



Australian Quaternary Newsletter

No. 1 March 1973

Quaternary studies in Australia have expanded remarkably in the last ten years but in a rather haphazard way. At present the large numbers of researchers and projects tend to be rather isolated in particular disciplines, such as coastal geomorphology, soil science or palaeontology. It is difficult for any one person to keep in touch with developments in the Quaternary outside his own discipline, partly because of the wide variety of studies, and partly because Quaternary results are often a byproduct of the main line of research - so, for example, the non-palynologist may be bogged down in pollen diagrams and vegetation history when what he really wants to know is the meaning of the vegetation changes in relation to his own research. Although research results may be readily available, the main subject may conceal aspects of direct relevance to other workers.

For these reasons, we personally find that we keep up with many advances merely by accident and feel that a cooperative effort to publicise current activity is needed; hence this newsletter, designed for all with an interest in the Australian Quaternary. The response so far to a fairly restricted call for contributions has shown that many others feel as we do.

The geographical scope of the Newsletter is that of the Quaternary land area shown in our symbol, that is, Australia and the island of New Guinea. Because of the close relationship between Quaternary Australia-New Guinea and the archipelago of Indonesia, and the importance of Wallacea to palaeoclimatologists, biogeographers and prehistorians, we hope to include reports on Quaternary research in Indonesia as well. New Zealand we have decided to exclude, somewhat reluctantly, as we feel that the amount of research underway there would make the Newsletter unwieldy.

The Newsletter will include a variety of reports and reviews. Perhaps most important will be accounts of research underway in Quaternary studies. These are not intended to be articles giving original research results, but just informative notes on who is doing what, and where. We hope that this kind of communication will lead to increased opportunities for joint research projects, or for minor participation in and visits to field projects.

The Newsletter will also report on the following:

1. Symposia or special publications of specialist societies with interests in the Quaternary.
2. The activities of the newly formed Quaternary Groups in Western Australia, Victoria and Canberra.
3. Facilities available to people working in the Quaternary. The most important, of course, are the Radiocarbon Laboratories, and information on these will be included in future issues. Apart from commercial concerns, we would like to compile a directory of people or institutions willing to analyse or identify materials of Quaternary age. Let us know if you have some service or speciality available to others.
4. Books and other publications relevant to Quaternary research.

This first issue has been designed to include representative items in most of these categories; consequently we have been forced to leave out some contributions we have already received. Our apologies to those people whose reports are not included; we shall try and fit these into the next issue. However, we would still like to get further reports, particularly from those on the edge of Quaternary research, so please fill in and return the Questionnaire included in this issue.

The Newsletter is not intended to publish original research or detailed review articles, but we do want news and opinions about Quaternary programmes both current and planned, and just about anything that you think would be of interdisciplinary interests. This of course includes political matters and viewpoints. For example, to what extent should those involved in Quaternary Research lobby for the preservation of sites of national importance (of course, many Quaternary workers are already involved in conservation problems). Perhaps it is time for the establishment of a clearing house to direct the attention of Quaternary researchers to sites - whether geomorphological, palaeontological or archaeological - which are threatened by development and so need urgent study. This Newsletter may be able to act as such a clearing house.

Jeannette Hope,
Department of Prehistory

Bruce Thom,
Department of Biogeography and
Geomorphology

Research School of Pacific Studies
Australian National University.

NATIONAL COMMITTEE FOR QUATERNARY RESEARCH

A committee exists to advise the Council of the Australian Academy of Science on Australian participation in the work and affairs of the International Union for Quaternary Research. The members of this committee are:

Professor E.S. Hills, FAA, (Chairman), School of Geology,
University of Melbourne.

Mr. G. Blackburn, Division of Soils, C.S.I.R.O., Adelaide.

Dr. R.W. Galloway, Division of Land Research, C.S.I.R.O., Canberra.

Mr. E.D. Gill, National Museum of Victoria, Melbourne.

Professor D.J. Mulvaney, Department of Prehistory, School of
General Studies, A.N.U., Canberra.

Dr. W.D.L. Ride, Western Australian Museum, Perth.

Professor D. Walker, Department of Biogeography and Geomorphology,
A.N.U., Canberra.

The late Mr. G.A. Taylor, Bureau of Mineral Resources, Canberra, was also a member of this committee.

INQUA 1973

The IX INQUA Congress will be held in Christchurch, New Zealand, 2-10 December, 1973. Facilities for the Congress will be provided by the University of Canterbury. The activities of the Congress will include a general assembly and plenary session, section meetings, symposia, business meetings of commissions and sub-commissions and pre- and post-Congress excursions. Field excursions will also take place in Australia.

The Organising Committee has invited contributions for the following sections, in particular welcoming papers which synthesize information on an interhemispheric or world-wide basis.

Group I. Quaternary Environments and processes

Sections:

- (a) Geologic and geomorphic phenomena
- (b) Pedologic phenomena
- (c) Climates
- (d) Shorelines
- (e) Tectonics and volcanism
- (f) Limnology

Group II. Flora and fauna, including man

Sections:

- (k) Quaternary biogeography
- (l) Archaeology and anthropology - Northern Hemisphere
- (m) Archaeology and anthropology - Southern Hemisphere

Group III. Stratigraphic subdivision of the Quaternary

Sections:

- (o) Marine stratigraphy
- (p) Non-marine stratigraphy

Group IV. Time

Sections:

- (s) Boundaries of the Pleistocene
- (t) Chronology of Quaternary events and age of Quaternary deposits
- (u) Palaeoecology, palaeontology, palynology, and isotope dating
- (v) Palaeotemperatures, palaeomagnetism, and isotope dating
- (w) Palaeopedology

Group V. Correlation

Sections:

- (x) Problems of correlation of Quaternary events and deposits
- (z) Inter-regional correlations

All correspondence, and requests for information concerning the Congress, should be addressed to:

Professor Jane M. Soons,
Secretary-General,
IX INQUA CONGRESS,
Department of Geography,
University of Canterbury,
CHRISTCHURCH. NEW ZEALAND.

Dr. R.W. Galloway, the Australian representative on the Organising Committee of the IX INQUA Congress has arranged the following excursions in Australia.

1. Southern N.S.W. including fluvial stratigraphy, soils, palaeosols, and neotectonic effects in semi-arid western N.S.W., the history of playa lakes and associated Aboriginal remains; glacial and periglacial phenomena in the Snowy Mountains; Lake George environment; Aboriginal sites and coastal evolution on the South Coast of N.S.W.

2. Western Victoria and Tasmania involving Quaternary volcanism in SW Victoria, coastal features (cliff-top dunes, aeolianite, etc), Pleistocene lakes, archaeologic sites and relationship of river terraces to deltaic sediments near Melbourne, glacial, periglacial and vegetation phenomena in Tasmania and the Mowbray Swamp palaeontological site.

3. Northern N.S.W. - Southeast Queensland. This is primarily a coastal geomorphology - stratigraphy excursion from Sydney to Heron Island on the Great Barrier Reef. There will also be an examination of Pleistocene volcanic features and fluvial terraces and soils in the Bundaberg-Maryborough area.

4. New Guinea. Prehistoric sites in the Wahgi Valley, glacial features and associated pollen-analysed sites on Mt. Wilhelm and coastal terraces of the Huon Peninsula will be inspected on this excursion.

Anyone seeking further information on Australian excursions should contact Dr. Galloway, Division of Land Research, C.S.I.R.O., Canberra.

We hope to provide more information on IX INQUA Congress in the next issue of the Newsletter.

SOCIETY NEWS

Quaternary discussion groups exist in Melbourne, Perth and Canberra. E.B. Joyce is the convener of the Victorian Quaternary Group which met several times in 1972. The programme of meetings proposed for 1973 is as follows:

Friday, 16th March: afternoon seminar on botanical aspects of the Quaternary - convener Philip Ladd

Saturday, 28th April: day excursion to Keilor, soils, archaeology, fluvial and marine terraces - convener Bernie Joyce

Friday, 18th May: afternoon seminar on coastal geomorphology - convener Neville Rosengren

Friday, 20th July: afternoon seminar on Quaternary climates - convener Jim Peterson

Friday, 21st September: Quaternary vertebrate palaeontology - convener Jim Warren

The Quaternary Studies Group in Western Australia grew from small beginnings within the Royal Society of Western Australia, but subsequently became independent, and arranges meetings, excursions and other activities. For information, contact Dr D. Merrilees, Western Australian Museum, or Mr. D.C. Lowry, the W.A. correspondent for this Newsletter (see p.).

In Canberra, the responsibility for meetings of the Quaternary Discussion Group alternates between the Departments of Prehistory and Biogeography and Geomorphology, in the Research School of Pacific Studies at the A.N.U.

The 45th ANZAAS Congress will be held in Perth, 13-17th August, 1973. Section 3 (Geology) hopes to organize a symposium on "Recent advances in the understanding of the Cainozoic geology of Australia". Planned excursions include Shark Bay (Quaternary carbonates) the South-West and the Collie - Bunbury - Capel areas. The W.A. Royal Society is preparing a part of the journal as an ANZAAS 1973 issue. The aim is to provide a review of research on the southwest of W.A. and will include articles on geology, soils, floral taxonomy, anthropology, etc.

MAJOR PROJECTS

Expedition to the Northern Great Barrier Reef, 1973

Aims

The main aim of the expedition is to determine whether present reefs of the northern Great Barrier Reef, Queensland reflect modern reef growth or are mainly older limestone features formed by Pleistocene reef growth, modified by erosion during lower stands of the sea, and veneered by Recent reef growth. It is hoped to construct a radiometrically-dated sea-level curve for the late Pleistocene and Recent in Queensland, and to determine the development of the reefs during this period.

Investigations will include:

- (a) geophysical studies to determine the internal structure of the reefs and the shelf from which they rise;
- (b) geomorphic studies on the reefs and reef-islands, to determine the relationships between reef-flat levels and tides and to identify the effects of Pleistocene and Recent sea-level changes;
- (c) geomorphic studies on raised platforms and deltaic sequences on the mainland coast, to correlate with reef features;
- (d) sedimentological studies on the coastal shelf, to identify areas of modern and relict sediments and to obtain information on the history of sedimentation;
- (e) limited biological studies on benthic organisms, particularly corals, molluscs and polychaetes, to determine the relationships between benthic communities and topographic and sedimentological features.
- (f) stratigraphy of reef deposits, to determine the nature of reef sediments, their diagenesis, and rate of deposition in the Late Quaternary

Areas and programme

Phase I. Lizard Island, Howick Group off Cape Melville and adjacent outer linear reefs (July-August): drilling, sediment sampling and geomorph reconnaissance.

Phase II. Cairns to Cape Melville geophysical surveys and sediment sampling, and continuation of geomorph studies (Sept-October).

Personnel

Dr. D. Stoddart (Cambridge; Leader), Dr. G.R. Orme (Qld; Deputy Leader).

Geomorphology: E. Bird, R.F. McLean, D. Hopley

Sedimentology: P. Flood, T. Scoffin, A. Bloom

Geophysics: G. Sargent, J. Webb, D. Taylor Smith

Stratigraphy involving drilling: B. Thom

Geochronology: H. Polach

Biology: C. Burdon-Jones, J. Collins, P. Gibbs, I. Price, J. Vernon

Sponsoring Organizations

The Royal Society, U.K.
University of Queensland
James Cook University
Royal Australian Navy
Australian National University
Bureau of Mineral Resources

The Second International Symposium on Coral Reefs will be held on board the M.V. Marco Polo on the Great Barrier Reef in June, 1973. The convener of the symposium is Dr. Orme. For further information concerning either the symposium or expedition, please contact Dr. Orme, C/- Dept. of Geology and Mineralogy, University of Queensland, St. Lucia, Queensland, 4067.

Carstensch Glaciers Project

The Carstensch Mountains of West Irian form the highest area in South east Asia and Australasia and support the only substantial glaciers between the Himalayas and New Zealand. Until recently the area was so inaccessible that only a few small expeditions reached them. Access is now easier, following the establishment of a copper mine by Freeport at 3,600 m, and a joint and ongoing research effort has been initiated by the Department of Meteorology, University of Melbourne, with major support from the ARGC.

Two field work seasons, in 1972 and 1973, have already taken place. Dr. U. Radok, Meteorology Department, Melbourne, is coordinating the glaciology, with accurate surveys of the ice fronts, and ice core studies. The survey has been assisted by the Department of Surveying, UNSW and Mr. C.R. Champion. Mr. J. Bennett, Flinders University is studying the ice ablation and micro meteorology. Dr. J. Peterson, Geography Department, Monash, is extending a survey of glacial and Karst geomorphology away from the present ice areas. Mr. G. Hope, Biogeography and Geomorphology, ANU is examining the distribution of vegetation in relation to glacial landforms, and investigating past vegetation changes by pollen analysis of post glacial tarn sediments. Mrs. J. Peterson is working on the peculiar cryovegetation of the ice surface. Dr. J. Hope, Prehistory, ANU is studying zoological collections and archeological material.

Useful results so far include a dated series of ice advances and retreats with possibly regional climatic implications, a 5,000 year old archaeological rock shelter deposit at 4,000 m, and detailed measurement of glacier retreat over the last 36 years. With completion of the glacier survey, the emphasis of the project will probably move to other fields, and if ARGC support continues, more participants may be interested. Dr. J. Peterson is organising the 1973-74 field work programme. Indonesian scientific participation has been sought from the start but various circumstances have prevented them from joining the field parties. There is considerable scope in the area for projects in meteorology, palaeoclimatology geomorphology, including process studies, and several aspects of biology, ranging from plant colonisation and ecology to vegetation history.

RESEARCH REPORTS

We are unable in the first issue of this newsletter to present a comprehensive summary of Quaternary research in Australia. We have already received from our correspondents many reports which will be included in the next issue scheduled to appear later this year. The following is a selection of activities which will serve to indicate the geographic spread of Quaternary studies in Australia, New Guinea and Indonesia, the variety of such activities and the type of information we are aiming to incorporate in future issues.

QUEENSLAND

Dr. David Hopley, Geography, James Cook University, Townsville, has taken over the role of Secretary of the Quaternary Shorelines Committee, ANZAAS, from Mr. Edmund Gill. All communications concerning this committee should be directed to Dr. Hopley.

G.H. Thompson, Division of Soils, C.S.I.R.O., Brisbane, has recently completed the description and mapping of soils in the Gympie and Cooroy districts. Different soils occur on each of three main terraces of the Mary River, and comparable soils occupy fans and fan remnants graded to the different terrace levels. The soils of the sand masses adjoining the coast are clearly related to distinct periods of sand accumulation. Maps and manuscript are now being compiled.

M.C. Quinnell, Curator of Anthropology at the Queensland Museum has been conducting a survey of Aboriginal parietal art in the Carnarvon Range and Maranoa region of Queensland's Central highlands. To date ninety sites have been recorded, these range from immense rock shelters to small boulders, they include stencils, paintings and engravings. This art may possibly have its origins in the Pleistocene, but much of the exact record seems to be ethnographically recent. The project which is financed jointly by the Queensland Museum, the Department of Aboriginal and Island Affairs, Brisbane, and the Australian Institute of Aboriginal Studies, Canberra, will continue in 1973.

W. Arndt, Division of Soils, C.S.I.R.O., Brisbane, has provided the following information on the problems of preserving the "Birinbah" Aboriginal Site near Forest Hill.

A large, complex and most unusual aboriginal ceremonial ground is located in the valley of Sandy Creek, a tributary of Lockyer Creek in S.E. Queensland. This well-preserved relic, built entirely of soil mounds, is situated on an old alluvial fan at the exit of a dry gully and about 5 metres above the level of the present-day flood plain.

Although this important relic is well-preserved, the alluvial fan on which it is located is seriously threatened by two large deep gully erosion systems and numerous small tunnel erosion systems. The solodic soil formation on the unconsolidated sandy clay fan is particularly susceptible to such erosion.

Preliminary studies suggest that the stability of this old fan was first threatened when the Aborigines built the mounds. As a result, the overflow in peak flooding was directed into a minor channel which developed into an erosion gully. When Europeans blocked this gully, all the flow was forced into the main channel, causing more gully erosion. The base level of the system has also be altered by constructing a dam.

Better knowledge of the geomorphological process involved is required to assess and control this threat to a valuable relic.

NEW SOUTH WALES

Dr. E. Frankel, advises that he has left Macquarie University (School of Earth Sciences). He has been awarded a Queens Fellowship in Marine Science to look at the marine geology-paleogeography of the Torres Strait area. He is particularly interested in problems of reef development following his doctoral studies in Princess Charlotte Bay, Queensland. He takes up his fellowship in May, 1973, and will be based at the University of Sydney. He has also been awarded a grant from the Crown of Thorns Committee to investigate geological aspects of the crown of thorns problem on the G.B.R.

Peter den Exeter, Geography, University of New England, is currently completing a Ph.D. on the geomorphological history of the coast between Taree and Port Macquarie, N.S.W.

P. Hughes, Geography, University of N.S.W., as part of his doctoral research over the past 2-3 years, has examined a number of archaeological sites on the South Coast of N.S.W. with view to finding out more about the geomorphic environments of the sites during the time they were occupied by Aborigines. From previous investigation by archaeologists all of the sites examined by Hughes were known to have been inhabited for several thousands of years; the oldest, a cave at Burrill Lake, for some 20,000 years. Among several lines of investigation, he looked in detail at the natural sediments which have contributed to the build up of occupation deposits, examining many characteristics of these for possible changes through time which might reflect either climatic or local geomorphic variation.

J.P. White, Anthropology, University of Sydney, in association with R.J. Lampert, Prehistory, Research School of Pacific Studies, excavated an Aboriginal midden on Hookah Point, Lake Illawarra, during January, 1973. P. Hughes visited the site as consultant in geomorphology. Although the site is well above present lake level, the occupation deposit was found to have been extensively reworked by wave action in a manner that suggests periodic stands of higher lake level during the past several of thousand years.

A.C.T.

G. Hope, Department of Biogeography and Geomorphology, A.N.U., has recently completed his Ph.D. thesis entitled "The vegetation history of Mt. Wilhelm, Papua New Guinea" which provides a record over the last 22,000 years of ice retreat and the migration of vegetation at various altitudes on this 4,500 m high mountain. Although glacier retreat started about 14,000 B.P., the major change from alpine to subalpine vegetation took place about 10,100 B.P., and a tentative palaeoclimatic reconstruction is inferred from this.

R. Luebbers, Department of Prehistory, A.N.U., is at present undertaking field work as part of his doctoral programme in the Robe area of South Australia. He is working on the problems of human occupation in relation to coastal environments. During the meeting of the Specialists Group in Sedimentology, Geol. Soc. Australia, at Robe in February, Mr. Luebbers took the opportunity of introducing many geologists to archaeological problems where they relate to Holocene sedimentation patterns and soil development.

R.J. Lampert, Prehistory, Research School of Pacific Studies, is continuing his long-term research programme on the South Coast of N.S.W. Present research is focussed on the Jervis Bay area where both archaeological sites and natural resources are being investigated with a view to determining patterns of Aboriginal subsistence exploitation. Plant resources on Beecroft Peninsula were examined by F. Hurrell, Botany, School of General Studies, marine foods in Jervis Bay are being surveyed by J. Douglas, Department of the Capital Territory.

VICTORIA

John Neilson of the Victorian Mines Department at a meeting of the Victorian Quaternary Group last July reported on the results of the latest studies of the Yarra delta, where during the last decade a clearer picture has emerged. Four Quaternary formations are distinguished, the oldest being the Moray Street Gravels, followed next by the Fishermen's Bend Silt. An appreciable period of sub-aerial weathering and erosion followed, together with the extrusion of the Newer Volcanic basalt flows of the lower Yarra valley, dated at 0.8 m.y. The deposition of the Coode Island Silt marked a marine transgression, and includes wood dated at about 8,000 to 9,000 B.P. The youngest deposit is the Port Melbourne Sand of littoral and aeolian origin, which in places once formed sand ridges parallel to the present coast.

E.B. Joyce, School of Geology, University of Melbourne, is compiling a bibliography for Australia and Papua-New Guinea on Quaternary tephrochronology. This report will be included in the World Bibliography on Quaternary Tephrochronology involving members of the INQUA Commission on this subject. Mr. Joyce is also evaluating ERTS-A satellite imagery for purposes of producing a geomorphic map of south-eastern Australia. He is continuing his study of Cainozoic volcanicity in Victoria. A catalogue of nearly 400 points of eruption has been prepared, and detailed studies of a number of volcanoes made. Particular attention has been paid to the maar volcanoes. During 1972, Mr. Joyce supervised two honours students in geology:

T. Stone: "Geology and geomorphology of the Mount Noorat volcanic complex, Western Victoria".

J. Anderson: "Quaternary geology and sedimentology of the Gallus sites and adjacent areas at Keilor, Victoria.

Dr. R.W. LeMaitre, School of Geology, University of Melbourne, recently organized a symposium on "Tertiary and Quaternary Volcanism in E. Australia". The main aim of the meeting was to try to relate the type of volcanism found throughout eastern Australia with its tectonic setting as inferred from geophysical data. People interested in obtaining further information on the results of this symposium should contact either Dr. Le Maitre or Mr. Joyce.

SOUTH AUSTRALIA

Murray Lindsay, Palaeontology Section, Geological Survey of South Australia, has among other interests a long-term project to assemble and identify Quaternary foraminiferal microfaunas from all South Australian Cainozoic coastal basins, with a view to application in biostratigraphy and palaeo-environment. Several biofacies can be distinguished representing a variety of coastal environments. Only occasional samples (e.g. south coast of Yorke Peninsula) have a planktonic component (near-shore, open-ocean). Correspondence would be welcomed.

G.L. Pretty of the South Australian Museum has carried out archaeological excavations on Roonka Station near Blanchetown in the Murray Basin ($34^{\circ}21'S$, $139^{\circ}36'E$). The site is situated next to the Murray River and before the coming of European colonists would have spread along a ribbon dune of sand skirting the edge of a broad elevated river flat. At one point this dune rose to a hump with an outlook first over a shallow lagoon, then across a low lying mudflat supporting reeds and red gums, to the main stream of the Murray. Beyond rose the high limestone cliffline of the left bank. Behind the hump was the broad extent of the flat whose high yield of

edible grubs, rongk to the Ngaiawang (the larval stage of Trictena argentata), has given the flat its name. The flat is a pediment derived from the breakdown of the Western Murray cliffline into a shallow slope at this point. The height of the dune summit above recorded maximum flood levels, with its access to lacustrine, riverine, woodland and mallee environments would have ensured its appeal as a dwelling site to Aboriginal Man.

Excavation has disclosed at least two and possibly three phases of occupation, in the sand which rests on a red clay. The sandy unit contains two stratigraphic components, an upper 'settlement' horizon, resting unconformably on a faintly ferruginised horizon containing only graves.

There are three distinct types of graves: (a) longitudinal pits containing fully extended skeletons, (b) circular pits and shafts containing contracted skeletons, and (c) deep vertical shafts containing bodies whose originally erect posture is preserved even where the skeleton have slumped into the base of the shaft. There are status graves and common graves, the former containing rich inventories of ornaments, among other grave goods. This wealth of finds and variety of mortuary detail at the one site is a complete departure from previous findings and has promise of an important addition to our knowledge of Aboriginal culture. Two initial radio-carbon dates have been obtained one of $18,150 \pm 340$ B.P. (a hearth at the base of the sandy unit) and one of $3,930 \pm 120$ B.P. (a grave at the base of the settlement horizon). Exploration of the red clay deep beneath the sandy unit shows no evidence of human use, but has produced fragments of fossil mammal bone. These have been tentatively identified as Sthenurus sp. Further excavations are planned in 1973 to clarify the stratigraphic detail of the settlement horizon. The chronology of the graves is to be the subject of an A.N.U. lab. project through comparison of assays of bone, soil and organic content with carbon. Funds recently received from the Australian Institute of Aboriginal Studies will support preparation of a descriptive analysis of the human remains.

Professor C.C. von der Borch has provided a report on the Quaternary Research Programme within the School of Earth Sciences at Flinders University. He states that Quaternary research at Flinders University is currently concerned with the geological record of Pleistocene eustatic sea level oscillations in South Australia. This study includes the stratigraphy and sedimentology of the thick (up to 250 m) coastal aeolianite sequences which are well exposed around the Central and Western portions of the State's coastline. It also involves intensive stratigraphic drilling of the remarkable sequence of stranded barrier islands and lagoons on the 65 km wide coastal plain in the southeast portion of the State.

The above work is leading to an understanding of the complex stratigraphic relationships recorded in the deposits in question. Ultimately this may lead to a documentation of Quaternary eustatic sea level oscillations in the sense of their relative sequence and magnitude, particularly when the study is extended onto the adjacent continental shelf using high resolution continuous seismic profiling. The next logical step will be an endeavour to obtain absolute dates of significant eustatic events, using the U/Th method of dating biogenic carbonates which will be set up at Flinders University by new staff member Dr. H.H. Veeh in 1973. Remains of solitary or colonial corals will be sought amongst some of the rocky reef faunas in the area and these will hopefully enable some meaningful dates to be obtained. The overall aim of this long term study will be a further refinement of our knowledge of Quaternary eustatic sea level oscillations. It is also hoped that it will throw light on the ultimate causes of glaciations.

TASMANIA

A. Goede, E. Colhoun, N. Chick, Department of Geography, University of Tasmania report on the following activities.

Macquarie Island was recently visited by E.A. Colhoun and A. Goede and mapping of glacial features was carried out over approximately one half of the island's total area. The island was not completely ice covered during the last Glacial and ice reached present day sea level only at a limited number of points. Observations were made also on periglacial, coastal and aeolian features. The island presents a very active periglacial environment and a large range of periglacial features was observed. A raised peat-covered marine terrace, apparently of post-glacial origin, surrounds the island, but is best developed along the West Coast. Sections were studied at Green Gorge and Bauer Bay and samples of fossil peat and bone collected for C14 dating. A report of the work done is in preparation and will be submitted to A.N.A.R.E. Work on coastal morphology and stratigraphy is in progress in Northern and South-Eastern Tasmania. At Coles Beach near Devonport, E.A. Colhoun and N.K. Chick have found solifluction material overlying a raised beach deposit which is correlated on morphological and altimetric grounds with the Glenhaven Terrace of the Ulverstone area described by Chick (1971). E.A. Colhoun is engaged in detailed studies of the morphology and stratigraphy of coastal features in South-Eastern Tasmania and a number of samples of organic material have been collected for C14 analysis. Related studies on a more local scale are being carried out this year by three honours students in the South Arm Peninsula and near Sorell. A. Goede has recently completed a study of the floodplain stratigraphy of the Tea Tree Rivulet in Eastern Tasmania and a paper has been accepted for publication in Australian Geographical Studies. The stratigraphic sequence supported by six C14 dates indicates four periods of alluvial deposition between 6000 and 3000 B.P.

WESTERN AUSTRALIA

The Geological Survey of Western Australia has no specific programme of Quaternary studies, but information on Quaternary stratigraphy emerges from studies on (i) geohydrology of the Perth metropolitan region, and in particular the Gnangara area; (ii) geohydrology of various river valleys in the North West Division, with ancient and modern alluvium; (iii) heavy mineral resources in Quaternary strand-line deposits; (iv) regional mapping on a scale of 1 : 250,000.

The Geology, Geography, Anthropology and Anatomy Departments of the University of Western Australia all have relevant current research programmes. The Geology Department deals with research into sedimentary processes and Quaternary sediments in the Shark Bay region and on the continental shelf between Rottnest and Mandurah. There is continuing study of climatological and geomorphological processes in the Geography Department. Analysis of newly recovered material, and a reassessment of the species of Parapapio from Sterkfontein, identification of new material from Kromdraai, and compilation of a check-list of fossil cercopithecoid species from South Africa is in progress in the Anatomy Department. Regional study of the prehistory, especially from an ecological point of view, of an area centred on Perth, is in progress in the Anthropology Department.

The C.S.I.R.O. Division of Soils has shown that there are soils in most south western landscapes resulting from Quaternary processes which appear to be periodic, though a framework for age correlation is at present lacking. For example, on the Swan Coastal Plain, soil properties have been clearly related to relative age. Other parts of Western Australia are less well known pedologically, and the Division's interest in the Quaternary is likely to be a long term one. The C.S.I.R.O. Division of Wildlife Research is investigating relict distributions of bird species related to Quaternary fluctuations of climate.

The Western Australian Museum's research programme at present includes work on fossil molluscs which is leading to some understanding of early as well as late Quaternary events in the Perth metropolitan regions, and work on fossil mammals and archaeology which taken together are leading to some understanding of the faunistic history of some areas, especially in the South West Division, and of the role of Aborigines in them. But mammal-bearing and archaeological deposits known at present appear to be confined to the late Quaternary.

INDONESIA

A Symposium on Recent Crustal Movements and Associated Seismic and Volcanic Activity sponsored by IAG/IUGG will be held from 10 - 18th November, 1973 at the Institute of Technology, Bandung, Indonesia. Further information from: The Organizing Committee for the International Symposium ... Activity, C/- Indonesian Institute of Science, Jalan Teuku Chik Ditiro 43, Jakarta - Indonesia.

BOOK REVIEWS

Aboriginal Man and Environment in Australia. Ed. D.J. Mulvaney and J. Golson. Australian National University Press. 1971. A\$12.50

Bridge and Barrier: the Natural and Cultural History of Torres Strait. Ed. D. Walker. Department Biogeography and Geomorphology, Publ. BG/3. Australian National University. 1972. A\$5.00.

K. Butzer has warned other Quaternarists about archaeologists; in general they call in the experts to answer questions they have framed, and they are apt to be indignant if the question is itself questioned. Perhaps this springs from the prehistorians' habit of regarding themselves as the last of the great synthesisers. With this in mind, it is interesting to compare these two volumes. The first derives from a seminar series held by the Prehistory Department, Research School of Pacific Studies, A.N.U. in late 1969, and the second from a symposium held at the A.N.U. in late 1971. Aboriginal Man includes articles reconstructing several aspects of the past environment in which Aborigines lived (in addition to research reports) while Torres Strait seeks the reasons underlying the distribution of biota in southern New Guinea and northern Australia.

The review articles in both are of extreme interest to all Quaternarists in presenting the current 'state of the art' in such things as palaeoclimates, sea levels and palaeoecology. The Torres Strait volume contains useful attempts at reconstructions of the processes underlying regional palaeoclimates, and as we all enjoy knocking down (or fitting into) such schemes, the writers (Nix and Kalma, Webster and Streten) have rendered a

valuable service. The Torres Strait volume is broken into four sections: the physical history of the region, phytogeography, zoogeography, and people. Each is brought together with a synthesising article which makes the interdisciplinary volume useful to everyone.

General readers (and perhaps the editors) have more trouble in relating the specific research articles to the general pattern. In this respect the prehistorians show less concern for their fellow Quaternarists than the biogeographers: the last 280 pages of Aboriginal Man puts Australian prehistory on show without really indicating where it is going. Non-prehistorians need (and deserve) a certain amount of help, for example a final review chapter. The volume does show the range of current research, in Australian Prehistory with reports of excavations of several different types of sites, including Koonalda Cave on the Nullarbor, and the lunette deposits in western N.S.W. Of importance to other Quaternarists are the studies of the interaction of the Aborigines and their environment, which have to be considered when interpreting any palaeoecological evidence.

One of the commendable things about both volumes is that the basic data will remain valuable for a long time, even when the syntheses have served their purpose.

* * * *

One of the aims of these book reviews is to uncover articles which may be less likely to come to general notice because they are buried in unlikely places or entombed in irrelevant matter. I still recollect my delight on delving through the hitherto unvisited shelves of a medical branch library and emerging with the 1961 volume of the New York Academy of Science entitled Solar Variations. This contained the first major review of the Australian Quaternary, by Gentilli. Readers are asked to reveal less well-known examples if they think them of general interest.

An instance of regional correlations is W. Wards article "Correlation of shorelines affected by earth movements", in the Association senegalaise pour l'Etude du Quaternaire de l'Ouest africain, Bulletin de Liaison. 33,34: 33-54. No doubt legions of Australian Quaternarists wait hungrily by the current journals shelf for this Bulletin to arrive, but some could conceivably miss out on an article which compares Gippsland shores younger than an estimated 250,000 years with marine terraces elsewhere. Because the dating of such shorelines must be uncertain, it is only by widespread comparisons that the rates of relative uplift and high sea levels can be sorted out. The results are consistent with the occurrence of rates of uplift increasing to the present day, and a method for investigating non-linear rates of earth movement is derived. As applied to Gippsland, it allows certain shorelines to be matched with greater confidence than previously to shoreline sequences on some parts of the Mediterranean. Some will be surprised that there is no attempt to compare the author's results with those so far published by John Chappell for New Guinea.

GSH

SITUATION VACANT

Dr. J. Bowler (Department of Biogeography and Geomorphology, A.N.U.) and Professor D.J. Mulvaney (Prehistory Department, S.G.S., A.N.U.) are extending their investigations of Pleistocene stratigraphic and environmental history of the lakes and dunes of western N.S.W. Important archaeological and palaeoenvironmental results have already come from the Lake Mungo area, including the oldest (32,000 years B.P.) dated occupation site in Australia, and a record of changing lake levels, related to climate change. A position is now available for 1 year on a half time basis for a Laboratory Technician (Grade 2) to assist Dr. Bowler with a large series of air photographs now being taken with stereo cameras using black and white, ektachrome, infra red black and white and in ra red false colour film. The technician will be responsible for indexing, filing and storing the photographs and helping to analyse them with a stereoscopic plotter. A small amount of darkroom work may be required, and an aptitude for handling general cartographic techniques. Interested persons may obtain further details from Dr. Bowler.

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We would welcome any volunteers in Papua New Guinea or Indonesia who would be prepared to act as local correspondents.

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