

NEWSLETTER

GEOLOGICAL SOCIETY
OF
NEW ZEALAND



No. 23

JULY 1967

NEWSLETTER

GEOLOGICAL SOCIETY OF NEW ZEALAND

Member Body of the Royal Society of New Zealand

No. 23

July 1967

CONTENTS

Royal Society of New Zealand Centennial Building Appeal	1
The Hamilton Conference, May 1967	2
Conference Tips	4
Annual General Meeting	7
Review - Invercargill and Dunedin Four-Mile Maps	8
Personal Notes	10

ROYAL SOCIETY OF NEW ZEALAND

BUILDING APPEAL

Members of the Geological Society will be approached shortly for donations towards the target of \$400,000 required to build Royal Society House. Judging by the unanimous support expressed for the appeal at our A.G.M. in Hamilton in May, geologists will not be "in the field" when the collectors call.

The concept of Royal Society House, centrally situated in Wellington, with its facilities available to the growing needs of its member bodies, is one which is both a worthy tribute to the past hundred years of scientific endeavour in New Zealand and a sound investment for the future, demonstrating the independence and vigour of New Zealand scientists.

Before the business community can be approached for help, the Royal Society needs a strong demonstration of support from its own membership and I am confident that the geologists will play their part generously.

THE PRESIDENT

THE HAMILTON CONFERENCE, MAY 1967

The first national conference of the Geological Society of New Zealand was held from May 10-15 1967, at the University of Waikato, Hamilton, and a large gathering of delegates heard a welcoming speech by the Vice-Chancellor, Dr D. R. Llewellyn, and the formal opening of the conference by the Mayor of Hamilton, Dr D. Rogers. Final enrolments were 101, distributed as follows:

University graduate students	24
University staff (six institutions)	22
N.Z. Geological Survey	21
Amateurs	11
Chemistry Division	3
Geophysics Division	3
N.Z. Oceanographic Institute	3
Soil Bureau	3
Other Government Bodies	8
Overseas (Japan and Australia)	2
Industry	1

In addition, two parties of undergraduates (from Auckland and V.U.W.), totalling 30, were present. The excellent attendance was most heartening in view of the decision by the N.Z. Geological Survey to reduce, on economic grounds, the number of its delegates by half.

The conference was divided into one whole and three half days of papers, and two full days and two half days of field excursions. Thirty two papers were presented (see below), and particularly welcome among these were contributions from Dr S. Banno, University of Tokyo; Mr R. D. Stanley, Matamata College; and Mr W. F. Heinz, Christchurch. The papers covered areas as widely scattered as Chile, British Columbia and New Caledonia, and ranged over the whole spectrum of geology. Although some speakers found the time allotted too short, presentation was of a high standard, with the ensuing discussions generally spirited. Each paper held interest, even for the most specialised, and undoubtedly this was the hallmark of a most successful conference. It is to be hoped that "joint sessions" will remain a spectre of the distant future.

The field trips were to the Hamilton basin where Quaternary deposits, surface features and soils were examined; to Cambridge for geomorphology, ignimbrites and Hokonui rocks; and separate excursions to the Maramarua and Waikato coal fields. These field sessions proved most stimulating and the complexities and variations found even in the youngest sediments were very striking to those dealing mainly with "hard" rocks. Visits to road-metal quarries brought to the fore the perennial problem of the "greywackes" - most delegates seemed to have a clear idea to which rocks the term refers, but there was no unanimity on definitions. This led to a recommendation at the annual general meeting that the Society endeavour to bring down a report on the term. A post-session tour of one and a half days to Kawhia Harbour was not as well patronised as had been originally indicated because of uncertainties resulting from the national railway strike, so that there was financial loss of \$9.28 which would have been covered had six more people attended.

Evening activities included a public address by Dr D. Kear, N.Z. Geological Survey, on the geological history of the Waikato region. This was very well received, as was an excellent sherry party. The Annual General Meeting, held on the Friday evening, was perhaps slightly more formal than in some other years (a hotel lounge has certain advantages)!

The following papers were presented during the conference:

S. Banno	Regularity of transitional element distribution among silicate minerals.
P. Blattner	Distribution of elements in composite plutonic rocks of British Columbia.
R. G. Burns	Trace element distribution rules and their significance - a review.

- L. Carter Geology of Pakaurangi and Puketotara Peninsulas, central Kaipara.
- G. A. Challis Permian and Cretaceous volcanic areas in New Zealand.
- F. F. Evison Active margins of the New Zealand continent.
- J. A. Grant-Mackie The Waikuku limestone - paleoecology and paleoclimatic significance.
- J. Healy Geology of the Kaimai tunnel section.
- W. F. Heinz Prospecting of certain gold-sulphide ore bodies by Earth-current measurements.
- R. A. Henderson Stratigraphy of New Zealand Cretaceous ammonites and their use in correlation.
- J. Hopkins Mesozoic sedimentary rocks in the Auckland region.
- N. de B. Hornibrook New Zealand Tertiary epoch boundaries.
- D. G. Jenkins Conodonts from the Reefton limestone.
- H. R. Katz Lateral fissure eruptions following the 1960 earthquake in southern Chile and their relationship to tectonics.
- D. Kear The interrelation of volcanism and tectonism in New Zealand geological history.
- J. D. McCraw Surface features and soil pattern of the Hamilton basin.
- S. Nathan Cretaceous rocks of the lower Buller valley.
- C. S. Nelson Sedimentology of glauconitic and micritic rocks of Pahaoa, south-east Wellington.
- H. M. Pantin Colours in marine sediments around New Zealand.
- C. H. Pharo Mesozoic stratigraphy and biostratigraphy in Baie de Fritzbuier, New Caledonia.
- J. J. Reed Pre-Tertiary basement geology and structure of the Taranaki-Cook Strait area.
- D. Rishworth Faulting rejuvenated by subcutaneous erosion along fault conduits at Earthquake Flat, Rotorua.
- J. C. Schofield Evidence for an interstadial 11ft sea level 31,000 years ago.
- M. J. Selby Aspects of the geomorphology of the greywacke ranges bordering the lower Waikato basins.
- D. Shelley Vermicular intergrowths as markers in metamorphic histories.
- R. D. Stanley The Tongariro multiple volcano.
- G. R. Stevens New Zealand Jurassic and Cretaceous paleotemperatures.
- R. P. Suggate Objectives and criteria in determining the Pliocene-Pleistocene boundary.
- W. G. Tennent Spectrochemical study of rare earth abundances in stream sediments of South Island granites.
- B. N. Thompson Forms of rhyolite domes at Maroa.
- G. C. Vucetich Late Quaternary volcanicity and climate in the upper Waikato valley.
- G. Warren The Haumurian and Piripauan type sections, Haumuri Bluff.

An extra paper by Dr A. Ewart, "On the origin of the volcanic rocks of the North Island", was fitted in during a geochemical session, and this was followed by the presentation to Dr

Ewart of the McKay Hammer Award for 1965

Altogether the Hamilton meeting proved conclusively that the Society can organise a highly successful conference, and much credit is due to those responsible for the planning.

- J. J. R.

CONFERENCE TIPS

by J. C. Schofield

FOREWORD (by the President)

The Society's conference in Hamilton in May of this year was both successful and enjoyable, and I hope that it has set a pattern for future memorable meetings. Although there are many factors that affect a conference, many of which - such as the weather, sickness, or a spirit of spontaneity - cannot be planned, its success depends in a large measure on smooth running based on adequate planning and organisation and on keeping the participants informed about arrangements.

Since the success of the Waikato conference was obviously not due to chance I have asked Mr J. C. Schofield, chairman of the organising committee, to pass on the formula as well as the lessons learned during our first national conference, for the guidance of future organisers.

Those who have helped to organise conferences well know that their smooth running depends heavily on co-operation from the participants, and I have therefore asked that this report be printed in the Newsletter to give the widest appreciation of the organisational methods and problems.

- N. de B. H.

INTRODUCTION

I have been asked by the President to make comments on the recent Hamilton Conference that may be of use to any organiser of future conferences. The type of conference is important; it can be extremely specialised, extremely generalised, or "in between". These remarks are mainly concerned with the "in between" type as my own feelings are that the Geological Society of New Zealand should always aim for this type of conference. The extremely specialised conference could be arranged by a University or by the New Zealand Geological Survey, e.g. the Quaternary Symposium at Canterbury University and other symposia that have already been successfully conducted in the past by these institutions, whereas the extremely generalised conference could be run by the Adult Education Department or by a collective society incorporating the amateur geological, lapidary and mineral clubs in New Zealand. The "in between" conference should cater for the very important overlapping of disciplines within the earth sciences as this overlapping leads more often to important breakthroughs and perhaps finally to new disciplines.

VENUE

It is preferable that the chosen area should be of wide interest with sufficient accommodation (preferably under one or two roofs) and an adequate lecture hall.

PREPARATIONS

Democratic beginnings

An organising committee with chairman and secretary-treasurer is required to:

- (1) establish liaison between different disciplines,
- (2) sort all suggestions and information,
- (3) circulate information in 1st and 2nd circulars.

(4) establish sub-committees responsible for:

- (a) venue arrangements: transport, food, hotels, lecture theatres, sherry party or other intertaintments, public address, etc.
- (b) time-table: sessions, tours, chairmen of sessions
- (c) finance: secretary-treasurer to receive conference fees, arrange hotel bookings and to have powers to deposit in and make withdrawals from a bank account.

Dictatorial ending

The chairman must perforce become more and more dictatorial and cautious as the time of conference is approached. Within a couple of weeks of its commencement he should know by the receipt of carbon copies of letters, that all timetable, venue and financial arrangements have been finalised. He should insist that for any arrangements made with contractors, e.g. caterers, bus companies, letters should be written itemising all details - seat numbers, costs, timetable, mics, phones, cups, etc. Providing such precautions as these are taken, and copies of all vital arrangements are held by the President, and by the Chairman and Secretary of the Organising Committee, no one man becomes vital to the running of the conference, e.g. the Organising Chairman could drop dead and all would be well.

Conference "flow"

Preparations before the conference should aim at minimising work to be done during the conference. This not only reduces the strain on the organisers but helps the conference to "flow" and may save participants' time and temper.

The Hamilton Conference was a "no-choice" conference, i.e. there were no concurrent sessions or alternative field excursions. Thus we were able to consolidate most of the expenses in the conference fee of £3. This covered all transport costs, all morning and afternoon tea costs, the cost of cut lunches for two excursions and the public lecture supper. But even for a multi-purpose conference, providing the initial circular-of-intent includes all alternatives, it should be possible to fix an average fee to cover most costs - the main exception being pre- and post-session tours. Such a consolidation of expenses saves a lot of queuing and selling of tickets during the conference. Incorporation of excursion costs in the conference fee also encouraged most people to use the buses, thereby reducing the number of cars making up the excursion tail.

Additional assistance is provided by supplying all abstracts and tour guides, stapled together in order of presentation during the conference; by posting a list of participants and their hotels pinned up on a board, and by supplying a stencilled map of the area showing position of venue, hotels, motels, P.O., etc.

SESSIONS

My personal feelings lead me (1) to avoid pressure groups that demand organisation of certain symposia, and (2) to avoid concurrent sessions, if possible. Formal announcements of named symposia, often with invited speakers, lead to re-hashing of known results and cluttering-up of the programme much more so than no such announcements. This view does not inhibit the final grouping of papers into symposia that become evident when the final timetable is prepared.

If insufficient numbers of papers are forthcoming then this is the time to listen to pressure groups - they will be prepared to fill the gap at short notice.

The organising committee needs the powers of selection and rejection of papers, but if, because of time, many papers have to be rejected, all sectional interests should be represented. At Hamilton the time of 25 minutes for presentation and discussion seemed to work satisfactorily.

TOURS

Tours should cover most aspects of the local stratigraphy. Short afternoon tours are preferable to long all-day tours, but are of course not always possible. Just as a long day of papers can become boring, so can a long excursion be tiring. The ideal would be to have papers in the morning and a tour in the afternoon.

Stops should often include contentious material that will promote greater interest and discussion. They should be safe as much as possible from passing traffic and of at least 20 minutes duration, preferably 30 minutes at most localities. The safety of participants and road traffic requires that buses should be parked off the road during stops and these must be located during preliminary coverage of a possible tour before actual route and stops are finalised. On winding roads, red flags or notices may be necessary to warn approaching motorists.

Prior permission for access to private property is also required.

All day tours should be arranged to include toilet and tea arrangements during lunch time.

A megaphone is useful for initial description of outcrop and also for subsequent remarks by those with dissenting views. The latter should be encouraged as much as possible.

DISCUSSION GROUPS

Informal discussion groups are as equally important, if not more important, than the formalised sessions and tours.

It was unfortunate that the hostels did not materialise in time for the Hamilton Conference. However, the sherry party, the supper that followed the public lecture, and the availability of lunch at the university where the sessions were held, provided alternative opportunities for informal development of discussion groups.

Tea breaks also provide opportunities for discussion and the refreshments should be provided in such a manner as to inhibit the development of frustrating queues, or the feeling of being rushed. Provision of refreshments in a room close to the lecture rooms, and for a period of 25 minutes, seem to work successfully at Hamilton.

VENUE FUNCTIONS

These should be provided to promote the development of informal discussion groups and such functions that do not do so should be minimised. If a half day for free activity, such as shopping, is not catered for then Friday evening should be kept free for shopping. We would have done better at Hamilton if the Annual General Meeting had been held on Saturday rather than Friday evening. The rather poor attendance at the A.G.M. could have been due in part to this clash of interests.

The National Commission for UNESCO has approved the Society's application for recognition as co-operating body. The Society is now on the mailing list for the "Unesco Chronicle", UNESCO press releases, and the Commission's Newsletter. Any matters arising from UNESCO's programme of possible interest to the Society will be brought to our attention.

ANNUAL GENERAL MEETING

The Society held its 12th Annual General Meeting at the University of Waikato on the evening of May 12, 1967. The meeting, chaired by the President, Mr N. de B. Hornibrook, was attended by about 60 members.

After a discussion of matters arising from the minutes of the previous Annual General Meeting various members reported progress on the preservation of the following sites of geological importance: Cape Turakirae, Waiohine Terraces, Target Gully shell pit, and Hutchinson's Quarry.

The following Officers and Committee were elected:

President:	Mr N. de B. Hornibrook
Vice-President:	Professor J. Bradley
Secretary:	Dr D. G. Jenkins
Treasurer:	Mr G. Warren
Committee:	Mr J. D. Campbell
	Mr D. R. Gregg
	Dr J. J. Reed
	Mr J. C. Schofield
	Dr I. G. Speden
Auditor:	Mr D. J. Daly

The President reported the resignations of Mr D. R. Gregg as the Society's secretary and of Mr B. W. Collins as the Society's representative on the Member Bodies' Committee of the Royal Society of New Zealand, and recorded the Society's appreciation of their work.

A motion presented by Professor M. Gage and amended by Dr R. P. Suggate has resulted in the following re-wording of By-law 3 of the rules covering the McKay Hammer Award:

"The Award shall be made to the author or co-authors of the most meritorious contribution to the geology of New Zealand and its dependencies (including the Ross Dependency) published in the previous two calendar years, provided the work has not already been the basis of the award."

The President reported that the financial target of the Royal Society of New Zealand Centennial Building Fund was £200,000, and both Dr R. W. Willett and Dr C. A. Fleming, Home Secretary of the Royal Society of New Zealand, gave further information about the centennial celebrations. A motion was then passed recommending that the incoming committee consider an interim donation of £50 to the Building Fund. [See also page 1.]

Dr R. W. Willett, after discussing the problem of greywackes, suggested that the Society should set up a sub-committee to consider the classification of greywackes.

General business ended at about 10 p.m. and because of the lateness of the hour the President deferred his address until the Society's next meeting.*

- D. Graham Jenkins (Hon. Sec.)

*Note The address will be delivered on the evening of Thursday January 25, 1968, at the University of Canterbury, Christchurch, during the ANZAAS meeting.

R E V I E W

SHEETS 24 AND 25, INVERCARGILL AND DUNEDIN GEOLOGICAL MAP OF NEW ZEALAND 1:250,000

About twenty years ago, the late Professor W.N. Benson commenced compilation, on a large sheet tracing cloth, of a geological map of Otago and Southland, at a scale of four miles to one inch. On this sheet were recorded the results of thesis mapping by his students, his own observations, and published data. If he had been alive today, no-one would have been more delighted at the near-completion of the corresponding section of the New Zealand Geological Survey's 1:250,000 mapping project. Of the seven sheets covering Otago and Southland, all but one, Stewart Island, are now published. Furthermore, all seven have been compiled by former students of Benson. It is perhaps not inappropriate to comment that the Survey Director who instigated the program, and the compilers of joint compilers of another four of the 26 sheets, are also former Benson students. The influence of a great teacher still looms large.

While in no way detracting from the sterling work of the compiler, I.C. McKellar, it may also be noted that Benson's own direct contribution to the Dunedin sheet is a major one. The sheet is indeed the only published map to date that incorporates any of Benson's subdivision of the rocks of the Dunedin Volcanic Complex. This is necessarily generalized from Benson's detailed MS map, but it effectively summarizes his field findings. Apart from this, the Dunedin sheet owes much to the work of a series of geologists in the Kaitangata Coalfield, culminating in H.J. Harrington's G.S. Bulletin No.59, to numerous student theses and smaller student projects, and by no means least, to the mapping by the sheet author, especially in the west of the sheet. One of the decisions taken early in the history of the 1:250,000 mapping project was to use, in the main, time-stratigraphic units. This decision was in fact inevitable if an acceptable unity were to be achieved on a national scale. Nevertheless, it is pleasing to see that a considerable effort has been made in sheet 25 to ensure that formations, the real primary units of geological mapping, are adequately differentiated, at least in rocks of Upper Cretaceous age, for which formational mapping is well established in the Dunedin district. It is hardly necessary to say that for almost all readers, it is much more important to know whether a certain area is underlain by say Abbotsford Mudstone or Waverham Sandstone, than it is to know the stage or series in the New Zealand time-stratigraphic system of nomenclature.

Another feature of the S25 map is the fine detail with which many boundaries are shown, a detail which contrasts with the rounded and evidently generalized boundaries which have been inevitable in parts of some other sheets. Of considerable general interest is the plotting of the mineral-bearing lodes in the Haast Schist Group, although it is disconcerting to find in the legend that effectively identical symbols are used for quartz reefs and igneous dikes.

B.L. Wood's Invercargill sheet covers the Hokonui Hills, famous in New Zealand geology since the heroic days of Cox and McKay. It incorporates the work of many geologists in many parts of the sheet, including A.R. Mutch's important mapping in the Morley area. It is perhaps especially notable in that it completes Mr Wood's reconnaissance mapping of the Fiordland Complex and his mapping of the Otago schists. The syntheses it provides of the geology of the Waiau basin and the Southland Plains are notable new results.

When Sheets 22 to 25 are assembled, one of the most striking features is the element of symmetry across the schist arch, bounded in part by the northwest trending Waihemo and Tuaepeka fault complexes with Permian and Triassic rocks beyond, and cut by the many northeast trending faults with their associated alluviated tectonic depressions. One of the major challenges remaining is the determination of a stratigraphy and structure for the broad belt of rocks intervening between the schists and fossiliferous rocks to the south and west of them. Another is the refinement of mapping of the truly formidable Fiordland Complex as well as of the lesser, but no more easy, Longwoods.

It is unfortunately true that the First Editions of both sheets 24 and 25 are marred by a distressingly large number of minor errors. Thus small areas are left uncoloured, others are coloured incorrectly according to the legend (e.g. Brighton Formation), symbols are omitted or left unconnected with the small patch of colour to which they apply. The decision to map the porphyrites of Southland, intrusive mainly into Lower Mesozoic sediments, as "Kp", and to colour them as sediments rather than igneous rocks, can well be questioned. All but a few sophisticated could be excused if their reading of the legend of Sheet 25 should lead them to the conclusion that the later rocks of the Dunedin Volcanic Complex are of Pleistocene age. In fact, the youngest of 8 radiometric ages currently available is about 10.7 m.y., well back in the Pliocene. Furthermore, some of the colour matches and matching of screens between sheets are not good, especially in the cases of the metamorphic subzones of the Otago schists, the Pareora Series, certain Permian units and the Pomona Granite. One wonders if it could not have been possible to achieve closer and more direct liaison between field officers and draughtsmen actually preparing individual sections of the maps.

But viewed in the wider perspective of this imaginative project, these are minor blemishes, and will not detract too seriously from the usefulness of the maps. How welcome they will be is indicated by the barrage of enquiries received for them at the Government Printer's Book Shop in Dunedin in the weeks and months preceding distribution. It is gratifying to see what a large proportion of these enquiries has been from non-geologists.

- D.S. Coombs

GEOLOGICAL TIME CLASSIFICATION

An often overlooked useful source of reference

M. Grace Wilmarth, 1925, "The Geological Time Classification of the United States Geological Survey Compared with Other Classifications, accompanied by The Original Definitions of Era, Period and Epoch Terms - a Compilation". U.S. Geol. Surv. Bull. 769: 138 pp.

- N. de B. H.

PERSONAL NOTES

Sir Charles COTTON and Dr C. A. FLEMING have recently been elected as Commonwealth Members of the Geological Society of London. Dr Fleming has also been invited to give the next William Smith lecture to the Geological Society, the first New Zealander to be so honoured. Heartiest congratulations are extended from the Society to Sir Charles and Dr Fleming.

Emeritus-Professor O.M.B. BULMAN, formerly Professor of Geology, Sedgwick Museum, Cambridge University, and a world authority on graptolites, recently visited New Zealand for a short period. Many members of the Society had the pleasure of meeting him socially and hearing him lecture.

A very pleasant event during the Hamilton conference was the marriage of Mr W. F. HEINZ of Christchurch, the Society's most active and enthusiastic amateur member, to Mrs M. Wright. The President and the Secretary had the pleasure of attending, and the best man was Dr H. M. Pantin. The Society's best wishes for the future are extended to Mr and Mrs Heinz.

Dr R. W. WILLETT has been appointed Assistant Director of D.S.I.R., Wellington. At the time of writing his successor to the directorship of the N.Z. Geological Survey has not been announced. The Society's congratulations are extended to Dr Willett.

Dr G. R. STEVENS, N.Z. Geological Survey, Lower Hutt, left early in July to attend the Luxembourg Colloquium of the Jurassic Sub-Commission of the International Union of Geological Sciences. He will return to New Zealand via London and North America and expects to be back early in September.

Dr J. T. KINGMA, N.Z. Geological Survey, Christchurch, has been awarded a Senior Foreign Scientist Fellowship of the U.S. National Science Foundation to take up the position of Visiting Professor at the University of North Dakota for the 1968-69 academic year. The Society's pleasure on this award is expressed to Dr Kingma.

Dr J. B. WATERHOUSE, N.Z. Geological Survey, Lower Hutt, recently returned to New Zealand from the University of Toronto by way of London and the U.S.S.R. In Russia he attended, as New Zealand representative, the First Constituent Assembly for the History of the Growth of the Geological Sciences, held in Erevan, Armenia. The meeting comprised three days of papers, including some dealing with Armenian geological history, and 4 days of field excursions.