA (volcanologist)
Dr J Grice, Ottawa Museum, Canada (Curator of Minerals)
Dr M Feinglos, Duke University Medical Centre, N Carolina, USA (Mineral collector).
Dr RH Wagner, Jardin Botanico de Cordoba, Spain (palaeobotanist)
Dr BS Venkatashala, Birbal Sahni Institute, India (palaeobotanist)
Dr Heidi Anderson, Botanical Research Institute Pretoria, Republic of South Africa (palaeobotanist)
Dr G Poinar, University of California Berkeley, USA (invertebrate palaeontologist)
Dr B Neuman, Institute of Geology, University of Bergen, Norway (palaeontologist)
Dr ND Newell, American Museum of Natural History, USA, (invertebrate palaeonotologist).

Volunteers: B Mitchell, E Hepburn, J Edwards, M Daniells.

Evolutionary Biology Unit

This Unit was established in 1988/89 to consolidate the Museum's initiatives in biochemistry and electron microscopy. These fields have the potential to solve questions which have resisted the best efforts of systematists for generations. The Unit is also responsible for the institution and maintenance of a frozen tissue collection. This will serve many scientific purposes. Not the least of these is that the collection represents a commitment to preservation of the genetic material of a vast array of wildlife.

Highlights

- Commissioning of the scanning electron microscope
- Establishment of the electrophoresis and molecular biology laboratory
- Organization of a large-scale frozen tissue collection

Scientific Services

Electron Microscopy

Scanning electron microscopes (SEMs) enable observation of intact specimens at very high magnifications revealing a wealth of morphological detail, in even the tiniest creatures, which was undreamt of prior to the development of these machines. The suite of rooms to house the Museum's SEM and its ancillary equipment was completed in November 1988. Since then the Museum's researchers have been making maximum use of this highly successful new facility. Photographs from this SEM have been reprinted in publications as diverse as *Australian Natural History, Muse, Australian Shell News, The Sydney Morning Herald* and many scientific papers.

Histology

The work of this laboratory involves cutting very thin 'sections' or slices (1/100 mm or less) of tissue samples which have been embedded in a supporting medium. These sections are then stained to reveal structural details when they are examined by light microscopy. The histology laboratory, walled up during recent building construction, is now operational again providing services for a number of research projects involving fish, insects, snails and sea-slugs.

Electrophoresis

This technique involves separating proteins by placing them on an inert gel, subjecting them to an electric current and then staining the gel so that the position of a given type of protein is revealed as a colour producing by-product of its enzymic action. Organisms differ in the mobility of their proteins in electric fields. These differences (for the same type of protein from several species) can be used for many purposes. For instance they can provide information to determine how closely related species are, whether there is more than one species in a collection which all appear the same and what males and females are in each species where there is a series of taxa, where the two sexes are dissimilar in appearance. A number of studies utilizing electrophoresis have commenced. These include work on Tasmanian cave opilionids, ocean perch, skinks, snails from estuaries and artesian springs, and New Guinea possums. Studies in each of these projects has been very useful in identifying new species and in clarifying the relationships between them.

Molecular Biology

Molecular biology is the study of the genetic material at the biochemical level. Its methods give a variety of types of information capable of identifying and classifying organisms. One such method, known as 'restriction fragment length polymorphism' analysis has been set up in the laboratory at the Museum. This technique uses enzymes known as restriction endonucleases to cut DNA (the genetic material) into molecules of sizes which are characteristic of the individual from which the DNA was taken. The differences between these characteristic sizes can be used in the same manner as protein electrophoresis, and with even greater flexibility. The Unit's first project to use this technique is a study of the fruit bats of Northern Australia and Papua New Guinea.

Future Plans

- Purchase of a good quality stereomicroscope for SEM preparation.
- Set-up of a second work station in the SEM preparation area.
- Purchase of a critical point dryer for the SEM.
- Establish a DNA sequencing capability in the molecular biology laboratory.
- Prepare methods for the analysis of chromosomes.
- Computerize data relating to the frozen tissue collection.

Invertebrate Zoology

Invertebrates (animals that have no backbones) greatly outnumber all other animals and directly affect man and the environment in countless ways. A gauge of general interest and involvement with invertebrates is the fact that public inquiries to the Museum on invertebrates, particularly spiders and insects, greatly outnumber those to any other section.

Highlights

The most exciting acquisition was a living fossil donated by French scientists collecting in deep water off New Caledonia. This was a new species of stalked crinoid (a sea lily, distantly related to star-fish) of the genus Gymnocrinus, which was previously only known from fossils from the Jurassic period (more than 140 million years old).

Dr Patricia Hutchings was the cruise leader on the Australian Museum's cruise on the "RV Franklin", the National Oceanographic Facility, in August 1988. They collected a wide variety of animals from depths of 500-3000 metres off the north-east coast of Queensland. Dr Jim Lowry led a second successful cruise on the "Franklin" to the Tasman Sea Mounts.

The S Palazzi collection of marine micromolluscs, mainly Mediterranean material, was purchased by the Trust and forms an important addition to the research collections.

Research – Why is it necessary?

Knowledge of Australian invertebrates and their relationships to the environment have grown significantly but often haphazardly over the last 200 years. Though in recent years research projects have been more organised and have had better defined aims, very little is still documented regarding Australia's invertebrate fauna, and vast numbers of species are not even named. Even many of those that directly affect human activities have never had any assessment of their habits or ecological significance. Our staff publish research results in many leading journals, including the Museum's publications, and information is passed to the public by lectures, the media, and on a one-to-one basis.

Entomology and Arachnology – insects, spiders and their relatives

Dr Michael Gray's examination of silk-producing structures was completed as part of a study of the relationships of the primitive filistatid spiders, supported by an Australian Research Council grant in 1989. In addition a pilot electrophoretic study was done to assess relationships between communal spider populations and species of the genus Badumna. A well known example of such a population is the massive communal web on the roof of the Grand Arch at Jenolan Caves. Cavernicolous spider faunas from the Southwest Tasmanian Heritage Area, Northwest Cape (WA), and the Undara lava caves (Nth Qld) were also studied. These previously unknown faunas are rich in relictual blind species of considerable zoogeographic significance. A report detailing the Tasmanian fauna was prepared.

Dr Marek Zabka, a polish spider worker, finished his stay as a Visiting Research Fellow in October 1988. He has submitted a paper on the jumping spider genus Ocrisiona and is preparing another on the flattened bark–dwelling jumpers of the genus Holoplatys.

Dr Glenn Hunt began working in Arachnology as an independent researcher this year. He works on harvestmen, a group of arachnids distantly related to spiders, and has completed a study of cavernicolous harvestmen from Tasmania. He has also been studying a new family of Southern Hemisphere harvestmen with an American worker, James Cokendolpher. This includes a pioneering study of the significance of spiracle structure (breathing pores). His research was supported by an Australian Biological Survey grant.

Much of our entomological research concerns the true flies (Diptera), so much a part of the Australian environment. About 8,000 Australian species are already known, but knowledge of the order is still very incomplete.

The long-legged predatory flies (Dolichopodidae) are being reviewed systematically by Dr Daniel Bickel. Some of these are predators of destructive bark beetles. He has recently finished a manuscript on one large subfamily, his work being supported by the Australian Biological Resources Survey.

Dr David McAlpine has completed the systematic study of Australian kelp flies with the assistance of Mr Roger de Keyzer through a Marine Science and Technology grant. Southern Australian coasts have the world's richest representation of these flies, but they were, till now, almost totally unknown. Dr McAlpine is also looking at the differences between insect species in terms of their adaptation to

different modes of life and the role played by specific characters in enabling each insect species to recognise its own kind.

Mr Gunther Theischinger (Research Associate) has investigated the Australian crane-flies (Tipulidae) and is producing a systematic monograph covering some hundreds of species.

Dr Gerry Cassis (Visiting fellow) has commenced a study of Australian lace-bugs (Tingidae), of interest because of numerous special associations with the native flora.

Dr Courtenay Smithers (Research Associate) has nearly completed an identification key to the world genera of bark-lice (Psocoptera), and is also studying bark-lice taken from communal webs of spiders.

Mr Geoff Holloway was awarded a MSc degree for his research on ichneumonid wasps. Dr Donald Quicke, from the University of Sheffield, England, spent a month studying our braconid wasps on a Visiting Fellowship.

Malacology

Dr Bill Rudman completed the first of a series of illustrated reports on the nudibranch fauna of Hong Kong. These beautiful 'sea-slugs' apparently thrive in the crowded, polluted waters of Hong Kong with over 300 species now reported from the region.

Dr Rudman has also completed a study of the brightly coloured chromodorid nudibranchs , involving how these marine animals remove distasteful chemicals from the sponges on which they feed, storing them in their own bodies to protect themselves from being eaten by fish. To warn fish the sea slugs have evolved bright colour patterns. He is also studying coral-feeding nudibranchs and preparing a monograph on the nudibranchs of New Caledonia.

Dr Winston Ponder's research concentrated on completing work on snails from artesian springs in Queensland, and on the anatomy and relationships of certain marine snails. He obtained two grants from the Australian Research Council to fund his work enabling him to be assisted by Mr Gerard Clark, Mr Roger de Keyzer, and Ms Alison Miller. One grant is to study a poorly known group of freshwater snails, the other to investigate a group of marine snails common around Australian coasts.

Marine Invertebrates

Dr Alan Jones, Ms Anna Murray and Ms Robin Marsh are continuing their investigation of sandy beaches in lagoons and bays of the Sydney region. These are both extensively used and subject to pollution and other human impacts, yet virtually nothing is known about their ecology. This study is rectifying this situation with respect to two of the numerically-dominant macrobenthic species which are amphipod crustaceans (sand hoppers). A novel sampling design was developed to accommodate the tidally-related behaviour of these species. As well, the analysis of data and publication of results is continuing from an earlier long-term study of the Hawkesbury benthic community.

Dr Patricia Hutchings received the degree of Doctor of Science from the University of Newcastle upon Tyne (UK) for her studies on the taxonomy and ecology of Australian polychaetes.

She has now begun a three-and-a-half year project to investigate the wetlands and subtidal benthic communities of Jervis Bay, NSW, as part of a multi-disciplinary study on the Bay. The project is funded on a contract by CSIRO which in turn is funded by the Department of Defence. Dr Hutchings is continuing her taxonomic studies of Australian polychaete worms and has finished several papers on the family Nereididae, including the commonly known ragworms.This project is funded by ABRS.

Dr Lynda Warren of the University of London, UK, obtained funds from the Royal Society, as part of the Australian bicentennial, to visit Dr Hutchings for three weeks to work on a revision of Mediomastus (F Capitellidae).

Dr Jim Lowry and Ms Helen Stoddart made good progress on the world generic revision of lysianassoid amphipods. Illustrations are finished for more than half of the 160 type species in the study. Work on the poorly known Australian lysianassoid fauna is dependent on progress made on the world generic revision project.

A new project to survey the biology and taxonomy of scavenging crustaceans (mostly cirolanid isopods, lysianassoid amphipods and myodocopid ostracodes) was started this year. Dr Lowry and Mr Steve Keable spent a month trapping these small invertebrates along the New South Wales coastline, much work done in the same areas where cray fishermen leave their pots

indicating the problem cray fishermen have saving their bait from these small but numerous marine pests.

Steve Keable and Jim Lowry also spent a month at Lizard Island studying scavenging crustaceans, thought normally to clean the floor of the reef by feeding on tiny dead invertebrates, but baited traps attract them in thousands. They were interested in finding out how many different kinds of scavengers live among the reefs at Lizard Island and how they split up the habitat.

Dr Frank Rowe left the Museum in December 1988 after 15 years service in the field of echinoderm systematics and biology. During this period he made an important contribution to both research and collections, and published 50 papers. The highlight of Dr Rowe's career was the discovery of a new class of echinoderms – the Concentricycloidea – which is found in the deep sea on pieces of sunken wood.

Elizabeth and Middleton Reefs Results

The second report from the Australian Museum's expedition to Elizabeth and Middleton Reefs funded by the Australian National Parks and Wildlife Service was completed. It includes reports on the reproductive activity of the Crown of Thorns starfish which has effectively removed 80-90% of the living coral on the reef slopes of both atolls and on the reproductive status of the corals. Many of the corals were ripe and it is suspected that they would spawn early in January/February. This was the first record of some of these species undergoing potential sexual reproduction, and may mean that recovery from the Crown of Thorns attack may be more rapid than initially thought.

Students and Invertebrate Research

Student's research projects in the Division include the following: P. Berents: Reproductive strategies in amphipod crustaceans. C. Glasby: Polychaete worms. R. Hanley: Taxonomy of scale worms. S. Keable: Scavenging crustaceans. W. Kiene: Bioerosion of coral substrate. A. Reid: Cephalopod taxonomy. G. Rouse: Reproductive biology of coral reef polychaetes. G. Skilleter: Ecology of cerithiid gastropods. W. Sleurs: Taxonomy of Rissoina. R. Wilson: Taxonomy of nereid worms.

Mrs Roslyn Blanche's successful BSc Honours project on the 'Geography of Kelp Flies' developed from her work in the Museum.

Many nations use our collections

Many thousands of invertebrate specimens have been added to the collections as the result of staff field collecting and donations by friends. Data from the spiders, echinoderms and crustaceans have been entered on computer, the latter by Mrs Clare Brown, a stalwart volunteer.

Our collection of crabs, prawns and lobsters has been expanded and re-organised to make specimens more accessible to staff and visiting researchers, and to give space for future expansion.

The incorporation of a large donated collection of Australian stoneflies (order Plecoptera) into the existing collection and the rearrangement of the entire stonefly collection according to a recent classification is nearing completion. This important group of insects is an excellent indicator of water pollution especially that caused by heavy metals. To this end the collection is already being utilised by the Centre for Environmental Toxicology, and a combined Water Board/Macquarie University project.

Curation of the huntsman spider (Heteropodidae) collection has been completed and work has begun on the jumping spider (Salticidae) collections. Assistance with this work was provided by Mr D Hirst (South Australian Museum), Dr Marek Zabka (Zakland Zoologii, Poland) and Mr Scott Laidlow (temporary assistant).

A large part of the activities of collection management is to make our collections available to research workers throughout Australia and overseas, through our loan programme. Specimens are sent on loan for up to one year and both Marine Invertebrates and Arachnology have developed computer systems for managing the loan programme. 104 loans of specimens, mainly crustaceans, worms, echinoderms, and corals were sent out last year from the Marine Invertebrate section, 52 from Malacology, and 77 from Entomology and Arachnology.

Field work

Dr Winston Ponder undertook field work in the Kimberley investigating freshwater systems as part of the Bicentennial Kimberley '88 Expedition. He also worked in Darwin on marine molluscs and Tasmania, with Janet Waterhouse, collecting freshwater snails, including participating in the survey of the SW. World Heritage Area.

Dr Mike Gray took part in a Western Australian Museum expedition to North West Cape to examine the invertebrate fauna in the extensive limestone cave system found there.

Dr Ponder and also Ian Loch led a successful TAMS shell-collecting tour to the Philippines in April.

Dr David McAlpine and Mr Barry Day undertook a trip to South Australia to obtain insects, particularly kelp-flies from the intertidal zone. They also discovered nobody flies (Aulacigastridae) in South Australia for the first time and obtained useful material of fern flies (Teratomyzidae).

Dr Dan Bickel collected for three weeks in Tasmania on a grant from the Tasmanian World Heritage Fund and gathered large samples of insects which are currently being sorted. He also collected extensively in northern NSW rainforests, with intensive sampling of Nothofagus forest at Gloucester Tops.

Dr Hutchings participated in an expedition to the offshore islands of the Kimberley Region in July 1988, and made substantial intertidal and subtidal collections from an area where there are virtually no collections in any museum. The expedition which chartered a fishing boat was funded by National Geographic, Field Museum in Chicago, the West Australian and Australian Museums, Woodside Petroleum and CRA Limited.

In October 1988 Dr Bill Rudman spent four weeks studying and collecting the nudibranch sea-slug fauna of New Caledonia as part of the preparatory work to writing a monograph on the New Caledonian fauna which he is undertaking at the request of the French research agency ORSTOM. All expenses for this most successful expedition were met by the French Government.

A collecting trip was made by Ms Penny Berents and Mr Roger Springthorpe to the wild coastline of western Victoria to fill gaps in our marine invertebrate collections. Crustaceans and echinoderms were their main targets of activities on rock platforms, sandy beaches and, by scuba diving, on rocky reefs.

P Hutchings, J Lowry, R Springthorpe, P Berents, R Paterson, I Loch and J Waterhouse participated in ORV "Franklin" cruises, two of which were held during the year. Mr Phil Colman participated in invertebrate and vertebrate collecting in New Britain.

Services to the Community and Science

Dr Rudman and Dr Ponder have been preparing a series of chapters on molluscs for the *Fauna of Australia* volume on Mollusca. This massive project coordinated by the Australian Biological Resources Bureau, Canberra, is utilising the knowledge of experts world-wide to produce a series of volumes outlining all the animal world of Australia.

Dr Ponder has prepared Museum submissions on Lord Howe Island in his role as Museum spokesperson on this island.

Dr Jones advised government departments concerning environmental management and is increasingly involved with commenting on environmental impact statements. He continues to serve as a councillor to the National Trust Coast Conservation Committee, the Coast and Wetland Society, the Management Committee of the Centre for Environmental Taxicology (UTS and SPCC) and the Friends of Dee Why Lagoon.

Dr Gray acts as museum spokesperson on cave biology. In this role he has assisted in conducting a survey of the Moore Creek Caves for the New South Wales Government. Outside the Museum he is a member of the Jenolan Caves Scientific Advisory Committee and is Treasurer of the Linnean Society of New South Wales. He has given five lectures to public and professional groups during the year.

As well as presenting papers at the 6th International Coral Reef Congress, held in Townsville August 1988, and running a pre-congress field trip for delegates, Dr Hutchings was invited to give a position paper at a workshop organised by The Great Barrier Reef Marine Park Authority on the effects of trawling on epibenthic communities in inter-reefal areas of the Great Barrier Reef. Dr Hutchings is Honorary Secretary of the Australian Coral Reef Society.

Workshops, lectures, symposia

Dr Hutchings participated in the 3rd International Marine Biology Workshop of Hong Kong and South China Seas in April 1989. She was involved in studying infaunal communities in Hoi Ha, an area designated as a Marine Nature Reserve.

During the year, Dr Jones delivered research papers to an International Symposium on Biomonitoring in Canberra and the Silver Jubilee AMSA at Sydney

University and addressed various local conservation groups.

Entomology and Arachnology staff gave 20 lectures and talks to members of various institutions and societies during the year including the Ambulance Association (as part of their training program), The Royal Zoological Society of NSW, the Museum Guides and the Discovery Room project "Meet the Scientists" held during school holidays.

Penny Berents participated in the training program for volunteer Museum Guides and introduced the new Guides to the Marine Invertebrate Gallery.

Two books edited by Dr Ponder have been published, one on the proceedings of a Symposium on gastropod phylogeny, and the other the results of a multi-disciplinary expedition to Dalhousie Springs in northern South Australia.

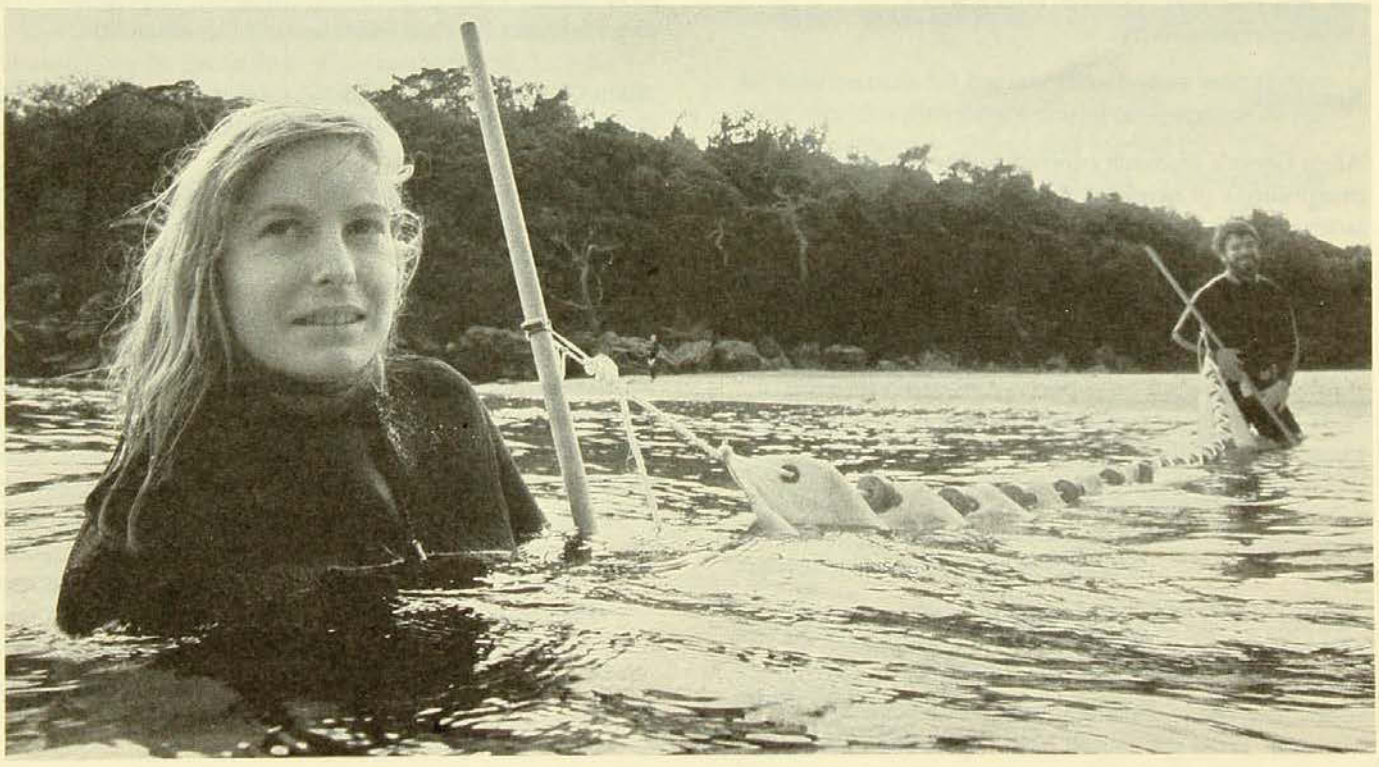
The many donors of material for our collections are thanked. Major collections have been received from the following: Mr F Allen (marine and land mollusc shells), Mr K Gilchrist (Tertiary fossil molluscs from Fiji), Mr I Buddle (insects), Mr M Moulds (insects), Mr R Mulder (wasps), Mr S Palazzi (marine micromolluscs), Mr N. Rodd (wasps), Mr G. Williams (insects), Estate of the late K. van Raalte (butterflies).

Future plans

Invertebrate research in the immediate future will feature cooperative work with the newly formed Evolutionary Biology Unit in the Museum, especially molecular taxonomic studies in gastropod molluscs, spiders, flies, and lace-bugs. The techniques now available will enable accurate discrimination of closely similar species, and the construction of phylogenies (family trees) reaching back 100 million years or more. Scanning electron microscopy will play an increasing role in several fields of research.

We plan to continue upgrading the collections, particularly where major new revisions have been undertaken, and to increase the availability of collection data to all those interested through modern data retrieval systems.

Sally Reader and Dr Jeff Leis sampling the tiny larvae of the fish life at Shelly Beach, Sydney as part of a two year project
Photo by Andrew Taylor, Sydney Morning Herald



Vertebrate Zoology

The purpose of the Vertebrate Zoology Division is to carry out research on the systematics, morphology, ecology, behaviour and evolution of vertebrate animals; to manage collections of these animals, and to provide information to scientists and the community. The Division also seeks to apply ecological principles to land and aquatic management.

Highlights

- Herpetology and Terrestrial Ecology sections move into new laboratories.
- First experimental evidence that nectar production in plants entails a "cost" in terms of diminished number of seeds.
- New tree kangaroo on the verge of extinction discovered in Papua New Guinea.

Herpetology

Highlights

- The section moved into new laboratories which have windows, high ceilings, light colours and no termites.
- Ms. Jenny Nancarrow, formerly a Museum Guide, joined the section's staff.
- Dr. Allen Greer's 40% cut in research assistance of last year was restored; which will restore productivity.

Research

Allen Greer's research centred on the taxonomy and morphology of skinks with special emphasis in the latter case on limb reduction and dentition.

Ross Sadlier continued ongoing research on the reptiles of New Caledonia. Descriptions of two new species of gekkonid lizard from New Caledonia were published, a paper on aspects of research into the New Caledonian scincid lizards was presented, and a manuscript on that research accepted for publication in the Memorial Queensland Museum.

Collection

Approximately 2,500+ specimens were registered and incorporated into the specimen reference collection. The most notable acquisitions were collections made during a *National Geographic* / Museum Trust sponsored field trip to New Britain, and Normandy and Sideia Islands in Papua New Guinea. From this trip a number of taxa not previously represented in the section's collection were obtained.

The majority of old register and ex-gallery reptile specimens were re-registered and incorporated into the collection under the current R-register system. The section's large type collection (approximately 200 primary and 2500 secondary types) was completely curated and relevant data entered into the database

Approximately 50 loans comprising nearly 1000 individual specimens were processed during the year.

Field Work

Allen Greer took 2 weeks leave to do field work in New Caledonia, amassing a collection of approximately 300 specimens and solving a two species taxonomic problem that had eluded investigators for years.

Community and Museum Activities

Allen Greer's general community activities involved: lectures to NSW Ambulance Brigade recruits; speaking to the Bankstown Bushwalking and Social Club and the Coast and Mountains Bushwalking Club; technical advice to *Bourke's Backyard* ; lectures to TAFE herpetology students; radio and television interviews on snakes, crocodiles and eccentric herpetologists; review of seven scientific papers consisting of 192 pages; checked facts for *Australian Geographic* magazine.

Allen Greer also identified 156 items for Australian Customs of which 32 (20%) were endangered species.

Allen Greer's Museum activities included presentation of "The Evolution of Fangs in Snakes" to Discovery Room children; lecture to Museum Guides; chairmanship of the Animal Care and Ethics Committee; sub-editorship of the Vertebrate Zoology section of the *Records of the Australian Museum* ; member of the Rankin Trust Fund for Herpetology Committee; member of the Postgraduate Grants Committee; member of the Short–term Assistance Committee, and Acting Divisional Head for approximately 20% of the year.

Ichthyology

Highlights

Mark McGrouther organised production of plastic jar insert mould to be used by several Museums in Australia.

Field trips were made to Green Cape, NSW; Madagascar and the Mozambique trench; Papua New Guinea; French Polynesia and on the HMAS Cook off Sydney.

Jeff Leis and Doug Hoese were promoted from Scientific Officers to Senior Research Scientists and Tom Trnski's position became permanent.

Research

John Paxton continued studies on deep-sea whalefishes with support from an ARC grant. Gonads from 25 specimens have been sectioned and to date no males have been found of this family living at depths up to 3000 m. Larvae and juveniles of two related families of whalefishes have been recently discovered and are being described for the first time.

Jeff Leis completed a major invited review paper on biology of the pelagic (larval) stage of coral reef fishes.

Jeff Leis studied overseas Larval Fish Collections at USNM, US National Marine Fisheries Laboratory, Miami, Scripps Institution of Oceanography, La Jolla (July) and Zoologisk Museum (Dana collectons), Copenhagen (August).

Doug Hoese concentrated on a project on the taxonomy of small freshwater gobies and gudgeons of New Guinea and northern Australia. The rivers and lakes of New Guinea contain the largest number of small freshwater gobies and gudgeons known from any region. Lake Kutubu is unusual in that all species of fishes in the lake are known only from the lake and the outlet stream. In addition a small species flock is known from the lake. One genus, which normally has only one or two species in rivers of Australia and New Guinea has five closely related species living together in the lake. Biochemical and geological evidence suggests the species have evolved in approximately the last 100000 years. Material obtained from field work in Papua New Guinea will aid in completion of the project.

Tony Gill's (Postgraduate student) PhD thesis on the taxonomy and zoogeography of the coral reef dottyback fishes is nearing completion and will be submitted in late 1989.

Collection

Mark McGrouther organised the manufacture of a mould to produce plastic inserts for Australian-made glass specimen jars. These new units come in three sizes and cost approximately 20-30% of the equivalent imported product.

Technical staff, volunteers and Des Beechey combined to input approximately 90% of the remaining computer data backlog (approximately 20000 lots and 16,500 stations).

Mark McGrouther designed a computer registration system for use in the field. Over 800 records were entered into shipboard computers on two fieldtrips. These data were then loaded onto the Section's "Titan" databases on return to the Museum. Field printing of final jar labels was initiated on the more recent fieldtrip. Both these advances reduce time required to process specimens.

Specimen jar labels are now regularly printed for adult and larval fishes using specially inked waterproof 'museum ink' ribbons. Adult fish labels are printed on perforated laundry tag paper and larval fish labels are printed on vegetable parchment.

All loan records for the last twenty-five years (over 1,000 records) previously stored on Decmate floppy disks have been modified and loaded into "Titan" databases on the Unison hard disk. These data are now readily retrievable.

Mark McGrouther organised the design and production of three part carbonised computer paper for automated processing of loan and exchange paperwork.

20% of the larval fish backlog has been registered (approximately 1000 lots). A large proportion of these registered specimens were used as a basis for the descriptions in the new larval fish book by Leis & Trnski (to be published in 1989\90).

The dried fish skins and mounts were totally curated by Alastair Graham. This collection comprises several hundred specimens some of which date back well into the last century, and are of significant historic

importance. Nine type specimens were 'rediscovered' plus several specimens listed as missing for over twenty years.

76 loans and exchanges of Australian Museum fishes were sent to other institutions (621 lots and 2100 specimens).

Over 2700 lots and 8700 specimens of adult fishes have been registered.

A procedure manual and policy statement for the fish section were submitted to the Trust.

A one–line summary printout of the entire collection was compiled and is currently being proofread.

All PVC specimen tanks damaged during the tank move to new storage have been repaired.

Acknowledgement of co-operation\donations

His Majesty, Emperor Akihito of Japan generously donated a set of the three-volume Coastal Fishes of Japan.

David Coates and Paul van Zwieten of the FAO (UNESCO) assisted with field work in Papua New Guinea.

Dr M Stiassny and Ms N Feinberg of The American Museum of Natural History and Dr H Kishimoto of Tokai University exchanged a collecton of fishes from Madagascar and Japan, respectively.

Dr L Knapp of the Smithsonian Oceanographic Sorting Centre and Mr R McKay of the Queensland Museum donated collections of fishes from South America and Queensland, respectively. Mr K Graham and Mr C Moore of NSW Fisheries donated specimens collected by FRV Kapala and from the Sydney Fish Markets. Ms P Kailola of the University of Adelaide donated a collection of catfishes. Dr W Ivantsoff and Ms L Crowley donated a large collection of hardyheads and rainbowfishes, some of which were types. Mr R Berghouse donated several large, valuable South American aquarium fishes.

The following people are acknowledged for assistance: Dr Walter Ivantsoff and Dr Jean Joss (Macquarie Univeristy), Mr Owen Griffiths (Mauritius), Dr Jerry Allen (Western Australian Museum) and the Royal Australian Navy.

Fieldwork

Mandy Beshaw, Alastair Graham, Jeff Leis, Mark McGrouther, Sally Reader, Tom Trnski and four volunteers participated in a seven-day collecting trip to Green Cape (near Eden). Fishes were collected from estuarine, marine and rockpool habitats, organised to fill gaps in the knowledge of the fish fauna from this region.

Mandy Beshaw, Alastair Graham, Mark McGrouther, John Paxton and Sally Reader spent five days on HMAS Cook collecting deep–sea fishes off Sydney. Despite very rough weather, trawls were made to maximum depth of 3,300 m (the deepest pelagic fish trawls ever made in the Tasman Sea) and a large number of very rare deep sea fishes were collected.

John Paxton spent nine Weeks in the western Indian Ocean, collecting in Mauritius and Madagascar. This included seven weeks aboard the Soviet research vessel Vityaz as part of an international team studying the deep sea fishes of the Mozambique Channel and a seamount 600 km south of Madagascar. Fishes were collected down to 3450 m. More than 2000 specimens, including shore fishes from Madagascar and Mauritius, were preserved for the museum research collections.

Doug Hoese obtained valuable material from freshwater rivers and lakes in a number of locations in Papua New Guinea.

Jeff Leis participated in collaborative research – ARC funded – at Lizard Island and Osprey Atoll, Coral Sea on RV Sunbird (with Professor Choat of James Cook University) for 2 weeks in November 1988.

Jeff Leis and Tom Trnski participated in a joint French Government\AMS Trust funded field trip for research on fish larvae in atolls in French Polynesia with Dr R Galzin and other French collaborators during January\Febuary for six weeks.

Conferences

Jeff Leis presented a paper at the International Coral Reef Symposium in Townsville (August).

Jeff Leis gave an invited paper on use of larval ecology in zoogeographic studies at the Symposium on Pacific Biogeography, at the Annual Willi Hennig Society Meetings, Stockholm, (participation paid for by Swedish Academy of Sciences) (August).

Doug Hoese, Mark McGrouther, John Paxton and Sally Reader attended the Australian Society for Fish Biology Annual Conference at the University of New South Wales. McGrouther, Paxton and Reader presented papers at a workshop on Australian Fish Collection Management at the Museum following the conference.

Community and Museum Activities

John Paxton lectured on deep sea fish reproduction to TAMS; gave radio interviews on pain in fishes, fish and pollution, and deep sea fishes; and appeared on television to discuss the megamouth shark. He was also a Visiting Lecturer in the Department of Oceanography, Xiamen University, People's Republic of China, giving a series of lectures on fisheries and fish biology, and served on the council of the Australian Society for Fish Biology and as a Scientific Associate of Taronga Zoo.

Jeff Leis gave invited lectures on his work on larval fish ecology in USA at the University of Miami, the University of Puerto Rico, Virginia Institute of Marine Science (July) and in Papeete, Tahiti at the French University of the Pacific (Febrary).

Mammalogy

Highlights

Tim Flannery discovered a new species of tree kangaroo from the Torricelli Mountains, Papua New Guinea. It is the largest endemic Melanesian mammal. Unfortunately it appears to have a very limited range and is critically endangered by increasing human activity in that area.

Research

Tim Flannery also found several new species of endemic rat in the Admiralty Group and on Manus Island during field work in 1988. The discovery of these rats will add to the understanding of the zoogeography of the area. Research into the archaeological material for the Solomon Islands shows that two species of endemic rats have become extinct 6–2000 years BP. Further research is planned into the status of the new tree kangaroo, as mentioned above.

The whale survey for humpbacks by WH Dawbin with volunteer helpers Peter Gill, Libby Eyre and others, funded by an MST Grant, again recorded sounds of northward migrating whales off Coffs Harbour in June and July. They found more interaction between whales and more social sounds as distinct from the usual ten minute structured songs, than at any time since recording started there in 1982. The behaviour and sounds had parallels to those sometimes encountered further north in tropical breeding areas. During aggressive behaviour between interacting humpbacks the stationary recording launch was unexpectedly bumped by one of the whales that was charging another. Dawbin recorded further sounds and songs between Whitsunday Islands and Hook Reef and at Hervey Bay, Qld. Songs of southbound whales were recorded off Coffs Harbour in September and October. Off Western Australia, with the cooperation of Chris Burton and J. Bannister, humpback songs were recorded at a number of localities between Shark Bay in the north to Cape Leeuin in the south. Burton recorded a surprisingly late song from a south bound animal off Ocean Reef (near Fremantle) in late November. Songs off the east and west coasts again differed from each other and both had changed somewhat from those of 1987.

Collections

Extensive collections were made in the Torricelli Mountains, New Britain and New Ireland, and from the islands of Milne Bay Province, PNG.

Marine mammal acquisitions again featured prominantly throughout the year. Whale strandings continue to supply interesting specimens and the assistance of the volunteer group ORRCA. in retrieving those specimens for the Museum is gratefully acknowledged. The collection continued to increase again with a strong emphasis on specimens from the PNG area. Registrations for the year number 1680. Requests for access to the data base also increased.

A wide variety of specimens were again received from other government and private organisations. These include Taronga Zoo, National parks and Wildlife Service, universities, and museums in Western Australia and Tasmania. Display quality specimens were sent to the Vanuatu Museum and a Children's Museum in Colorado, USA Moves are also underway to increase other exchange programmes with overseas institutions. Approaches have been made to Museums and Universities in the USSR, Japan and the USA.

A major relocation and review of the mammals held at Rushcutters Bay was undertaken in January, 1989. The process had three phases involving reassessment of the scientific value of some specimens, with subsequent deregistration of 20 specimens. Some large gallery mounts of overseas mammals have been sent on loan to the Newcastle Regional Museum for use in their displays. The remaining specimens were unceremoniously shifted to a storage area recently partially vacated by Anthropology. The nature and forced speed of the move has resulted in an even more crowded and inaccessable collection – however, it is anticipated that this situation will be relieved next year with the availability of improved shelving and space.

Fieldwork

Tim Flannery and Tish Ennis carried out survey work and collecting in the Torricelli Mountains, Manus Islands and New Ireland, Papua New Guinea in June, 1988. In December 1988 using RV Sunbird, further work was done on New Britain and the islands of Milne Bay Province by Tish Ennis with the help of Walter Boles, Phil Colman, Roger de Keyser, P German and G Hangay. During April 1989, Tim Flannery carried out field work on Groote Eylandt to provide material for evolutionary studies at the Australian Museum.

Linda Gibson carried out a preliminary survey in March of the bat fauna of the New England tableland area. The work was conducted at the University of New England's Research Station north of Armidale and in some of the old gold mines to the east of Armidale.

Conferences

Tim Flannery attended the Vertebrate Palaentology Meeting, The Extinctions Workshop (Sydney), The Australian Mammal Society Meeting and he also addressed the NELA International Conference on Environmental Law, held in Sydney in June. This important conference was attended by high-level Government representatives from throughout the world. Dr Flannery was the only biologist asked to speak.

Linda Gibson attended the symposium on koalas held in Sydney in November 1988 and the scientific meeting of the Australian Mammal Society held in Alice Springs in April 1989.

Community and Museum Activities

Tim Flannery was a committee member of the Royal Zoological Society, University of New South Wales, and has been elected to the Zoological Committee of the Zoological Parks Board.

Linda Gibson's general community and Museum activities included membership of the National Trust's Coastal Conservation Committee; participation in Taronga Zoo's educational programme of "Extending Career Options for Girls"; talks to volunteer groups on wildlife rehabilitation; lectures to the volunteer group ORRCA on whale rescue; introductory lectures on mammals to the Museum guides; sitting on interview panels for the Institute of Fisheries and the NSW NPWS and a talk on whales to the Vanuatu Natural Science Society. Linda Gibson also identified 138 items for Australian Customs.

Judy Marlow(Research Associate) assisted the South Australian Museum and the Tasmanian NPWS with identification of seal specimens. In one case, the identification of a seal skull from Maatsuyker Island, Tasmania, led to a significant change in the known distribution of the two species of fur seal that occur in southern Australia. Judy Marlow's expertise has also increased our knowledge of the seal species present on Macquarie Island.

Ornithology

Highlights

- Old Rushcutters Bay vacated.
- Walter Boles presented paper at International conference.
- Staff participated in New Britain collecting trip.

Research

Walter Boles continued his work on the Tertiary avifauna from Riversleigh, Queensland, identifying several new forms, including a peculiar bird of prey, a swift, a stork and various songbirds. Additional material of the purported small emu Dromaius gidju showed that this form was closer to the common ancestor of emus and cassowaries than previously suspected and deserves a new generic name. Whilst overseas, Mr Boles worked in the collections of the University of Kansas; University of California, Berkeley; and Los Angeles County Museum of Natural History.

He also attended the International Symposium on Avian Palaentology and Evolution in Los Angeles in September, 1988, and presented a paper, "A revision of Dromaius gidju Patterson and Rich, 1987, from Riversleigh, Queensland, Australia". This paper will appear in the proceedings of the symposium to be published by the Los Angeles County Museum of Natural History. He also presented an overview of his work to the Conference on Australasian Vertebrate Palaeontology, Evolution and Systematics.

The compilation of a guide to ageing and sexing Australian birds, carried out by Mr Boles for the Museum, under contract to the Australian Bird and Bat Banding Scheme, neared completion. It will cover some 170 species.

His book, *Robins and Flycatchers of Australia* , published in late 1987, won the Whitley Award of the Royal Zoological Society of New South Wales as the best illustrated natural history book to appear in 1988. This is the fifth volume in the series produced by the National Photographic Index of Australian Wildlife.

Mr. Wayne Longmore, Museum Associate, submitted to the *Records of the Australian Museum* the manuscript of the list of types of birds held by this Museum. This has been prepared over several years in Mr. Longmore's spare time.

Collection

Editing of the computerised library list of generic and specific names was completed, including the standardisation of names and updating of junior synonyms. Redesigned datasheets and labels for study skins were brought into use with pleasing results. All current loans and most of those completed since 1975 were entered into the computerised record system.

Large numbers of specimens were received from NSW National Parks and Wildlife Service and Taronga Zoological Park and through public and professional donations. A valuable spirit collection was made during field work on New Britain and Normanby and Sideia Islands, Papua New Guinea. The important Bettington-Hyem Egg Collection was received by the section; this contains about 2000 clutches, including some rare species previously unrepresented in the Museum's collections, and is very well documented. Large study skins, mounted specimens, eggs and nests were moved with the closure of the Old Section of the Museum's Rushcutters Bay storage. These are now housed in a (marginally) better area within the same building. Expansion of this area and improvement of conditions will continue as Anthropology vacates 2 more space.

Field Work

The highlight of the year was work in south central New Britain, where Walter Boles joined staff from other sections of the Museum,for nine days. Mr Boles also invited Mr Wayne Longmore to accompany him to the state forests south of Deniliquin.

Community and Museum activities

Walter Boles completed his first year as editor of Corella, journal of the Australian Bird Study Association. He continues on the Taxonomic Advisory Committee of the Royal Australasian Ornithologists Union, and assisted with the Museum Guide training programme and with classes from Wollongong University and the University of New South Wales. He gave talks on his fossil work to the NSW Field Ornithologists Club and the Ornithology class of the Workers Education Association. Considerable time was also spent coordinating the moves from Old Rushcutters Bay and serving on the Disaster Planning Committee and Discovery Room Committee.

Terrestrial Ecology Section

Highlights

Dr Graham Pyke obtained the first experimental evidence that the production of floral nectar entails a cost to a plant. Working with Christmas Bells, a plant pollinated by honeyeaters, he and his assistants demonstrated that plants which produced relatively large amounts of nectar set fewer seeds than plants which produced less nectar, and with no differences to other plant attributes.

Research

Dr Graham Pyke and assistants continued work on the abundance, nesting and movements of honeyeaters in heathland in Brisbane Water National park to test the hypothesis that resident honeyeater density is limited by territorial behaviour. They removed some of the residents for one month. As expected, other birds quickly took their place. When the original territory owners were released they disputed occupancy with the newcomers. Within a few weeks some birds had departed leaving the same

number of residents as before the experiment.

During that month, the honeyeaters were housed at Taronga Zoo which enabled Dr. Pyke and Taronga Zoo staff to collaborate on dietary choice experiments using the captive honeyeaters. They found the honeyeaters preferred the least concentrated nectar sugar solution offered to them.

Dr Pyke and his assistants also completed another summer field season of research on the pollination ecology of Christmas Bells with emphasis on nectar production and the effects of fire on flowering. The research is carried out at the Barren Grounds Bird Observatory, near Jamberoo, about 150km south of Sydney. They discovered that it costs a plant something to produce nectar. They also continued studies on the manner in which honeyeaters act as agents of pollen transfer between flowers.

Field Work

Graham Pyke and Greg Gowing carried out field studies of honeyeaters in Brisbane Water National Park throughout the year, and field studies of Christmas Bells at the Barren Ground Bird Observatory during December 1988 and January 1989.

Community Activities

Graham Pyke was a member of the Research Committee of the Royal Australasian Ornithologists' Union, the NSW National Parks and Wildlife Advisory Council, and the NSW Government Non-Indigenous Animals Advisory Committee.

Future Plans

The processing of incoming specimens will remain Herpetology's main objective for collection management in the coming year. Ongoing curation of the existing collection and refining of the database will be undertaken where possible.

Ichthyology expects to move into new offices; complete entry of all raw collection data entry, labelling and registration.

Mammalogy expects to begin a survey of mammals of the South West Pacific next year, the first of its kind since 1849, and it is hoped to identify endangered species and locate new species. Further research to investigate the conservation status of the new tree kangaroo is planned, and the possibility of commencing an endangered species breeding program, possibly in conjunction with Taronga Park Zoo.

Mammalogy also looks forward to moving office and laboratory facilities, improving our access to the collections. and receiving the level of assistance currently offered to other collections.

Terrestrial Ecology staff will continue their research on Christmas Bells and honeyeaters. In April Graham Pyke will travel to Simon Fraser University, Vancouver, Canada, where he will hold a Canadian Government Research Fellowship for one year.

Visitors to Herpetology

- Prof. John Legler from the University of Utah to examine tortoises.
- Mr Mike McCoy from the Solomon Islands to talk about skinks of the Solomon Islands.
- Prof. Harvey Pough, Cornell University, to confer on the evolution of Lerista.
- Mr Glenn Shea from the University of Sydney to work on blue–tongue lizards.
- Dr Rick Shine from the University of Sydney to examine elapid snakes.
- Mr Jonathan Webb, honours student at Sydney University, to examine blind snakes for information on feeding and reproductive habits.

Visitors to Ichthyology

The fish secton had 14 overseas visitors during the last 12 months. These included the following:

- Dr Kunio Amaoka from Hokkaido University, Japan, who worked on flatfishes.
- Dr Peter Castle from Victoria University, Wellington, who worked on eels.
- Dr William Eschmeyer from the California Academy of Sciences, USA, who worked on the nomenclature of fishes.
- Dr Melanie Stiassny from the American Museum of Natural History, USA, who worked on New Guinea fishes and presented a seminar during her visit.

Visitors to Mammal Section

- Dr Jared Diamond, UCLA to discuss zoogeography of mammals.
- Dr Colin Groves, ANU examining primates.
- Dr Geoff Hope, ANU Canberra, working on Melanesian mammals.
- Dr Roger Martin, Monash University, examined the collection of koalas and tree kangaroos.
- Dr JP White, University of Sydney working on New Guinea mammals.
- Dr Pat Woolley, La Trobe University, Melbourne, working on New Guinea dasyurids.

Taken by Dr Tim Flannery in Papua New Guinea of the newly discovered Tree Kangaroo seen here with a young native

Administration Division

Attendants /Cleaners

Additional factors have had to be dealt with this year in cleaning the Museum in the face of the work of building contractors, not only in the new wing, but on services passing through the existing building.

Among these factors have been dust, accumulation of cement, sand and building materials, oil, grease and water, as well as obstructions caused by power tools, machinery and temporary partitions.

Despite these difficulties, the Cleaning Staff have ensured that staff and visitors have been inconvenienced as little as possible under these circumstances.

Buildings

This year has seen the completion and occupation of most of the new buildings.

A much needed injection of Capital funds has occurred in the first part of a two-year renovation program for areas in the older buildings. Areas improved are:

Yurong Street Buildings

- Scientific services laboratory
- Herpetology laboratory
- Vertebrate Ecology laboratory
- Ramp to old Pacific Store

Main Building

- Level 4 TAMS and staff recreation area
- Baby change room
- Fast Food Cafe
- Anthropology Offices
- Photography Studio
- Accounts Cash Office

There have been major relocations this year including vacating a leased premises in Rushcutters Bay. The National Photographic Index has now moved to a leased building within a short distance of the Museum.

Finance

The Finance Branch is responsible for the general financial and accounting services of the Museum.

During the year a restructure of the Branch resulted in the creation of an additional position and the upgrading of five other positions. The restructure together with the on-going upgrading of computer hardware and software has ensured the continued maintenance of proper accountability and the adoption of new procedures to provide more meaningful management information systems.

Guides

Staff

- Three new permanent appointments
- A new Chief Guide in March 1989
- The third **Guides Training Course** was conducted

New Exhibitions

All guides trained for the new galleries and conducted tours in temporary exhibitions for the first time. Following the success of the tours of "First Impressions," the guides trained for the visiting "Ancient Macedonia" exhibition in 1989 and participated in all exhibition openings and in most evening events.

Tours

Booked tours have proved extremely popular with Language Centres , TAFE and other colleges Behind the Scenes tours during Senior Citizens' Week were highly successful with more than 10 people on each tour. Highlight tours were very popular particularly during December/January with 100 more tours conducted than in the previous Christmas holiday period.

Future Plans

- An expanded guiding program reaching out to all sectors of the community,including tours for special
- groups such as language students and handicapped people.
- Seasonal Programs focusing on internationally or nationally recognised dates such as Earth Week and Aboriginal Week, and featuring special tours (some of which go outside the Museum), videos, films and occasional public lectures.
- 4th Guides Training Course for which the guides are currently preparing comprehensive reference packages for each gallery.

Photography

The Photography Section provides a comprehensive photographic service to all Museum Divisions, comprising original colour transparency and black-and-white images for galleries research, publications, collection documentation and publicity. As the power of appropriate imagery has become increasingly necessary in all types of publications, there has been a growth in demand for the provision of photographs, both for the Museum and outside publishers.

Sales of rights for publication is continuing to increase as publishers and researchers become aware of the resources within the Section. The installation of new lighting equipment and reconstruction of the work space as a result of the 1987 section review will ensure the Section provides a high quality service in this area.

The Photographic Archives has been given a higher priority due to its growing importance as a historical and financial asset, and the need for a planned conservation program.In December 1988, Ric Bolzan, Debra Phillips and Karen Handley attended a photographic conservation workshop in Canberra to obtain detailed information about glass photographic plates. Subsequently a consultant was engaged to provide an assessment of the collection and make recommendations for future management. Another outcome has been increased communication with Materials Conservation, the Library and Anthropology with regard to archival photographic material held in those Divisions and planning for its future.

The Howard Hughes Collection of cine-films was deaccessioned and sent to the National Film & Sound Archives, ensuring that these unique films will be maintained as part of Australia's cinematographic heritage.

The Section was visited during the year by Frank Coffa, Head of Photography, Museum of Victoria.

Security

A fresh approach to risk management has resulted in a professional asset protection program. An increased use of electronic surveillance included the installation of Motion Detection CCTV in the "Pieces of Paradise" Gallery. The modernisation and extension of the Intruder Detection System has included the introduction of a computerised control centre staffed on a 24-hour basis. A number of new Security Officers have joined the team and have taken part in an extensive certificate training course designed to cover all aspects of essential guarding skills.

A dress uniform has been introduced and is indicative of the desire to shift the emphasis from "enforcement" to "service" security.

The Museum's Security Officers were the first government security officers to become qualified under new security legislation.

Staff

Emphasis this year was on Staff Development and the continued improvement of services to Museum staff.

A comprehensive training program is under way with courses in job seeking, supervision, public contact, staff appraisal, selection techniques, time management, and induction being held so far, including a two-day live-in workshop on external issues and marketing with presenters including Ross Gittins and Bob Beale from the *Sydney Morning Herald*.

A Staff Appraisal Scheme was introduced for all Museum staff after careful testing and review. Seminars about the scheme have been held and a training program for supervisors is under way.

Two sound/slide shows were produced – *An Introduction to the Museum* for new staff and *All about Staff Appraisal*. Equipment for training was purchased including a video camera which will be used for making training videos.

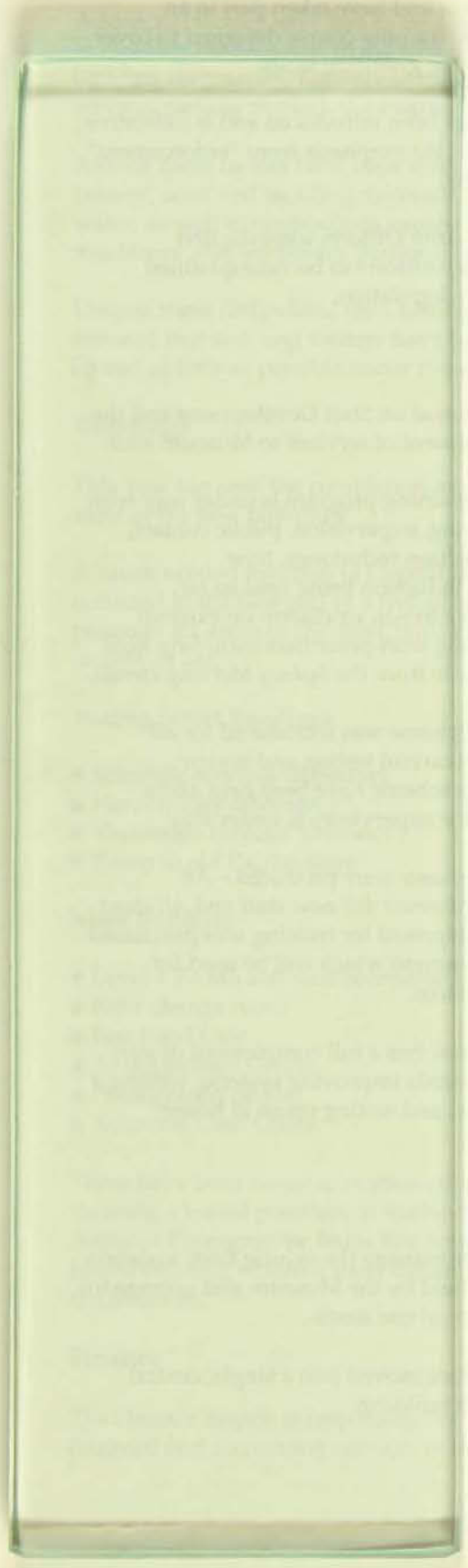
The Staff Section now has a full complement of staff and is working towards improving systems, writing a procedures manual, and setting up an in house salaries function.

Stores

Staff from the Store manage the vehicle fleet, maintain the level of stores held by the Museum and arrange for the printing of general use items.

In February, the Store moved into a single, central location in the new building.

Community Relations



Community Relations promotes the Museum's central image as a centre for scientific research, a source of enjoyable experiences and as an educator. Through publications such as *Records of the Australian Museum*, *Australian Natural History*, promotional brochures, material on new exhibitions and the Annual Report, we spread knowledge about Australia's natural environment and cultural heritage.

This year the Museum's public profile reached an all time high. There was an emphasis on new exhibitions this year - promoting them and their significance to the Museum's overall philosophy. The publicity and public relations section also responded to the demand for information regarding our natural environment and cultural heritage, especially in areas of current concern. Increasingly, the Museum, its collections and accumulated scientific knowledge - are being sought after by a wide variety of media organisations. There was a greater emphasis this year in assisting Museum scientists to communicate their knowledge more effectively.

We also affected promotions assisting the Museum in its image as being accessible to the community, providing regular entertainment and several highly successful promotions in conjunction with the media.

Australian Natural History

This year saw the unveiling of the new look *Australian Natural History* magazine. The magazine has been expanded to 96 pages allowing for an increase in the content of regular columns, more feature articles and the introduction of a 'Question and Answer' section. Photographic content has likewise increased and with the high quality reproduction obtained from our new printers the magazine has never looked better. To complete the makeover the cover sports a new logo and *Australian Natural History* is now officially known as ANH. Everyone involved with the magazine is very proud of their new product and have received nothing but congratulations from readers and advertisers.

ANH subscription department has installed an IBM computer and at present all subscribers are being transferred onto it, bringing the printing of mailing lists inhouse. Subscriber enquiries and changes can also now be dealt with in a much more efficient and instantaneous manner.

Future Plans

The next financial year will see an emphasis on promoting and advertising ANH. Our first step will be the production of an advertising kit that will present the new magazine to potential advertisers and sponsors.

Museum Shop

A full year of trading from the Museum's second shop has meant a significant growth in total sales, this year amounting to $750000. This, together with the consistently high quality products, display and presentation in both shops has placed the Australian Museum Shops at the top of quality museum shops in Australia.

This year has seen the further development of Museum-related merchandise such as a range of skull replicas from the 'Tracks through Time' gallery and T–shirts with the distinctive red-orange 'Dreamtime to Dust' image.

Traditional weaving from the Women's Co-operative in Tuvalu (South Pacific), carved wooden figures from Easter Island made interesting additions to the existing range of artefacts from New Guinea and the Solomon Islands. Aboriginal Art and Crafts are still the most important part of the artefact range and the Museum shop continued its strong support of Aboriginal crafts people from all around Australia.

Records of the Australian Museum

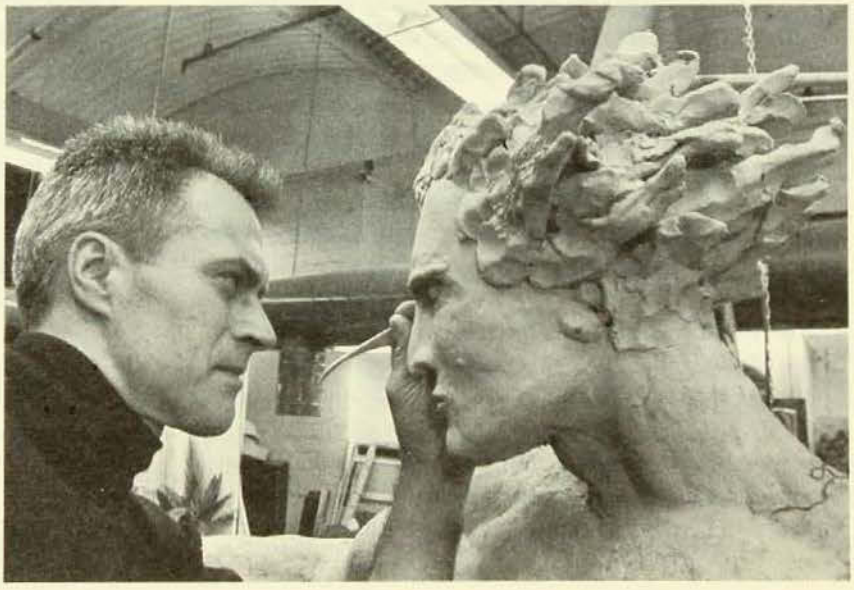
During the past year the first of the Technical Reports of the Australian Museum was published, titled "The Biology and Geology of Tuvalu: an Annotated Bibliography" by Kerry Rodgers (University of AucklandNew Zealand) and Carol Cantrell (Australian Museum).

In addition, *Records Volume 40 Numbers 3/4 and 5/6, Volume 41 Numbers 1/2 and Supplements 9 and 10* were published, representing a total of 687 pages. The issues contained nine zoological papers, two palaeontological papers and two zoological monographs. Australian Museum scientists published one third of the papers and the rest were by Australian and overseas scientists.

Several taxonomic papers on crustacea were published as well as two papers on new rodent species from Papua New Guinea by Dr Tim Flannery (Australian Museum) and Flannery et al. Drs Dave Bellwood and Howard Choat (James Cook University, Queensland) published a paper on juvenile phase colour patterns of parrotfishes from the Great Barrier Reef, complete with 40 colour photos.

The Supplement series contained two major studies, one by Dr Barry Russell (Northern Territory Museum) on labrid fishes (wrasses) from the south-west Pacific, with 38 colour photos, and the other by Drs Bill Williams (University of Adelaide) and Jerry Barnard (Smithsonian Institution, USA) on the freshwater amphipods of Australia. This second supplement represents the first part of a major series on this group, and introduces one new family, four new genera and seven new species.

Museum preparator, Orest Keywan, modelling Tarzan for the 'Rituals of the Human Lifecycle' exhibition.
Photo by Ric Bolzan



Exhibition Division

The Exhibitions Division is responsible for providing visitors with an understanding of the natural environment and cultural heritage by creating stimulating exhibitions.

They are also responsible for maintaining pleasant facilities of high standard for all visitors to the Museum.

Highlights

- Museum of the Year Award
- Computer-aided design
- Ancient Macedonia
- Taonga Maori
- The New Skeleton Gallery

Museum of the Year Award

'Pieces of Paradise: Pacific Art through many eyes' won the 1988 Westpac Museum of the Year award for the best exhibition. This beautiful exhibition with its astonishing artefacts, vibrant colours and carefully structured interpretation received many bouquets from public and critics alike before it closed on Easter Monday 1989 and the artefacts returned to the dim quiet of the collection space. Mr Bodo Matzick designed and produced the exhibition under the project leadership of Dr Jim Specht.

Computer-aided Design

Designers now have a Macintosh II and laser printer to use as a design tool. After a three day in-house course in February 1989, all Designers became proficient with the Macintosh. Computer graphics, desktop publishing and word-processing capacity has made the information assembly and presentation aspects of exhibition design faster, more accurate and a better end product.

Ancient Macedonia

The largest antiquities exhibition ever to leave Greece with more than 400 items spanning 7000 years.

The exhibition is the first touring exhibit to be shown in the Museum's new temporary exhibition space, opening on May 20th, 1989.

This installation and the one which preceded it have proven that the new exhibition space is well designed for the use it will increasingly have; high quality, stimulating temporary exhibitions. Project Manager, Mr Glenn Ferguson supervised the exhibition installation.

Taonga Maori: Treasures of the New Zealand Maori People

The Australian Museum is the organising museum for this national touring exhibition to open in Sydney on October 1, 1989.

Over 500 traditional and modern Maori artefacts will be presented to Australians with the involvement of Maori people.

The exhibition will be toured in a specially designed exhibition package which breaks new ground in achieving high quality finishes with ease of assembly and packing.

The Project Manager is Mr Bodo Matzick assisted by Mr Russ Weakley.

The New Skeleton Gallery

When the very successful 'Skeleton Gallery' was removed in 1987 it was planned to produce another in a more suitable location.

Planning for this exhibition is well advanced and has passed the first review of Senior Management.

The new exhibition will be in the 'Long Gallery', previously used for temporary exhibitions and will compliment the Victorian period of this fine room.

The Skeleton Gallery Team is under the leadership of Exhibition Project Manager, Mr Bob Ross-Wilson.

Future Plans

- Australian and New Zealand Tour, Taonga Maori
- Enlarged Discovery Space
- Plans for new Marine exhibit
- Dinosaurs Alive, robotic dinosaur exhibition
- Investigation Centre, hands-on-science!

Education Division

The **Education Division** exists to communicate the ideas, concerns, scientific knowledge and research interests of the Museum to the Australian public.

Highlights

- Profitable, joint venture lecture series with Botanic Gardens
- Move into new offices
- Greatly increased use of services by secondary and tertiary students.

Programs

Extension Services -Museum in a Box; Museum on the Road; Wandervan; Museum Train

Schools Programs - Class Visits; Gallery Visits; Teachers Previews; Work Experience

Community Programs - Discovery Room; Tertiary Groups; Lecture Series

Extension Programs

Museum in a Box

The Museum in a Box service provided schools throughout the State with loan cases containing real specimens and resource materials on Museum related topics.

Museum on the Road

Museum on the Road travelled to far Northern NSW in 1988 covering towns to the Queensland border. The exhibitions 'Mammals in Australia' and 'Aboriginal Australia' proved very popular in these areas. 'Papua New Guinea – The Abelam People' and 'Life in the Sea' travelled between Cooma, Wollongong, Newcastle and Sydney. All exhibits were returned to the Museum in early 1989 for repairs. The very popular 'Arid Australia' exhibition returned for 1989 to supplement the country program after the retirement of the train.

Wandervan

The Wandervan for groups with special needs experienced another successful year visiting schools, hospitals, psychiatric and corrective institutions, retirement homes and migrant centres.
The van expanded its joint service with Taronga Park's Zoomobile. A number of bicentennial events were attended including a celebration at Australia's oldest school.

Activity therapy programs were highlighted including birdwatching, pet care, bushwalking and a seashore and mangrove excursion. A special theme on seashore animals was introduced to highlight environmental issues.

Museum Train

The Museum Train closed in December 1988, after 11 years service, during which time it took two exhibitions around NSW, travelled 39000km, visited 231 towns and had 700000 visitors.

New Directions

Public Seminars have been conducted in country towns in association with a MOTR exhibitions, by Education staff and by members of the Anthropology Division. More are being planned.

Several country schools have been visited by Education staff with teaching specimens, Teaching Kits for specialist topics, inservicing for rural teachers and publications resulting from the lecture series should assist teachers from outer regions. Information on the Museum's activities is being provided to every senior high school student in the State.

School Programs

Class Visits

The Education Staff continued to have a major commitment to face to face teaching. Hands–on learning continued to provide exciting opportunities for Primary and Junior Secondary groups to develop skills and knowledge appropriate to a range of curriculum areas. Senior Secondary groups, who are forming an increasing proportion of the Division's clientele, were provided with lecture/demonstrations illustrated with the Division's extensive teaching collection. Evolution and Human Evolution were the most popular topics for senior classes.

The Division's Teaching Spaces are being set up as "Hands-On Rooms" where teachers have a greater involvement in their class visit to the Museum.

Room has been very successful. It is supported by a comprehensive Teacher's Pack which is currently being upgraded. The "Hands-On Room" approach is being developed for Earth Science (initially featuring dinosaurs) in the Peppermint Room and Animal Biology in the Mushroom.

Gallery Visits

The three galleries that opened in 1988 are proving very popular with senior secondary groups. A gallery booking system was implemented at the beginning of 1989, making a tremendous difference to the efficiency and enjoyment of visiting groups.

Teachers Ideas Packs were produced for 'Dreamtime to Dust', 'Tracks through Time' and 'Rituals of the Human Life cycle'. The 'Dreamtime to Dust' pack contains an informative 19 page booklet describing the animals on display in the exhibit. This booklet is available for separate sale and has proved to be popular.

Education staff are developing curriculum support material for teachers using the Museum galleries and upgrading the existing material that is sent to booked groups using the education rooms.

Teachers previews were conducted for all new exhibitions and MOTR exhibitions, allowing teachers to become acquainted with the exhibitions and the resource material prior to bringing students.

Community Programs

The Discovery Room has successfully presented natural science and anthropology based interactives to more than 134000 visitors this year. Holiday "Meet Museum Scientists" and the weekend demonstrations by community/scientific groups have continued to be a highlight. The new video-microscope unit, trialled in Term 2, is an exciting addition to the range of interactive exhibits.

During Term 2 the Discovery Room opened on weekday mornings to both school groups and general visitors, increasing the weekday usage of the Room by 200% and making this resource available to a much wider audience.

Tertiary Groups

Groups of Tertiary Students are an expanding segment of the Division's clientele. Special programs have been organised for university and teacher education groups.

Lecture Series

A lecture series on the Australian Environment, organised jointly with the Royal Botanic Gardens for senior biology teachers, was very well attended. Based on this success a series of weekend events for teachers is being planned.

Participation in Museum Developments

Staff have contributed to the development of all new exhibitions and with the training of volunteer guides as well as running field trips for explainers, education volunteers and TAMS.

Work Experience

The Division co-ordinates the Museum's work experience program which places Year 10 students in all sections of the Museum for one week. 75 students were placed in the Museum during the year.

Management

Education Division staff moved to new quarters east of the Temporary Exhibition Hall, making a third teaching space, the Mushroom, available for education programs as well as improving the working conditions of Education Officers and Typists.

The Division has moved further towards computerisation for marketing, bookings and records. Desk-top publishing has simplified the production of printed material and resulted in significant savings. Next year's staff development activity will emphasise computer skills and the measurement of readability in printed matter and gallery texts.

Professional and Community Activities

Several members of staff are active members of the Museum Education Association and the Division is represented on the TAMS Council and the Board of Museum Studies of Sydney University. We have begun to develop joint projects with the Zoo, Botanical Gardens and the Museum of Applied Arts and Sciences.

Sarah Main and Sally Stephens have assisted with the development of radio programs and correspondence school materials for the Department of Education.

Anne Skates gave a paper entitled "Trends in Biology Education in Museums" to the IUBS Commission for Biological Education at Macquarie University in August.

Armstrong Osborne attended the IGU Study Group "Human Impact on Karst" in August 1988 presenting the paper "A long past and a short future? Geological and European history of karsts in New South Wales".

Carolyn MacLulich, Sarah Main and Anne Skates attended the MAA biennial conference at the Powerhouse, Sydney in September, 1988. Anne Skates gave a paper – "Speaking Objectively ".

Carolyn MacLulich attended the Association of Science & Technology Centres Conference in Boston, USA, where she presented aspects of the Discovery Room's development . She also spent time at the Ontario Science Centre, Toronto, discussing issues of interactive exhibit development and staffing with design and education staff at the Centre.

Future Plans

This year we reviewed our programs in the light of audience information, commercial opportunities, technical advances and a decision to work harder for Environmental Education.

Over the next three years our planning will broaden the audience we serve, include a more commercial approach to materials development and focus more on social and environmental issues.

Two immediate projects will be an extension of the Discovery room into an enlarged "Discovery Space" and the establishment of an innovative "Investigation Centre" to act as a contact point for public enquiries, allow the public to identify their own specimens with the help of systematic collections and keys and give opportunities for the public to participate in the process of scientific enquiry.

Sponsorship

- Apple: sponsored the Wandervan
- Commonwealth Bank: sponsored the Museum Train and gave support in each town visited.
- Regional radio stations: – provided free advertising for the Museum Train
- The Sydney Morning Herald: – sponsored printing for Museum in a Box.
- The Water Board: – has agreed to sponsor Museum in a Box.

Figures at a glance 1988-1989

	Students/Clients	Public	Total
Class Visits	25,108*		25,108*
Gallery Visits	51,461*		51,461*
Discovery Room	4,600	130,000	134,600
Museum in a Box	12,210**		12,210**
Museum on the Road	38,100^	116,472^	154,572^
Museum Train	8,330^^	10,406^^	18,736^^
Wandervan	7,059		7,059
Work Experience	75		75
TOTAL	146,943	256,878	403,821

* depressed by Teachers' Federation industrial action limiting excursions
** service not provided Term 2, 1989 due to fire
^ exhibitions out of service for repairs January–March 1989
^^ Train program ceased December 1988

Lizard Island Research Station

Established in 1973, the Research Station provides support for scientific research into all aspects of biology, geology, oceanography, hydrology and ecology on the northern Great Barrier Reef. Accommodation, boats, diving equipment, a running sea water aquarium system and air conditioned laboratory facilities for up to 16 scientists are available right on the reef. The station's 14m catamaran plies the waters north to Papua New Guinea and south to Gladstone assisting in a variety of research programs.

Highlights

- Discoveries presented at International Symposium in Townsville
- Busiest year ever
- Two new 7.2 Maluminium Dories

Research

Research from work done at Lizard Island Research Station was well represented at the very successful 6th International Coral Reef Symposium in Townsville. Associate Professor AWD Larkum and Dr GC Cox (University of Sydney), 1988 Lizard Island Fellows, reported on a previous undescribed cyanobacterial symbiont found in sponges from Lizard Island. The three other 1988 fellowship holders, plus a host of the researchers from the station, also contributed interesting papers which are being published in the proceedings of the symposium.

Phylogeny of Australian Amphipoda

James Darwin Thomas (Reef Foundation) and Jan Clark (Smithsonian Institute) studied the distributional ecology of cryptofaunal coral reef amphipods. Long-term research goals are to examine the evolutionary relationships of amphipods from comparable coral reef habitats. The goal is constrained by the paucity of research collections of amphipods from the Great Barrier Reef. A number of new taxa were collected and will require formal description before comparisons of amphipod assemblages from the Caribbean, Central and South Pacific and Indian Ocean reefs are undertaken.

Black Marlin Favor Scad Bait

P Spear (James Cook University) was able to dissect 11 black marlin at the station during the marlin season, September to November, with the cooperation of Lizard Island Lodge and the marlin fishing boats. All the fish had been caught on scad which is interesting as most, if not all, boats troll kawa kawa, spaniards or shark mackerel as well. 48 billfish larvae between 3 -10 mm were caught in plankton tows.

Examination of the parasites in the marlin, including remnants from previous infections, suggested that there is no interaction between the juvenile inshore group and mature offshore fish. Many of the parasites found on coastal caught fish were absent at Lizard and vice versa.

Peter believes that fish between 50-500 kg are the key to establishing the relationships in migratory habits between juveniles and adults. These fish would also assist in establishing the size/ages of sexual maturity for each sex.

Taxonomy of Ascaridoid Nematodes from Marine Fishes

Dr N L Bruce, Dr L R G Cannon, Dr T Cribb and R T Springthorpe (Queensland Museum, CSIRO and Australian Museum) visited the station to collect parasitic nematodes (Ascaridoidea in particular) from predatory and scavenging marine fishes.

An approximate total of 100 fish stomachs were examined (about 31 species) and of these only 3 yielded ascaridoid worms. In nearly all fish examined the gut mesenteries were infested with larval ascaridoids, the causative organism of anisakiasis or 'sushi disease'.

The worms collected were of interest in spite of the rarity. One species from Lutjanus argentimaculatus and L bohar belongs to a new genus. The other, from Scomberomorus commerson is the first record of the species since its description, and the first record from Australia. Travel assistance for this work was provided by Australian Airlines.

Scavangers at work

S Keable (Macquarie University) is working on small invertebrates, particularly amphipods and isopods) which forage in tropical waters. These animals are well known from cold water and deep sea environments but little is known about them in tropical waters. They cause problems to fisheries using traps or nets by destroying the bait and

attacking the catch making it unmarketable. Steve is collecting these scavengers using small traps baited with fish scraps. His work is being assisted by an Australian Museum Postgraduate Grant and by travel assistance from Australian Airlines. He is being supervised by Dr J Lowry from the Australian Museum.

Still Another Busy Year

As of early May, the station was experiencing its busiest year ever! An average of 9.8 users per night used the station compared with 9.5 users the previous year. Captain Matt and Mipi Jumelet assisted Dr I Poiner's (CSIRO) sea grass research in Torres Strait in August/September and October/November. Mr C Rasmussen (James Cook University) took cores from reefs off Cairns in September. Professor H Choat (James Cook University) and Dr J Leis (Australian Museum) in November studied larval fish in the waters around Lizard. In December/January Captain Matt and Mipi Jumelet took RV Sunbird on a cruise to the seldom traveled regions of New Britain Province, Papua New Guinea. Relief Captain Terry Ford skippered the vessel for Brian Long (CSIRO) to Torres Strait for sea grass sampling with Relief Crew, Angela Fielding. With Relief Crew, Lois Wilson, Captain Ford assisted marine archaeologists from the Queensland Museum in their search for wrecks off the far north Queensland coast.

Additional New Vessels

With the generous assistance of North Queensland Engineers and Agents the station has obtained two 7.2 m aluminium dories each with a 36 hp diesel engine. These safe and economical vessels will further increase researchers access to reefs within a 50 km radius of Lizard Island.

A new 4.3 m Savage dinghy was purchased in October to replace an aging DeHaviland. We hope it will help meet station boating needs for the next 10 years.

Telephone Installed

The new microwave office phone has assisted with station business and the Golf Phone has been popular with researchers, fisherman, campers, lodge staff and guests. A FAX machine, kindly donated by the Kirby Foundation, really put us in the 20th century.

Fellowship Awarded

The successful Lizard Island Doctoral Fellow for 1989 is Mark McCormick who is enrolled in the Marine Biology Department, James Cook University of North Queensland. The title of his project is "Factors influencing the settlement and subsequent survival of a group of mullids on the Great Barrier Reef."

As the standard of applications was high the Museum is also offering partial support in 1989 to Joel Elliott, Department of Biological Sciences, Florida State University. The title of his project is "The influence of larval recruitment, dispersal and acclimation ability to host specificity of anemone fishes." QANTAS Airlines will assist by providing a complimentary air ticket.

Station Volunteers

We would like to thank the following people who volunteered their time to help improve the facilities of the station and to assist with scientific research. Their assistance has made the station a better place to work and live and has helped push back the boundary in quest for knowledge. Their contribution is appreciated:
S Barrie, J Caley, L Cowen, J Cuddihy, J Fuller, P Goddard, L Goggin, J Godwin, S Griffith, J Horstmann, P Howard, C Hudson, M Johnson, M Jull, C Justine, L Katz, B Lawerence, P Lyons, J McGrory, M Merklein, A Papas, S Pleydell, T Pople, M Stafford-Smith, M Shand, C Symth, C Williams.

Tours

The station tours attracted over 1500 people during the year. Most of the visitors are passengers from the MV Noel Buxton and MV Queen of the Isles with the rest coming from the SV Bounty and other tall ships, the Lizard Island Lodge, yachties and campers.

Future Developments

-Increase primarily scientific research and secondarily educational use of the station
-Expand accommodation available for users
-Improve safety standards by replacing oldest dinghies with newer models
-Establish long term observations of hydrological parameters
-Build a well ventilated wet lab

Library

The Museum Library collections form a major natural history literature resource in Australia. Our objectives are to conserve, acquire, organise, retrieve and disseminate information to support the work of the Museum staff.

The Library also makes its collections available for the scientific and educational activities of organisations and individuals.

Highlights

- 6,300 people visit Library!
- Developments in sectional Libraries
- Linnean Society serials integrated

Linnean Society Serials Collection Catalogued

Cataloguing has now been completed of a collection of serials donated in 1983 by the Linnean Society of New South Wales. A total of 435 titles have now been integrated into the Library's Serials Collection. The titles are, in many cases, the only set held in Australia.

Conservation Survey of Rare Books and Archives

This survey was carried out by consultant paper conservators and we now have a detailed report on the conservation status of our Archives and Rare Books. Much of the information contained in the report will be used along with other information to (a) develop a long term Conservation program for these collections; (b) set essential priorities for action within the confines of the available funds.

Library Visits

During the past year, we have had an average of 30 clients/visitors per day – a large increase on previous figures, due in no small part to the new location and the possibilities this has provided for increased and more effective accessibility and services. The new location has also given us the chance to display some of our collection. During the past year, the Library has had displays of Gould's Birds of Australia, books of voyages and travels to Australia, select items from the Archives and objects from the Minerals Collection of the Museum which have attracted many visitors. During the year we have hosted and given talks to Senior Citizens Week Tours, University of New South Wales School of Librarianship Groups, The Australian Museum Society, Library Association of Australia / IFLA Conference Groups, launch of Marion Ord book on the works of the Scott Sisters and Special Libraries Groups.

Koala Research Stamps

Library staff researched early illustrations of koalas available from within our collection. These were used for stamps, the sale of which would contribute to the koala research projects of the Australian National Parks and Wildlife Service. Illustrations from Perry's Arcana, Krefft's *Mammals of Australia* and Gould's *Mammals of Australia* were used and the stamps were launched in the Library.

New Edition of Archives Guide

Due to demand and the addition of considerable new material, a second edition of the *Guide to the Australian Museum Archives* was published. This edition is generally available only by purchase. The Guide is continually updated and it is expected that another edition will be produced in the future. A survey of the inactive records in the scientific section is currently being undertaken and it is expected that much additional Archival Material will be identified and documented.

Developments in Sectional Libraries

Approximately one-third of our monograph collection and a tenth of our serials collection are held in the sectional libraries, along with some rare books. Questionnaires were distributed to all sectional libraries in order to identify their perceived needs. The results will be used to develop long term plans and priorities. Catalogues of both the Anthropology and Lizard Island collections were produced using d-BASE, material from Anthropology and Mineralogy was transferred back to the Main Library and with regard to the Education Section, preliminary discussions were held and an action plan formulated for stocktake and conversion of the Library's holdings onto ABN, to produce the first sectional library microfiche catalogue.

Staff Development

Library staff attended a wide range of conferences, seminars and workshops in order to ensure that knowledge and skills are continually updated. They include the following – LAA/IFLA Conference, Networking Your Computer Seminar, AUSTRALIS

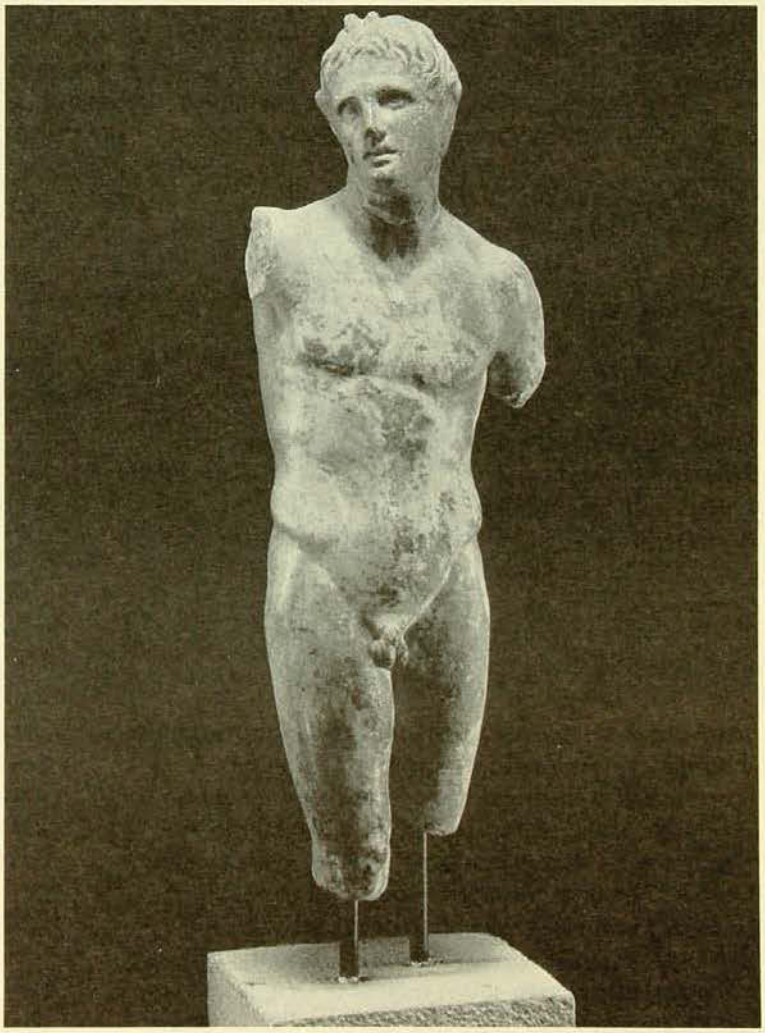
Training, ABN Training, Planning for Computerisation Seminar, Regrading Seminar, LIBNET Training, Selection Panel Training, Managing Your Self and Others, Effective Management Course, Staff Appraisal Workshops, WORDPERFECT Training, Classification and Indexing Workshop and Lessons from Leningrad – a disaster Management Course. Ideas and skills developed at these courses have all had a direct relevance to our day-to-day performance in the effective provision of information services.

Future Plans

- Conservation program for archives and rare books
- Identification of archival material in scientific sections
- Sectional libraries to be given high priority
- Disaster planning, including fiching and off-site storage of vital records.

Visitors

This year we enjoyed fruitful discussion and exchange of ideas and publications with the following heads of Libraries: Rex Banks (British Museum of Natural History), Nina J Root and Miriam Tam (American Museum of Natural History), Christiane Parker (Museums and Art Gallery of the Northern Territory) and Barbara Staples (CSIRO Division of Wildlife Ecology).



One of the sculptures of Alexander the Great on display in the 'Ancient Macedonia' exhibition

Materials Conservation Division

The **Materials Conservation Division** aims to prevent damage to the collections, conserve items of special importance, undertake research to increase the immediate and long–term preservation of the collections, and disseminate information on conservation methods.

Highlights

- 'Rituals in the Human Life Cycle' exhibitionopened
- New laboratory completed and occupied
- Computerisation of records established

Rituals in the Human Life Cycle

Over four hundred artefacts representing a diversity of manufacturing techniques (from ancient Egyptian to modern Australian Aboriginal) were conserved for this exhibition. New methods were developed to cope with the wide range of materials requiring stabilisation. The close monitoring of the condition of the objects on display will be the only true test of our success and will be undertaken regularly.

Pieces of Paradise

The award–winning 'Pieces of Paradise' exhibition was dismantled in April with some of the objects requiring post–exhibition conservation. The construction of long- term support systems was necessary before many of the objects could be returned to the storage area.

Research on Painted Artefacts

The evaluation of materials to reduce flaking of paint from ethnographic objects is nearing completion after 4 years. Experimentation has aimed at determining the most suitable adhesive for securing paint to the surface of wood without damaging or altering its physical appearance.

New Building

The Materials Conservation Division has moved into their new laboratory and is now enjoying the much–needed extra work space and storage areas. The move of the Anthropology collections into the new storage areas also began this year. The Division has been manufacturing transport and storage systems for the safe relocation of the artefacts. Of particular interest was the moving of about 40 canoes (ranging from two to seven metres in length) out of the Rushcutters Bay store into the new Pacific Store. They were passed out a floor window, lowered to the ground by crane and then transported on supports in trucks with specially adapted suspension.

Pest Control

An integrated pest control program has been implemented to reduce insect infestations in the Museum collections. The Anthropology, Ornithology and Mammology storage areas are being closely monitored for insect activity and, where necessary, chemical and physical methods have been adopted for their control.

Research on Controlled Atmosphere Fumigation

A major research project is underway to assess the viability of low oxygen atmospheres as a fumigation technique for the control of insect infestations. Cultures of several major museum pests – drug store beetle, powder–post beetle and clothes moth – have been prepared and are being maintained. Experimental trials to determine the mortality rates for these insects following prolonged exposures to low oxygen atmospheres have commenced.

Information Management

The Conservation Division now has a local area network supporting four terminals which offer a range of software. Databases have been established for the library, job register, object loans, accounts, pest control, conservation projects, materials and equipment. Computerisation of the conservation worksheets and photographs is continuing. The network is also linked to the international Conservation Information Network providing information from the Getty Conservation Institute's database in Ottawa.

Conservation of Collections

The Division has commenced a conservation project on the treatment of rare Marind Anim material from Irian Jaya. The ornate costume pieces are made from sago spath covered with a resin holding intricate seed designs. The objects, although in exceedingly poor condition, are considered to be a unique part of the Anthropology collection.

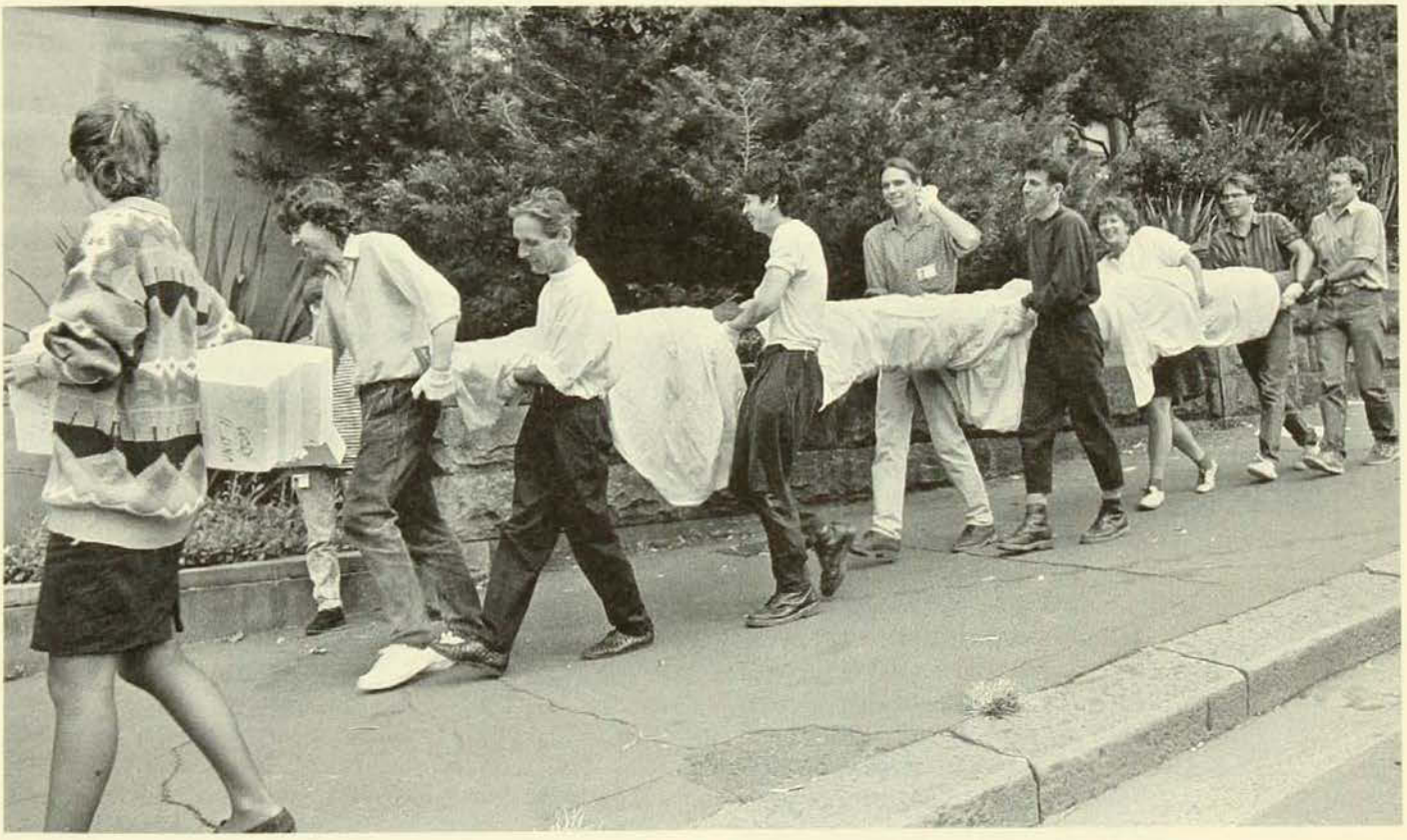
General

Sue Walston was on sabbatical from June 88 - June 89; Mark Gilberg and Karen Coote shared the duties of

four-day disaster response workshop in Geelong and has organised an emergency plan and supplies to assist in the recovery, treatment and protection of collections. Marcelle Scott and Marcela Pacheco attended a course in database application. Chris Mott has begun work on the conservation of a unique 90-year-old crocodile specimen. The two Kwakiutl Totem Poles were cleaned prior to their return to Canada and Michael Kelly prepared a custom made packing case for the safe return of the Eagle and Bear Masks. The Conservation Division in association with the Artificiers repaired the new Totem Pole which was damaged at Expo 88 and it is now mounted in the Atrium.

Future Plans

- Complete computerisation of records
- Publish results of flake adhesion research
- Assess the practility of low oxygen atmospheres in controlling insect infestation
- Publish notes on dust and vibration monitoring in the new building
- Assess the conservation needs of natural history collections
- Publish notes on the treatments used in the 'Pieces of Paradise' and 'Rituals in the Human Lifecycle' galleries



Museum staff members returning a large housepost from the Sepic Province, PNG to stores after being on display in the 'Pieces of Paradise' exhibition.
Photo by Anthony Farr

National Photographic Index of Australia

Aims and Activities

The National Photographic Index of Australian Wildlife is an ever increasing archive of photographs of the mammals, birds, reptiles and frogs of Australia, maintained as a reference to supplement the Museum's collections of preserved specimens; as a source of illustrations for publishers and authors; and as the basis of richly illustrated books produced by the Index.

Highlights

- The Index moved from Rushcutter's Bay to premises in the basement of the Museum Annexe in Yurong Street, bringing it into closer physical and personal contact with the rest of the Museum.
- Use of the Index by authors was 250% greater than in the previous year.
- Test of the *Encyclopaedia of Australia Terrestrial Vertebrates* was almost completed (only the section on snakes remaining to be written).

Much of the year was occupied with reorganisation related to the change of premises. The texts of three volumes of the bird series are ready for publishing - *Volume 6 (Honeyeaters); Volume 7 (Parrots and Pigeons) and Volume 8 (Raptors and Gamebirds).* Only two volumes remain to complete the series.

The main collection now includes some 27000 colour photographs encompassing more than 95% of the extant species of the tetrapod vertebrates found in Australia.

Historical Section

The move to the Museum Annexe has provided the **Historical Section** with better storage and working space for the five volunteers who are responsible for this archive of black-and-white photographs, mainly of birds. Most of the year has been devoted to merging into the collection the very large donation from the Bird Observer's Club of Australia. The lantern slide collection of the Queensland Museum was received in June 1989.

Some of the most valuable of the lantern slides and glass negatives show signs of deterioration. A project to duplicate these in 35mm format has begun.

This year saw the first commercial use of 60 year old photographs) from the Historical Section.

The Australian Museum Society

The Society's primary aims are to act as a link between the community and the Museum, to promote and increase awareness of the work of the Museum, and to assist the Museum financially.

Highlights

- Launch of the 'Science Super Series'
- Final contribution to the major bicentennial Exhibition'Dreamtime to Dust', bringing TAMS sponsorship to $100000
- Overseas Tours Program includes Peninsula Malaysia, Sumatra, New Guinea, the Amazon and China

Science Super Series

The Australian Museum and TAMS jointly launched an ambitious new project called the Science Super Series. Announcing the Series, Robyn Williams said :

"We're keeping Australians in touch with the most important ideas in science today. The Australian Museum is trying to fill a gap at a time when environmental science has never been so important. we are bringing the world's leading authorities to speak on present concerns".

700 people heard Richard Leakey speak on Human Origins in November 1988 and another 700 people heard famed Canadian geneticist, Dr David Suzuki, in April 1989. At that lecture at least another 400 were disappointed that we were unable to accommodate them.

Other top scientists and naturalists will include Carl Sagan, Steven Jay Gould, Jane Goodall, Desmond Morris, David Attenborough, Peter Raven and James Lovelock .

Tours and Expeditions

An outstandingly successful overseas tours program included destinations as varied and exotic as Peninsula Malaysia, Sumatra, Papua New Guinea, the Amazon, and China. All TAMS tours are led by scientists and naturalists whose presence adds a depth to the travel experience which is gaining for TAMS tours an enviable reputation.

Office Relocation

TAMS now occupies very attractive offices in a small section of the Rooftop of the Museum. The space is well–equipped and conducive to efficiency, as well as offering better facilities for members. The budget allowed for a contribution towards the refurbishment of the new Rooftop area for Museum staff.

Program

Aside from lectures, a full program of excursions, field trips, in-house activities and social functions, all met with an enthusiastic response.

Membership Hits 6000

This increase is attributable mostly to all the bicentennial activity at the Museum, probably the busiest and most stimulating 12 months in the experience of TAMS as well as of the Museum.

The Circles of Natural History

Membership to **The Circles of Natural History** has vastly increased and we are most grateful for the support of the following companies and individuals:

Amatil Limited
Australian Airlines
Australian Geographic Pty Ltd
Australian Guarantee Corporation Pty Ltd
Dr DK Baird
Banque Nationale de Paris
Boral Limited
Cadbury-Schweppes Pty Ltd
Caltex Oil (Aust) Pty Ltd
Canterbury Timber & Building Supplies Pty Ltd
Consolidated Press Holdings Ltd
Coopers & Lybrand
Cyanamid Australia Pty Ltd
DHL International (Aust) Pty Ltd
George Weston Foods Limited
Harris–Daishowa (Aust) Pty Ltd
Johnson & Johnson Aust Pty Ltd
Miss B Keenan
Leighton Holdings Limited
Lotto Management Services Pty Ltd
Olivetti Australia Pty Ltd
Ord Minnett Group Limited
Peter Weiss Pty Limited
Sir John Proud
Qantas Airways Ltd
Rank Xerox (Aust) Pty Ltd
Readers Digest Services Pty Ltd
Rochford Williams International Pty Ltd
Roden Print Pty Ltd

Rothmans Holdings Limited
Siemens Limited
Mr WS Tatlow
The Broken Hill Proprietary Co Ltd
The Commonwealth Industrial Gases Ltd
The Regent Sydney
Starkstrom Control Gear (Aust) Pty Ltd
Wellcome Australia Limited
Wild Leitz (Aust) Pty Ltd

Future Plans

- 'The Science Super Series' will be expanded to include the four speakers per year which were envisaged in the original concept
- A membership drive will be initiated as part of a three-year plan to reach 10000

Finances

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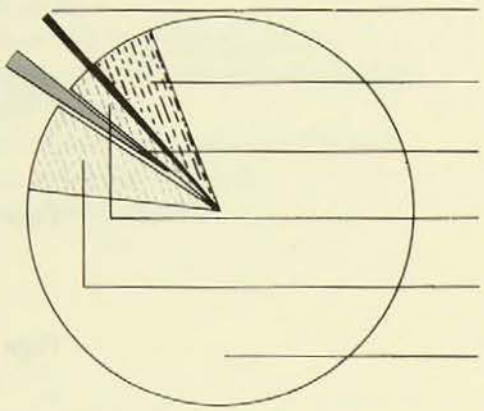
AUSTRALIAN MUSEUM- FUNDING (NON CAPITAL)



Net Income, Australian Museum Society: 0.6%

Statutory Endowment/ special subsidy: 5.3%

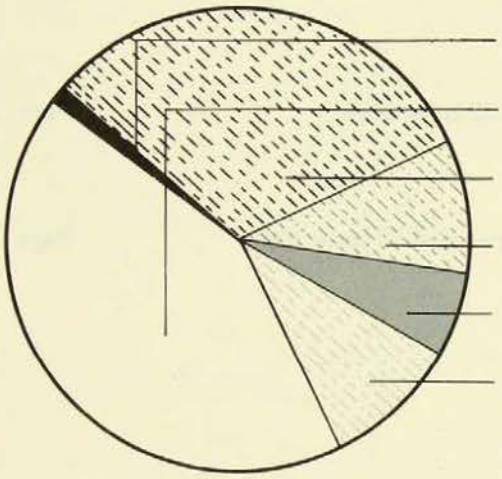
Australian Government Research Grants: 1.4%

Net Income from Trading: 2.3%

Other funds raised by the Museum: 7.6%

State Government: 82.8%

FUNCTIONAL EXPENDITURE (NON CAPITAL)



Depreciation/ Doubtful debts: 1.5%

Scientific research/ collections: 41.9%

Administration/ general*: 31.6%

Community Relations: 9.2%

Education: 6.1%

Exhibitions: 9.7%

* Includes rent, electricity and other building costs and overheads.

Outline Operating Budget 1989/90

	$'000
Budgeted Income	
• State Government	10,818
• Specific Purpose Funds	3,315
• Other	80
	14,213
Budgeted Expenditure	13,422
Budgeted result for year Surplus (– Deficiency)	791

Outline Capital Budget 1989/90

	$'000
Budgeted Income	
• State Government	2,299
• Specific Purpose Funds	611
	2,910
Budgeted Expenditure	2,910

Auditor-General's Certificate
Australian Museum Trust

The accounts of the Australian Museum Trust for the year ended 30 June 1989 have been audited in accordance with Section 34 of the Public Finance and Audit Act 1983.

As disclosed in Note 1.1, the financial statements of the Trust have been prepared in compliance with the Australian Statements of Accounting Standards except for the non-inclusion of: the Museum's collections; the land and buildings other than recent additions (as detailed in Note 8.1); and the employer's liability for superannuation. I am unable to quantify the effect on the balance sheet of these omissions.

This is the first year in which the financial statements have been prepared on this basis, so consequently previous years' comparative figures were not available and the funds statement has not been prepared in accordance with the requirements of Australian Accounting Standard AAS12 "Statement of Sources and Applications of Funds" in that movements in working funds have not been separately disclosed.

In my opinion, except for the effects of the matters referred to in the preceding paragraphs, the balance sheet, income and expenditure statement and funds statements, read in conjunction with the notes thereto, comply with Section 41B of the Act and exhibit a true and fair view of the financial position at 30 June 1989 and the transactions for the year then ended.

K J Robson, FASA CPA
Auditor-General of New South Wales

Sydney
18 October 1989

Australian Museum Trust
Statement in Accordance with Section 41B(1)(f) of Public Finance and Audit Act, 1983

In accordance with a resolution of the Australian Museum Trust we state that:

a. The financial statements and notes thereon exhibit a true and fair view of the financial position and transactions for the year ended 30 June, 1989;

b. The financial statements have been prepared in accordance with the provisions of the Public Finance and Audit Act, 1983 and the Public Finance and Audit (Statutory Bodies) Regulation 1985 and the Treasurer's Directions; and

c. We are not aware of any circumstances which would render any particulars included in the financial statements to be misleading or inaccurate.

C Bull
Deputy President of the Trust
11 August 1989

H C Cogger
Acting Secretary of the Trust
11 August 1989

Australian Museum Trust
Income & Expenditure Statement
for the Year Ended 30 June 1989

1988		Note	1989 Con-solidated Fund	General Purposes Fund	Specific Purposes Fund	Total
Not Available		1				
	Income		$	$	$	$
	State Government	2				
	– Recurrent Services		10,142,904			10,142,904
	– Endowment			300,000		300,000
	– Subsidy			350,000		350,000
	– Bicentennial			38,208		38,208
	Australian Government	3			176,231	176,231
	Net Income from Trading Operations	4		282,735		282,735
	Other	5		297,880	587,760	885,640
	Net Income from Museum Foundation				2,351	2,351
	Net Income from The Australian Museum Society				69,551	69,551
	Net Income from Peter Rankin Fund				1,509	1,509
	Total Income		**10,142,904**	**1,268,823**	**837,402**	**12,249,129**
	Expenditure					
	Administration & General		3,617,438	140,302		3,757,740
	Community Relations		972,191	125,471		1,097,662
	Education		647,520	77,060	5,952	730,532
	Exhibitions					
	– General		1,020,644	17,328	37,697	1,075,669
	– Amortisation			85,217		85,217
	Scientific Research/Collections		3,885,112	295,101	810,563	4,990,776
	Depreciation		141,953	24,112		166,065
	Doubtful Debts			10,139		10,139
	Total Expenditure		**10,284,858**	**774,730**	**854,212**	**11,913,800**
	Operating Surplus (–Deficiency) for Year		–141,954	494,093	–16,810	335,329

Australian Museum Trust
Balance Sheet
at 30 June 1989

1988		Note	1989
		1	$
Not Available	Current Assets	7	
	Cash on Hand and at Bank		100,869
	Receivables	7.1	676,833
	Inventories	7.2	181,924
	Investments	7.3	91,062
	Total Current Assets		**1,050,688**
	Non Current Assets	8	
	Property	8.1	17,098,121
	Plant & Equipment	8.2	862,030
	Deferred Costs – Exhibitions	8.3	1,690,865
	Employee Leave Entitlements Owing by State Treasurer	8.4	1,416,197
	Total Non Current Assets		**21,067,213**
	Total Assets		**22,117,901**
	Current Liabilities	9	
	Creditors and Accrued Charges	9.1	679,390
	Bank Overdraft		159,728
	Grants Received in Advance	9.2	56,433
	Total Current Liabilities		**895,551**
	Non Current Liabilities	10	
	Employees Leave Entitlements	10.1	1,416,197
	Total Non Current Liabilities		**1,416,197**
	Total Liabilities		**2,311,748**
	Net Assets		19,806,153
	Capital & Retained Earnings	11	
	Advance – State Treasurer		75,000
	Assets Acquired Free of Capital Liability	11.1	19,817,081
	Accumulated Deficiency	11.2	–85,928
	Total Capital & Retained Earnings		**19,806,153**

Australian Museum Trust
Statement of Source and Application of Funds
for the Year Ended 30 June 1989

Source of Funds	1989	
	$	$
Funds from Operations		
Inflow of Funds	12,249,129	
Less Outflow of Funds	11,652,379	
Net Inflow of Funds from Operations		596,750
Capital Funds provided by Government		3,069,911
		3,666,661
Application of Funds		
Property Improvements	2,773,047	
Acquisition of Plant & Equipment	298,742	
Exhibitions Capitalised	544,417	3,616,206
Decrease in Working Capital		50,455
		3,666,661
Reconciliation of Funds Flow from Operations with Operating Expenditure		
Operating Expenditure	11,913,800	
Less Amount set aside for Amortisation & Provisions	261,421	
	11,652,379	

Australian Museum Trust – Notes to and Forming Part of the Financial Statements for the Year Ended 30 June, 1989

1. Summary of Significant Accounting Policies

1.1 Basis of Presentation

Prior to 1989 the Trust's financial statements were prepared on a "modified" accrual accounting basis by exemption approved by the Treasurer under Section 41B(2) of the Public Finance & Audit Act 1983. By decision of the Trust the financial statements have now been prepared in accordance with full accrual accounting principles with the exception that the Trust's collections and portion of the historic Museum property and site have not been valued for Balance Sheet purposes, the outstanding liability for employee superannuation has not been brought to account, nor has trading stock movements been taken into account in determining the net income from trading operations. Notes 1.3 and 8.1 address those issues. With those exceptions the statements comply in all material respects with the accounting standards and disclosure requirements of Australian Accounting Standards, industry practices, the requirements of the Public Finance and Audit Act, 1983, and the Public Finance (Statutory Bodies) Regulation, 1985. The statements have been prepared in accordance with the historical cost convention and do not take account of changing money values.

The principal effects of the change in accounting practice are:

- Non-current assets, with the exceptions already mentioned, donated by the public or acquired free of charge from Government are recorded in financial statements.
- Non-current assets acquired by the Trust are now capitalised instead of being expensed in the year of acquisition except where otherwise stated.
- Non-current assets are depreciated except where otherwise stated.
- The full amount of expense and liability in respect of employees leave entitlements is brought to account.
- Operations financed from Consolidated Fund are accounted for on an accrual basis rather than mainly on a cash basis that operated previously.

With the adoption of full accrual accounting, a Balance Sheet is compiled in place of a Statement of Financial Position and an Income and Expenditure Statement has replaced a Statement of Financial Operations. The absence, in the statements, of comparable figures for the year ended 30 June, 1988 relates to the lack of effective figures for that year because of the changes in accounting presentation. An exemption from the application of Clause 8(1) of the Public Finance and Audit (Statutory Bodies) Regulation, 1985 has been sought from the Treasurer.

1.2 Fund Accounting

The Trust maintains proper accounts and records for all its operations in terms of Section 41(1) of the Public Finance and Audit Act, 1983. To ensure observance of the limitations and restrictions placed on the use of resources available to the Trust, accounts are maintained in accordance with the principles of fund accounting. This procedure classifies resources for budgetary control, accounting and reporting purposes into distinct funds established according to their appropriation nature and purposes. Funds that have similar characteristics have been combined into fund groups for purposes of budgeting and preparation of the Income and Expenditure Statement. The Balance Sheet records the combined assets and liabilities of the fund groups but preserves (by appropriate notes) the identity of specific and general purpose fund balances retained at year end.

1.3 Collections, Works of Art, Specimens and Other Acquisitions

Because of the intrinsic value of the vast majority of acquisitions of the character referred to and in accordance with policies generally followed by similar museums in North America the Trust does not assign a value to collections in its Balance Sheet. Acquisitions are expensed against operations in the relevant year of purchase. Acquisition costs do not feature as a major component of operating costs.

By way of example, the costs so expensed over the past five years were:

	$,000
1984/85	90
1985/86	132
1986/87	80
1987/88	69
1988/89	65

See also comment under note 8.3 concerning Exhibitions and note 13 Insurance.

2. Consolidated Fund Appropriations

Funds are provided by the State under allocations voted to the Ministry for the Arts to promote knowledge about the natural environment of Australia with particular emphasis on the natural sciences of biology, anthropology and geology. Allocations together with actual funds expended are recorded at page 57 of the Treasurer's Public Accounts for 1988/89. In summary, expenditure against the amounts provided inclusive of supplementary allocations by the Treasurer for the past two years was:

	1988/89	1987/88
	$	$
Recurrent Services	10,525,888	9,149,245
Capital Works & Services	2,773,047	7,802,065
	13,298,935	16,951,310

Within the sum provided by the State for 1988/89 were amounts of $300,000 as an Annual Endowment in terms of Section 14 of the Australian Museum Trust Act, 1975 and an amount of $350,000 as a matching grant for sponsorship funds raised by the Trust. Funds raised by the Trust by way of sponsorships amounted to $350,000. The amount received from the Consolidated Fund was limited to a matching grant to a maximum of $350,000. Endowment and subsidy accounting transactions are recorded through the Trust's General Purposes Fund. A reconciliation between the Consolidated Fund payments to the Trust as recorded in the Treasurer's Public Accounts for 1988/89 and figures in the Trust's Income and Expenditure Statement is recorded at note 12 herein.

3. Other Government Grants

The Australian Government provided grants for specific scientific and other purposes of an aggregate of $232,665 during 1988/89. Movements with respect to those funds and balances held at the beginning of the year to 30 June, 1989 were:

	$
Opening Balance	78,051
Received 1988/89	232,665
	310,716
Transfers to Operations Income 1988/89	254,283
Closing Balance*	56,433

Additional funds of an aggregate of $38,208 were received from the State Bicentennial Council towards the funding of Bicentennial Exhibitions during 1988/89.

*Closing Balance is reflected in the Balance Sheet Liability, Grants Received in Advance.

4. Net Income from Trading Operations

4.1 Shop Trading Account

The following summary incorporates stock movements, salaries and other costs and is therefore not directly comparable with the net income from trading shown in the Income and Expenditure Statement.

	$	$
Sales		761,507
Less: Cost of Sales:		
Opening Stock	145,422	
Purchases	492,295	
	637,717	
Less Closing Stock	181,924	455,793
Gross Profit		305,714
Direct Wages & Costs	148,739	
Other Costs	39,943	188,682
Net Profit		117,032

4.2 Other Revenue of an aggregate of $437,952 was derived from Restaurant activities, Gallery income, sales of brochures and other activities.

5. Private Grants, Donations and Sponsorships

An aggregate of $488,991 was received from private sources for scientific research and exhibitions etc. Movements with respect to funds received in 1988/89 and balances held at the beginning of the year were:

	$'000
Opening Balance	29,580
Received 1988/89	488,991
	518,571
Expenditure capitalised or transfered to Operations Income 1988/89	601,915
Closing Balance	−83,344

The overexpenditure of $83,344 has been brought to account as accrued income for 1988/89.

6. The Australian Museum Society (TAMS)

The Society was established for the purpose of fostering interest amongst the general public in natural history and the work carried out by the Trust. A final instalment of $25,000 was paid to the Trust in 1988/89 towards a $100,000 sponsorship by TAMS of the Museum's exhibition Dreamtime to Dust.

7. Current Assets

7.1 Receivables

At an aggregate value of $676,833 recorded at balance date these comprised:

	$	$
Debtors	27,208	
Less Provision for Doubtful Debts	10,139	17,069
Accrued Income		659,764
		676,833

Within the figure of $659,764 for accrued income is an amount of $563,881 recoverable from the Consolidated Fund in 1989/90. The amount represents the net of accrued charges brought to account at 30 June, 1989 for goods and services at a cost of $595,418 and rent paid in advance $31,537.

7.2 Inventories

The value recorded at 30 June 1989 $181,924 represented stock in trade held by the Museum's shopping outlets. Stocks were brought to account at the lower of average cost price or market value.

7.3 Investments

Investments recorded at cost comprised:

	Cost	Face Value
	$	$
Bank Term Deposit Maturing 11 August 1989	20,992	20,992
Bank Endorsed Commercial Bill Maturing 14 July 1989	70,070	71,000
	91,062	91,992

8. Non-Current Assets

8.1 Property

The value recorded in the Balance Sheet covers the following Trust property:

	$
Museum Building Extension	16,859,029
Lizard Island Research Station Buildings	239,092
	17,098,121

The amount brought to account for the Museum complex in College and William Streets does not include a value for the historic Museum building and site vested in the Trust by the Australian Museum Trust Act 1975 and its predecessor statute. The value recorded represents the capital costs of additions and improvements funded by the State and other significant sources (eg Australian Bicentennial Grants) between 1 July, 1986 and 30 June, 1989 together with refurbishment costs $959,029 in 1988/89 arising from the extension.

The extension became operational late in 1988/89 and accordingly depreciation will be brought to account for the first time in 1989/90.

In recognition of the heritage value of the older Museum building and in order that an appropriate charge can be recorded against operations annually, in future, the Trust is arranging for an assessment of the cost of deferred maintenance requirements to determine a reasonable and practical catch-up period for the earmarking of funds to service the historic building maintenance arrears.

The Lizard Island Research Station site is occupied by the Trust as lessee from the Queensland Government for a 25 year period terminating in 1998 at an annual rental of $25. Buildings erected at an aggregate cost of $283,291 between the years 1973 and 1989 were brought to account at an adjusted value of $246,174 at 1 July, 1988 to take into account cost less accumulated depreciation. The buildings are now being depreciated over their remaining estimated life of up to 40 years on the assumption that the lease will be renewed in 1998.

A first depreciation charge of $7,082 against operations was brought to account in 1988/89.

8.2 Plant & Equipment

This brings to account:

a. An adjusted capitalisation of plant and equipment acquired and expensed against Operations in the years 1984/85 to 1987/88 after allowing for accumulated depreciation to 30 June 1988;
b. The capital value of plant and equipment acquired in 1988/89; and
c. The book value of (a) and (b) after allowing for depreciation at appropriate rates, as a charge against Operations in 1988/89.

The book values are summarised following:

	$
Adjusted Capital Value Brought to Account at 1 July 1988	722,271
Acquisitions 1988/89	298,742
	1,021,013
Less Depreciation 1988/89	158,983
Book Value at 30 June 1989	862,030

8.3 Exhibitions

Major exhibitions owned by the Trust were recorded at an aggregate value of $1,690,865 at 30 June, 1989. That value represents capitalisation of development and establishment costs of exhibitions that will continue to generate revenue or provide a community service beyond the financial years in which costs were incurred.

Development and establishment costs as capitalised include material and construction expenditure but do not include an assessment of the intrinsic value of collection items incorporated in an exhibition unless specifically purchased (and thus costed) for the purpose. Labour costs for permanent staff inputs to the development of exhibitions have not been brought to account although attention is being directed towards the question of capitalising direct labour costs in future.

The aggregate value recorded in the balance sheet is derived from two components:

8.3.1 Exhibition assets fully expensed against operations in previous years remaining operational and brought to account at 1 July, 1988 for the first time at $1,146,448; and

8.3.2 Exhibition assets developed and established (including works in progress) during 1988/89 that were capitalised at $629,634 as deferred costs with a view to amortisation over their anticipated operational lifetime.

In line with changes in financial policy associated with capitalisation of major exhibition costs in 1988/89, two financial adjustments will now be brought to account annually over the operational lifetime of the exhibition assets concerned until the group mentioned in 8.3.1 become non-operational, viz:

8.3.3 Those exhibition assets formerly expensed against operations and subsequently capitalised at 1 July, 1988 will be proportionally reduced to reflect a value that has regard to their remaining lifetime: and

8.3.4 Exhibition asset expenditure incurred from 1 July, 1988 and operational after that date will be capitalised and a relevant Exhibition operational lifetime determined for apportioning costs by way of amortisation against operations over the years concerned.

The accounting action for 1988/89 is summarised following:

	$	$
Adjusted book value at 30 June 1989 of Exhibitions Operational at 1 July, 1988		1,146,448
Capitalisation of Exhibitions developed in 1988/89	629,634	
Deduct value Amortised against Operations 1988/89	85,217	544,417
Book Value of Exhibitions at 30 June 1989		1,690,865

8.4 Employee Entitlements – Owing by State Treasurer

The amount brought to account $1,416,197 represents the past service costs for Trust employee leave entitlements. As mentioned in note 10.1, those costs are funded by the State Treasurer on benefit emergence.

9. Current Liabilities

9.1 Creditors and accrued charges totalled $679,390.

9.2 Grants Received in Advance

The balance of $56,443 recorded at 30 June, 1989 related to moneys held in the Specific Purposes Fund on account of Australian Government funded projects.

Fund accounting arrangements are summarised at Note 1.2.

10. Non-Current Liabilities

10.1 Employee Leave Entitlements

The assessed liability brought to account at 30 June, 1989 comprised:

	$
Accrued Long Service Leave	860,463
Accrued Annual Leave	555,734
	1,416,197

Assessment of the liabilities as recorded was based upon:

a. Long Service Leave represents liability for the total value of leave accrued but not taken by employees with five or more years' service. Effective for the year ended 30 June 1989 an on-cost of 1.95% on gross salaries and wages is charged against operations and paid to the State Treasurer towards funding the liability on benefit emergence.

b. Annual Leave payments with respect to leave taken during the year are charged as an operating cost. Accordingly the liability as recorded above represents the accumulated value of untaken annual leave (inclusive of industry loadings) at 30 June 1989.

10.2 Employee Superannuation Entitlements

The Trust has sought advice from the Government Actuary as to the past service liability for the unfunded employer liability in respect of Trust employees covered by the State Superannuation Scheme and the State Public Service Superannuation Scheme. It is proposed to bring this to account in future in a similar manner to the accounting treatment for accrued leave entitlements as mentioned in notes 8.4 and 10.1.

11. Capital & Retained Earnings

11.1 Assets Acquired Free of Capital Liability

The amount brought to account at 30 June 1989 represents the capitalisation at ascertainable cost of property, plant and equipment and exhibition assets, $19,788,736, acquired by the Trust free of capital liability (see also note 8.1 Property).

11.2 Accumulated Funds

Although Operations for 1988/89 resulted in a Surplus of $335,329 for that year the changes in financial practice as discussed herein disclose accumulated deficiencies not brought to account in previous years of $421,257. When adjusted for the Surplus of $335,329 for 1988/89 the Accumulated Deficiency was reduced to $85,928 at 30 June 1989.

12. Reconciliation Trust Income and Expenditure Statement and Treasurer's Consolidated Fund Payments

		$
	Consolidated Fund Payments to Trust for Recurrent Expenditure	10,525,888
Add:	Accrued Expenditure not reflected in Treasurer's Accounts	595,417
		11,121,305
Deduct:	Rent Paid in Advance	31,537
		11,089,768
	Income recorded in Consolidated Fund Section of Income & Expenditure Statement	10,142,904
	Transfers from Consolidated Fund Income to General Purposes Fund Income	650,000
	Plant & Equipment Purchases Capitalised	296,864
		11,089,768

13. Insurance

For insurance purposes, plant and equipment is valued at $862,030 (cost less depreciation).

The Trust's collections were valued in 1981 by the Museum at $76 million. The current value of these items may, however, be substantially in excess of this amount. The State Government acts as self insurer for any fire-loss or damages to collections amounting to more than $5 million, arising from any one claim.

Insurance cover has been arranged to cover exhibits up to the amount of $5 million.

14. Audit Fee

The fee for the audit of the Trust's accounts and records by the New South Wales Auditor-General's Office was $18,000. The Auditor received no other benefits.

15. Commitments for Goods and Services

The Trust had no liability for Goods and Services contracted for at 30 June 1989 not otherwise accounted for in the balance sheet.

16. Outstanding Capital Commitments

The Trust was not contracted for Capital Expenditure commitments at 30 June 1989.

17. Contingent Liabilities

The Trust was not aware of any contingent liability relevant to its functions at 30 June 1989.

18. Material Assistance Provided at No Cost to the Trust

Material assistance provided to the Trust for which payment was not made (figures are not available as to the cost of these services) included:

- Postal, freight services provided by the Government Courier Service.
- Recruitment services provided by the Department of Administrative Services.

19. Members Fees or Benefits, etc

Trust members do not receive emoluments or other benefits of office. There were no loans made to members, officers or employees of the Trust.

20. Leases

The Trust has forward commitments for lease rentals with respect to two properties it occupies as lessee. The commitments are:

	Lease A	Lease B
	$	$
1989/90	149,184	255,360
1990/91	149,184	To be negotiated
1991/92	149,184	
1992/93	To be renegotiated	

In the case of lease "A" rentals are subject to adjustment for increases in Land Tax, Council, and Water Board rates.

End of Audited Financial Statements

Publications

Anthropology

Beck, W., R. Fullagar & N. White, 1988. Archaeology from ethnography: the Aboriginal use of cycad as an example. In 'Archaeology with ethnography: an Australian perspective' (eds B. Meehan & R. Jones): 137-147. Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.

Bolton, L., 1988. Trading stories. Paradise 71: 35-38.

Fullagar, R., 1988. Recent developments in Australian use-wear and residue studies. In 'Industries lithiques: traceologie et technologie' (ed S. Beyries). British Archaeological Reports International Series 411: 133-145.

Jones, R. & B. Meehan, 1989. Past and present foods of the Gidjingarli: ethnographic and archaeological perspectives from northern Australia on tuber and seed exploitation. In 'Foraging and farming: the evolution of plant exploitation' (eds D.R. Jarris & G.C. Hillman) **:pp nos.** Unwin and Hyman, London.

Lampert, R.J., 1988. Aboriginal life around Port Jackson, 1788-92. In 'The art of the First Fleet and other early Australian drawings' (eds B. Smith and A. Wheeler): 18-69. Oxford University Press, Melbourne.

Lampert, R.J., 1988. A preliminary report on fieldwork in the Lake Eyre Basin, Kimberley and Western Desert regions, 1987. Australian Archaeology 26.

Lampert, R.J., 1989. Archaeology. In 'Natural history of Dalhousie Springs' (eds W. Zeidler and W.F. Ponder): 7-12. South Australian Museum, Adelaide.

Lampert, R.J. and P.J. Hughes, 1988. Early human occupation of the Flinders Ranges. Records of the South Australian Museum 22: 139-168.

Lampert, R.J. and T.A. Konecny, 1989. Aboriginal spears of Port Jackson type discovered – a Bicentennial sequel. Antiquity 238: 137-141.

Meehan, B., 1989. Plant use in a contemporary Aboriginal community and prehistoric implications. In 'Plants in Australian archaeology' (eds W. Beck, A. Clarke & L. Head): 14-30. Tempus, Archaeology and Material Culture Studies in Anthropology, University of Queensland, Brisbane.

Specht, J., 1988. Pieces of Paradise. Craft Art May/July: 81-85.

Specht, J., 1988. Spriggs in Paradise. Australian Archaeology 27: 128-130.

Specht, J., R. Fullagar, R. Torrence & N. Baker, 1988. Prehistoric obsidian exchange in Melanesia: a perspective from the Talasea sources. Australian Archaeology 27: 3-16.

White, P., J. Allen & J. Specht, 1988. Peopling the Pacific: the Lapita Homeland Project. Australian Natural History 22(9): 410-416.

Earth Sciences

England, B.M. & F.L. Sutherland, 1988. Volcanic zeolites and associated minerals from New South Wales. The Mineralogical Record 19: 389-406.

Henley, J., 1988. The Chapman Collection; a national treasure. The Mineralogical Record 19: 461-463.

Sutherland, F.L., 1989. Tertiary volcanism. In 'Geology and mineral resources of Tasmiania' (eds C.F. Burrett & E.L. Martin). Geological Society of Australia Incorporated Special Publication 15: 383-386.

Sutherland, F.L., A. Ewart, L.R. Raynor, J.D. Hollis, & W.D. McDonough, 1989. Tertiary basaltic magmas and the Tasmanian lithosphere. In 'Geology and mineral resources of Tasmania' (eds C.F. Burrett & E.L. Martin). Geological Society of Australia Incorporated Special Publication 15: 386-398.

Sutherland, F.L., D. Roots, & A.D. Robertson, 1988. Late compression and relative rotation events between eastern Australia and the Tasman Sea Floor. In 'New England orogentectonics and metallogenesis' (ed J.D. Kleeman): 186-191. Department of Geology and Geophysics, University of New England, Armidale.

Sutherland, F.L. & G. Webb, 1988. The mineral collection of the Australian Museum. The Mineralogical Record 19: 377-380.

Evolutionary Biology Unit

Colgan, D.J., 1988. Hormonal effects on the development variation of the glucose-metabolizing isoenzymes of the grasshopper *Caledia captiva* (Orthoptera: Acrididae). Entomologia Generalis 13: 21-27.

Colgan, D.J., 1988. Cloning of homologous sequences after filter hybridization. Nucleic Acids Research 16: 10359.

Colgan, D.J. & P.D. Christian, 1988. A putative reoviral genome contaminating mitochondrial preparations from the grasshopper, *Caledia captiva*. Journal of Invertebrate Pathology 52: 474-476.

Colgan, D.J., 1989. Developmental variation and allozymic polymorphism in the enzymes of glycolysis in grasshoppers. Journal of Evolutionary Biology 2: 141-151.

Invertebrate Zoology

Gray, M.R., 1988. Epigean and cavernicolous arachnids (spiders and harvestmen) from the Western Tasmanian World Heritage Area. Directed Wildlife Research Project Report, Folio 94, 21 pp. Tasmanian Lands, Parks and Wildlife Department.

Gray, M.R., 1989. Identification, distribution and habitat of Funnel Web Spiders (Araneae: Hexathelidae: Atracinae). In 'Adverse reaction to arthropods' (eds B.A. Baldo & D.G. Harle). Proceedings of the Sydney Allergens Group 6: 3-24.

Gray, M.R. & G.J. Anderson, 1989. A new Australian species of the spider genus *Argyrodes*. Simon (Araneoidea: Theridiidae) which preys upon its host. Proceedings of the Linnean Society of New South Wales 111: 26-31.

Holloway, G.A., 1988. Banksia beetle. Australian Natural History 20(10): 457.

Howard, R.K., G.J. Edgar & P.A. Hutchings, 1989. The faunal assemblages of seagrass beds. In 'Seagrasses: a treatise on the biology

seagrasses with special reference to the Australian region' (eds A.J. McComb, A.W.D. Larkum & S.A. Shepherd): 536-564. Elsevier, North Holland.
Hunt, G.S., 1988. The harvestman's taxonomic tool. Australian Natural History 22: 400.
Hutchings, P.A., 1988. Voyage to Elizabeth and Middleton Reefs. Australian Natural History 22 (11): 485-488.
Hutchings, P.A., 1988. Elizabeth and Middleton Reefs marine resource survey: laboratory analysis of marine samples. Report to Australian National Parks and Wildlife. pp 55.
Hutchings, P.A., J. Van der Velde & S. Keable, 1988. Baseline survey of benthic macrofauna of Twofold Bay, NSW with a discussion of the marine species introduced into the Bay. Proceedings of the Linnean Society of NSW 110(4): 339-367.
Jones, A.R., 1988. Zoobenthic species richness in the Hawkesbury Estuary: pattern and variability associated with major physicochemical factors. Australian Marine Sciences Association Silver Jubilee Commemorative Volume: 6-10. Wavelength Press, Chippendale.
Jones, A.R. & J. Frances, 1988. Sublittoral zoobenthic communities of Homebush, Ermington and Bray's Bays, Parramatta River, N.S.W. Wetlands 8: 16-20.
Loch, I.W., 1988. *Gennaesinum* for geriatrics. Australian Shell News 63: 8.
Loch, I.W., 1988. Voracious volutes. Australian Shell News 63: 9.
Loch, I.W., 1988. Of molluscs and men. Australian Shell News 64: 1-2.
Loch, I.W., 1988. Elizabeth and Middleton Reefs. Australian Shell News 64: 4.
Loch, I.W., 1988. Swainson's mistake. Australian Shell News 64: 9.
Loch, I.W., 1988. *Octopus cyaneus* blues. Australian Shell News 64: 9.
Loch, I.W., 1989. Some light on dark mitres. Australian Shell News 65: 4-5.
Loch, I.W., 1989. Gourmet octopus. Australian Shell News 65: 9.
Loch, I.W., 1989. A leap and a creep. Australian Shell News 65: 9.
Loch, I.W. & W.B. Rudman, 1988. Molluscs. In 'A survey of Elizabeth and Middleton Reefs'. Australian National Parks and Wildlife Service Report: 116-137.
Lowry, J.K. & R.T. Springthorpe, 1988. Crustaceans. In 'A survey of Elizabeth and Middleton Reefs'. Australian National Parks and Wildlife Service Report: 96-115.
McAlpine, D.K., 1989. A synopsis of the Australian Piophilidae (Diptera: Schizophora). General and Applied Entomology 21: 17-24.
Moulds, M.S., (Research Associate) 1988. The status of *Cicadetta* and *Melampsalta* (Homoptera: Cicadidae) in Australia with the description of two new species. General and Applied Entomology 20: 39-48.
Moulds, M.S. (Research Associate) & A.J. Graham, 1988. A new species of *Jalmenus* Hubner (Lepidoptera: Lycaenidae) from Western Australia. General and Applied Entomology 20: 57-62.
Ponder, W.F., 1988. Bioluminescence in *Hinea braziliana* (Lamarck) (Gastropoda: Planaxidae) Journal of Molluscan Studies 54: 361.
Ponder, W.F., 1988. *Potamopyrgus antipodarium* – a molluscan coloniser of Europe and Australia. Journal of Molluscan Studies 54: 271-285.
Ponder, W.F., 1988. The Truncatelloidean (= Rissoacean) radiation – a preliminary phylogeny. In 'Prosobranch phylogeny' (ed W.F. Ponder). Malacological Review, Supplement 4: 129-166.
Ponder, W.F., 1988 (ed). Prosobranch phylogeny. Malacological Review, Supplement 4, pp 336.
Ponder, W.F., 1989. Mollusca. In 'Natural History of Dalhousie Springs' (eds W. Zeidler & W.F. Ponder): 71-77. South Australian Museum, Adelaide.
Ponder, W.F. & A. Waren, 1988. Classification of the Caenogastropoda and Heterostropha – a list of the family group names and higher taxa. In 'Prosobranch phylogeny' (ed W.F. Ponder). Malacological Review, Supplement 4: 288-328.
Rudman, W.B., 1988. The Chromodorididae (Opisthobranchia: Mollusca) of the Indo-West Pacific: the genus *Ceratosoma* J.E. Gray. Zoological Journal of the Linnean Society 93: 133-185.
Rudman, W.B., 1988. Australia's nudibranchs. Desk Calendar: Westpac Financial Services, 1989.
Rudman, W.B. & G.J. Avern, 1988. Molluscan dentistry – the tales that teeth tell. Australian Natural History 22(9): 388-393.
Smithers, C.N. (Research Associate), 1988. New records of Australian Nymphidae (Neuroptera). Australian Entomological Magazine 15(4): 141-143.
Smithers, C.N. (Research Associate), 1988. The female and egg of *Austromerope poulteni* Killington (Mecoptera: Meropeidae). Entomologica Scandinavica 19: 109-111.
Smithers, C.N. (Research Associate), 1989. A distinctive new species and new distribution records of Stilbopteryginae (Insecta: Neuroptera: Myrmeleontidae). Proceedings of the Linnean Society of New South Wales 110(4): 407-410.
Theischinger, G. (Research Associate), 1988. New and little known species of stoneflies from Australia (Insecta: Plecoptera). Stapfia 17: 147-157.
Theischinger, G. (Research Associate), 1988. *Archichaulioides glossa* and *Protochauliodes eungella*, two new species of Megaloptera from Queensland and Western Australia (Insecta: Diptera: Tipulidae: Limoniinae: Eriopterini). Stapfia 17: 163-200.
Theischinger, G. (Research Associate), 1988. *Lyriomolophilus*, a new subgenus of *Molophilus* Curtis, from Australia and its species (Insecta: Diptera: Tipulidae: Limoniinae: Eriopterini). Stapfia 17: 201-209.
Theischinger, G. (Research Associate), 1989. *Austrothaumalea bickeli* spec. nov., a new thaumaleid from Australia (Insecta: Diptera: Thaumaleidae). Stapfia 17: 211-213.
Theischinger, G. (Research Associate) & W.W.K. Houston, 1988. Megaloptera. Zoological Catalogue of Australia. Volume 6. Ephemeroptera, Megaloptera, Odonata, Plecoptera and Trichoptera: 23-32. Bureau of Flora and Fauna

with the Australian Government Publishing Service, Canberra.
Ward. T.J. & S.F. Rainer (Research Associate), 1988. Decapod crustaceans of the North West Shelf, a tropical continental shelf of north-western Australia. Australian Journal of Marine and Freshwater Research 39: 751-765.
Webb, G.A., G.A. Williams & R. de Keyzer, 1988. Some new and additional larval host records for Australian Cerambycidae (Coleoptera). Australian Entomological Magazine 15(3): 95-104.
Williams, G.A. (Research Associate), 1989. Insect conservation – things we can do. Myrmecia 25(1): 20-22.
Williams, G.A. (Research Associate) & T.A. Weir, 1988. Further new species of Australian Mastogeniinae (Coleoptera: Buprestidae). Journal of the Australian Entomological Society 27: 179-181.
Zeidler, W. & W.F. Ponder, 1989. (eds) Natural history of Dalhousie Springs. South Australian Museum, Adelaide, pp 138.

Vertebrate Zoology

Balushkin, A.V., V.V. Fedorov & J.R. Paxton, 1989. A new genus and species of whalefish, *Notocetichthys trunovi* gen. et sp. nov. (Cetomimidae) from the Lazarev Sea, Antarctica. Voprosy Ikhtiologii 29: 155-157.
Boles, W.E., 1988. Abnormal feather wear of the Providence Petrel *Pterodroma solandri*. Australian Bird Watcher 12: 235-237.
Boles, W.E., 1988. What good is a dead bird? Cumberland Bird Observers Club Newsletter. Bicentennial edition: 14-15.
Boles, W.E., 1988. Bird in the hand – Rufous Songlark. Corella 12: 25.
Boles, W.E., 1988. Red-capped Robin. Australian Natural History 22(9): 408.
Boles, W.E., 1988. Review: A Field Guide to the Birds of Hawaii and the Tropical Pacific, by H.D. Pratt, P.L. Bruner and D.G. Berrett. Pacific Island Monthly 59: 39.
Cogger, H.G., 1989. Herpetofauna. In 'Mediterranean landscapes in Australia; mallee ecosystems and their management' (eds J.C. Noble & R.A. Bradstock): 250-265. CSIRO, Melbourne.
Dawbin, W.H. (Research Associate), 1988. Baleen whales. pp. 44-63; Whale songs. pp. 64-65; Sperm whales (Family Physeteridae). p. 67. In 'Whales, dolphins and porpoises' (eds R. Harrison & M.M. Bryden). Weldon Owen, Sydney.
Dawbin, W.H. (Research Associate), 1988. Whales that migrate from Antarctica to Australasian waters. Antarctica Society of Australia Newsletter 12: 1-6.
Disney, H.J. (Research Associate), 1988. Notes on breeding of Welcome Swallows in captivity. Australian Zoologist 24: 211-215.
Flannery, T.F., 1988. Stuffed and pickled: treasures from the historic Australian Museum mammal collection. Australian Natural History 22(10): 458-462.
Flannery, T.F., 1988. Wildlife of the Stars. Paradise 68: 19-24.
Flannery, T.F., 1988. *Pogonomys championi* n.sp., a new murid (Rodentia) from montane western Papua New Guinea. Records of the Australian Museum 40: 333-342.
Flannery, T.F., 1989. Origins of the Australo-Pacific land mammal fauna. Australian Biology Review 1: 15-24.
Flannery, T.F., 1989. Plague in the Pacific: a new perspective on the last 40,000 years. Australian Natural History 23: 20-29.
Flannery, T.F., 1989. Tenkile lives. Paradise 73: 22-26.
Flannery, T.F., P. Kirch, J. Specht & M. Spriggs, 1988. Holocene mammal faunas from archaeological sites in island Melanesia. Archaeology in Oceania 23: 89-94.
Flannery, T.F. & T. Rodd (scientific editors), 1988. Australia's wilderness heritage. Kevin Weldon Press, pp 800. 2 vols.
Flannery, T.F., K. Aplin, C.P. Groves & M. Adams, 1989. Revision of the New Guinean genus *Mallomys* (Muridae: Rodentia), with descriptions of two species from subalpine habitats. Records of the Australian Museum 41: 83-105.
Flannery, T.F., E. Hoch, & K. Aplin, 1989. Macropodines from the Pliocene Otibanda Formation, Papua New Guinea. Alcheringa 13: 145-152.
Gibson, L.M., 1989. Weddell Seal, Australian Natural History 22(11):504.
Greer, A.E., 1989. Observations on the osteology and natural history of the agamid lizard *Ctenophorus femoralis*. Western Australian Naturalist 18(1): 21-23.
Hoese, D.F. & Y. Obika, 1988. A new gobiid fish, *Fusigobius signipinnis*, from the western tropical Pacific. Japanese Journal of Ichthyology 35(3): 282-288.
Inouye, D.W. & G.H. Pyke, 1988. Pollination biology in the Snowy Mountains of Australia: comparisons with montane Colorado, U.S.A. Australian Journal of Ecology 13: 191-210.
Leis, J.M., 1988. The odd life of larval fish. Australian Natural History 22(10): 452-455.
Leis, J.M., B. Goldman & S.E. Reader, 1989. Epibenthic fish larvae in the Great Barrier Reef lagoon near Lizard Island, Australia. Japanese Journal of Ichthyology 35(4): 428-433.
Paxton, J.R., D.F. Hoese, G.R. Allen & J.E. Hanley, 1989. Zoological Catalogue of Australia. Volume 7. Pisces: Petromyzontidae to Carangidae. Bureau of Flora and Fauna with the Australian Government Publishing Service, Canberra, pp xii + 665.
Pyke, G.H., L.P. Day & K.A. Wale, 1988. Pollination ecology of Christmas Bells: effects of adding artificial nectar on pollen removal and seed set. Australian Journal of Ecology 13: 279-284.
Pyke, G.H. & H.F. Recher, 1988. Seasonal patterns of capture rate and resource abundance for honeyeaters and silvereyes in heathland near Sydney. Emu 88: 33-42.
Pyke, G.H., H.F. Recher & P.J. O'Connor, 1989. Patterns of residency and movements among honeyeaters in heathland near Sydney. Emu 80: 30-39.
Pyke, G.H. & P.J. O'Connor, 1989. Corroboree behaviour of New Holland and White-cheeked Honeyeaters. Emu 89: 55-57.
Randall, J.E. & D.F. Hoese, 1989. *Apogon limneus*, a

new apogonid fish from New South Wales. Records of the Australian Museum 40: 359-364.
Rich, T.H.V., T.F. Flannery & M. Archer, 1989. A second Cretaceous mammalian specimen from Lightning Ridge, NSW, Australia. Alcheringa 13: 85-88.
Sadlier, R.A., 1988. *Bavayia validiclavis* and *Bavayia septuiclavis*, two new species of gekkonid lizard from New Caledonia. Records of the Australian Museum 40: 365-370.
Smedley, D.I. & W.E. Boles, 1988. Sex and age characteristics of the Rufous Songlark *Cincloramphus mathewsi*. Corella 12: 14-18.
Winterbottom, R. & D.F. Hoese, 1989. A new genus and four new species of fish from the Indo-West Pacific (Pisces: Perciformes: Gobiidae), with comments on relationships. Life Science Occasional Papers of the Royal Ontario Museum No. 37: 1-17.
Yang, Y.R., B.G. Zeng & J.R. Paxton, 1988. Additional specimens of the deep sea fish *Hispidoberyx ambagiosus* (Hispidoberycidae, Beryciformes) from the South China Sea, with comments on the family relationships. UO 38: 3-8.
Zimmerman, M. & G.H. Pyke, 1988. Experimental manipulations of *Polemonium foliosissimum*: effects on subsequent nectar production, seed production and growth. Journal of Ecology 76: 777-789.
Zimmerman, M. & G.H. Pyke, 1988. Reproduction in *Polemonium*: assessing the factors limiting seed set. American Naturalist 131: 723-738.
Zimmerman, M. & G.H. Pyke, 1988. Pollination ecology of Christmas Bells: patterns of standing crop of nectar. Australian Journal of Ecology 13: 301-309.

Education

Osborne, R.A.L., 1988. A long past and a short future? Geological and European history of karsts in New South Wales (Abstract). Lecture Program and Abstracts, Study Group (S7) International Geographical Congress, August 1988. Centre for Resource and Environmental Studies, ANU, Canberra.
Osborne, R.A.L. & D.F. Branagan, 1988. Karst landscapes of New South Wales, Australia. Earth-Science Reviews 25 (1988): 467-480.
Osborne, R.A.L., 1989. Natural environment and cultural heritage: the Australian Museum as a resource for HSC geography. Geography Bulletin 21(1): 36-37.
Skates, A., 1988. Book review, Boonja Bardak Korn: all trees are good for something. Australian Archaeology 25: 135.

Library

Cantrell, C., 1988. A bushranger's promissory note: Captain Moonlite in Fiji. Australian Coin Review 24(9): 26-30.
Cantrell, C. & K.A. Rodgers, 1988. Australia and the Funafuti connection 1. Sollas's expedition of 1896. Search 19(5/6): 273-277.
Cantrell, C. & K.A. Rodgers, 1989. Australia and the Funafuti connection 2. An all Australian assault. Search 20(1): 27-30.
Kumvaj, M., 1988. A guide to the Australian Museum Archives by M. Buddin, M. Organ, L. Trott. 2nd edition revised and enlarged by Mary Kumvaj. Australian Museum, Sydney, pp 91.
Rodgers, K.A. & C. Cantrell, 1989 (1987). The birds of Tuvalu: a faunal list and annotated bibliography. South Pacific Journal of Natural Science 9: 83-109.
Rodgers, K.A. & C. Cantrell, 1989 (1987). Tuvalu's weather and climate: an annotated bibliography. South Pacific Journal of Natural Science 9: 111-142.
Rodgers, K.A. & C. Cantrell, 1988. Charles Hedley and the 1896 Royal Society Expedition to Funafuti. Archives of Natural History 15(3): 269-280.
Rodgers, K.A. & C. Cantrell. 1988. The biology and geology of Tuvalu: an annotated bibliography. Technical Reports of Australian Museum 1: 1-103.
Rodgers, K.A., C. Cantrell & R. Sims, 1988. The Horiba Cardy pH meter C-1: some field experiences. Chemistry in New Zealand 52(7): 136-137.

Materials Conservation

Walston, S., K. Coote & D. Horton-James, 1988. Ethnographic collections: case studies in the conservation of moisture-sensitive and fragile collections. In 'The museum conservation of ethnographic objects' (eds T. Morita & C. Pearson). Senri Ethnological Studies 23: 69-110. National Museum of Ethnology, Osaka, Japan.

Preparations

Hangay, G. & A. Vojnits, 1988. A report on collecting trips to Malaysia in 1987. Folia Entomologica Hungarica 48: 251-254.
Hangay, G. & A. Vojnits, 1988. A report on collecting trips in Australia in 1987. Folia Entomologica Hungarica 48: 247-250.

Lizard Island

Coates, M., D.W. Connell, J. Bodero, G.J. Miller & R. Back, 1986. Aliphatic hydrocarbons in Great Barrier Reef organisms and environment. Estuarine, Coastal and Shelf Science 23: 99-113.
Gladstone, W., 1988. Killer whale feeding observed underwater. Journal of Mammalogy 69: 629-630.
Gladstone, W., 1989. Attack. Underwater.
Gronell, A.M., 1988. Sexual dimorphism: its causes and correlates in the orange-tailed blue damselfish, *Chrisiptera cyanea* (Pisces: Pomacentridae). Unpublished Ph.D thesis, University of Sydney.
Hoegh-Guldberg, O., 1988. A method for determining the surface area of corals. Coral Reefs 7(3): 113-116.
Nash, W.J., M. Goddard & J.S. Lucas, 1988. Population genetic studies of the crown-of-thorns starfish, *Acanthaster planci* (L.), in the Great Barrier Reef region. Coral Reefs 7: 11-18.
Newman, L.J. & J.G. Greenwood, 1988. A new species of Gymnosome, *Pneumodermopsis spoeli* (Gastropoda: Opisthobranchia), from the Great Barrier Reef, Australia. The Veliger 31(1/2): 75-79.
Pitcher, R., 1988. Validation of a technique for

reconstructing daily patterns in the recruitment of coral reef damselfish. Coral Reefs 7(3): 105-111.

Poore, G.C.B. & H.M. Lew Ton, 1988. *Amakusanthura* and *Apanthura* (Crustacea: Isopoda: Anthuridae) with new species from tropical Australia. Memoirs of the Museum of Victoria 49(1): 107-147.

Poore, G.C.B. & H.M. Lew Ton, 1988. Antheluridae, a new family of Crustacea (Isopoda: Anthuridea) with new species from Australia. Journal of Natural History 22: 489-506.

Poore, G.C.B. & H.M. Lew Ton, 1986. New species of *Aenigmathura* and *Pseudanthura* (Crustacea: Isopoda: Paranthuridae) from eastern Australia. Memoirs of the Museum of Victoria 47(1): 59-73.

Poore, G.C.B. & H.M. Lew Ton, 1988. A generic review of the Hyssuridae (Crustacea: Isopoda) with a new genus and new species from Australia. Memoirs of the Museum of Victoria 49(1): 169-193.

Staff

D.J.G. Griffin, MSc, PhD	Director
H.G. Cogger, MSc, Phd	Deputy Director
M. Ingham	Secretary to Director
S. Zantiotis	Assistant to Deputy Director
I. Gorman	Assistant to Director *
S. Winspear	Corporate Promotions Manager from March 1989

Administration

G McKenzie AASA, CPA	Chief Administrative Officer
J Shewan	Secretary to CAO *
P Klobe	A/g Secretary to CAO

Attandant/Cleaners

R Beshay	Cleaner
K Bilbie	Cleaner
S Boustani	Cleaner
N Calavrios	Cleaner
P Carey	Gardener
E Cosmo	Cleaner
E Drakoulaki	Cleaner
J Elias	Cleaner
N Gregoire	Cleaner
M Gregory	Cleaner**
A Griffith	Cleaner**
J Harris	Cleaner
G Hastie	Cleaner
H Henne	Cleaner
J Ie Hung	Cleaner
T Jones	Cleaner
N Koulouris	Cleaner
Y Lee	Cleaner*
J McElwee	Cleaner
S Mellish	Cleaner
N Sarwa	Cleaner
N Sarwa	Cleaner*
B Walsh	Cleaner

Building

P Fletcher	House Officer
K Hawkey	Typist
K Henderson	Typist* **
I Shepherd	A/g Building Manager *
L Stockdale	Building Manager

Finance

W Baker	Mail Clerk*
F Cox	A/g Trust Fund Payment Clerk
A Crane	Senior Accounts Clerk *
N Davis	Payments Clerk *
C Francisco	Cashier *
N Gertenaar	Consolidated Fund Payment Clerk
T Goyan	Accountant *
S Kuchar	A/g Assistant Finance Officer, A/g Accountant *
J Marsden	Finance Officer
B May	Senior Accounts Clerk
D Schizas	Trust Fund Payment Clerk *
M Self	Assistant Accountant ** *
T Wong	Mail Clerk
J Wong	Cashier

Guides

G Gatenby BA	Chief Museum Guide *
L McInnes, BSc (Hons)	Chief Museum Guide
H Slarke, B	Museum Guide
J Stol, B App Sc	Museum Guide
A Youssef, B Tourism	Museum Guide

Volunteer Guides

M Beavis, BSc Dip Ed AGGA
C Johnston, Teach Cert
G Oldfield, BSc Dip Ed
C Palmer
A Ponton, BE ASTC MIEA
B Silver
J Stuart, BA Dip Mus Stu
J Anderson, B Arch Dip Anth
C Dodgso, BA (Hons)
G Geering, BA TAFE Teach Cert
E Guinan, BSc MBS
J Kinsela
J Lane, Teach Cert
L McHale
S Pels, MSc Dip Hort
P Sanderson, BSc
K Smith
C Wood, Teach Cert
E Geering, BA Dip Ed
R Hackett, BA RN Mid Tres
J Irani, RN
L Kovacs, PhD
M Lawrie, BA LLB
D Mellish
E Oakley, Dip Ed
F Scheuermann, BA JD (NY) Int Law (Geneva)
F Sinn, BA Dip Ed MACE
J Steenson

Photography

R Bolzan	A/g Head Photography
A Farr	A/g Photographer
K Handley	Museum Assistant
K Lowe	Photographer **
	A/g Head Photography *
M Ortega	Photographic Operator
D Phillips	Photographer **

Security

C Adcock	Gallery Officer
J Beames	Gallery Officer
S Bender	Patrol Officer
S Brudo	Gallery Officer *
G Bunham	Patrol Officer *
H Butler	Gallery Officer
B Dearinger	Control Officer
B Griffiths	Gallery Officer
M Haddleton	Patrol Officer
J Lane	Gallery Officer
U Lederman	Control Officer
D McGlynn	Patrol Officer *
I McIntosh	Gallery Officer
R Milroy	Control Officer
B Murphy	Patrol Officer
W Payne	Gallery Officer
H Pierson	Gallery Officer
K Randall	Control Officer
D Read	Gallery Officer
E Reynolds	Gallery Officer
B Sears	Control Supervisor
D Shallis	Assistant Manager
I Shepherd	Manager
S Solomon	Control Officer

Staff

R Carter	Clerical Assistant *
D Grubb	Staff Manager
K Hawkey	Receptionist *
K Henderson	Typist *
L Kelly, BA Grad Dip Emp Rel Officer	Personnel/Staff Development
P Klobe	Receptionist *
G Korting	Assistant Staff Manager
B McKellar, BA	Assistant Staff Manager
G Nichol, BA	Assistant Staff Manager *
R Pignone	Receptionist
J Rae	Receiptionist *
A Sommer	Telephonist
J van der Velde, BSc (Hons)	Assistant Staff Manager *

Stores

T Ireland	Stores Officer
J Rusten	Stores Officer
W Steele	Stores Officer ** *
P Eggler	Stores Officer ** *
A Tewfik	Museum Assistant ** *
S Laidlaw	Museum Assistant** *

Anthroplogy

L. Bolton BA (Hons), Dip.Mus.Stud, MA	Senior Technical Officer (Collection Manager)
S. Florek MA	Technical Officer (Documentation Officer)**
N. Goodsell BA	Technical Officer (Documentation Officer)**
J.L. Howarth	Typist
K. Khan BA (Hons), Dip Anthrop .	Senior Technical Officer*
R.J. Lampert PhD, FAHA	Senior Research Scientist*
B. Meehan BA(Hons), MA(Hons) PhD FAHA	Scientific Officer (Head of Division from 1.1.1989)
J. Specht MA, PhD	Senior Research Scientist (Head of Divison to 31.12.1988)
S. Thomsett BA(Hons), Dip. Mus. Stud.	Technical Officer
Z. Wakelin–King BA(Hons)	Senior Technical Officer (Collection Manager) **

Temporary

V. Attenbrow BA(Hons), PhD	Scientific Officer (from 6.3.89).
N. Baker BA(Hons)	Technical Officer.
J. Bible BA	Technical Officer (Collection Manager).
J. Bona	Technical Assistant **
L. Bonshek BA, Dip.Mus.Stud.	Technical Officer*
R. Bright	Museum Assistant, Archaeology move *
R. Carey	Museum Assistant, Archaeology move *
N. Chadwick	Technical Officer *
T. Corkill BA(Hons)	Technical Officer **
K. Cutmore	Clerical officer.
S. Folwell BA	Museum Assistant, Archaeology move *
R. Fullagar BA, MA(Prelim), Fellow PhD.	Australian Research Council
C. Gartside	Associate Diploma in Adult Education, Technical Officer (Aboriginal Liaison Officer) from 10/4/89.
P. Gordon	Technical Officer (Aboriginal Liaison Officer) *
M. GrahamBA	Technical Officer*
T. Heinsohn BA(Hons), Dip. Mus.Stud,	Technical Officer*
B. Hise	Technical Officer*
Y. Jones BA (Vis.Arts)	Museum Assistant*
C.A. McGrath BA	Technical Officer*
S. Marshall	Technical Officer*
A. MatteaBA	Technical Officer**
A. Nolan BA(Hons)	Technical Officer*
K. Normoyle	Museum Assistant, Archaeology Move *
A. Szalay BA(Hons)	Technical Officer
J. Spencer BA	Museum Assistant*
R. Torrence PhD	Research Associate
P. Van de Maade	Museum Assistant, Archaeology Move *
S. Weir	Museum Assistant, Archaeology Move *
K. Westmacott BA	Technical Officer*
K. WilsonBA	Technical Officer.

Consultants

K. Barlow PhD.	Anthropologist.
R. Bolzan BA(Visual Arts)	Photographer.
D. DonlonBA	(Hons) Human Biologist.
R. Fullagar BA, MA(Prelim)PhD,	Archaeologist
D. Lipset PhD.	Anthropologist.
D. Losche	MA, M. Phil., PhD., Anthropologist.
D. Phillips	Photographer

Community Relations

D. Alrich	Public Relations Officer*
G. Deacon	Public Relations Officer
P. Dempsey	Secretary
M. Dingle	Head of Division
F. Doig BA (Comm)	Editor, *Australian Natural History*
J. Eather BA (Comm)	Publicity Officer
J. Hanley, BA	Assistant Editor, *Records of the Australian Museum*
G. Hickey BSc	Scientific Editor, *Australian Natural History***
A. Maxwell	Publicity Officer *
C. McGahey	Circulations Officer

Museum Shops

Kirsten Annetts	Shop Assistant
Simon Bate	Shop Assistant
Veronica Brown	Shop Assistant
Sarah Peck	Shop Assistant
Jonathan Pritchard	Shop Assistant
Vicky Rusina	Assistant Manager
Lula Saunders	Shop Manager
Lynn Hemming	Shop Assistant**
Samantha Tadourian	Shop Assistant**
Margaret Deighton	Shop Assistant**
Susan Meadows	Shop Assistant**
Sussan George	Shop Assistant**
Richard Carter	Shop Assistant**
Maria Miranda	Shop Assistant**
Michael Bahles	Shop Assistant**
Caroline Underwood	Shop Assistant**
Pam Russell	Shop Assistant**
Joan Beavis	Shop Assistant**
Olga Armstrong (volunteer)	
Anna Patrinos	Shop Assistant**

Data Base

D. Beechey	Data Base Manager
R. Blakemore	System Administrator

Earth Sciences

Mineralogy & Petrology

J. Henley, BAppSc, FGAA	Senior Technical Officer and Head of Division and Collection Manager.
R.Pogson, BAppSc (Hons)	Technical Officer (scientific) Acting Collection Manager (from
J	anuary 1989).
F. Sutherland, MSc, PhD, FAIG	Senior Research Scientist and Head of Division (from January 1989)
G. Webb, BA, FGAA, Dip DT	Technical Officer (Scientific)

Temporary Assistants:
P. Christie
B. Barron
S. Folwell
G. Rowlands

Education

E. King, MA, Dip Ed	Head, Education
G. Ebeling, BSc, DipEd	Education Officer
Z. Harkness	Education Officer**
G. Hunt, BSc, DipEd, PhD	Education Officer**
C. MacLulich, BEd (Hons) Dip Mus Studies	Education Officer
S. Main, BA, DipEd	Education Officer
R. Osborne, DipEd, MSc, PhD	Education Officer
A. Skates, Dip Teach, BA	Education Officer
A. Saunders, BA, DipEd	Education Officer
S. Stephens, BSc (Hons)	Education Officer
A. Watterson, BSc(Hons), DipEd	Education Officer
D. Millar	Preparator
M. Robinson, B Appl Sc	Preparator
F. Fletcher	Typist
E. McPhee	Typist
H. Samios	Typist
G. Bartalesi, Dip. Teach (Primary)	Senior Explainer**
L. Ferguson	Senior Explainer**
M. Khun, B.Ed (Science)	Senior Explainer**
P. McDonald	Senior Explainer**
J. Sharpe, BA (Comm), DipEd	Senior Explainer**
K. Gambley	Senior Explainer**

Explainers**
D. Ayres C. Bowden N. Brew E. Coomber
R. Corran P. Destefanis S. Edwards
R. Eggins L. Field H. FlorianiE. Gatchalian
A. Gonzalez M. Gordon F. Greening
A. Hall H. Handley M. Harrigan A. Harris
N. Hazenveld C. Heffron M. Hill J. Kabanoff
A. Kagis J. Lambert C LamondP. Leane T Mansour
D Mezaaber L Narezzi P. O'Donovan
M. Peredi M. Petrovska M. Raphael F. Ridley
L. Slade J. Smith M. Surjan M. Teffer
M. Thomson K. Unsworth M. Vreugdenhil
P. Willis S. Young

Exhibitions Division

R. Joyner, ADIA	Head of Division
M. Cloyd	Secretary

Design

M. Armstrong, BA (Vis Art)	Museum Assistant *
G. Ferguson, Dip App Art	Project Manager
A. Grassham	Designer
A. Gregg, BA (Vis Art)	Museum Assistant
K. Gregg	Designer
M. Keogh, GDC	Designer
B. Matzick	Project Manager
A. Richards, Dip Vis Art	Acting Head of Design
P. Rizzuto, B Ed. Art	Museum Assistant
B. Ross–Wilson	Project Manager
R. Weakley	Designer

Audio Visual

D. Sweet	Technician *
D. Beveridge	Technician

Preparations

M. Bray	Preparator
M. Dingley	Preparator
G. Hangay, Grad Dip Vis Art	Chief Preparator
J. Hood	Preparator
B. Horn	Preparator
C. Johnston	Preparator
O. Keywan	Preparator
T. Lang	Preparator
E. MacLeod, Dip Art	Preparator
R. Moloney	Preparator
T. Ralph	Preparator
R. Scott-Child	Preparator
A. Wang	Preparator
C. Wang	Assistant Preparator

Evolutionary Biology Unit

G. Avern, BSc, MSc, Dip Ed	Senior Technical Officer
D. Colgan, BSc, BEc, PhD	Scientific Officer
L. Grover, BSc (Hons)	Technical Officer (Temporary from 26.2.89)
G. Serkowski	Technical Officer
J. Trimble BSc	Technical Officer (Temporary from 16.2.89)

Invertebrate Zoology

Arachnology

M. Gray, MSc, PhD	Scientific Officer
C. Horseman	Technical Assistant
G. Hunt, PhD	Research Worker
S. Laidlow, BSc	Technical Assistant (temporary)
M. Zabka, PhD	Visiting Fellow
J. Thompson	Technical Assistant (temporary)

Entomology

L. Albertson, BSc	Technical Officer (temporary)**
D. Bickel, PhD	Scientific Officer
G. Cassis, PhD	Visiting Fellow
B. Day	Technical Assistant
R. de Keyzer, BSc	Technical Officer (temporary)**
G. Holloway, MSc	Technical Officer
D. McAlpine, MSc PhD	Principal Research Scientist
D. Quicke, PhD	Visiting Fellow
C. Urquhart, BSc	Technical Officer (temporary)

Malacology

G. Avern, MSc, Dip Ed	Technical Officer **
P. Burton	Technical Assistant **
C. Clark	Research Assistant
P. Colman	Technical Assistant
R. de Keyzer, BSc	Technical Officer **
S. Laidlaw, BSc	Technical Assistant *
A. Le Roi	Technical Assistant ** *
I. Loch	Senior Technical Officer (Collection Manager)

A. Miller	Technical Officer *
W. Ponder, MSc PhD	Principal Research Scientist (Head of Division)
W. Rudman, MSc PhD	Principal Research Scientist
K. Walker	Typist*
J. Waterhouse, BSc	Technical Officer

Marine Invertebrates

Crustacea

S. Keable, BSc	Technical Officer
J. Lowry, MA, PhD	Senior Research Scientist
R. Springthorpe, BSc	Technical Officer
H. Stoddart, BSc	Technical Officer

Echinoderms

M. Atkinson, MSc	Technical Officer *
P. Filmer-Sankey, BSc	Technical Officer *
F. Rowe, PhD MBiol	Senior Research Scientist *

Worms

C. Glasby, MSc	PhD Student
L. Howitt, BSc	Research Assistant (temporary)
P. Hutchings, DSc, PhD	Principal Research Scientist
R. Paterson, BSc	Technical Officer
A. Reid, BSc	Research Assistant
D. Zula	Museum Assistant * **

Collections Management

L. Albertson, BSc, Grad Dip.	Technical Officer Art
P. Berents, MSc	Senior Technical Officer, Collection Manager
T. Glasby	Technical Officer *
S. Laidlaw, BSc	Technical Assistant *
R. Walker, MSc	Technical Officer *

Marine Ecology

A. Jones, MSc PhD	Research Scientist
A. Murray, BSc	Technical Officer
J. Nelson	Technical Officer (temporary)
V. Tzioumis, BSc	Technical Officer (temporary)
A. West, BSc	Technical Officer (temporary)

Library

N.Bain	Library Technician
G. Baker, BA. (Lib.Sc.),ALAA	Chief Librarian
J. Brazier	Archivist (Temporary)*
C. Cantrell	Assistant Library Technician
J. Dermand	Assistant Library Technician (temporary)*
J. Dudman	Museum Assistant
M. Kumjav, BA, Dip. Lib.	Librarian
I. McAllan	Assistant Library Technician (Temporary)*
A McConochie	Senior Library Technician
M. Pettit	Typist
C. Pyne	Clerical Assistant

Lizard Island Research Station

Angela Fielding	Relief crew *
Captain Terry Ford	Relief Captain *
Ms. Joyce Hull	Accommodation/Transport Officer *
Mr. Roy Hull	Maintenance Engineer *
Captain Matt Jumelet	Captain
Mipi Jumelet	Crew
Dr. Barbara L. Kojis	Co-Director
Mr. Lance Pearce	Maintenance Engineer from 17/8/88
Ms. Marianne Pearce	Accommodation/Transport Officer from 17/8/88
Dr. Norman J. Quinn	Co-Director
Mr. Paul Watts	Maintenance Engineer *
Mrs. Margaret Watts	Accommodation/Transport Officer *
Lois Wilson	Relief crew *

Materials Conservation

L.Asper	Museum Assistant
G.Bailey	Assistant Conservator
T.Boreland	Australian Youth Trainee
A.Coggins, BSc(Hons) DipEd	Technical Officer (Scientific)
K.Coote, BA BSc(Hons)	Conservator
S.Costello	Technical Officer
P.Edmonds	Assistant Conservator
S.Folwell	Typist
S.Gatenby, BSc	Conservator
M.Gilberg, MSc PhD.	Scientific Officer
D.Horton-James, BSc	Conservator
M.Kelly, DipArt	Preparator
A.Laerkeson	Museum Assistant
C.McLennan	Assistant Conservator
C.Mott	Assistant Conservator
M.Pacheco	Museum Assistant
A.K.Rostek	Assistant Conservator
M.Scott, BAppSc	Conservator
C.Sugarman	Assistant Conservator
R.Tekanawa	Assistant Conservator
B.Walding	Museum Assistant
S.Walston, DipCons(Lond)	Head of Division
S.Weir	Museum Assistant
A.West, BSc	Technical Officer (Scientific)
S.Zounis, BAppSc	Technical Officer (Scientific)

National Photographic Index

R. Strahan, MSc, FIBiol, FAIBiol, FRZS, FANZAAS	Executive Officer
T.R. Lindsey	Scientific Editor *
S. Bird	Collections Manager
B. Thode-Kuppershaus	Clerk
J. Coghlan	Typist

Tams

S. Bridie	Executive Officer
W. Wilkins, BA	Project Officer
D. Galt	Manager, Corporate Membership
F. Shinn	Book Keeper
B. Thomas	Clerk *
D. McMiles	Administration Officer

Council

R. Saunders	President
C. Williams	Vice President (from 28 March 1989)
B. Wilson	Treasurer
I. Gorman	(from March 1989)
J. Irani	*
D. Nicholas, BSc (Tech)Dip Env. Stud	
R. Morecroft	*
P. Pearce	(from March 1989)
R. Pearson, BA, LL.B	*
J. Twyford	(from March 1989)
H. Rossiter, BSc, DipEd,MI Biol. C.Biol.*	
P. White, MA, PhD	
H. Wootten, QC	(from March 1989)

Museum Staff Councillors

M. Dingle	
D. Griffin, MSc, PhD	
E. King, MA, DipEd	
D. Sweet	*
B. Ross-Wilson	(from March 1989)

Vertebrate Zoology

Herpetology

A. Greer PhD.	Senior Research Scientist
J. Nancarrow	Technical Officer (Sci)**
R. Sadlier BSc	Collection Manager
G. Shea BVSc	Technical Officer (Sci)**

Ichthyology

M. Atkinson MSc	Technical Officer (Sci)*
M. Beshaw BSc (Hons)	Research Assistant**
D. Brown BA	Technical Officer (Sci)**
A. Gill BSc (Hons)	Post Graduate Student
A. Graham BSc (Hons)	Technical Officer (Sci)***
D. Hoese BA, PhD	Senior Research Scientist
J. Leis BSc, PhD	Senior Research Scientist
M. McGrouther BSc (Hons)	Technical Officer (Sci)
J. Paxton MSc, PhD	Research Scientist
S. Reader BSc	Technical Officer (Sci)
D. Rennis BSc, MSc	Technical Officer (Sci)*
T. Trnski BSc	Technical Officer (Sci)

Mammalogy

T. Ennis	Technical Officer (Sci)**
T. Flannery BSc, PhD	Research Scientist
L. Gibson	Collection Manager
H.Parnaby PhD	Technical Officer***

Ornithology

W.E. Boles BSE	Senior Technical Officer and Collection Manager

Temporary Staff

I. McAllan BSc	
L. Albertson BSc	
A. Gillespie BSc	
P. O'Connor BSc	
L. Todd	
L. Sharam	
C. Wang	

Terrestrial Ecology

D. Ayers	Research Assistant*
G. Barrett, BSc (Hons)	Research Assistant*
M. Christy, BSc (Post Grad Nat. Res.)	Research Assistant*
S. Fraser	Research Assistant (Australian Traineeship System)
G. Gowing, BSc (Hons)	Senior Technical Officer
G. Pyke, BSc (Hons), PhD	Senior Research Scientist
G. Serkowski	Technical Officer (Sci)*

* Denotes permanent or temporary position no longer occupied by this person.

**Denotes part time employment.

Research Associates

His Imperial Highness
The Crown Prince Akihito
M Archer PhD
I Bennet MSc
C E Chadwick BSc
R O Chalmers ASTC
W Dawbin DSc
H J de S Disney MA
B Egloff MA ScD DSc
J W Evans
H O Fletcher MSc
J Forshaw
R L K Fullagar BA PhD
B Goldman BSc PhD
J D Hollis PhD
K W Huffman BA DipEthnol
P Kailola BSc
K C Khoo BSc (Hons)
F D McCarthy DipAnthrop DSc
P M McDonald BSc MEd
J E Marlow BSc (Hons)
G A Mengden BSc PhD
M Moulds
T R New PhD
H Paxton BA PhD
J Pickett MSc DPhilNat
E C Pope MSc CMZS
S F Rainer BSc MSc PhD
L R Richardon MSc PhD
R Shine BSc PhD
C N Smithers MSc PhD
W Starck PhD
N Tait PhD
F H Talbot MSc PhD FLS FRZS FRSA
G Theischinger
A G Thorne PhD
I W B Thornton PhD
J P White MA PhD
M J Whitten BSc (Hons) BA PhD FTS
G Williams
R V S Wright
J C Yaldwyn MSc PhD

Associates

K Atkinson
B Bertram
K Carnaby
AA H Chapman
N Coleman
L Courtney Haines
G Daniels
J Frazier
H Goodall
A Healy
V Kessner
R Kuiter
T R Lindsey
N W Longmore
D F McMichael CBE MA PhD
W McReaddie
K Meguro
D R Moore MA DipAnthrop
R Morrison
N W Rodd BSc
A B Rose
D J Scambler BSc
R Steene
G Swan
M Tuckson
L Wilson