GEOLOGICAL SOCIETY OF NEW ZEALAND NEWSLETTER

No. 11 December 1961

CONTENTS

THE SOCIETY

The Geological Society of New Zealand was founded in May, 1955. Its objects include fostering investigations into the various fields of earth science and serving as a medium for the expression of the views of New Zealand geologists. Membership is open to all those interested in the earth sciences, including all branches of geology, mineralogy, petrology, glaciology, geophysics, seismology, oceanography, pedology, hydrology, palaeontology, mining, and the utilization of minerals and rock products. There is only one class of members, and the annual subscription is at present ten shillings.

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May, 1961 to May, 1962

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THE NEWSLETTER

The Newsletter is published twice a year. Contributions in the form of personal notes, short items of geological interest, news of the mineral industries, suggestions for Society activities, reports of meetings, descriptions of field trips, reviews or criticisms of recent publications, and similar items, will be welcomed.

Items for the Newsletter should be sent to the Editors, C/o N.Z. Geological Survey, P.O. Box 368, Lower Hutt, New Zealand.

Unless specifically indicated, opinions expressed in the Newsletter are not to be regarded as the official views of the Society.

NEWS FROM THE AUCKLAND GEOLOGY DEPARTMENT

1961-62 for the Department has been a period of consolidation, with settling into and equipping new quarters, altering student courses, and, as a result of both, increasing academic and technical staff by one member each (Dr P.F. Ballance and Miss B. Miller). Nevertheless, it has also been a very productive period, with enlarged classes, growing numbers of graduates, and a broadening of fields of staff and student research.

New Advanced Courses. With the beginning of 1961, advanced B.Sc. courses were altered to allow greater concentration on a chosen field. At the suggestion of Professors Lillie and Brothers, the third year course in all science departments has been expanded and split into two units - IIIA and IIIB. In geology one unit consists of palaeontology and stratigraphy, the other of petrology and mineralogy, and each has in addition general geology. Many students will do both units together, but there is provision for those who prefer to specialise in one of the two branches. Those with a bent towards the biological side may do the palaeontology-stratigraphy option plus Zoology IIIA or Botany IIIA, while others may prefer to take the petrology option with chemistry or physics. In this way, students desiring to specialise in oceanography, palaeobotany, geophysics, geochemistry, etc., are able to make a selection of more useful degree units than previously.

During the first year of operation of these new courses 5 students have taken both options and 2 the palaeontology-stratigraphy option only. It would appear that in 1962 we will have 3 or 4 doing both, a couple taking only the more biological option, and 3 the petrology-mineralogy option only.

In the new courses the accent has been on increased practical work, both

in the lab. and in the field, and results suggest that the reorganisation will prove a valuable but not too extreme step towards greater specialisation at under-graduate level.

With the greater amount of practical work offering, more teaching and research equipment has been needed, and some additional items recently acquired include a parallel grinder (for continuous sectioning); vacuum and pressure pump (for latex moulding, impregnation, and disintegration); sieve shaker, sample splitters, and centrifuge (for sedimentary petrology); and sketchmaster and stereoscope (for photogeology).

Student Research. Nine students are engaged on research as part of their M.Sc. course; their fields are as follows:

Mr P.J. Barrett - a study of sedimentary rocks and palaeogeography of lower Tertiary Te Kuiti Group in the Waitomo area, west of Te Kuiti;

Mr M.R. Gregory - a study of Waitemata rocks in the western area of Auckland City, including an examination of the relationship of the Manakau Breccia and Parnell Grit;

Mr M.G. Laird - a stratigraphic and structural study of an area of Hokonui and Te Kuiti sediments and Quaternary volcanics between Hamilton and Raglan;

Mr D.C. Lowry - stratigraphy and structure of Hokonui (Triassic) and Mohakatino (Miocene) sediments and Quaternary andesites in the Moeatoa area, south of Kawhia Harbour;

Mr V.R. McGregor - structure and petrography of the greywackes and glacial geology in the Macaulay River area of the Southern Alps, at the head of Lake Tekapo;

Mr D.N.B. Skinner - a petrographic and stratigraphic study of the Mochau--Colville area, Coromandel Peninsula, with special attention to xenoliths in and the contact aureole of quartz diorite intrusives ("Coromandel Granite") and the relationship of Tertiary sediments and volcanics;

Mr D. Smale - a study of the relationship of the various Mesozoic sediments, and the problem of the volcanics, in an area of Coromandel Peninsula, between Colville and Coromandel;

Mr S.B. Seagar - a structural study of (?) Jurassic greywackes in a coastal portion of the Hunua Ranges, E.S.E. of Auckland City; and

Mr B.N. Thompson - a petrological and physiographic study of Quaternary rhyolite domes, ignimbrites, and faulting in the region of the Maroa volcanic centre, south of Atiamuri.

Most of these students anticipate submitting their theses by the beginning

of the 1962 academic year. Mr McGregor, however, has temporarily set his aside in order to join the present field party in Antarctica. He will be working in dolerite and Beacon rocks on the north side of the Beardmore Glacier.

Sabbatical and Special Leave. Professor R.N. Brothers returned in February after 15 months in and around Europe, when he attended the International Geological Congress, and, working from Oxford and Imperial College, London, conducted field work in Scotland and Ireland. As a result of his trip the advanced labs here have hundreds of specimens of miscellaneous igneous and metamorphic rocks set out on tables and benches, and the structural properties of our relatively new building are being severely tested.

Early in the year Mr E.J. Searle was awarded the D.Sc. degree for his work on the Auckland volcanic field and the Quaternary geological history of the Auckland (city) area. During the August vacation he attended the Pacific Science Congress at Honolulu and also visited Tahiti and Fiji.

- J.A. Grant-Mackie

OTHER AUCKLAND NEWS

(Contributed by Mr D. Kear)

During this winter regular meetings of the Geological Society have been held in Auckland, with attendances of between 15 and 30. The geology of Iceland was invitingly illustrated by Dr R.N. Brothers. M. Laird and D. Skinner described their travels in Antarctica, one's faith in the record of sea level fluctuations of the south-west Pacific was restored by J.C. Schofield, and scientific problems raised by Economic Geology were discussed by D. Kear. As an experiment for future years, a discussion was held on four recent papers on various aspects of New Zealand geology, introduced by different members of the group. This proved a great success, and the numbers both of debating points and debators were increased.

The Otahuhu District Office of the Geological Survey has completed the publication of the 1:250,000 sheet 1 and virtually of sheet 2A. Current field work has been very scattered, partly in Whakatane and Tauranga areas of sheet 5, in Taranaki (sheet 7), and in the Manukau and Coromandel areas (sheet 3). Mr R.F. Hay has accompanied Australian geologists to Northland in connection with many outback mineral deposits there; D. Kear and B.C. Waterhouse have spent a considerable amount of time investigating the west coast iron sand deposits and made a flying visit to the North Cape serpentine deposit; J.C. Schofield both tripped around the Pacific with H.M.N.Z.S. Endeavour, and was the only New Zealand geologist at the ANZAAS meeting in Brisbane; while B.N. Thompson has continued his work on Waikato dam sites and the geology of Rotorua. Mr F.E. Bowen has very recently arrived from Greymouth on transfer to Otahuhu.

VICTORIA UNIVERSITY OF WELLINGTON GEOLOGY DEPARTMENT

Dick Blank returned to the United States in September after completing an account of an area of ignimbrites in the Waikato, and collaborating with Cooper, Wheeler and Willis in a description of an area in southern Victoria Land. His visit to New Zealand has been a productive one, and he was much liked by everyone who came in contact with him.

A new visitor is Jim Aronson, a geochemist from the California Institute of Technology. He will be attached to Victoria University for nine to twelve months field work, and is collecting igneous rocks for isotope dating when he returns to the United States.

Ross Lauder has been granted refresher leave for nine months from August of next year, and intends to travel widely in order to see as many ultrabasic areas as possible.

For new M.Sc. areas Roger Cooper will be mapping the upper Takaka Valley, and Ian Willis the Baton River area, north-west Nelson. Dick Walcott will probably be working on an area near Maruia Springs where Dr Wellman discovered graptolites last year.

- P. Vella

CHRISTCHURCH SECTION

During the year the CHRISTCHURCH COLLOQUIUM OF GEOLOGY forged a closer link with other geological groups in the country by becoming a section of the Society.

Nine well attended meetings (average attendance 38) were held, when lectures covering a wide range of subjects were heard. Most of the lectures dealt with regions beyond New Zealand but topics that stimulated thought about our problems here; Quaternary interests were particularly well served.

It is satisfying to see members from the Canterbury Museum, the Geology, Geography, and occasionally other departments of the University of Canterbury, the N.Z. Geological Survey, and others with little or no formal training in geology brought together to share a common interest.

The lectures heard were:

Professor P. von Woldstedt of Bonn - "The Stratigraphy of the European Pleistocene."

Professor P. von Woldstedt - "The ice age in the non-glaciated part of Europe and the evolution of Man."

Miss D. Rodley and Messrs P.B. Andrews, I.B. Campbell and J.G. Speight of the University of Canterbury discussed some of the results of their recent research projects.

Mr G. Warren, N.Z. Geological Survey - "Antarctic Geology."

Professor W.E. Powers of Northwestern University - "The glaciation of Illinois and Wisconsin, and the history of Lake Michigan".

Dr Sevon, University of Canterbury - "The Tertiary Stratigraphy of South Dakota."

Dr Kingma, N.Z. Geological Survey, discussed recent advances in sedimentology, and described sedimentary laboratories he saw while in Europe earlier this year. He also mentioned possible lines of research that could be followed in New Zealand.

Professor A.H. Voisey, University of New England, Armidale - "Continental Evolution."

Dr M. Gage, University of Canterbury - "Some regional contrasts in Pleistocene Geology."

- L.E. Oborn

NOTES FROM THE GEOLOGY DEPARTMENT, UNIVERSITY OF OTAGO

The Department is delighted by the award of a Nuffield Fellowship to Mr J.D. Campbell, Senior Lecturer, who will travel next May to Cambridge with his family for a year's refresher leave.

A recent appointment to a Lectureship is Mr J.B. Wright of the Kenya Geological Survey and formerly of Oxford University. Mr Wright has written a number of publications on the iron oxide minerals, and has papers in the press on regional work in East Africa. One of his main tasks at Otago will be to take over and expand the mineragraphy course which was initiated some years ago by Dr A.J.R. White. Mr Wright is due to arrive in Dunedin about the end of January.

Mr M.J. McNamara was awarded a Unilever Fellowship at the end of last year. He acted for the first two terms of 1961 as a Temporary Assistant Lecturer, before going overseas on his scholarship. Mr C.T. Harper will act similarly during 1962 as a Temporary Assistant Lecturer.

Two Ph.D. projects of geological interest are at present in their concluding stages, that of Mr B.M. Gunn, primarily on the differentiation of the Ferrar dolerites, Victoria Land, and that of Mr R.M. Carr on stability relations in the system Al_2O_3- SiO_2 - H_2O and the formation of micas by reactions between kaolinite and feldspars.

An innovation during the year has been the institution of a geological research group discussion, held in the Geology Department on Tuesday afternoons and widely attended by senior students and staff, officers of the Geological Survey and Soil Bureau, and other interested persons. The list of speakers and topics is as follows:

Mr E.H. Brown:	Structure of Otago schists of the Mt Stoker area.
Mr J.D. Campbell:	Problems and principles in the study of Triassic and Jurassic brachiopods and associated stratigraphy.
Mr R.M. Carr:	Silicate reactions at moderate temperature and pressure.
Prof. D.S. Coombs:	The 1959-60 eruption of Kilauea.
Mr I.L. Daniel:	Stratigraphy of the Brighton - Abbotsford area.
Prof. R.V. Dietrich:	Banded gneisses.
Mr B.M. Gunn:	Orogeny and metamorphism in the Ross Geosyncline.
Mr C.T. Harper:	A section through the Permian and Kaihikuan of the Takitimu Range.
Dr W.A. Hodgson:	Rhythmic sedimentation in the Carboniferous Limestone. Studies of local sediments.
Mr J.D. McCraw:	Quaternary land forms in Central Otago.
Mr M.J. McNamara:	A meditation and a nappe on Maungatua.
Dr H. McQuillan:	Prospecting for Shell Oil in Iran.
Dr W.D. Means:	Structural studies in Otago schists.
Prof. H.N. Parton, Mr J.G. Wilson, and Prof. D.S. Coombs:	Philosophy of Science.
Mr H. Service:	Work of the Geological Survey in Malaya.
Prof. A.H. Voisey:	Tertiary land surfaces in Australia.
Dr H.W. Wellman:	Some geological problems.
Mr B.L. Wood:	Some aspects of Pleistocene geology in Otago.

RECENT GEOLOGICAL VISITORS TO OTAGO

During the past few months several overseas geologists visited Dunedin and travelled widely on excursions in the South Island. Members of staff of the Geology Department, Otago University, and of the Geological Survey accompanied the visitors at various stages and had many discussions on local geological problems.

Professor R.V. Dietrich spent several days in Dunedin during September, while travelling on a grant from the U.S. National Science Foundation. He is professor of geology at the Virginia Polytechnic Institute, Blacksburg, Virginia, and is an authority on banded structures of metamorphic and igneous rocks. An interesting lecture, illustrated by some highly unusual colour slides, was given on this subject by Professor Dietrich before a full attendance of senior research students, staff, and others at the Geology Department, Otago University. During two field trips to the Brighton - Taieri Mouth metamorphic section, and on a four-day excursion in Central and West Otago, Professor Dietrich found that many of his impressions of Otago metamorphic geology, gained mainly from the earlier work of Dr F.J. Turner, had to be revised in the light of recent work here. Roadside arguments, frequent and provocative, and often laced with a refreshing streak of humour, accompanied the re-shaping of ideas.

Professor A.H. Voisey from the University of New England, Armidale, N.S.W., spent most of the last term at the Geology Department, Otago University, as a visiting teacher. Professor Voisey has done much work in Australia in the fields of geosynclinal sedimentation and structure, and on ore deposition. Two series of lectures were given, namely "The Growth of Continents by Geosynclinal Processes" and "Ore Deposition". The former dealt with earlier views of continental origins and growth, and Wegenerian drift, touched on the later drift hypotheses of Warren S. Carey, and concluded with Professor Voisey's views of growth by accretion, based on Australian examples. The latter series described briefly the structural factors of sulphide ore deposition, dealt at greater length with environmental controls in fields such as Broken Hill and Mt Isa, and concluded with recent discoveries and hypotheses on the syngenetic formation of bedded ore deposits.

Professor and Mrs Voisey were accompanied, in relays, by members of the Geology Department and the Geological Survey on an extensive excursion - through the Hokonui sequence in Southland, through Central and West Otago, and to several districts of Canterbury and Westland. It says much for the visitors' stamina, and for New Zealand geology and scenery, that their interest and Professor Voisey's unfailing stream of questions, comments, and comparisons were maintained throughout.

Dr N. Haile visited Dunedin for two weeks while on leave from his work as Regional Geologist, Colonial Survey, North Borneo. Accompanied by his wife, Dr Haile travelled to most of the tourist attractions in the South Island; he also went on two excursions with members of the Geology Department

and Geological Survey, and sat in on the Geology Department's research discussions. Dr Haile has done much regional work on the geosynclinal greywacke terrain of North Borneo and is co-author of a geological bulletin on the area.

- B.L. Wood

PROFESSOR W.N. BENSON

in New England and New Zealand

by A. Voisey, Professor of Geology, University of New England, Armidale, N.S.W.

The late Professor W.N. Benson may well be regarded as belonging to Dunedin since he spent so much of his long geological life contributing to the knowledge of this area and of New Zealand as a whole. He is also remembered, too, in the area where he cut his geological teeth, to the extent that no student of the geology of New England in New South Wales is allowed to commence field work without first having read several of Professor Benson's papers.

The attitude which Benson adopted towards the geology of Otago appears to a very large extent to have been conditioned by his early work 1912 to 1916 in the north-eastern portion of New South Wales, as the result of which he produced an extraordinarily important series of papers for the Proceedings of the Linnaean Society of New South Wales under the heading of "The Geology and Petrology of the Great Serpentine Belt".

It was perhaps a remarkable act of fate which caused Benson, at an early age, to accept the Chair at Otago, thinking at the time that it might be a stepping stone to the Sydney Chair when it was relinquished by the late Professor Sir Edgeworth David, whose teaching and example greatly influenced Benson's whole life. Instead of moving to Sydney Benson built a reputation for himself and his school in Dunedin.

The remarkable aspect of the appointment was, however, the fact that in Otago were rocks and geological structures which bore certain important resemblances to those so familiar to him in New England. It was possible for the young professor to continue his work on serpentines, greywackes, and deformed erosion surfaces in another region. In mapping the western slopes of New England Benson worked his way by bicycle and on foot through a belt of country nearly 200 miles in length and 30 miles in width, dividing into "series" an upper Palaeozoic rock sequence of greywackes, mudstones, limestones, tuffs, and lavas upwards of 25,000 feet in thickness.

He separated these beds from a complex of cherts, jaspers and phyllites which could not be dated by fossils but which appeared to be lower Palaeozoic, and he described spilites, keratophyres, dolerites, and other igneous rocks, as well as his beloved serpentinites.

In unravelling the complex structures of the area Benson recognised a number of faults and folds, and laid down a sound basis for all future work. Not content to work only on petrology and structure he collected numerous fossils, and, once again, it is upon the foundations laid by him that the later zoning of the upper Palaeozoic sequence has been based.

Although he did not write a great deal on the physiography of New England Benson showed that he was aware of the work of the Government Geologist, the late Mr E.C. Andrews, in the recognition of several post-Cretaceous land surfaces by following several of these into his area and by discussing the physiographical history of the western slopes.

It is not surprising that on his arrival in Otago Benson at once saw similarities with his field area, and, in a more complex setting, was equipped to sort out the late Cretaceous and other surfaces and to study the sedimentary deposits and basalts laid down upon them.

As a visitor to Dunedin after 23 years in New England, with Benson's contribution always in my mind, I was delighted to see something of the geology of Otago. I, probably more than most others, can appreciate how Benson must have felt on his arrival and how he must have relished the work because he knew how to go about the difficult but fascinating task of sorting out his old friends and acquaintances. Those of you in New Zealand who see the results of his work in this country should know that you are not alone in your appreciation of a masterly geologist.

THE TENTH PACIFIC SCIENCE CONGRESS

by Maxwell Gage

Nine out of about fifty New Zealanders who attended the Congress in Honolulu (August 21 to September 6, 1961) contributed papers in the several sections concerned more or less directly with geological sciences, and others also took part in the discussions. There was no single Geology section, but geological papers were spread through the programmes of various sections and divisions, including geophysics, oceanography, geography, botany, and zoology. Inevitably this resulted in two or more papers that one wanted to hear being scheduled for the same time, but it was ovviously impossible to get through the amount of material available without running at least two sessions simultaneously in each section. On the whole, the chairmen kept the sessions running fairly well to time. An excellent daily news sheet gave warning of last-minute programme changes, and there was adequate

seating, so that it was usually possible to be in the right place at the right time to hear a particular paper. Special mention should be made of some excellent films showing recent eruptions of Kilauea and Krakatau volcanoes.

The items for geologists were included mainly in the Maury Memorial Symposium for Antarctic Research, in symposia entitled "Pacific Islands Terraces. Eustatic ?", "Volcanism and Plutonism", "Tsunamis", "Pleistocene and post-Pleistocene Climatic Variations in the Pacific", "Topography and Sediments of the Pacific", "The Earth's Crust in the Pacific Basin" and "Pollen Clues to Ancient Pacific Floras", in the Contributed Papers sessions of various sections, and in two of the post-sessional field trips (in which the writer was unable to take part). Different symposia left different impressions. For example, after hearing the Antarctic symposium and "Topography and Sediments", one felt that geographical location was the only reason for placing the papers together, whereas "Tsunamis", "Earth's Crust", and "Climatic Variations" appeared to be constructive, leading to mutual enlightenment and the discovery of unsuspected common ground between authors. Other symposia, such as "Pacific Island Terraces" and "Biogeography of the Pacific" disclosed apparently irreconcilable points of view.

Publication of proceedings of the Congress will be limited to the Abstract volume (already issued), formal reports and resolutions of the standing committees and of the whole Congress in plenary session, together with a few selected Congress symposia. Individual authors and symposium organizers are given the responsibility for publishing other symposia and separate papers in the appropriate journals.

Arrangements for transport and accommodation worked smoothly, except for a temporary difficulty due to the influx of over a thousand more registrants than were expected. The programme organizing and the general management of the Congress were carried out efficiently, yet in a relaxed and friendly way - perhaps a characteristic of Hawaii. In the writer's opinion it was a very successful and useful congress, at least for geologists, and he would attribute its scientific success largely to the emphasis which the organizers placed upon inviting contributions to symposia dealing with a specified theme, rather than upon trying to accommodate a large number of unrelated papers in the short time at their disposal. A genuine and at least partially successful effort was made to break through the barriers of specialization, and to encourage workers in different fields to explore areas of common interest.

All those who attended the Congress would agree that Hawaii is just about the ideal place for holding a science congress. Few members failed to find some time to sample the pleasures of swimming, eating, sightseeing and Hawaiian hospitality, but in case the sun-tanned appearance of returning members has aroused the suspicion that an undue amount of time was spent on Waikiki Beach, it should be pointed out that both the opening and closing plenary sessions of the Congress were held in the middle of the day in the open-air Andrews Theatre. But to conclude on a more serious note, it should be recorded that several speakers at the final sessions spoke with obvious sincerity and some emotion on the example of the Pacific Science Congresses, in showing that scientific workers of different races, nationalities and political convictions find it possible to communicate and co-operate in a friendly spirit.

THE INTERNATIONAL MINERALOGICAL ASSOCIATION

by Prof. D.S. Coombs

History. On July 16, 1957, during the Montreal meeting of the International Union of Crystallography, a provisional committee was set up to prepare for the formation of an International Mineralogical Association. The Association formally came into being at an inaugural meeting held in Madrid, April 8-10, 1958. Its stated objective is the furtherance of international co-operation in the mineralogical sciences. Symposia and excursions were arranged for the Madrid meeting, and commissions were established on abstracts, mineral data, new minerals, and museums.

The first general business meeting was held at Zurich on September 1 and 2, 1959, symposia being presented on Twinning and on Alpine-type fissure minerals. These have been published by the Instituto Lucas Mallado of Madrid as an issue of "Estudios Geologicos" in the series "Cursillos y Conferencias". Copies can be obtained (price £ 1.50 or 90 pesetas) from the Secretary of I.M.A., Professor J.L. Amoros, Museo de Ciencias Naturales, Castellana 84, Madrid.

In order that New Zealand might participate in the work of I.M.A., a New Zealand Mineralogical Group was formed under the sponsorship of the National Committee of Crystallography, itself sponsored by the Royal Society of New Zealand. The Crystallography Committee was able to negotiate simultaneously for grants to pay dues both to the International Union of Crystallography and to I.M.A. (At present the dues to I.M.A. for a body of under 25 members are £ 15 per annum). The present writer was nominated as Chairman of the N.Z. Mineralogical Group and I.M.A. Representative, charged with keeping N.Z. members informed on I.M.A. affairs. Subsequently, in February 1960, the N.Z. Mineralogical Group was accepted by the Executive Committee for membership of I.M.A.

Copenhagen Meeting. (August 22-25, 1960). 36 voting delegates from 22 members societies were present together with many other mineralogists who divided their time between the International Geological Congress and I.M.A. sessions. Professor D.J. Fisher of Chicago was elected President, Professors C.E. Tilley (Cambridge) and G.P. Barsanov (U.S.S.R.) Vice-Presidents, and Professor Amoros Secretary. Symposia were presented on "Mineral Synthesis" (8 papers) and "Feldspars" (21 papers). The latter were spread over two days, one of these a marathon extending from 8.15 a.m. to 6 p.m. - for those who lasted the distance. No doubt in part as a result of increasing data and in part the result of face-to-face discussions a degree of convergence was apparent in interpretations presented by groups hitherto holding divergent viewpoints. The symposia are again being published by the Instituto Lucas Mallado of Madrid and can be ordered through Professor Amoros.

The four commissions held meetings and presented reports. Highlights of their activities were as follows:

Museums (Chairman: Professor C. Frondel, Harvard). A world list of mineral collections is being compiled. An indication of the scope of this task is given by the fact that the U.S. committee alone has already obtained data on about 600 collections. Several years may be required before the whole project can be completed. A second major project of the Commission is to prepare a finding-list by which type and analysed specimens could be located. Dr J.J. Reed has been nominated New Zealand member on the Commission.

Abstracts (New Chairman: Professor M. Fornaseri, Italy). At the Zurich meeting this Commission agreed:

(1) To work for the production of international mineralogical abstracts in a single language for western countries.

(2) That in principle each country should abstract its own journals, and discussions were to be opened with the U.S.S.R. concerning the exchange of abstracts.

It is to be noted that these objectives are already met to a substantial extent by Mineralogical Abstracts, published originally by the Mineralogical Society of London and since 1959 jointly with the Mineralogical Society of America. Dr W.A. Watters is N.Z. contributor for the Mineralogical Abstracts organization and is also N.Z. member of the I.M.A. Abstracts Commission. During 1958-59 Dr Watters and the writer endeavoured to abstract all post-war papers of mineralogical interest published in New Zealand which had not previously been covered, and it is hoped that the future coverage will be systematic.

Members of regional or national societies contributing English abstracts giving a comprehensive coverage of papers appearing in their region are entitled to a reduction of 50% in the cost of Mineralogical Abstracts, i.e. £1.11.6 instead of £3.3.0, if they do not already receive it at a favourable rate through membership of the Mineralogical Societies of London or America. It seems that this provision might well apply to New Zealand members.

Mineral Data (Chairman: Professor H. Strunz, Berlin). The programme for discussion included such topics as the most acceptable conventions for symbols (e.g. refractive indices, ellipsoid axes), conventions for orientation of crystals and the like. It is understood that the adopted recommendations are to be published, but unfortunately they have not been received yet by the writer. It is too much to hope that all member societies will urge adoption of all the recommendations in the journals of their respective countries, but it can reasonably be hoped that some approach to greater uniformity of usage will result.

New Minerals and Mineral Names (Chairman: Dr M. Fleischer, U.S.G.S.). Recommendations are not yet available.

In addition, a new commission was established, on the Teaching of Mineralogy, and amongst several liaison committees a Committee on Petrographic Nomenclature was formed to consult with a corresponding committee

of the I.G.C., overlap of objectives between the two international bodies here being apparent.

Washington Meeting, April 14-27, 1962. The programme includes pre- and post-sessional excursions, commission meetings, and symposia as follows: Mineralogy of Sulphides; Open Session; Layered Intrusives.

Details of this meeting have already been circulated to members of the N.Z. Mineralogical Group. Anyone interested who has not received this information, or anyone who would like his name added to the list of members of the Group, should inform the writer at the Geology Department, University of Otago, P.O. Box 56, Dunedin.

A NOTE ON THE 35TH ANZAAS CONGRESS, BRISBANE, MAY/JUNE 1961

by J.C. Schofield

As is unfortunately common in international meetings such as ANZAAS there were too many papers for the time available, Most could be fitted, however, into a number of symposia, as follows: "Marine Calcareous Sedimentation", "Petroleum Exploration in Australia","Precambrian Geology", "Cretaceous Stratigraphy", "Ring Dykes and Cone Sheets", "Late Cainozoic Geology of Australia", "Syngenesis in Ore Deposition", "Ground Water Problems", and "Miscellaneous Papers". There were concurrent sessions on most days. Titles only will be included in a forthcoming volume of the Australian Journal of Science.

To me the highlights of the congress were (a) the Presidential Address by Professor D.S. Coombs, (b) the symposium on Syngenesis in Ore Deposition, and (c) the buffet tea arranged by the Geological Society of Australia. Professor Coombs' address on his well known work on "Progress and Problems in Very Low Grade Metamorphism" held the interest of a large audience for over an hour despite the excessive heat and the poor ventilation in a blacked-out room. As far as the symposium was concerned, this was of particular interest because Australia is at present a hotbed of syngeneticists who are doing some extremely interesting work to prove their point, and incidentally to indicate possible new areas of mineralization. Such work includes investigations into the environmental aspects of ore occurrence, both from observations made in the field and from chemical experiments carried out in the laboratories of the Bureau of Mineral Resources. Nevertheless, epigeneticists have not been completely banned from Australia, and I will long remember the impassioned plea by Dr W.R. Browne that the possibilty of epigenesis should not be overlooked at some occurrences.

INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS

Recent issues of the "Chronique de l'U.G.G.I.", nos 34, 35, and 36 (for March, May, and June, 1961, respectively) contain information on three items of special interest to members of the Society: these are (1) the Upper Mantle Project (organised by the International Committee for Geophysics), (2) a recent tectonic map of the Earth, and (3) an International Symposium on Volcanology, to be held in Tokyo during 1962.

(1) Upper Mantle Project. The objective of the Upper Mantle Project is to stimulate world-wide co-operation in research into the outer 1000 kms of the Earth. At a meeting held in Paris during January last, a Working Group under the chairmanship of Professor V.V. Beloussov (U.S.S.R.) was set up to consider the best way of tackling this project. It was stressed that studies of the upper mantle and of the crust have been continuing for many years, but without co-ordination. For instance, in the United States there are several groups of scientists working in this field, but interpretation varies from one group to another, and Professor Beloussov said that this also applies to the U.S.S.R. At the same time, the Working Group stressed that a special effort should also be made to initiate new investigations. A three-year programme of research is suggested, and a symposium on the Upper Mantle Project is planned to be held in Moscow in 1963. The symposium will be divided into two parts, namely (1) One week for Working Groups on the various disciplines related to the project, and (2) A second week devoted to a general symposium.

(2) Tectonic Map of the Earth. A reproduction of a tectonic map of the Earth, compiled by Professor Beloussov, is included in the "Chronique de l' U.G.G.I." no. 35. On it New Zealand is shown as an "island arc of the second type". The immediately surrounding ocean, extending eastwards as far as the Chatham Islands, is shown as epicontinental sea, while the Tasman Sea is included in "regions of moderate depths in the oceans --------with oceanic or intermediate crust". Unfortunately no detailed description of the legend accompanying the map is given. It is hoped that the map will be displayed during the next Annual General Meeting of the Society.

(3) International Symposium on Volcanology. This symposium will be held in Tokyo from May 9 to 19, 1962, under the sponsorship of the International Association of Volcanology. Subjects to be discussed are: (1) Prediction of time and place of volcanic eruptions, and (2) Relation between magmas and the nature of volcanic eruption. Field trips and visits will be arranged during the Symposium, and excursions to various active volcanoes after the conclusion of the meeting are also planned.

Further details on any of the above items may be obtained from Mr J. Healy, N.Z. Geological Survey, P.O. Box 499, Rotorua.

THE PATTERN OF EUSTATIC SEA-LEVEL FLUCTUATION DURING THE QUATERNARY PERIOD

by Paul Vella

The following four fluctuations of sea-level relative to the lithosphere are inferred from stratigraphic thicknesses and depths of deposition of late Pliocene to early Pleistocene sequences in Wairarapa, Hawkes Bay, and Wanganui:

	Wwp	-	Ww	-	Wh	-	E. Wn	-	U. Wn	-	
Rise	-		475		375		250		210		ft
Fall		350		475		350		230		200	ft

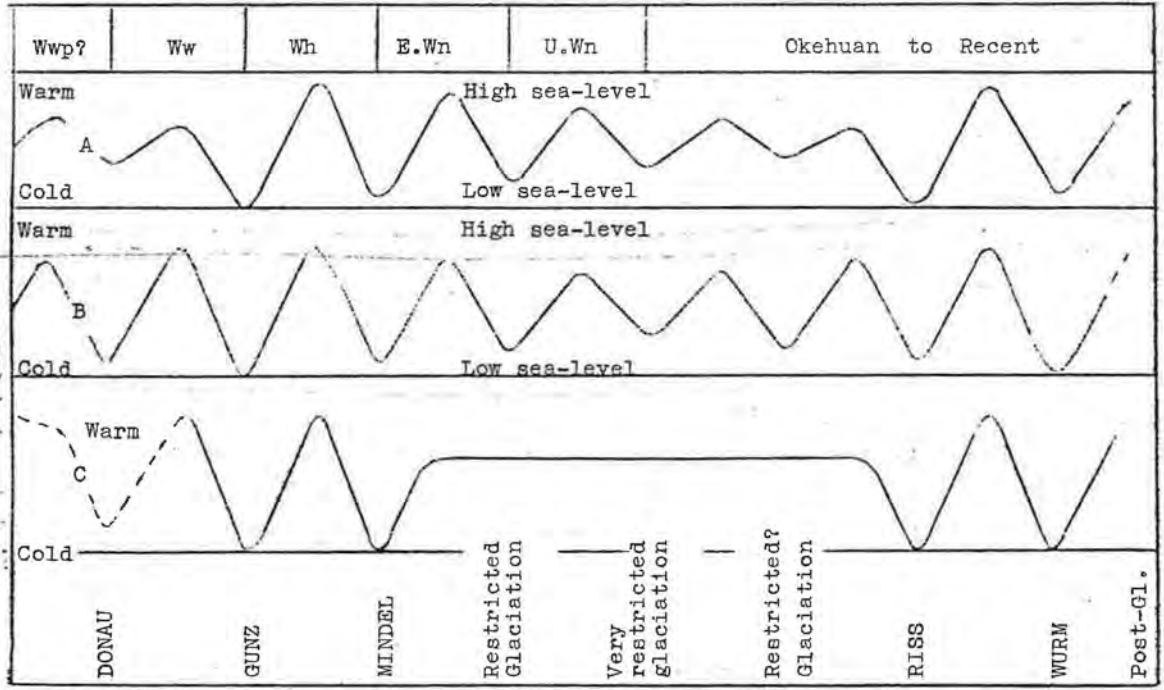
(Wwp: Waipipian; Ww: Waitotaran; Wh: Hautawan; E. Wn: Early Nukumaruan; U. Wn: Late Nukumaruan.)

The fluctuations may be due to diastrophic oscillations, but are inferred to be caused by glacio-eustatic sea-level changes, because each has the same amplitude in Wairarapa, Hawkes Bay, and Wanganui, and most (if not all) took place within the Quaternary Period. The Waipipian - Waitotaran (Late Pliocene ?) fluctuation is inferred from approximate data, and the amplitude given for it above may be considerably in error. The later fluctuations are inferred from more accurate data; any error in them is inherent in the method of estimation and should be in the same sense and in about the same proportion for all values. The error is not likely to be more than 30 %, and the relative amplitudes are probably nearly correct.

If they are eustatic sea-level fluctuations they reflect the sum of fluctuations in the amount of ice on the land throughout the world, and though they may not reflect local temperature fluctuations, they may be assumed to reflect the sum of temperature fluctuations throughout the world.

The inferred Hautawan to Late Nukumaruan sea-level oscillations successively decrease in amplitude and suggest two possible patterns of Quaternary glaciations shown by curves A and B (Fig. 1). In both curves, troughs may be treated as low sea-level, low temperature or glacial phases, peaks as high sea-level, high temperature or interglacial phases. In curve A two major pulses, each followed by a series of diminishing fluctuations, are assumed. In curve B a cyclic change in amplitude of fluctuations with two maxima is assumed. Both curves can be reconciled with the conventional view of the Quaternary as having four glacial stages with a long interglacial phase between the second and third glaciations (Fig. 1 C). In curve A the first pulse and the first trough following it represent the two early (Gunz and Mindel) glaciations, the remainder of the first diminishing series of fluctuations represents the long interglacial, and the second pulse and first trough after it represent the two late (Riss and Wurm) glaciations. The Holocene is the rising or warming phase of the second

Figure 1. - Possible Patterns of Glaciation.



fluctuation in the diminishing series following the second pulse. In curve B glaciations are represented by the troughs of the two fluctuations at each maximum of changing fluctuation amplitudes. The long interglacial phase is represented by the fluctuations of lesser amplitude between the two maxima of changing amplitudes, and the Holocene is the rising phase of the first of a series of fluctuations of smaller amplitudes.

In both curves the first fluctuation after each pair of major glaciations would include a moderate glaciation which should be recognised fairly readily in favourable areas, and the second fluctuation after each pair of major glaciations would include a slight glaciation which would be recognisable only in the most favourable areas. In curve B a further slight glaciation and moderate glaciation would be represented in the fluctuations leading up to the second pair of major glaciations.

Superimposed on these curves must be imagined minor oscillations which cause stadials and interstadials, and which may or may not be harmonic with the main fluctuations. Either curve may be imagined as a generalised temperature graph, extending back into the Tertiary, superimposed on a gradually falling average temperature curve. Each may be imagined extending forward into the future, showing the Holocene as the beginning of a second "long interglacial" phase.

The four-fold pattern of Quaternary glaciations has been widely recognised and must contain some germ of truth. At the same time, a modern school of Quaternary geologists are justified in recognising more than four glaciations (apart from pre-Gunz glaciations). The pattern suggested by either curve A or curve B could reconcile opposing opinions on the number of glaciations that have occurred if the modern school is prepared to accept that newly recognised glaciations were less intense and less extensive than the four generally recognised glaciations.

FLASHBACK - ON THE ORIGIN OF EARTHQUAKES

(See Newsletter No. 10, p. 11)

by R.D. Hill, Dept. of Geography, University of Auckland

It is well known that the town of Wellington was severely damaged by an earthquake resulting from movement along the Wairarapa Fault in 1855. The earthquake was experienced over an estimated area of 360,000 square miles, of which some 4,600 square miles in the vicinity of Wellington was elevated.

The district had, however, experienced a number of earthquake shocks prior to the damaging one of 1855. In 1846, for example, Judge Chapman recorded 24 shocks, ten of them in one month, at his Karori residence, while in the following year there were 16 shocks (Wakefield, 1848). In

1848 there was a major earthquake resulting from movement on the Awatere Fault (Cotton, 1954). Fortunately there was no loss of life in Wellington although some property, mainly chimneys, was damaged. The occurrence, however, prompted some interesting comments by the "Wellington Independent" as to the origin of earthquakes:

> "Whichever theory we may take as the correct one in respect to the causes which originate earthquakes, it cannot be denied that the quantity of rain which fell during the winter, pouring into the bowels of the earth, and coming into contact with substances which are well known to generate heat and steam, or gas, has in great measure produced the convulsions which we have now to record. Furthermore, we have sufficient evidence to prove that the gas or steam has now forced a vent for itself------which------is not likely to be closed for a long period to come" [a reference, perhaps, to Weld's report of the opening of a fissure along the Awatere Fault (Cotton, 1954, p. 364)]. "Knowing this, knowing that in no single instance has a vertical or upheaving motion been experienced with any fatal effect in New Zealand, and knowing from the formation of the country that the effects (or dying efforts) of that power, which first raised this country from the deep and made it fit as an habitation for man, must be experienced in a manner similar to the subsidence of a storm, we consider that taking all these circumstances into consideration, we have no greater reason to dread abiding in New Zealand than we had on the first day that the settlers landed on these shores."

References.

Cotton, C.A., 1954. Submergence in the Lower Wairau Valley. N.Z. Journ. Sci. Tech., B35, 364-369.

Wakefield, E.J., 1848. The Handbook for New Zealand. John W. Parker, London.

Wellington Independent newspaper of 25 October, 1848, 4, 317, 2.

TENTH NEW ZEALAND SCIENCE CONGRESS

This congress will be held in Christchurch, on 13-17 August, 1962. It has been put forward a year in order that it should coincide with the centennial of the Canterbury Branch of the Royal Society of New Zealand. The Annual General Meeting of the Geological Society will be held during the Congress.

Dr W.D. Sevon, Department of Geology, University of Canterbury, P.O. Box 1471, Christchurch, has been appointed Secretary of the Geology Section of the Congress.

AUSTRALIAN TRIP

Notes on Quaternary Geology in Australia and on Coastal Morphologies and Construction

by J.C. Schofield

The purpose of my visit to Australia (May 17 to June 4) was to attend the ANZAAS meeting at Brisbane (see p.) and to exchange views with those actively engaged in coastal studies. I was fortunate in being able to travel by private car from Sydney to Brisbane with Mr B. Thom, a geomorphologist interested in coastal morphologies, and two of the eight days spent on this trip were with Mr P. McKenzie, a coal geologist of B.H.P., Newcastle, who makes it his hobby to study present coastal changes and processes. Fine weather, unusual scenery and good company made this trip a very pleasant and useful one.

Quaternary Geology in Australia.

Australia's Quaternary is receiving more attention than in the past, but mainly from geographers trained in geomorphology and from pedologists; the lack of geological background could lead to erroneous conclusions. High level terrace remnants are slowly receiving recognition, although the time-honoured Australian dogma, based on sub-horizontal dips of their Mesozoic rocks, that these are structural benches may be hard to dispel except in areas of steeply dipping strata. Possible confusion lies in a possible misnomer of many high-level remnants of highly weathered alluvial deposits as colluvium. Maybe it is possible to have colluvial gravels, but horizontal gravels in clays do not add up in my mind to any answer but alluvium.

The so-called Miocene laterite is now believed to be a composite of several laterites. The laterite was used as a datum plane, since when present erosion has occurred. Now that the laterite appears to be several, the youngest being possibly Quaternary in age, the Australians may begin to appreciate that rapid rates of erosion are possible.

Coastal Morphologies and Construction.

Foredune and Beach-ridge Development. The development from berm to incipient foredune, to foredune - and their present transient nature as distinct from the preservation of parallel series of older examples - are some of the most fascinating features along the eastern seaboard of Australia and in parts of New Zealand.

A berm is a flat-topped, back-shore, wave-deposited bank of sand that can be more than a chain in width along exposed parts of the coast. Its flat top is smooth, at about high tide level, and may be horizontal or have a slight slope either seaward or landward. Its seaward margin is the gently sloping foreshore, sloping from about high to low tide level. Sometimes it is fronted by well developed cusps. Its internal structure was not seen except in old ridges that may have had the same origin. Cross sections of

these exposed in mineral sand quarries showed parallel bedding which dipped seaward similar to the slope of the present foreshore. Undoubtedly a berm is developed during progradation, each individual bed being deposited along the full width of the foreshore.

McKenzie has found that under present conditions berm development along the eastern shores of Australia is usually seasonal - being built up during fine weather and eroded during the remainder of the year. A berm will, however, occasionally remain long enough for fast-growing coastal vegetation such as spinifex to gain a foot-hold. Such vegetation traps any sand being moved about by the wind and as a result several feet of wind--blown sand may be deposited on top of a berm, thus raising its level but destroying its original smooth surface. Several examples of such "wind--raised berms" several feet in height above high spring tide level were seen; these had a sparse cover of vegetation and an irregularly undulating relief, but still with an essentially flat top. At Nine-mile Beach, south of Newcastle, such a "wind-raised berm" graded northwards along the coast into a slightly raised foredune with its crest at the seaward margin of the "wind-raised berm". These "wind-raised berms" are perhaps better named incipient fore-dunes, the term berm being more usefully restricted to a flat--topped bench formed by wave deposition, whereas the word dune always implies wind accretion.

Like many berms that never develop into foredunes these recent foredunes appear to be transient under present conditions. All stages of erosion were seen. Erosion commences by the sea cutting into them, forming steep cliffs and destroying the bonding action of the vegetation. This leads to blow-outs destroying the original symmetry of the foredunes, which become extremely irregular in outline before moving seaward by further sea erosion or landward by wind transport.

Series of sand ridges parallel to the present coast show all three morphologies, the bulk being berms and incipient foredunes - fully developed foredunes appear to be confined to the beginning and end of the series.

The question arises as to why there have been periods when these sand ridges are preserved, as distinct from the present period, when their development appears to be only transient. It is noticeable throughout the world that in areas of previous progradation erosion now predominates: the question can be put in alternative ways, namely - why has progradation ceased, or why has the sedimentary supply apparently decreased ? There are two possible causes - climatic change and sea-level change.

Several cycles of progradation followed by erosion are shown by the chenier plain of the Firth of Thames. As this plain was built during the last 4,000 years climatic fluctuations have hardly been great enough to affect the sedimentary supply from the land. Nevertheless, slight climatic changes such as wind velocities and direction may affect the supply from the sea floor just as seasonal changes do at present, but from a long term point of view, any recent small changes in climate are unlikely to have prolonged effects (see conclusion below).

Sea-level change, on the other hand, could have long term and world-wide effects. Falling sea-level not only increases sedimentary supply through stream erosion, but it also lowers wave-base level, which effectively increases the sedimentary supply from the sea floor in areas where the latter is in equilibrium with wave-base deposition and erosion. This must be the case in areas of previous shore-line progradation, for otherwise sediment would have been depositied out to sea. Similarly, during rising sea-level the reverse could occur. Hence the coastal erosion often seen today that coincides with rising sea-level. Rates of extraneous sedimentary supply into such a system must, however, be balanced against the rates of sea-level changes. Thus for example, it would be possible still to have progradation during a rising sea-level providing the extraneous supply of sand was able to retain the wave-base - sea-floor equilibrium with some sand left over for progradation. In this case the rates of progradation would decrease. Progradation would only cease once the rapidity of sea-level rise equalled the rapidity of build-up of the sea floor.

In areas of along-shore drift, erosion during rising sea level would tend to supply extra sediment for such drift, and thus progradation may continue in the down-drift area. The chenier plain of the Firth of Thames is a good example where there is erosion, standstill, and progradation in that order along the coast.

Conclusions. In conclusion I must draw attention to an apparent anomaly. There is little doubt that (a) periods of sea-level rise favour coastal erosion, and (b) the transient, present day berms are formed under fine weather conditions. That is, with the rise of wave-base level under one set of conditions of rising sea level, erosion is favoured; but under another set of conditions of fine weather and calm seas an apparent consequent rise of wave-base produces progradation. These two processes can be reconciled in the following way. Consider coastal processes during sea-level standstill and assume that coastal equilibrium is attained. Under these conditions, wave steepness and energy content play an important part in progradation or erosion as well as wave-base - sea-floor equilibrium. The latter is demonstrated by diurnal variations of erosion during high tide and progradation during low tide, all other factors being equal. McKenzie notes that "----- when a delicate equilibrium is attained, a surprisingly large quantity of sand on the frontal crest of the berm is replaced in each tidal cycle". Somehow or other this coastal equilibrium is upset during stormy conditions and at the same time the sea-floor - wave-base equilibrium no longer applies, but on return of less stormy conditions the latter balance reasserts itself so that material removed seawards during erosion is returned as the coast is once again prograded. In other words, wave-base - sea-floor equilibrium is an important factor during relatively calm periods, but is over-ridden by other factors during stormy conditions. It continues to be the most important factor during changes of sea level, so that although short range variations in erosion and progradation may occur during, say, a fall of sea level the overall result will be one of coastal progradation.

Regions for determining past sea levels.

When dealing with the type of sand ridge described above it would be difficult to determine past sea levels, even to within an accuracy of 2 or

5 ft. This must always apply in areas where a large amount of sand is involved and which is capable of being transported by wind as well as by sea. Thus, the better areas for study of past sea levels are those in which beach ridges are predominantly formed of particles too large for wind transport - this not only obviates the masking action of wind-blown material but leaves the student in no doubt that he is dealing with water-formed topography and sedimentary structures. If at the same time an area could be chosen where there is a large supply of coarse sediment, progradation is likely to persist for longer periods than in areas of smaller supply, and thus a more complete record of sea-level changes will be preserved.

Dune Migration.

Mr Thom has made a study of coastal deposits north of Newcastle, and I was immediately struck by the similarity of the sequence of events when compared with those along the Ninety-Mile Beach area of Northland. At both localities there have been periods of foredune and beach ridge development that have alternated with periods of parabolic and transverse dune migrations. Possibly the latter developed during periods of rising sea level when the sea-floor - wave-base equilibrium is disturbed, allowing erosion of the coast. Coastal erosion causes blow-outs to occur in the foredunes, from which full-scale dune migration may develop. This theory is partly based on present activities, which consist of rising sea level and dune migration, but unfortunately how much of the latter is due to natural causes and how much is caused by depletion of the vegetation cover by man is not known.

It could be argued that dune migration takes place during falling sea level, when at first sight it might appear that (a) more sand is available from exposed strand flats for the wind to blow inland, and (b) the water table would drop and thus reduce the chances of survival of the vegetation. Both conditions are probably not taking place. Falling sea level is a slow process even during its fastest rates of fall, say 5 to 10 ft a century. Thus, a strandflat is not exposed overnight, and instead of large amounts of sand being available for immediate wind dispersal it is in fact slowly trapped in foredunes and beach ridges (see above). Similarly, a fall in sea level need not mean a fall in water table. The position of the latter is dependent on permeability, rainfall, and distance from the ground-water outlet; in this case the latter lies at the coast, which without doubt trends seawards when sea level falls. Many factors are involved, but it is even conceivable that the water table might rise locally during a period of falling sea level.

TRANSACTIONS OF THE ROYAL SOCIETY OF NEW ZEALAND

At the Annual Meeting of the Council of the Royal Society of New Zealand held on 19 May, 1961, it was decided that, commencing with Volume 89, the Transactions will be issued in four series, as follows:

Transactions of the Royal Society of New Zealand	Botany
Transactions of the Royal Society of New Zealand	Zoology

Transactions of the Royal Society of New Zealand Geology
Transactions of the Royal Society of New Zealand General

Each of the series will begin with Volume 1, and each volume will consist of an indefinite number of parts, each part consisting of a single paper with its own part number and date of publication, but paginated within the volume to which it belongs. Each paper will be distributed to its author as soon as it is published, and at the same time it will be available for sale at the office of the Royal Society. The parts will not be bound together.

The members of the Royal Society of New Zealand (i.e. members of its member bodies, e.g. Geological Society of N.Z.) will be entitled to receive the Transactions on payment of a levy of 10/- annually for one series. The annual levy for each additional series will be 5/-. As in the past the Proceedings will be available to members without charge. The General Series will be distributed free of levy to members who elect to receive it, until its bulk warrants an annual levy. The new levies will apply from Volume 2 of the New series.

The Committee of the Geological Society has decided that it will undertake to supply members with Transactions and Proceedings from Volume 2 onwards. As pointed out in the circular enclosed with Newsletter No. 9 (December, 1960), it is preferred that members who already belong to other branches of the Royal Society should continue to obtain their Transactions and Proceedings through these branches. Other members who require Transactions and/or Proceedings should write to the Secretary, C/o N.Z. Geological Survey, P.O. Box 2110, Christchurch, specifying which series of the Transactions they require, and whether they wish to receive the Proceedings. Each volume will be distributed at intervals in groups of parts. The Committee has decided that there will be a charge for postage and packing in addition to the levy. This will initially be 5/- per year for one series of the Transactions, making the total charge to members 15/- per year for one series. These charges will not be due until 1962. Proceedings will initially be distributed free to those members requesting them.

HAMILTON MEMORIAL PRIZE, 1962

This prize for younger scientists, in memory of Augustus Hamilton, is administered by the Royal Society of New Zealand and may be awarded in 1962. The rules relating to the award are given in the Trans. Roy. Soc. N.Z. 65: 485-6 (1936). It is awarded for "original pure scientific research work carried out in New Zealand or in the Islands of the South Pacific Ocean." Applications for the prize are to be made by individual authors and should reach the Secretary, Royal Society of New Zealand, P.O. Box 196, Wellington, by 31 December, 1961.

GEORGE HARRY UTTLEY, C.M.G., M.A., D.Sc., F.G.S. (1879-1960)

The death of Dr G.H. Uttley deprived the Geological Society of New Zealand of a senior member who formed a link with the heroic days of New Zealand geology at the beginning of the century, and of an experienced research worker on fossil Polyzoa. An account of his life and achievements by Dr J. Marwick has already appeared in the Proceedings of the Royal Society of New Zealand, vol. 89, part 2. Educated in Dunedin, Uttley passed his M.A. with Honours in 1902 and afterwards taught at Waitaki Boys' High School (1903-13) where his pupils included M. Ongley and J. Marwick. (The headmaster of the school at this time was Dr J.R. Don, who taught geology there as a school subject and who published a thesis on the origin of gold reefs.)

Uttley completed his B.Sc. in 1910 and M.Sc. in geology in 1912, with a thesis on Oamaru geology. He was the first to make known (in a joint paper with Marshall, 1913) the names of many important fossil localities at Oamaru, including Target Gully, which was brought to his notice by Ongley as a school boy and which was later to yield the richest New Zealand Tertiary molluscan fauna known, including 98 species previously undescribed.

After teaching in Melbourne, Uttley returned to New Zealand as principal of Scots' College, Wellington (1916-22), and during this time he published papers on North Otago stratigraphy that gained him his D.Sc. Later he was principal of Wairarapa High School and Southland Boys' High School (1930-45), and after his retirement was awarded the C.M.G. for his services to education (1947). He was active in public life, and was a founder of the Southland Branch of the Royal Society of New Zealand. In his retirement in Christchurch and later in Wellington, he published two papers on New Zealand Polyzoa, a group he had studied for several years.

Younger geologists who knew Uttley will treasure the memory of a vigorous and healthy septuagenerian whose conversation brought to life the geological controversies of 50 years ago and the lively personalities of the pioneer geologists who took part in them.

-C.A.F.

PERSONAL NOTES

The Society's congratulations are extended to DR E.J. SEARLE, who has been promoted to Associate-Professor of Geology at the University of Auckland.

PROFESSOR R.S. ALLAN, Geology Department, University of Canterbury, is at present overseas on sabbatical leave. He attended the Pacific Science Congress, and until early December he was in the United States, studying in particular organisation and display in museums. He will spend the remainder of his time overseas, until August 1962, at Cambridge, particularly in connection with brachiopod studies.

DR C.A. FLEMING, N.Z. Geological Survey, Lower Hutt, attended the 10th Pacific Science Congress in Honolulu during August/September; he was organiser of a section dealing with Antarctic Relationships in the symposium on the Biogeography of the Pacific Basin. After the Congress he visited the active volcanic region on the island of Hawaii.

DR WILLIAM E. POWERS of Northwestern University, Evanston, Illinois, arrived in Christchurch in January, 1961, as a Fulbright research scholar. During the year he has been attached to the Geological Survey and has been studying the Hurunui and Waiau River terraces and their relations to glacial advances in the headwater areas. Both the glacial and river deposits here he finds show many contrasts to those in the central United States, in part because they are the results of mountain glaciation rather than continental. Among the contrasts are the very steep gradients, heavy loads, and braided channel patterns of the large New Zealand rivers; the general absence of definitive weathering features here that can be used to identify drifts or outwash; the general absence of identifiable loess horizons in the glacial stratigraphy; the occurrence in New Zealand of diastrophism that has visibly affected the structures of many deposits; and the presence of elevated marine benches near these terrace deposits but with an uncertain relationship to them.

DR J.T. KINGMA, N.Z. Geological Survey, has transferred from Lower Hutt to Christchurch, where he will be carrying out special studies on sedimentation.

MR A. STEINER, N.Z. Geological Survey, Lower Hutt, attended during September an international symposium on ignimbrites and hyaloclastites held in Catania, Sicily. During the course of the excursions held during the Meeting visits were made to several famous localities, including Mt Etna and the Eolian volcanoes (Stromboli, Lipari, Vulcano); some volcanic vents in Tuscany were also examined. On his way back to New Zealand Mr Steiner spent four days as a guest of the Geological Survey of Israel.

DR J.J. REED, N.Z. Geological Survey, Lower Hutt, returned late in November from four months overseas during which he visited a large number of geological institutions, especially in Britain and North America, and was able to see in addition many well known field areas, including the greywacke terrain of the Harz Mountains, metamorphic and igneous rocks in Cornwall, the classic schist zones of Angus, Scotland, the Sudbury and Bancroft districts of Ontario, and the uranium deposits of the Colorado Plateau. He was particularly interested in comparing and contrasting the Franciscan Formation of California with analogous rocks in New Zealand. In California he was able to meet in advance Dr R.G. Coleman, U.S. Geological Survey, Menlo Park, who is spending a year in New Zealand.

MR G. NORRIS, formerly at the Sedgwick Museum, Cambridge, arrived in New Zealand during November, and is to be attached to the palynology section of the Geological Survey, studying in particular spores in Jurassic and Cretaceous rocks.

WANTED One Brunton Compass. Please reply B.L. Wood, P.O. Box 79, DUNEDIN.

THE NEW ZEALAND MINERAL CLUB

The Society welcomes the recent formation in Wellington of the New Zealand Mineral Club and extends its good wishes for the future to the Club.

The club, which has at present a membership of over 30, has as its principal objects the following:

1. To bring together people interested in mineralogy, geology, gemmology, and lapidary work.

2. To assist and advise members in field work and technical matters dealwith the above subjects.

3. To arrange regular meetings of members for the purpose of exchanging ideas and information in these fields, and to arrange addresses by speakers whose knowledge would be of benefit to members.

4. To encourage the setting up of branches in other parts of New Zealand.

Further information on the activities of the Club may be obtained from Mr J. Gamble, 53a Fitzherbert Street, PETONE.

NEW MEMBERS

The following new members have joined the Society during the past year:

Cope, R.N., 16 Aranoni Street, WELLINGTON.

Dalrymple, J.B., Geography Department, University of Auckland, P.O. Box 2553, AUCKLAND.

Hicks, P.F., Shell, B.P. and Todd Oil Services, P.O. Box 1873, WELLINGTON.

Means, Dr W.D., Geology Department, University of Otago, P.O. Box 56, DUNEDIN.

Pratten, R.D., 152 William Street, BROKEN HILL, N.S.W., AUSTRALIA.

Pearson, E.W., 23 Whaka Crescent, CHRISTCHURCH.

Sevon, Dr W.D., Geology Department, University of Canterbury, CHRISTCHURCH.

Short, Dr K.C., Shell, B.P. and Todd Oil Services, P.O. Box 1873, WELLINGTON.

Speight, J.G., 4 Kainga Road, BELFAST (N.Z.)

Walcott, R.J., C/o Antarctic Division, D.S.I.R., P.O. Box 6022, WELLINGTON.

STOP-PRESS

Geological Society of New Zealand Incorporated

The Society was incorporated under the Incorporated Societies Act, 1908, at Christchurch on 4 December, 1961.

Items for the next issue of the Newsletter will be welcomed by the Editors, C/o N.Z. Geological Survey, P.O. Box 368, Lower Hutt, New Zealand.
