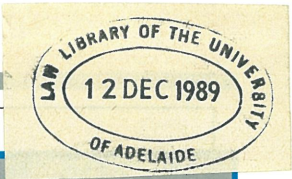


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Great Barrier Reef
Marine Park
Authority

ISSN 0314-6510

Reeflections Reeflections

DISCOVER THE GREAT BARRIER REEF MARINE PARK



EDUCATION &
INFORMATION

More than a million people each year visit the Great Barrier Reef and admire the beautiful corals and fish, but how many people know how the Reef was formed or how the hundreds of plants and animals depend on each other for food and survival?

A new book **Discover the Great Barrier Reef Marine Park** compiled by Lesley Murdoch of GBRMPA's Education and Information Section and published by Bay Books answers these and many more questions about this World Heritage Site.

Wonderland National Launch

More than 150 guests attended the book's national launching, appropriately held in the Great Barrier Reef Aquarium in Townsville on 15 June 1989. These included Ms Annette Robinson from Bay Books Sydney, patrons of the Aquarium, local newsagents and bookshop people, tourist industry and media personnel, Authority members Professor Rhondda Jones and Mr Pat Smith, and GBRMPA staff.

Marine Park Message

In launching the book GBRMPA Chairman Graeme Kelleher said, 'The goal of the Au-



Lesley Murdoch (R), compiler of a new book on the Marine Park, autographs a copy for Townsville newsagent Judy Robertson.

thority is to provide protection for the Reef and ensure its preservation in perpetuity.' 'To this end, education is a critical factor. With only a small staff and thousands of square kilometres to cover, protection in the form of policing is not the answer. This was why the Authority had always focused on education as its principal management goal. Publications such as Discover the Great Barrier Reef were a vital part of that process.'

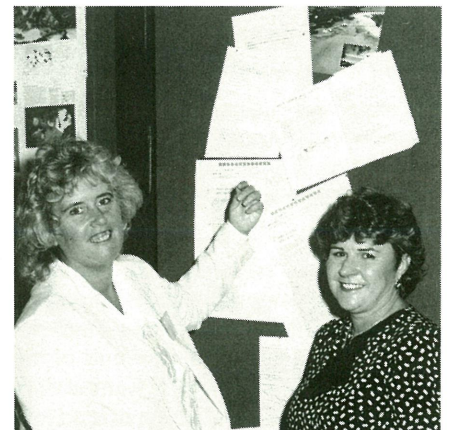
Mass Market Appeal

Discover the Great Barrier Reef is a uniquely comprehensive publication with wide ranging appeal. The spectacular photography, informative illustrations and simple straight forward text has been aimed at a diverse market.

It slots comfortably into a tourist niche and would be an extremely useful addition to all school libraries. In concluding, Graeme Kelleher, described the book as inexpensive, informative and exceedingly attractive and commented that the early response to it in Australia and overseas had been overwhelming.

He was confident this latest publication fills a previously unoccupied niche and congratulated Author Lesley Murdoch and publishers Bay Books on a first class publication.

Discover the Great Barrier Reef Marine Park is a 96-page full colour book for \$9.95. It is available from newsagents throughout Australia, bookshops and the Great Barrier Reef Aquarium Shop (contact details on page 11).



Lesley Murdoch (L) and Rhonda Lane who helped type the manuscript.

BEHIND THE SCENES AT THE GREAT BARRIER REEF AQUARIUM



Deborah Cavanagh
Interpretive Officer
Great Barrier Reef Aquarium

A slender white fish with green and pink lightning bolts around each eye nibbled impatiently at the nozzle of the vacuum cleaner. It was waiting for me to stir up the sand and release a few tasty morsels buried beneath the surface. Batfish, shaped like dinner plates with fins, brushed my shoulder as they cruised past for a close inspection.

Ignoring these interruptions, I continued to help Aquarium diver Chick Nelson with his morning chores: clean the tunnel windows, vacuum the loose algae littering the floor of the Reef Tank and dust the light coating of sediment that may have settled on the corals.

Cleaning jobs are not the only routine tasks to occupy Aquarium staff behind the scenes. Some of these are concerned with keeping the physical system operating while others are concerned with keeping the visitor side of operations stimulating.

Nature's Helpers

To create and maintain a living, thriving coral reef in the Aquarium, we have replicated, as closely as possible, all the environmental conditions that would be found on a coral reef.

Water currents are created by pumping water through large return pipes and waves are formed with the aid of a wave machine, driven by air pressure, at one end of the Reef Tank. This movement of water is vitally important in the circulation of food and oxygen and in moving waste products through the water purification system.



Vacuum cleaning is an important part of the Aquarium's daily housekeeping.

Algae — Key to Water Quality

The aquarium is a closed system. Tank water is recycled and purified using nutrient-absorbing marine algae. Algae use waste products of animals as nutrients during photosynthesis, the process vital for their growth. This process also returns oxygen to the water and maintains stable acidity/alkalinity levels.

The 'algal turf scrubber' system, developed by Dr Walter Adey at the Smithsonian Institution in the United States, recreates these natural processes. Special 'turf' algae grow on plastic screens in a shallow tray. Every 20 seconds a tip bucket releases a swish of tank water across the screens.

The turf formed on the screens is harvested about every ten days, removing the tank wastes with it when discarded.

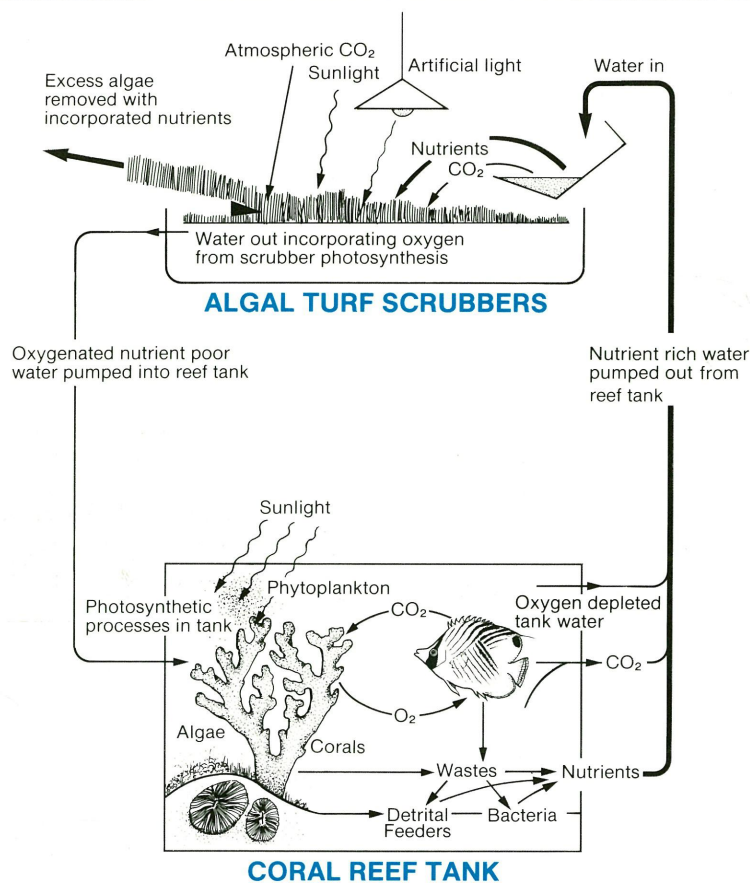
As sunlight is essential for photosynthesis, large bright lights above the algal scrubbers can be activated on overcast days and also at night to extend the period of photosynthesis.

The greatest water quality challenge at the Aquarium is the Reef Tank. Reef-building corals flourish only in clear, warm, sunlit waters with extremely low nutrient levels — parts per billion of nitrogen and phosphorus, compared to parts per million found in home aquariums.

Maintaining this environment requires regular monitoring of nutrient levels and manipulation of the algal turf scrubbers to improve algal productivity and nutrient removal. As well as using lights at night, staff have also experimented with increased water flow rates to the scrubbers.



Control of water quality requires regular measurements of nutrients. Biologist Dr Janice Morrissey uses an auto-analyser to test tank water samples.



Simplified diagram of the relationship between the photosynthetic and nutrient exchange events in the coral reef tank and the algal turf scrubbers.

Light Considerations

Reef-building corals and other creatures such as clams have symbiotic algae living within their tissues and therefore need plenty of sunlight to flourish. The walls of the tank pose a seasonal shading problem, with the eastern side of the tank being excessively shaded in winter and the western side in summer. The solution has been to select species of corals and other plants

and animals accustomed to low light levels for these areas.

Too much light is also a problem. During the peak of summer in Townsville, the high levels of ultraviolet light inhibit photosynthesis on the algal turf farm and may damage some shallow corals in the tank. This is overcome by shading the turf farm throughout the summer and shading the tank during the middle of the day.



Students use the facilities of the Discovery Room as part of a special school program Stars and Spines about the group of animals called Echinoderms.

Temperature Tolerances

Reef corals grow best where temperatures are warm (24-29°C) and relatively stable (annual fluctuation of <5°C). Seasonal extremes of 23°C to 31°C have been recorded in the tank. Temperatures greater than 30°C were associated with coral bleaching and subsequent mortality. The Great Barrier Reef is rarely exposed to average water temperatures exceeding 30°C.

The overheating problem has been overcome by passing the warmer surface water from the reef tank through the tidal holding tank where a cooling system has been set up and then back to the mid levels of the reef tank. The shading already mentioned above helps reduce heat input and also, all exposed heat absorbing surfaces are painted white to maximise reflection. Fans increase the evaporative cooling over the turf farm. This strategy has coped with a series of 36°C days.

The Living Reef

The biological community of the reef tank is planned to be as self-maintaining as a natural reef environment. This requires a suitable balance between all the elements in the food web. Animals have been added to the tank to keep the algal growth down (herbivores), to stir up and clean the sandy bottom (detritivores) and to keep the populations of some species under control (carnivores). Fine-tuning of the animal population continues with the experience of finding the most suitable species for particular sites and the need to remove predators to the predator tank when they grow too big and hungry.

All of this effort is aimed at providing a unique Reef education resource. As the only Aquarium in the world with a large living coral reef, we offer visitors of all ages an opportunity to learn about the Great Barrier Reef, and explore it with a greater understanding and appreciation.

Aquarium Helpers

Public support for the Aquarium is strong — over 500,000 visitors in its first two years. Over 10,000 school children have attended our special programs; more than 3000 people have joined our membership program and 120 people have trained as volunteers to assist in the daily running of the Aquarium.

The efforts behind the scenes are keeping our creatures happy and healthy so they in turn do their job of entertaining and educating visitors.

The Great Barrier Reef Aquarium booklet gives more information. See At the Aquarium Shop on page 11.

ORAL HISTORY OF REEF USE: A FINGER ON THE PULSE



RESEARCH

Regina Ganter
Currently Teaching Fellow
Division of Humanities
Griffith University

Only since the introduction of scuba diving equipment in the 1960s have scientists been able to observe the Reef on a regular basis. The Great Barrier Reef Marine Park Authority has now put its finger on the pulse of human use of the Reef and consulted those who had the Reef as their workshop since the early years of this century.

The oral history component of the research program initiated by the Crown of Thorns Starfish Advisory Review Committee in 1985 is now completed. Its aim was to access popular knowledge of the Great Barrier Reef, particularly with reference to crown of thorns starfish aggregations prior to the introduction of scuba diving equipment in the 1960's. Over one hundred interviewees in the Torres Strait, Japan and along the Queensland coast, mainly former participants in the mother-of-pearl industry, contributed their experience. Some of the respondents first entered pearl-shelling in 1916 and look back on a long-standing relationship with the Reef.

The oral history procured a variety of information of interest to reef scientists. Two fishermen independently report tricky snapper (*Lethrinus chrysostomus*) as a predator of crown of thorns starfish. Other respondents made available old photographs of island shores which permit a comparison of beaches and reefs with present conditions. The combined accounts of participants provide a colourful illustration of the commercialisation of fishing in Queensland, and of experimental reef uses from turtle canning to oyster farming. Interviewees remembered the introduction of prawn trawling on the

Reef in 1954, the rise and decline of 'wogging' (dragging a lure to resemble an injured fish), the development of fish marketing and specifically mackerel marketing, on-board filleting and refrigeration, and the introduction of prawning into the Torres Strait area in the late 1960s. Some offered their own explanation of marine phenomena, on the basis of years of observation of local conditions.

The interviews attest to the fragile nature of reef resources. The 'capitalist logic' of resource extraction which requires a resource to be thoroughly exploited in order to be commercially viable, becomes apparent in many of the accounts, e.g. 'once you found a good patch of trochus you went over it from all angles until it was cleaned up. You had to make money, see?' (Miyamoto Sadakichi). The Australian interviewees showed a general consensus that multi-use management of the Reef was desirable.

Pearl-shell and Trochus Fishery

Trochus gatherers in particular may be seen as the pioneers of the Great Barrier Reef, and it was among them that a high degree of familiarity with crown of thorns starfish was found. The first marine industry based in northern Queensland was the pearl-shell and trochus fishery. While oyster and fin-fishing were still part-time occupations, the gathering of mother-of-pearl represented a fully-fledged industry. Its workforce gained intimate knowledge of reef

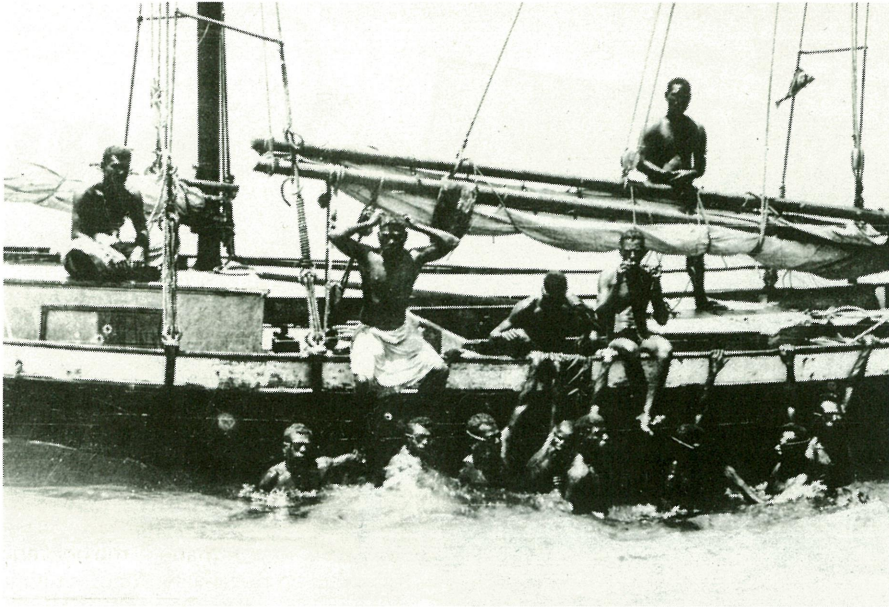
conditions from their daily experience and annual rounds, so that these people were in a unique position of knowledge concerning the Great Barrier Reef province prior to World War II. People from 'all kind of country' were engaged in these industries, particularly Japanese, Papua New Guineans, Aborigines and Torres Strait Islanders.

The types of reef knowledge of informants from the mother-of-pearl industry varied according to their ethnic origin, because the labour market in the industry was stratified according to race. The Japanese dominated pearl-shell diving, the most prestigious role in the mother-of-pearl industry. On pearl-shell luggers, the first diver (stern diver) was also the captain or skipper of the boat. He was in command of the boat and crew with responsibility for recruiting, provisioning, boat maintenance, and navigation. The skipper interpreted and maintained charts, located and tested shell-beds, observed tidal and weather patterns and based his day-to-day decisions on his intimate knowledge of reef conditions.

Mainland Aborigines were signed on as crew for the trochus and beche-de-mer boats which fished the reefs from Thursday Island to Mackay. Torres Strait Islanders were also engaged in swimming diving, along the Great Barrier Reef as well as on their own luggers, acquired under a scheme of the Papuan Industries Limited. In order to supplement the low wages fixed by negotiation between master



Preparing beche-de-mer for the Chinese market, Warrior Island, Torres Strait. Reproduced from a W Saviile-Kent photo published in 1893.



Trochus shell was obtained by swimming diving with goggles. This boat is one of the fleet operated entirely by Torres Strait Islanders under the Papuan Industries Scheme. Dated 1917. Courtesy Oxley Library.

pearlers and the Department of Native Affairs, Aborigines and Torres Strait Islanders sometimes dried and sold the trochus meat to Chinese and collected ornamental shells, particularly giant tritons, for pocket-money. One interviewee suggested that the practice of picking up triton shells considerably contributed to a decline in their numbers.

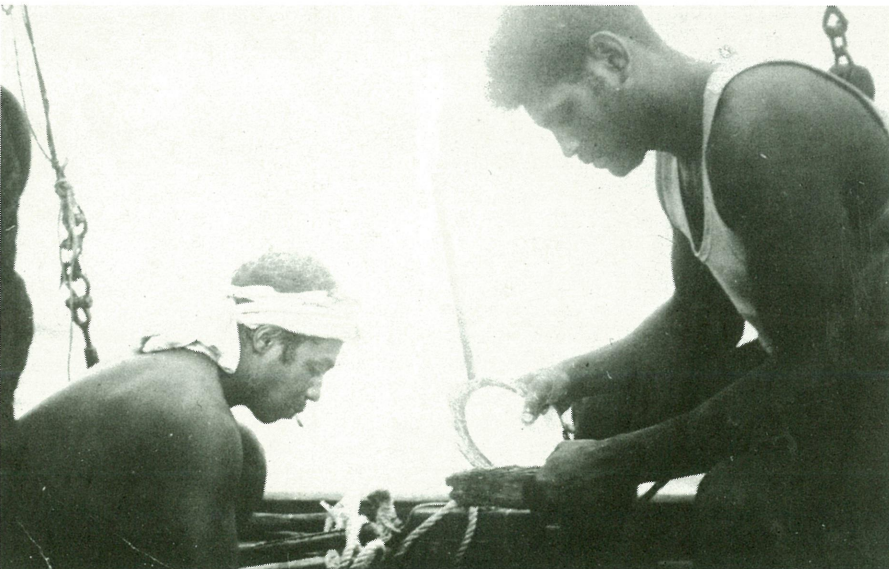
Life on the Lugger

Work on the lugger was organised as a kind of apprenticeship system, where new recruits first were assigned as cooks, then enginemen, tenders and try-divers. They acquired their working knowledge from their skippers, including diving pro-

cedures, shell collecting and processing, and first aid measures for the types of injuries sustained from diving.

Trochus divers recalled abandoning reefs because the abundance of crown of thorns starfish made swimming diving impossible, and they habitually broke off stag-horn coral to gain better access to trochus shells and often sustained coral abrasions.

The most common treatment suggested for coral abrasions was to blacken rice in a saucepan and infuse it with hot water to apply to the wound, so that the heat of the water would soothe the pain, a technique learned from Japanese skippers. Rice poultices were also used to treat minor cases of bends.



Two divers with pearl shell on board the lugger Phyllis, about 1958. Photo courtesy Pedro Guivarra.

Crown of Thorns Starfish

Of the former participants in the mother-of-pearl industry, the Meriam speakers, from Murray, Darnley and Stephen Islands (Mer, Erub and Ugar) are particularly familiar with crown of thorns starfish and refer to it as *urmemeg*, a term which incorporates the word 'fire' (*ur*) to refer to the painful sting of the starfish. They sometimes occurred on the 'home reefs', i.e. the reefs from which women procured food on a regular basis by wading, and if any of the starfish were found, the Meriam people would remove them. In other parts of the South Pacific (Samoa, Fiji, Solomon Islands, New Britain, Manus, Gambier Islands, Ponape, Palau, Tonga), crown of thorns starfish injuries are traditionally treated by placing the mouth of the same starfish which caused the injury on the wound. In Australia a range of treatments were used for crown of thorns starfish injuries, but a treatment which may be considered as specific to crown of thorns starfish injuries, is not known.

Industry Decline

After World War II, Torres Strait Islanders replaced the Japanese in the role of diver and skipper until the introduction of plastic buttons saw the demise of the pearl-shell industry in the 1960s. Mother-of-pearl is in keen demand at present and fetching high prices. Several Torres Strait Islanders see the resumption of trochus diving as a commercially viable future to move towards greater independence from government transfers. However, the complex administrative procedures of licensing present a formidable barrier to their re-entry.

Two reports by Regina Ganter summarise the findings of the Oral History of Reef Use and are available from the Great Barrier Reef Marine Park Authority. 'Oral History of Human Use and Experience of Crown of Thorns Starfish on the Great Barrier Reef' (July 1987) deals with crown of thorns starfish-related issues, and the separately bound Appendix provides a resume of each interview conducted in Australia. 'The Japanese Experience of North Queensland's Mother-of-Pearl Industry' (October 1988) is an account of the mother-of-pearl industry with summaries of interviews conducted in Japan.

At Currajong State School in Townsville, year 2 student Chelsea listened to the sound of the sea in her classroom cleverly transformed into a reef setting. (Photo courtesy Townsville Bulletin).



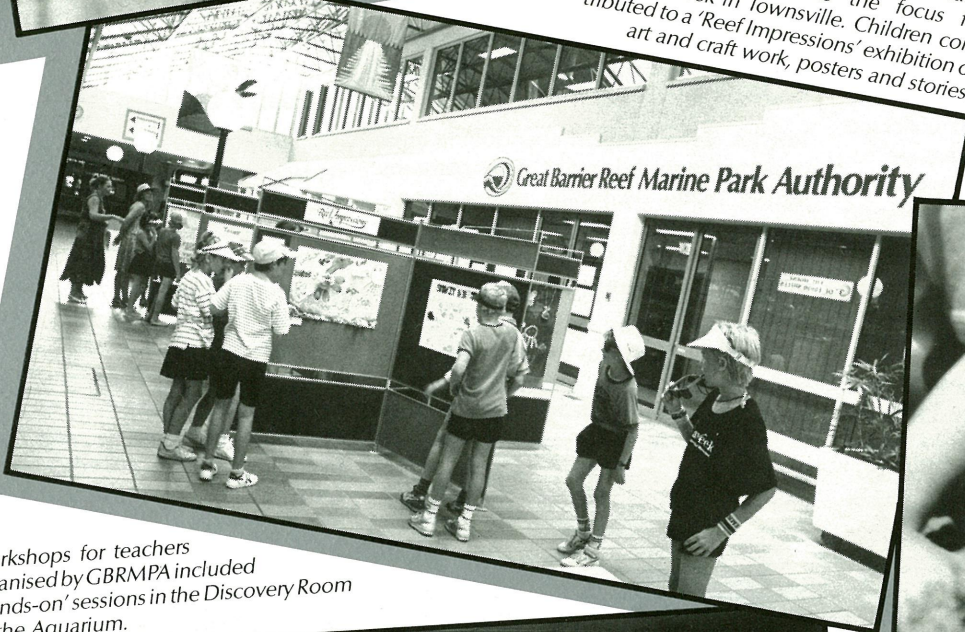

Seaweek

Communities 15-

Seaweek is an annual event aimed at helping us enjoy and appreciate the sea.

Planning for Seaweek 1990 has been the focus of the Education Society of Australasia, promoting wise use of the sea. 1 April

The Wonderland complex was the focus for Seaweek in Townsville. Children contributed to a 'Reef Impressions' exhibition of art and craft work, posters and stories.



Workshops for teachers organised by GBRMPA included 'hands-on' sessions in the Discovery Room at the Aquarium.



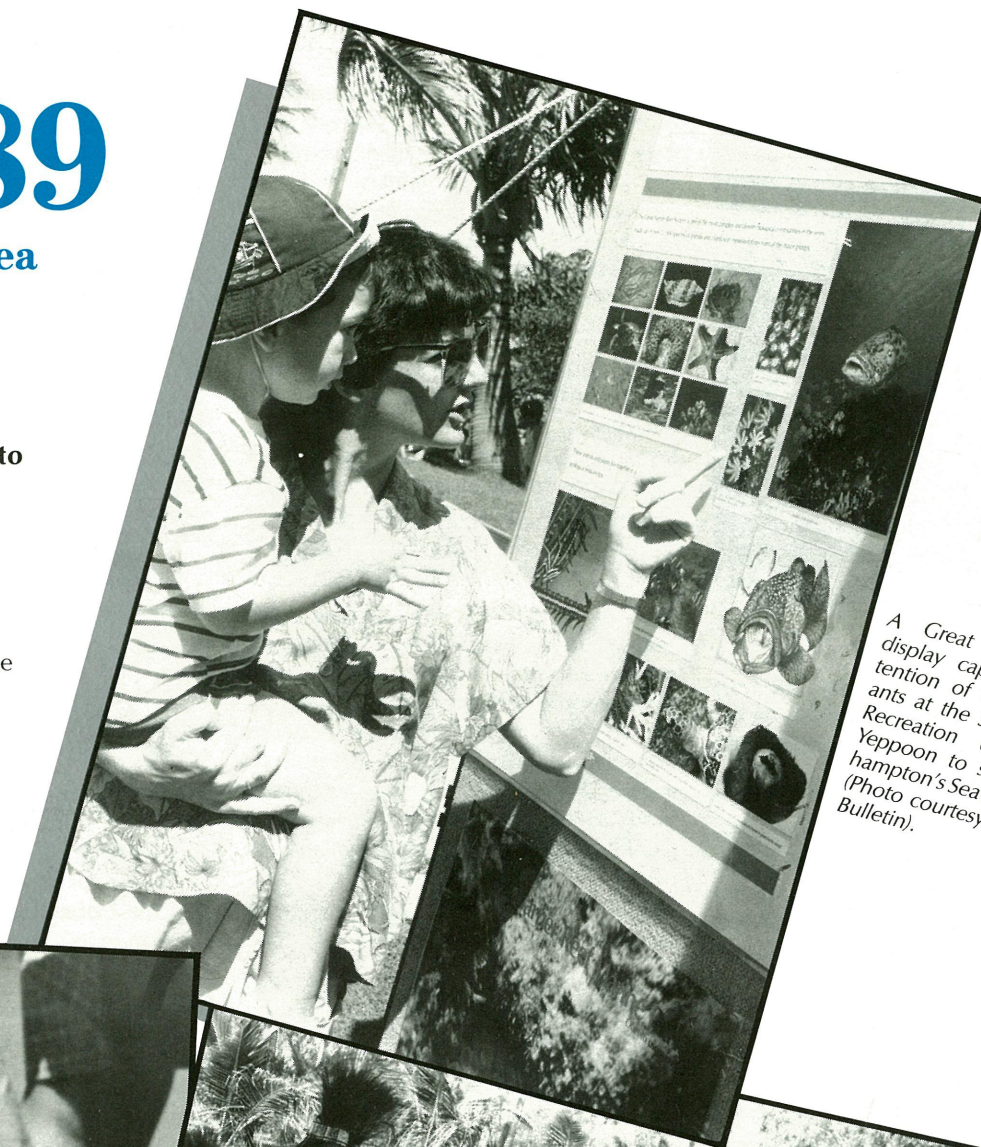
In Cairns, five-year-old Paul was among the year 1 pupils on a beach excursion. (Photo courtesy Sport'n'Life, Cairns).

Seek '89

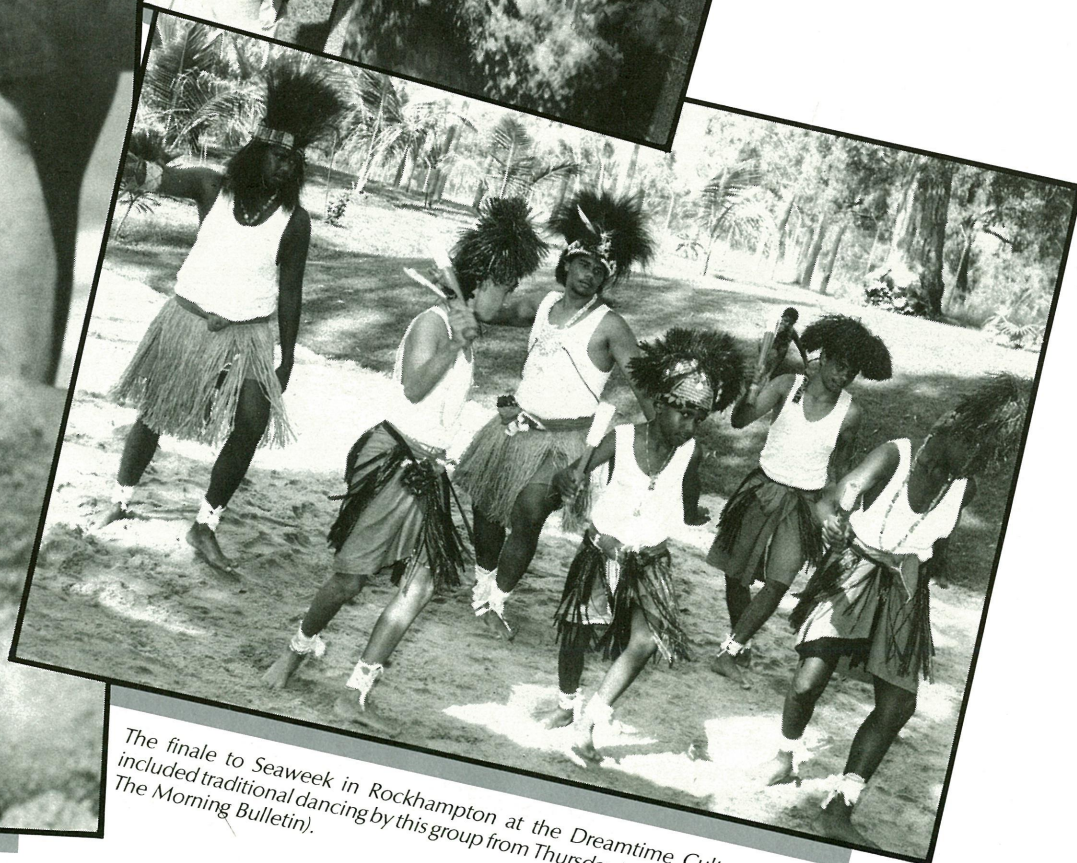
Celebrating the Sea
23 April

ned at encouraging people to
the marine environment.

started. Members of the Marine
are gathering ideas for again
sea between 24 March and
1990.



A Great Barrier Reef display captured the attention of these participants at the Sea Safety and Recreation day held at Yeppoon to start off Rockhampton's Seaweeek program. (Photo courtesy The Morning Bulletin).



The finale to Seaweeek in Rockhampton at the Dreamtime Cultural Centre included traditional dancing by this group from Thursday Island. (Photo courtesy The Morning Bulletin).

from Trinity Beach State School who had fun on

THE LIBRARY OF THE GREAT BARRIER REEF MARINE PARK AUTHORITY



EDUCATION &
INFORMATION

The GBRMPA Library is a major repository for information relating to the Great Barrier Reef. The Library was established in 1980 by Jean Dartnall following a review of the information needs of the GBRMPA by staff of the James Cook University Library. The present library system, although somewhat physically altered following the relocation to the new building in 1987, still adheres to the library policies developed by its first librarian.

The Library houses a special collection of some 3000 monographs, 250 periodical titles and approximately 4000 maps and aerial photographs. It is situated on the first floor of the office of the Great Barrier Reef Marine Park Authority in the Reef Wonderland complex in Townsville. In addition to books and periodicals, the staff of the Library manage the GBRMPA's valuable collection of 22,000 colour slides and black and white photographs. Other documentary material, such as Parliamentary papers, pamphlets and theses, also form an integral part of the Library's collection.

As the principal aim of the Library is to support the information needs of the Authority and its staff, the core collection reflects their needs and interests. The Library also aims to collect anything and everything on the Great Barrier Reef as a subject. In order to support this aim the REEF database, which is available on-line on the CSIRO AUSTRALIS system, was developed jointly by GBRMPA and CSIRO. REEF contains nearly 11,000 references to published and unpublished material on the Great Barrier Reef. A quarterly Current Awareness Bulletin is produced and an annual bibliography of entries on the database is available on request. The 1988

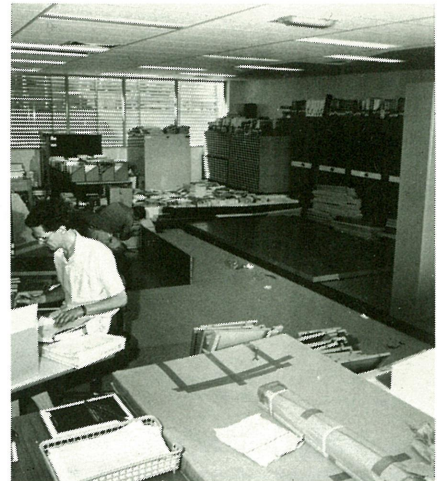
annual bibliography will soon be available from the Library.

The Library is available to interested members of the public or to students who may wish to consult the collection within the Library itself. The Library staff also answers general mail or telephone inquiries from outside the organisation and makes the collection available to external users through the national inter-library loans system.

Other databases which can be accessed through the Library include HERA, the database of the Australian Heritage Commission, the Australian Bibliography of Agriculture database, the Australian Marine Research in Progress database, and STREAMLINE, the database of the Department of Primary Industries and Energy.

In addition to these the Librarian can search, on-line, a number of important reference sources including the Australian Bibliographic Network (ABN), the Australian Public Affairs Information Service (APAIS), Australian Government Publications (AGP), and the Australian legal databases INFO-ONE and SCALE. The James Cook University collection is available on microfiche along with other important collections such as the updated catalogue of Commonwealth Legislation.

Maps and aerial photographs have been catalogued and the collection can be searched by reef and island name or by the unique reef/island identification number, or by geographic locale. Usage of the re-



Work continued as the compactus storage was installed.

organised map and aerial photograph collection has increased substantially. New material is now being added to the holdings. These acquisitions will ensure that the collection will become a comprehensive map and photographic coverage of the whole Marine Park.

In order to provide adequate storage for the Library's rapidly expanding collection, conventional shelving has been replaced by compactus storage facilities. This means that the Library has room for further expansion in its present location for at least three years.

For more information on the GBRMPA Library services and collections contact the Librarian, David Lawrence, or the Library Assistant, Rozel Brown, on (077) 81 8801.



The new-look library on the first floor of the GBRMPA office in Great Barrier Reef Wonderland, Townsville.

INTERPRETATION COURSES FOR TOUR OPERATORS



EDUCATION & INFORMATION

Tourism has been recognised as an important industry which affects the Marine Park and which requires careful management. Research indicates that the tourist industry has a significant impact on forming positive attitudes about the Australian environment by providing experiences of the 'real thing'.

Based on successful courses in Cairns in 1988, Marine Parks (GBRMPA and the Queensland Department of Environment and Conservation) developed a series of regional training programs in 1989 to assist Reef tour operators provide educational and entertaining experiences for tourists visiting the Great Barrier Reef.

Ten courses have been offered in major coastal centres from Bundaberg to Port Douglas. Each course is individually designed, taking into account the attractions and tourist services in the region. Over 250 people have participated in workshops which are conducted over two or three evenings by staff from Q.DEC and GBRMPA.

The courses aim to improve the understanding of the Reef, the Marine Park and to assist those involved in the tourism industry to accurately and entertainingly pass on this information to visitors. Emphasis is on the benefits of interpretive and educational programs and facilities which can be offered at little cost by operators.

The Marine Parks Tourism Training courses won the 1989 Queensland Tourism Award for tourist services. Q.DEC management officers Mr Leigh Harris and Ms Margaret Gooch and GBRMPA's Mr Don Alcock accepted the award at the presentation evening in July. The courses will now be judged for the Australian Tourism Awards to be announced in October.

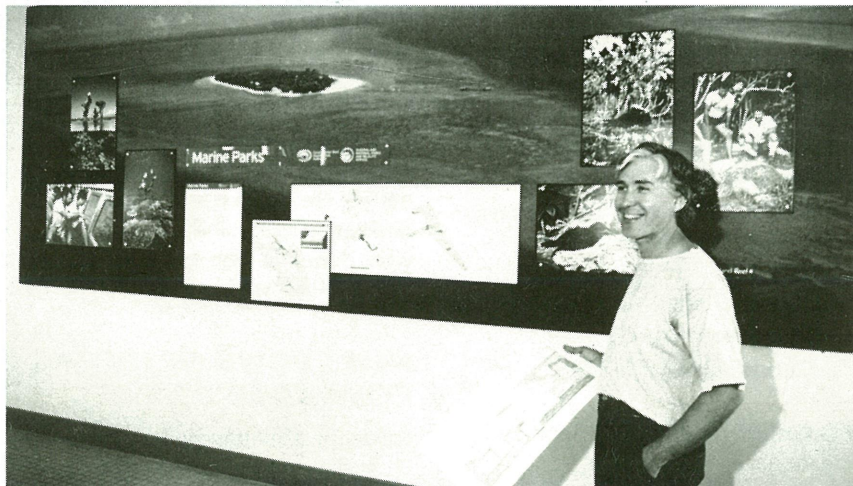


Marine Parks Tourism Training courses aim to assist Reef tour operators provide educational and entertaining experiences for their visitor customers.

MARINE PARKS INFORMATION FOR VISITORS TO GLADSTONE



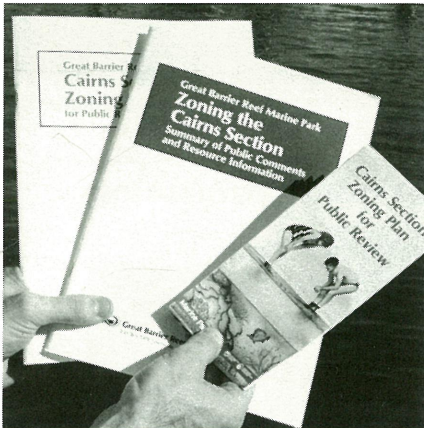
The display providing information about the Mackay/Capricorn Section of the Marine Park has recently been installed in the Gladstone Airport Terminal (above) and at the terminal at the Gladstone Marina (below).



UPDATE ON CAIRNS SECTION ZONING PLAN REVIEW

Public input into the preparation of a new zoning plan for the Cairns Section will be sought again when the proposed plan is launched in Cairns on 9 October.

Interested persons and organisations will be able to submit their comments on the plan until 31 January 1990. Once again a mail-back brochure, detailed zoning plan and explanatory booklet will be available at many outlets in the region adjoining the Cairns Section.



NEW GREAT BARRIER REEF CONSULTATIVE COMMITTEE

In July the Minister, Senator Graham Richardson, made new appointments to this Committee. It was established by the *Great Barrier Reef Marine Park Act 1975* as an independent advisory body for both the Minister (on matters relating to the Act) and the Authority (on the Marine Park).

The new Committee comprises:

Mrs E Bourne, Queensland Conservation Council

Mr R Bygott, Queensland Fish Management Authority

Mr J Ferguson, Department of the Arts, Sport, the Environment, Tourism and Territories

Mr A Fontes, Barrier Reef Diving Services and Dive Tourism Association of Australia

Mr M Gibson, Aboriginal Co-ordination Council and Hopevale Council

Mr R Goodwin, Mayor of the City of Cairns

Mr D Griffith, Queensland Sport and Recreational Fishing Council

Mr E Hegerl, Australian Littoral Society and Queensland Conservation Council

Dr T Hundloe, Griffith University

Mr J McEvoy, Queensland Department of Environment and Conservation

Mr G McKaige, Far North Queensland Promotions Bureau Tourism Task Force

Mr W Kehoe, Queensland Commercial Fishermen's Organization

Mr A Maestracci, Association of Marine Park Tourism Operators and South Molle/ Hook Island Enterprises

Dr H Marsh, James Cook University of North Queensland

Mr J. Wallace, Quicksilver Connections and Association of Marine Park Tourism Operators

These are three-year appointments.

Mr Graeme Kelleher continues as the Authority's appointee.

The Committee therefore represents a wide cross-section of interests in the Great Barrier Reef from both the public and private sectors. Dr Marsh is Chairman.

'User pays' in the Marine Park is an issue that will involve the Committee over the coming year.

OBITUARIES

Two members of the previous Consultative Committee died earlier this year. Graeme Kelleher paid the following tribute: 'We were greatly saddened by the deaths of **Professor Kevin Stark** and **Mr Peter Conaty**.

'Kevin had for many years been Chairman of the Consultative Committee and had worked closely with the Authority and me personally in many technical areas. He had a great ability to deal with complex issues in an integrated fashion, to bring warmth, humour and intelligence to the solution of conflicts and to create accord out of such conflicts. He contributed uniquely to the Great Barrier Reef Marine Park.

'Peter Conaty represented the commercial fishing industry on the Consultative Committee. He showed an unusual degree of dedication to that industry and to all those who depended on him. He too contributed to the Marine Park.'

NEW CROWN OF THORNS COMMITTEE

Following a recommendation of Professor D T Anderson's review into crown of thorns starfish research and management, the GBRMPA has established a new advisory

committee — the Crown of Thorns Starfish Research Committee (COTSREC).

Smaller than the Crown of Thorns Starfish Advisory Review Committee it replaces, COTSREC aims to meet three times a year to review applications for funds, to receive and deliberate upon the reports of assessors on these applications, and to review progress of the program before the next round of applications.

Professor John Swan continues as Chairman of the new committee. Other members of COTSREC are **Dr J T Baker** and **Dr P Moran** (AIMS), **Professor R Golding** (JCU), **Mr R Pearson** (Qld DPI), **Dr K Sainsbury** (CSIRO), **Mr G Kelleher** and **Dr L Zann** (GBRMPA).

A workshop was held in conjunction with the first meeting on 17-19 July 1989 to brief new committee members on past research and to gather researchers' advice on future priorities, schedules, costs and mechanisms. Researchers presented information on predation, impacts of fishing, human influences, geological studies, coral recovery, biology, ecology, recruitment, hydrodynamics and controls.

The Prime Minister's statement on the environment, *Our Country Our Future*, released on 20 July announced that crown of thorns starfish research coordinated by the GBRMPA would receive an additional \$750,000 to June 1991. The Minister announced an additional \$500,000 for 1991-92 making the total funds: 1989-90 \$750,000; 1990-91 \$1 million; 1991-92 \$1 million. Details of the research program for this year will be finalised about mid October.

AUTHORITY MEMBERS

New part-time members of the Authority were appointed in early 1989 following the resignation of Sir Sydney Schubert in July 1988 and the end of Dr Joe Baker's membership in December 1988.

Mr Pat Smith is acting as part-time member (Queensland nominee) for one year. Mr Smith is Deputy Under-Secretary of the Queensland Department of Environment and Conservation.

Professor Rhondda Jones was appointed for a three-year term. Professor Jones, an ecologist with research interests in population dynamics, is Professor of Zoology at James Cook University of North Queensland.



The jellyfish stole the show at the Serif Awards night. From left SBC Australia president Ian Blyth, Ray Neale (GBRMPA Education/Information leader), guest speaker Jeff Herrington from the US and Lesley Murdoch (GBRMPA).

SERIF AWARDS TO GBRMPA

The Serif Awards are presented annually by the Society of Business Communicators to foster excellence in business communications throughout Australia.

Education and Information Winners

Four national awards for excellence were presented to Education and Information Section entries. The Reef Awareness Pageant for the North Queensland Games won Gold in the SPECIAL WORK category, as did the publishing of Project Reef-Ed for best EXTERNAL PUBLICATION. Reeflections won a Magazine Merit Award and an article 'Coral Moon Magic' received an award in the news feature writing category. In accepting the awards, Ms Lesley Murdoch acknowledged the valuable contributions of all those who had helped make the projects so successful.

Business Communicator of the Year

Lesley Murdoch also received the special Diamond Serif Award which honours the most outstanding all-round professional

achievement by an individual based on performance in all aspects of business communications.

Brian Jaques, Serif Awards national convener, said the Diamond Serif recognised Lesley's range of programs for the Great Barrier Reef Marine Park Authority.

'We hoped,' said Brian, 'to recognise someone who had demonstrated individual multi-disciplinary communication skills, reflecting a trend increasingly evident in today's business climate. In this, we succeeded.'

Said Brian: 'Lesley is a writer but, as her range of entries showed, she has mastered such skills as editing, publishing, mounting pageants and awareness campaigns and often on a tight deadline, far from the resources of major cities.'

'She has not only mastered these skills, but successfully translated them into effective communications. Her two Gold Serifs each scored the highest marks awarded by judges in any category, and her Awards of Merit earned commensurate praise.'

Brian Jaques concluded: 'SBC national chairman Ian Blyth, the National Serifs Committee and I congratulate Lesley on her outstanding achievement. We look forward to the presentation of her Diamond Serif trophy at the SBC Australia National October Conference in Wollongong.'

TWO NEW REEF APPRECIATION AREAS

Following positive public comment on the proposal, new Reef Appreciation Areas have been established to protect two important dive and snorkel areas in the Central Section of the Marine Park — on **Credlin Reef** off Mackay and on **Bait Reef**, offshore from The Whitsunday Islands.

The Reef Appreciation Areas will cover less than 20% of each reef. More than 80% of each reef will remain open to fishing and collecting.

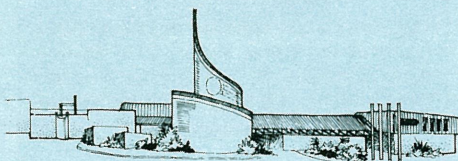
Credlin Reef is recognised as an important tourism site while Bait Reef is a favourite and intensively used spot for diving as well as fishing.

1989 MESA CONFERENCE

Marine Education Society of Australasia Conference, 7-10 December, Lorne, Victoria.

Inquiries: John Tomkin
Marine Science Laboratories
PO Box 114
Queenscliff Vic 3225
Telephone (052) 520 111

AT THE AQUARIUM SHOP



The Great Barrier Reef Aquarium is a 40-page booklet compiled by GBRMPA staff for *Australian Science Mag* (Darling Downs Institute Press). Ten articles describe how a marine wonderland has been replicated on land, covering the many and varied aspects of this innovative Aquarium, a feature of the Bicentennial project, Great Barrier Reef Wonderland.

Written by the Aquarium's designers and operators, the articles are well illustrated with colour and black and white photographs and diagrams.

An informative booklet for only \$3.00

All retail inquiries should be addressed to
The Manager
Aquarium Shop
Great Barrier Reef Wonderland
Flinders Street East
TOWNSVILLE QLD 4810
Phone (077) 81 8875

Wholesale inquiries should be addressed to
Education/Information Section
Great Barrier Reef Marine Park Authority
PO Box 1379
TOWNSVILLE QLD 4810

SENIOR TOPICS THE GREAT BARRIER REEF

Ashton Scholastic
Vol4 No5 1989
12 pages \$4.95

This issue of Ashton Scholastic's Senior Topics series has been produced in co-operation with GBRMPA and features a reef zoning game to enable students to better understand the management of the Marine Park.

The game encourages students to role play different lobby and user groups concerned about an area of the Great Barrier Reef.

Students learn about issues and problems facing management agencies like GBRMPA, in order to act as representatives of fishing groups, tourist developers, conservationists, scientists and indigenous people. The game culminates in a 'public meeting' to debate the future zoning of a fictitious area of the Marine Park.

While the zoning game is designed for middle to senior secondary students, the role play can be adapted for much younger students. The publication includes a large poster of a colourful 'reefscape' and smaller posters of reef creatures.

The **Senior Topics Great Barrier Reef** is available through the Aquarium Shop for \$4.95 plus \$1.50 postage.

CROWN-OF-THORNS STARFISH: QUESTIONS AND ANSWERS

P Moran
Australian Institute of Marine Science
1988; 35 pages paperback \$7.70

Only one of the tens of thousands of animal species on the Great Barrier Reef has aroused public interest, emotion and debate to a point where it frequently captures media attention — the crown of thorns starfish.

What causes outbreaks of this starfish? Can they be controlled? What is being done at present to understand the starfish phenomenon?

Research over the past 25 years has answered many of the basic questions raised by the starfish outbreaks and their effects on the Great Barrier Reef. Many questions remain unanswered and new ones have appeared.

Dr Peter Moran of the Australian Institute of Marine Science leads a large study on

the biology and ecology of the starfish. In **Crown-of-thorns Starfish: Questions and Answers**, he address 42 of the most commonly asked questions about the starfish. Questions are arranged in subject areas and amply illustrated by colour and half-tone plates. Answers are based on the latest scientific information but are written in plain English for easy reading. The book would be ideal for secondary school students preparing assignments and projects, but everyone with an interest in the Great Barrier Reef would learn something about this important scientific and management issue.

THE UNDERWATER AUSTRALIA DIVE GUIDE

Neville Coleman
Nelson 1987
270 pages paperback \$24.95

In the past divers planning an itinerary for a dive holiday in Australia had to refer to articles in dive magazines, or take pot luck. Neville Coleman's book is a guide to the facilities available to divers with some indication of what may be found in each dive location.

The book begins with a brief history of diving in Australia, from 'hard hat' diving for pearl shell through the advent of scuba to the present day. Other useful chapters cover the Great Barrier Reef and the Marine Park, underwater hazards, medical services, diving doctors and instruction agencies.

The bulk of the book is given to the regional chapters. These give a brief description of attractions in each region, a service directory for dive shops and dive boats and a dive reference chart. However the diver expecting maps of dive sites will be disappointed. Some regions also have scant information.

The book's greatest merit is in being a quick guide to facilities available in most areas of Australia and therefore recommended reference for those planning extensive dive holidays.

Although some excellent dive guides have become available recently for east coast dive sites, the list of further reading shows the lack of dive guides for Australia existing two years ago. The author is to be commended for tackling such a daunting subject.

SNORKELLING

R Moffatt
Wet Paper Publications 1988
96 pages \$9.95

One of Wet Paper's Marine Studies Series, **Snorkelling** is a book for students and adults interested in learning how to snorkel safely in the sea.

Topics covered include snorkelling equipment — masks, snorkels, fins, wet suits, other equipment and how to select it; snorkelling skills — pool snorkelling, techniques, fitness, attitudes, judgments, safety rules, hand signals; basic first aid, safety and resuscitation; accidents involving marine creatures — stone fish, sea wasp, cone shells and more; open water snorkelling; basic snorkelling biology — eye, nose, throat, ears, lungs, heart and circulation; basic snorkelling physics — temperature, pressure, buoyancy, Archimedes principle.

Wet Paper Publications catalogue is available from 14 Milbong Terrace, Ashmore Qld 4214.

NOTES

Reflections is published by the Great Barrier Reef Marine Park Authority on a quarterly basis with the intention that it should cover a range of topics and serve as a forum for discussion. Your contributions are important to ensure that representative points of view are presented and items of interest are brought to the attention of our readers.

We ask that contributions be kept to a maximum length of 1500 words and be accompanied by the author's name, designation and address. Photographs (preferably black and white prints) drawings and diagrams will be gratefully received.

The Editor will assume that material submitted for publication has appropriate organisational approvals where necessary. The Editor reserves the right to reject or modify contributions. If modification is considered necessary, it will be referred to the author for approval.

Contributions should be sent to:

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