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Australian Quaternary Newsletter

No. 2 November 1973

We produced the first issue of the Australian Quaternary Newsletter as an experiment. Perhaps we had been stimulated by the skeptics who felt we were wasting our time, but still we felt that there was a need to provide researchers in matters Quaternary with a local "clearing house". From the response received in the form of letters, returned questionnaires and verbal comments, it is apparent that a demand exists for the product.

About 250 copies of No. 1 were sent out, and so far 144 questionnaires have returned. About two a week are still filtering in. We hope that those who have not yet completed the questionnaire will do so. Please contact us if you need further copies. Anyway, we consider the response more than adequate to justify continuation of the Newsletter.

Several people commented that their work was not strictly within the scope of the Newsletter, for one reason or another. We don't intend to make any hard and fast rules about the limits of Quaternary research, so even if you are interested in the Quaternary only peripherally, we would like to keep sending you the newsletter. Some aspect of your work which to you is of only minor importance, may be highly significant to workers in other fields. We are considering publishing in future issues some articles which discuss in a general way the implications for other Quaternarists of the more specialised fields, such as, for example, soil science, or palaeontology.

In the second issue we are again confronted with a selection problem. We have enough material to fill three newsletters of this size. At the moment we are reluctant to produce larger issues, but may consider putting out more per year. Again we apologise to those who have sent us information which is not included in this issue; it will appear in future ones. However, we still want any pertinent information on the following:

1. New research projects involving any aspect of the Quaternary planned to start in 1974.
2. New facilities to be established in 1974, which will cater for Quaternary workers. (eg. dating laboratories).
3. Comments on the preservation of sites, species or environments which you may consider endangered. We may be able to strengthen our Canberra lobby if we can be supplied with enough critical data. (For an example, see the article on "Organic deposits as a vanishing Quaternary resource" in this issue.)

4. Reviews of books or long articles of Quaternary interests; we would prefer not to solicit reviews. Brief statements of 100-300 words will do.

We attached a note to issue No. 1 requesting your reaction to paying for future issues. Only 8 people said they would not pay. Several expressed some unwillingness (not another subscription!) but these were counter-balanced by people willing to pay more (How can you do it so cheaply?). Well, the Newsletter in 1973 has been subsidised by the Academy of Science, and after some discussion, the Academy has agreed to continue with secretarial assistance, but to help them defray costs we must ask for a contribution from recipients. So we will be sending you an invoice for A\$1 (US \$1.50) with our next issue. The subscription for institutions will be A\$2 (US \$2.50). Those who have already paid will be credited with \$1 in 1974. If anyone really cannot pay (because of currency restrictions etc.), we will send the Newsletter free of charge.

Jeannette Hope
Dept. Prehistory,

Bruce Thom,
Dept. Biogeography and
Geomorphology,

Research School of Pacific
Studies,
Australian National University.

No.2 Second edition. March 1974.

We apologize for the late arrival of your copy of the November 1973 A.Q.N., due to problems with the duplicating system.

The exhibition on Quaternary Australia at the National Library, Canberra, is also late, and is due to open on March 12th, 1974.

INQUA Australian Excursions 1973

As reported in Newsletter No.1, the Organizing Committee of the IX INQUA Congress, Christchurch, New Zealand, has arranged a number of excursions in Australia. Unfortunately, enrollment for these excursions was somewhat disappointing, and it has been necessary to modify their operation. In some cases this should prove advantages as access to more difficult sites will be possible using smaller vehicles.

Excursion D2A, a pre-conference excursion which was originally intended to cover Western Victoria and Tasmania, will now be restricted to Western Victoria. This will enable the leaders, E.Gill and B.Joyce, to concentrate on detailed aspects of Quaternary volcanism, coastal phenomena, and archaeological sites.

Excursion E1, will be conducted post-INQUA, and will involve J.Bowler, B.Butler, S.Pels, R.Galloway, I.Raine, R.Coventry, B.Thom and R.Lampert as guides. The excursion will use a mini-bus, and will cover parts of the Mallee and Riverine Plain (Mildura, Mungo sheep station, Swan Hill, Echuca), Snowy Mountains (Khancovan, Thredbo, Perisher), Canberra and Lake George, and South Coast of N.S.W. (Moruya, Murramurang, Burrill Lake, Bass Point). J.Bowler, A.N.U., is the general co-ordinator.

Excursion D3, a pre-conference excursion initially designed to cover coastal regions from Sydney to Gladstone, will now be divided into two parts. Phase A to be led by B.Thom, P.Roy and T.Longford-Smith will cover the coast between Sydney and the Myall Lakes with specific attention being given to the coastal sand deposits in the vicinity of Port Stephens. The participants will fly to Brisbane and on Phase B will examine Quaternary fluvial, coastal and volcanic phenomena in southern Queensland, and then will visit Heron Island on the Great Barrier Reef. W.Ward, CSIRO., Brisbane is organizing Phase B.

Excursion D5 to New Guinea remains virtually unchanged and will be led by D.Walker, J.Golson and J.Chappell.

Anyone requesting further information about these excursions should write to R.Galloway, CSIRO., Canberra, or tour leaders.

INQUA VISITORS TO AUSTRALIA

During December and January numerous international Quaternary scientists will be visiting Australia. Some of these are listed below.

Dr R.V.Ruhe,
Director,
Water Resources Research Center,
and Professor of Geology,
Indiana University,
Bloomington, Indiana.

Dr Ruhe will be in Canberra 17-18 December, and can be contacted through Mr H.Polach, School of Earth Sciences, A.N.U.

Professor A.Cailleux,
Centre for Northern Studies,
Laval University,
Quebec City, Canada.

Professor Gailleux will be in Canberra for two weeks beginning 21 December, and can be contacted at the Department of Biogeography and Geomorphology, A.N.U.

Professor G.F.Mitchell,
Department of Geology,
Trinity College,
Dublin, Eire.

Professor Mitchell will be in Canberra for two weeks beginning 21 December, and can be contacted at the Department of Biogeography and Geomorphology, A.N.U.,

Professor A.Bloom,
Department of Geology,
Cornell University,
Ithaca, New York.

Professor Bloom will be in Canberra for two months beginning 1 January, and can be contacted at the Department of Biogeography and Geomorphology, A.N.U.

Dr A.Metcalf,
University of Texas,
El Paso, Texas, U.S.A.

Dr Metcalf will be in Canberra for two days 14-16 November, and his main interest is Quaternary molluscs. He can be contacted through Dr R.Galloway, CSIRO.

Professor Troy Péwé,
Department of Geology,
University of Arizona,
Tempe, Arizona.

Professor Péwé, a periglacial-glacial geologist, will be in Canberra 26-30 November, and can be contacted through Dr. R. Galloway, CSIRO.

There will be other visitors associated with INQUA excursions, but it is not known at this time whether they will be staying for longer periods in Australia.

Send any enquiries you may have to Dr. A. Polach, ANU Radiocarbon Dating Lab, School of Earth Sciences, ANU, P.O. Box 4, Canberra, 2600.

LIBBY 14C HISTORY OF CLIMATE PROJECT

Professor W.F.Libby, Director, Institute of Geophysics and Planetary Physics, University of California, Los Angeles, founder of the 14C dating method and Nobel Prize Laureate, proposes to initiate an intensified world-wide 5 year study on Problems of Late Quaternary Climates by co-ordinating research around selected Radiocarbon Dating Laboratories. Libby proposes to raise funds to support this 14C HISTORY OF CLIMATE PROJECT and the radiocarbon dating researchers Libby has contacted personally in the first instance to assist him are: Berger (UCLA), Damon (Arizona), Kigoshi (Tokyo), Lal (Bombay), Lerman (South America), Olsson (Uppsala), Polach (ANU), Rafter (New Zealand), Rubin, (USGS), Suess (La Jolla), Tamers (Venezuela) and Tauber (Copenhagen). Libby is also endeavouring to establish contacts with daters in USSR and China.

His proposal is many-faceted and can be summed up in the following questions:

1. What are the Late Quaternary geologic records in various parts of the world which are particularly useful for study of palaeoclimates?
2. What is necessary in terms of radiocarbon dating and other isotope facilities to support an intensified study of Late Quaternary palaeoclimates?

In addition, Libby's proposal entails consideration of funding and co-ordinating all those aspects of palaeoclimatic research which use 14C and other isotope methods. Henry Polach has been asked to assess the possible roles of the ANU Radiocarbon Dating Laboratory in this context, and seeks comments on the plan, particularly how any attack could be made in Australia and Antarctica on Upper Quaternary history. The following questions may be some guide:

1. Have we suitable stratigraphies, in which a continuous chronology is possible at the very best resolution achievable by 14C dating?
2. Do the geological or archaeological deposits contain a good record of any palaeoclimatic indicators (eg. pollen, faunal sequences, stable isotopes)?

Send any comments you may have to H.A.Polach, ANU Radiocarbon Dating Lab., School of Earth Sciences, ANU, P.O. Box 4, Canberra, 2600.

LATE QUATERNARY AUSTRALIA

An exhibition covering some aspects of Australia's last 50,000 years is being arranged jointly by the National Library and the Australian National University. The exhibition will be displayed concurrently in the National Library, Canberra, and at the IXth INQUA Congress in Christchurch, New Zealand. The National Library exhibition will be on display for about three months over the summer of 1973-74.

The exhibition is aimed at a general level and attempts to show the kinds of research relevant to the Quaternary in selected areas of Australia and in an interdisciplinary frame.

EXHIBITION OF PERIODICALS, BOOKS AND TEACHING AIDS

Together with the Quaternary exhibition, a selection of relevant Australian periodicals and books will be shown. Teaching aids will probably be confined to map lists etc. because of problems of transport to Christchurch. Since this newsletter is planned to reach you only a week or so before INQUA, it will be too late for many additions to this exhibition. However, if you have something that you feel should not be omitted, take it along in INQUA with you.

For further information on both these exhibitions contact -

Eleanor Crosby,
Department of Prehistory,
Research School of Pacific Studies,
Australian National University,
P.O. Box 4,
CANBERRA 2600
(Telephone 49.3039).

LAKE FROME PROJECT

A co-operative project has commenced to examine aspects of the Quaternary geology of Lake Frome, South Australia. Scientists from three organizations, Bureau of Mineral Resources, Canberra, Australian National University, and South Australian Geological Survey, are involved. Interest in the lake lies in the fact that as an internal drainage system it possibly contains a reasonably complete Late Quaternary sequence of sediments. The B.M.R. team is investigating the possibility of the accumulation of metals in a drainage system of this type. Dr .J.Bowler, ANU is interested in the nature of climatic change as inferred from the sediment record. R.Callen of the South Australian Geological Survey is working on Cainozoic sedimentology, regional mapping and uranium mineralization. During the field investigation in September, 1973, samples were collected from auger holes and pits at over 60 locations in the lake. Stratigraphic sequences exposed on the islands within the lake were examined. Helicopter support was used to transport the field party to many sites.

Dr Ralph Jensen, B.M.R., is the co-ordinator of the project, and any enquiries should be directed to him.

GREAT BARRIER REEF SYMPOSIUM, 1

In June-July, 1973, a field conference on coral reefs was held on board the M.V. Marco Polo. The conference lasted 10 days and was attended by over 300 scientists. Conference papers were presented on the ship as it cruised north from Brisbane to Lizard Island. Parties left the ship at Lizard to inspect local fringing reefs and the ribbon reef known as Carter Reef. On the return to Brisbane stops were made at Palm Islands, Hayman Island and Heron Island. Inclement weather prevented further stops.

Biological and geological problems were discussed during the Symposium, the proceedings of which should be published in 1974. Papers of direct Quaternary interest dealt with methods and results of radiometric dating of corals and associated sediments. It is planned to review these papers in a future issue of the newsletter after the proceeding's volume is published.

Enquiries concerning the proceedings should be directed to -

Dr G.R.Orme,
Department of Geology,
University of Queensland.

GREAT BARRIER REEF EXPEDITION, 1973

Following the Symposium in July, the Great Barrier Reef Expedition, 1973, got underway. This expedition was under the leadership of Dr. D.R. Stoddart, Cambridge University, and was sponsored by the Royal Society of London, University of Queensland, and James Cook University. It has been divided into 3 phases: Phase I lasting from July 16 to August 19, Phase II continuing until the end of October, and Phase III in November. Reports on Phases II and III will be discussed in the next issue of the newsletter.

Phase I was supported by 3 vessels, all of which operated in the Howick Group, approximately 100 miles north of Cooktown.

The work of Phase I fell into four main parts:

3) drilling program, b) sediment sampling program, c) island geomorphology program, d) dating program. Zoological work was also carried out on living corals in support of a) and d), and botanical studies were made of island plants including mangroves.

Nine scientists were involved in Phase I and the following is a list of their activities.

P. Flood, University of Queensland, reef flat sediments and inter-reef sediments.

P. Gibbs, Marine Institute, Plymouth, U.K. fauna of inter-reef sediments, especially polychaetes.

G.R.Orme, University of Queensland, Deputy-Leader, inter-reef sediments and logging of drill core.

R.F.McLean, A.N.U., geomorphology of islands with specific interest in cemented beach sediments.

H.Polach, A.N.U., collection of living and fossil specimens for 14C dating.

T.Scoffin, University of Edinburgh, U.K., reef and reef flat sedimentology.

D.R.Stoddart, Cambridge University, U.K., Leader, island geomorphology and plant ecology.

B.G.Thom, A.N.U., Supervisor of drill operation and mangrove ecology.

J.Vernon, James Cook University, coral ecology.

Highlights of Phase I included: a) the location of one major and one minor unconformity in the drill core obtained from Bewick Island. This hole went to 96 feet, and a 48 ft hole was drilled on Stapleton Island b) delineation of sediment zones on reef-flats; c) recognition of various phases of diagenesis in reef and cay sediments including those deposited by wave action above present sea level; d) discovery of cemented terrigenous materials in beach-reef rock sections on some islands; e) two types of beachrock were distinguished (inclined intertidal and platform at H.W.S.): f) analysis of bio-erosion of cemented carbonate sediments showed distinct zones with respect to elevation and distance from the sea; g) the presence of dead coral colonies covered by mangroves was recorded on two islands, and h) collection and in-field preparation of living specimens of coral and molluscs for use as modern reference standards for 14C dating. Approximately 100 species of living and fossil corals were collected, of which 17 will be used for 14C analysis.

Any enquiries concerning the Expedition should be directed to the Leader (Stoddart or Deputy-Leader (Orme)).

ORGANIC DEPOSITS AS A VANISHING QUATERNARY RESOURCE

The palynologists of the Department of Biogeography in Canberra were recently casting an eye over their newspapers to the sound of slurped tea and dunking biscuits when a feature article blazed out "12,000 year old peat in Wingecarribee swamp, excavated by a peat mining company". "Dear me", "how interesting", "Jeez", "Woddayuno", "Goodness gracious", they exclaimed, since they thought they knew of all palynological endeavours in their area. Had someone scooped them with the oldest site for this part of Australia? And had the peat company stripped off all the organic matter from the site, leaving none for pollen? A few phone calls later it was found that the date was fictitious; digging in various records revealed 3 dates from 5 m down of around 1500-2000 B.P. And the peat company had only recently started operations, but knew of sections up to 10 m deep,

later confirmed by the palynologist with a 1185 cm core, which will be dated. However this situation underlines the present limited knowledge of organic deposits in Australia and of increases in the rate of exploitation. Wingecarribee swamp is quite well known, but its investigation has been put off in favour of more exotic sites.

Swamp peats and other organic sediments such as lake gyttias are valuable to Quaternary study because fossils in them often form a continuous sequence which can be directly radiocarbon dated. It is thus possible to give an accurate chronology for changes in pollen and other plant fossils or micro-fauna. More rarely mammal remains or human artifacts can be discovered, such as the remarkably preserved Danish Tollund bodies, whose flesh, stomach contents, and clothes were recovered intact, tanned by the acid peat.

Pollen analysis in Australia has not yet fulfilled its role as a key technique to unravelling palaeoclimatic events, as it has in other areas, although about 45 sites have now been pollen analysed in detail, in most parts of Australia and New Guinea except the northwest. (No - you haven't missed the literature because most haven't been published yet). The two most important sites, on the Atherton Tableland of North Queensland and near Wabag in Papua New Guinea, certainly provide a clear picture of vegetation change over the past 150,000 and 50,000 years respectively, but their application to southern Australia is limited. The bones of extinct marsupials have been found in swamp deposits near Lancefield, Vic, King Island, Tasmania, Mowbray Swamp, and Tari, Papua New Guinea. Although no human remains are known from swamps, wooden artifacts (which are not usually otherwise preserved) have been recovered from Wylie swamp near Millicent, South Australia, and the Wahgi swamps near Mt Hagen, Papua New Guinea.

Because Quaternary studies of Australian peat deposits have been slow to commence, there is now some danger that vital areas will be mined for peat or drained and ploughed up perhaps losing evidence that will not be obtainable in other ways. This is not to say that peat mining is to be deplored since the best chance of significant discoveries is in the course of systematic peat cutting, as shown by the European discoveries. But there the peat cutters have, by now, a fair idea of what scientists are looking for, and the scientists are able to fit all deposits into a general stratigraphy so that the loss of part of the section is not serious. The draining of virtually all of Australia's wet lands for agriculture can certainly be opposed on general conservation grounds, although the extinct marsupial remains in Tasmania were discovered during ditching of swamps. The disturbance to stratigraphy and even the destruction of the peats arising from drainage can make the deposits useless to Quaternary studies, and there is a case for preservation of at least part of these areas.

At this stage we need to take stock of the organic deposits suitable for various Quaternary investigations in Australia and to identify sites of potential value that may be in some risk. The problem is one facing most branches of Quaternary investigation - that of educating people who are working in surficial deposits, particularly drillers, earthmovers, foresters, limestone quarrymen and in the present case, peat cutters and drainers, to recognise the existence of specimens and how to notify interested persons. This general problem could be discussed in the

Newsletter, for example, the desirability of sending a brief pamphlet to these people and to science teachers, and at the same time setting up registers of Quaternary sites of various types. Some comments on the problems or methods associated with this kind of activity would be welcome. So far as peat mining is concerned only three companies are known to be active, the Wingecaribee operation, one near Perth and one at Wyrie Swamp, S.A. However, feasibility studies have been undertaken at Atherton and near Hobart. These companies have been, or will be contacted and asked to look out for items of interest, and peat stratigraphers (a tiny body of dedicated men and women shunning the limelight if their avoidance of publication is anything to go by) encouraged to work on the deposits as soon as possible. It is quite possible that there are local peat mining efforts or sites which are not yet known to us. Some effort should be made, with the help of Quaternarists in other branches, to learn of these sites.

New Guinea, at least, is one place that we don't need to worry about; to anyone who has to walk around on it, it seems to consist of a succession of bottomless swamps separated by sheer mountains, neither of which will yield readily to development pressures.

G.S.Hope

SOCIETY NEWS

We don't have any information yet on next year's activities by local Quaternary groups, but would like to note that the Victorian Quaternary Group puts out a news bulletin on its activities. More information is obtainable from E.B.Joyce, Geology Department, Melbourne University, Parkville, 3052.

There is a variety of specialist societies which may be of interest to Quaternary workers. The Geological Society of Australia has several specialist groups which hold symposia and seminars. One of these, the Specialist Group in Palaeontology and Biostratigraphy is also publishing a newsletter, called Nomen Nudum. The latest issue, July 1973, gives fairly extensive lists of Australian palaeontologists and their research interests. Anyone who wants to get Nomen-Nudum should send \$1 to the treasurer of the group, Mr M.J.Clarke, Department of Mines, G.P.O. Box 124B, Hobart, Tasmania 7001. The editor of the newsletter is Dr John Pickett, Geological and Mining Museum, 64 George Street, Sydney, 2000. Other specialist groups are in Sedimentology, and Geochemistry and Mineralogy. The G.S.A. is also preparing a general newsletter. Interested readers should get in touch with the Secretary, Geological Society of Australia Gemmology House, 24 Wentworth Avenue, Sydney, 2010, for further information on these.

The Far Eastern Prehistory Association, concerned with prehistoric studies in the Asian, Pacific and Australian regions has also begun to publish a newsletter. Although it has a wider geographic coverage than AQN, including research done in countries from Madagascar, through India, Burma, Cambodia, Vietnam, Malaysia, Indonesia, Papua New Guinea and Australia, to New Zealand, Micronesia and Polynesia, and a narrower range of research interests, it may be of relevance to many Australian Quaternary workers other than archaeologists. For further information, write to R.J.Lampert, Department of Prehistory, Research School of Pacific Studies, Australian National University, P.O. Box 4, Canberra, 2600.

The Australian Systematic Botany Society was formed at a meeting of botanists in Melbourne on 7th April, 1973. Its aims are to promote the study of systematics, to encourage and facilitate the dissemination and exchange of information among all those interested in the taxonomic botany of the Australian region, and to stimulate and assist systematic research and teaching. To become a member, send a subscription of A\$3 (US \$5 for overseas members) to the treasurer, Dr A.Kanis, Herbarium Australiense, C.S.I.R.O., P.O. Box 1600, Canberra City, 2601.

The Institute of Australian Geographers will be holding its 12th Annual Conference in Hobart, 4-7th February 1974. Three field trips are of interest to Quaternary specialists:

1. Geomorphology of the Barilla Valley and South Peninsula. (Leaders: Dr E.Colhoun and Mr N.Chick)- Feb.5th
2. Periglacial landforms of Mt Wellington. (Leaders: Prof. J.Davies and Mr A.Goede). Feb. 5th.
3. The Tasman Peninsula. (Leaders: Colhoun, Goede, Chick and Mr R.Kellaway). Feb. 6th.

For information, contact R.Kellaway, Department of Geography, University of Tasmania, Box 252C, G.P.O. Hobart, 7001.

RESEARCH REPORTS

The following reports have been grouped on the basis of the state in which the field work has been done. For projects of a more general nature, the report is included under the state where the worker is located.

QUEENSLAND

Ann Smith, Geography Dept, James Cook University, Townsville, is measuring some characteristics of surface sediments from three modern fringing reefs and cores from Hayman Island reef, with a view to obtaining information on the geological history of the Hayman reef.

R.F.Isbell, CSIRO Division of Soils, Townsville, is studying red soils derived from basalt in North Queensland, under a rainfall range of 600-400 mm. The basalts occur in distinct physiographic provinces and range up to 4.5 million years in age.

Laila Haglund-Callev. 18 Montrose Rd. Taranga Brisbane

Mike Archer, Queensland Museum, is working on a variety of palaeontological projects, including a study of the dasyurids and petaurides of the Etadunna Formation, (middle Miocene), the pliocene dasyurids of New Guinea, and the Pleistocene and recent dasyurids of Australia and New Guinea. Dasyurids, for non-zoologists, comprise the carnivorous marsupials, including the small marsupial-mice, the native and tiger-cats, and the Tasmanian devil and wolf. The petaurids include the ringtail possum and gliding possums.

NEW SOUTH WALES (including ACT)

A.D. Albani, University of N.S.W. School of Applied Geology, has completed a sedimentological and ecological study, using Foraminifera, of Broken Bay, N.S.W. The distribution of sediment types and biotypes has been considered in the light of hydrological parameters. He is continuing work on the Foraminiferal fauna from the NSW continental shelf.

Harry Allen, Dept. Anthropology, University of Auckland, recently completed a PhD thesis at the ANU, Dept. Prehistory, entitled "Where the Crow Flies Backwards", it is a study of the relationships of Aboriginal Man and land in the Darling Basin, N.S.W., over the last 32,000 years. It includes archaeological research on Lake Mungo, the site of the earliest human remains yet found in Australia. Harry is currently studying Maori shellfishing in Northland New Zealand, but is initiating a project on human land-use of west Arnhem Land-Oenpelli area to begin in 1975, combining archaeology and ethnography.

A.R.H. Martin, Botany Dept. University of Sydney, is working on pollen analysis and ¹⁴C dating of sediment from Club Lake, Mt Kosciuszko and other areas. He has also instigated a scanning electron microscope survey of Proteaceae pollen. The aerial spore and pollen rain of the Sydney area is being surveyed, with two Hirst spore traps. Slides of Australian and exotic pollen are available on an exchange basis, and a catalogue will be sent on request.

John Douglas, Environmental Conservation Section, Department of the Capital Territory, Canberra, is studying the Quaternary geomorphology and specifically the onshore and offshore processes of Jervis Bay. He is also working on the Aboriginal middens and their relationship to the environment at Jervis Bay as a project for an M.A. thesis.

Jack Mahoney, Dept. of Geology and Geophysics, University of Sydney, has compiled, with W.D.L. Ride, Western Australian Museum, an Index of the Fossil Mammals of Australia and New Guinea, which should appear early next year. Apart from taxonomic information, it will include reprints of early rare articles on many of the classic Pleistocene faunal sites in Australia. Jack's main research interest is rodent taxonomy and he is prepared to help with identification of rodent fossil material.

Gerry van Tets, CSIRO Division of Wildlife Research, Canberra, is working on the identification of bird bones from aboriginal middens, caves and muttonbird colonies. They include bones of cormorants, petrels, megapodes, quail, rails, parrots, kingfishers, bowerbirds and other songbirds. Since 1971, Gerry has been building up a reference collection of bird bones which is now the second largest in Australia (the largest is in the National Museum of Victoria). Donations of carcasses for the collection are gratefully accepted.

R.J. Wasson, School of Earth Sciences, Macquarie University, is currently concerned with the morphology and history of alluvial fans in eastern and south-coastal Australia. Particular attention is being given to the fans on the Mundi Mundi Plain immediately west of Broken Hill in NSW.

VICTORIA

Edmund Gill, retires from the National Museum of Victoria on December 11th. However, he continues his long interest in the Quaternary with a quantitative study of how the present sea makes its impress on the land, as a control for measuring more accurately past levels of the sea. Another current project relates to Lake Colongulac, Vic. There the Colongulac "parna" began deposition about 20,000 B.P. Carbon from a thin soil in the "parna" dune on the east side of Lake Corangamite, Vic., has been dated at about 15,000 yr BP.

Philip Ladd, Botany Department, Melbourne University, is studying Holocene vegetation changes in East Gippsland, Victoria, as a PhD project. He is concentrating on swamp deposits near Orbst and Bendoc, using pollen analysis to elucidate their history.

Pat Rich, The Museum, Texas Tech University, Lubbock, Texas, has just completed a PhD thesis discussing the phylogenetic relationships of the Dromornithidae (Class Aves) to other groups of birds, in particular the ratites (all the large flightless birds). The dromornithids comprise a group of large to truly gigantic (the largest may have weighed up to 1500 lbs) ground birds endemic to Australia. As presently recognised the group contains 5 genera and 8 species, including the previously reported Dromornis australis and Genyornis newtoni. All these birds became extinct by the end of the Pleistocene, along with the giant marsupials. Pat's thesis also deals with the origins of the Australian non-passeriform avifauna in light of recent data of past continental arrangements. She will be continuing this work during a 9 months visit to the Zoology Dept. Monash University, starting December 1973, and is interested in any Dromiceidae (emus) and Anseriformes (ducks, geese and swans).

In a limestone cave at Buchan, in East Gippsland, Victoria, a deposit containing a rich fauna and traces of human occupation extending back into the Pleistocene Period has recently been found. Part of the cave has been excavated by Josephine Flood of the Department of Prehistory, R.S.P.S., Australian National University, the work being financed by the Australian Institute of Aboriginal Studies. The large quantity of animal and bird bone, all in an excellent state of preservation, is being analysed by Jeanette Hope, of the same department. A preliminary report on the site appears in Josephine Flood's PhD dissertation on the prehistory of the south-eastern highlands of Australia entitled *The Moth-hunters*, and it is hoped that these data will be published in 1974. Particularly important points of interest about the site are that the deposit contains extinct fauna such as *Sthenurus orientalis* stratified in an undisturbed deposit below human occupation charcoal from the beginning of which is dated to about 17,700 years B.P. The human occupation continues till about 8,700 years B.P. after which the dark cave was apparently vacated, although the rock shelter outside continued to be used intermittently till the nineteenth century. The stone and bone tools found in the deposit are extremely similar to those found in the earliest 8,000 year old levels at Rocky Cape in N.W. Tasmania, and also compare closely with the assemblage currently being revealed by the excavation at Devil's Lair in Western Australia.

WESTERN AUSTRALIA

George Kendrick, Western Australia Museum, is at present working on a comparison of modern and mid-Holocene mollusc assemblages in the Swan Estuary, and the interpretation of past environments, as well as an analysis of early Pleistocene mollusc assemblages from the central Perth Basin. He is prepared to assist with the identification of mollusc material from southern Western Australia.

Colin Sanders, Geological Survey of WA, is investigating the Quaternary calcretes in WA arid areas. Calcrete has formed from the replacement of valley-fill alluvial sediments, by carbonate precipitated from carbonate saturated ground and soil water. Drilling and testing of calcretes for water supplies for recent mineral developments has shown them to be prolific aquifers. For instance, a calcrete at Millstream in the Pilbara is supplying 6 million gallons per day to developing towns, and a large calcrete near Wiluna, in central WA, has been shown to be able to yield up to 3 million gallons per day of potable water. Mr Sanders would be interested in any references that could be incorporated into a Bibliography of calcretes in Australia.

Sylvia Hallam, Dept. Anthropology, University of WA, is studying the archaeology of the Perth area, with a regional survey of a transect from the coastal plain (centred on the Swan estuary) through the jarrah forest belt, to the open Avon Valley terrain in the interior. Distributions and relative density of sites, material between zones and sub-zones (e.g. the aeolian limestone, sand plain and piedmont alluvium) and changes in distribution

and densities over time are being studied, so far from an unsystematic sample of over 120 sites. A systematic sampling of grid squares in various ecological zones is planned.

Abundant ethnohistorical data provide a contact base-line for resources and exploitative patterns demography and networks of contact and interaction; and so a basis for plotting changes in population density, resource useage and grouping over time, and relating these to changes in terrain (sea level, and vegetational and faunal changes, climatically of humanly induced.) The role of firing is particularly well attested. Statistical characteristics of artefact assemblages of early, middle ('backed blade'), late and final (post-contact) occupation phases are being studied with selected excavations providing dated checkpoints.

Peter Bridge, 248 Rutland Ave, Carlisle, W.A., is studying the origin and development of phosphates in bat guano. Studies of material from Jurien Bay, W.A., the Nullarbor, and Sarawak and Sabah have yielded several new mineral species and many rare poorly described ones. He would like any specimens of unusual guano deposits, whether bird or bat.

Kevin Morgan, Consulting Geologist, Regional Resources Evaluation, Perth, is studying the relationship between climate, geomorphology and groundwater in Western Australia. Some preliminary results were published in Section 11, 24th Int. Geol. Congress; 1972, Montreal.

SOUTH AUSTRALIA and NORTHERN TERRITORY

R.P. Bourman, Department of Geography, Adelaide, C.A.E., is working on the Fleurieu Peninsula, S.A., where he is mapping and correlating the Quaternary alluvial fill river terraces, and also studying the late Palaeozoic glacial land forms and laterites.

Dr George Williams, 1 Fifthe Avenue, St Peters, South Australia, is studying late Quaternary piedmont sedimentation, soil formation, palaeoclimates and radiocarbon chronology in the Alice Springs region, N.T., and late Quaternary chronology of sedimentation, erosion, soil formation for coastal dunes in south eastern Australia.

John Dodson, Dept. Biogeography and Geomorphology, ANU, is using pollen analysis, swamp stratigraphy and radiocarbon dates to describe the sequence of vegetation change in the lower South East of S.A. A 4.5m section from Lake Leake, near Mt Burr, has been studied in detail and a complete record over the past 10,000 years has been compiled. Two sites from nearby swamp areas have also been studied and the results compare well with the Lake Leake data. A drill core has been collected from Lake Leake which provides a record going back from 10,000 years. It contains a clay--peat-clay-peat-clay-sand series which contains pollen in countable numbers; several radiocarbon dates are currently being determined.

A further site, Wyrie Swamp, near Millicent, is being studied in conjunction with Roger Luebbers, Dept. Prehistory, ANU as several Aboriginal artefacts have been recovered. The vegetation record in the swamp shows that the site would have been a good source of food.

TASMANIA

Eric Colhoun, Dept. of Geography, University of Tasmania, Box 252C, Hobart, 7001, informs us that staff and research students from other universities working in Tasmania are welcome to make temporary use of the Geomorphology Laboratory in the Department of Geography. This department would also be willing to exchange offprints on Quaternary topics with libraries of other departments on an annual basis. Anyone interested please contact E.Colhoun.

Dr. Ron Vandewal, who recently completed a PhD thesis on the prehistory of Yule Island, Papua, and who has since been carrying out an archaeological survey of the Torres Strait islands, has been appointed Curator of Archaeology at the Tasmanian Museum, Hobart, and will be transferring his research interests from the tropics to the colder climate of Tasmania.

PAPUA NEW GUINEA

John Chappell, Dept. of Geography, SGS, ANU, has almost finished the first stage of a major investigation of Quaternary raised coral reefs in the Huon Peninsula, New Guinea, with the completion of a set of 77 dates, both ^{14}C and $\text{Th}^{230} \text{U}^{234}$. He is also studying neotectonics in New Zealand, and continuing analysis of landscape evolution on the New Guinea dated terraces. David Dunkerley, a PhD scholar in Geography, is currently in New Guinea where he is studying processes of limestone erosion on the Huon raised reefs.

D.E.Mackenzie, School of Geology, University of Melbourne, is studying the origin of high-potassium basalts and associated andesites and dacites in the Quaternary volcanoes of the Highlands of Papua New Guinea and their possible relationship to porphyry copper deposits. The work is at an early stage, but he has eliminated the possibility of the influence of a Banioff zone in the production of the magmas. The origin of the high levels of K, SR, Rb, Ba etc, is still uncertain but Cu seems to follow K and is concentrated K-rich magmas. He is interested in any information of N.G., highland volcanoes, and may be able to help in identifying and tracing sources of volcanic ashes in New Guinea.

Russell Blong, School of Earth Sciences, Macquarie University, is working on tephrochronology and Quaternary history in the New Guinea Highlands. He is finger printing the volcanic ashes of Highland New Guinea, with special reference to the prehistoric sites at Kuk in the Upper Wahgi Valley.

Colin Pain, Soil Bureau, Hamilton, N.Z., has just completed a PhD thesis at the ANU on the Late Quaternary geomorphic history of the Kaugel Valley, W.H.D., Papua New Guinea. He is also working with Russell Blong on tephrochronology in the New Guinea highlands.

INDONESIA

Ian Glover, Institute of Archaeology, London, is interested in Late Pleistocene and early Recent archaeology in S.E.Asia, and particularly eastern Indonesia and in trading systems and economic anthropology of traditional Indonesian societies. He is analysing material excavated from a late stone age cave, Ulu Leang, near Maros, Sulawesi Selatan. He has just spent 3 months in the field in that area, continuing his research.

Dr H.Th.Verstappen, Schubertlaan 8, Enschede, Netherlands, is studying the effect of Quaternary climates on landforms and their evolution in Indonesia. He is mostly interested in the climatic sequences in the younger Pleistocene (Wurm particularly) and the Holocene (a.o. climatic optimum). Because of the proximity of north and west Australia to Indonesia, he is also very interested in Quaternary research under way in these areas, and would like to hear of any recent Australian literature on this, particularly as Australian journals are hard to find in Holland.

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The following people have agreed to act as local correspondents for the Quaternary Newsletter, so please pass on reports, comments etc. to them. Alternately, send them direct to the editors:

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