HISTORICAL STUDIES

GROUP

NEWSLETTER

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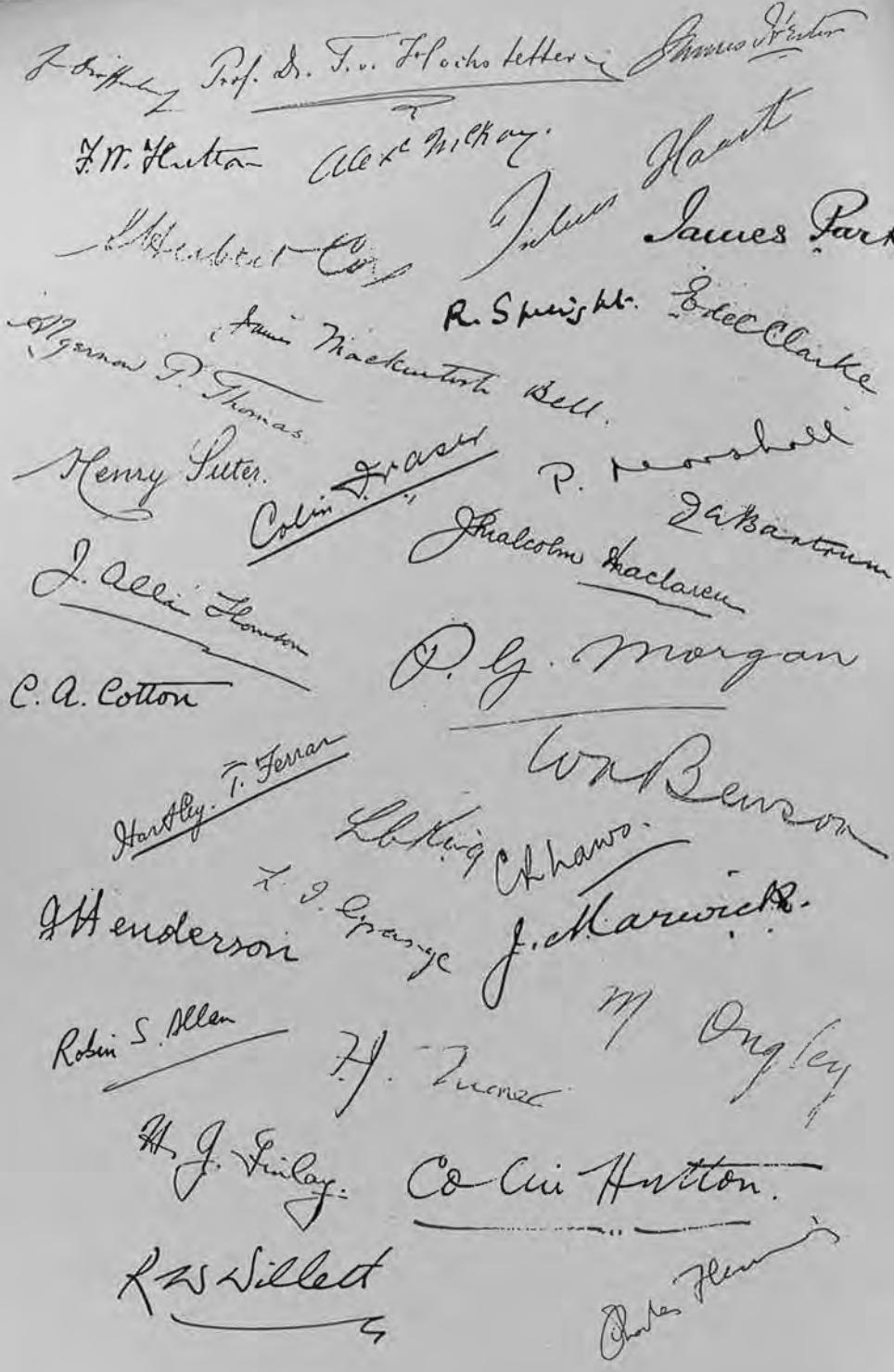
GEOLOGICAL SOCIETY
OF NEW ZEALAND



"Astronomy is no more than the 'foreign department' of that most synthetic of all sciences, Geology."

- T. C. Chamberlin

EDITORIAL

Enclosed with this issue of the Newsletter is the Second and Final Circular for the INHIGEO Symposium to be held in Sydney in July. Several of our members have already indicated their intention to attend and some will be giving papers. Your attention is drawn to the deadlines listed on page 2.

We are pleased, in this issue of the Newsletter, to pay tribute to Cyril Firth who celebrated his 90th birthday early this year. Cyril was an important figure in Auckland engineering geology for many years and was a pioneer in the field of soil mechanics.

Also in this issue is George Scott's talk at the New Zealand Geological Survey anniversary seminar in 1990. There were other talks at that seminar which would be of interest to our readers: perhaps those speakers could provide articles for the Newsletter.

We also print some reminiscences by Max Gage of his wartime geology activities. Other members should be able to provide us with similar articles on New Zealand wartime geology.

Members of the Historical Studies Group held an informal meeting during the Wellington Conference. One suggestion put forward was that our retired members give us their recollections of some of their contemporaries e.g. Fyfe, Macpherson.

The low membership of the Historical Studies Group is of concern. At the last three annual conferences of the Geological Society of New Zealand an invitation to join the Group has been posted on the notice board but the response has been an absolute zero. I am afraid that there is not a great 'sense of history' in the Society but we should all do our best to change that attitude. Most of the information we publish is new and in a largely untouched field. Our Newsletter would be a worthwhile acquisition to most of the country's geology libraries. After all there is no charge at present.

So - Spread the good word

and - remember the INHIGEO meeting. See you there.

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IN THE BEGINNING – Johann Reinhold Forster

"The two Forsters were the most effective and 'professionally' consistent scientific team to sail with Cook. . . . . Between them they were to publish more than all of Cook's other scientists put together and their writings, literary, philosophical and scientific, influenced several generations of European geographers and later scientists in the Pacific and beyond, including Alexander von Humboldt who was a student of both. . . . . Yet to most New Zealanders they remain, in the shadow of Cook and Joseph Banks, relatively unknown."

– Hoare, 1979

In 1772 Joseph Banks declined to sail on Cook's second voyage because of the restrictions placed on accommodation for himself and his staff. As replacements the Admiralty appointed Johann Reinhold Forster (1729–1798) and his son Johann George Adam Forster (1754–1794), who duly sailed on the 'Resolution' even though Banks 'swore and stamp'd upon the Warfe like a Mad Man'.

Although primarily a zoologist Johann Reinhold Forster contributed much to the infant science of geology and he can, with some justification be regarded as the first geologist to visit this country.

In 1768 he published 'An Introduction to Mineralogy' in which he adopted a more scientific approach than his contemporaries by including tabular material on such properties as specific gravities etc. This was followed in 1772 by 'An Easy Method of Assaying and Classifying Mineral Substances'.

In 1780 Johann Reinhold Forster was appointed professor of natural history, medicine, and mineralogy in Halle, his old university in Germany where he taught until his death

in 1798. He continued to publish in earth science and his last original publication, 'Observations and Truths' was, in essence, a, theory of the earth.

His 'magnum opus', published in 1778, was 'Observations Made During a Voyage round the World' This is one of the first studies of natural phenomena as a whole and is thus a predecessor to Humboldt's 'Kosmos'. It also anticipates much of the geology done by Darwin on the 'Beagle' sixty years later.

The journal kept by J.R.Forster on Cook's second voyage has only recently been rediscovered (Hoare 1982). The 'Resolution' called at two places in the the South Island, Dusky Sound and Queen Charlotte Sound and in his Journal Forster describes the rocks as follows:

Dusky Sound

> The Rocks themselves are composed of a kind of coarse Granite, commonly formed of a Stone full of small striated black particles, interspersed with *Daze* or *Glist* (*Mica*) & some parts of Iron or rather (*Wolfram*). I observed here & there some particles of *Glimmer* or *Russian Icing*-glass between the rock. *Quartz* is here & there in veins & in large pieces mixed with them: & I found likewise small Specks of the same kind of Stone, whereof the Natives make their hatchets & Ornaments for their Ears, & which seems to be a kind of *Nephritic-Stone* or *Jade*; some small particles of *Cockle* or *Sherl* where likewise but seldom to be met with: in some places the rocks were reddish, as tinged with ruddle, but I never found the *ruddle* itself, though the Inhabitants had some fine pieces of it, which they tinge their hair & paint their faces & *Ahoo's* with. I never could find the least mark of any metal or ore among the innumerable Stones I examined, if I except that the Glimmer in the black striated Rock Stones looks something like an unyielding Iron-ore.

Queen Charlotte Sound

> The hills are covered on top with a mould arising from the putrefied leaves & trees, but immediately under this thin stratum is another of a clayey-Marle, & still deeper the same is hardened into Stone, which runs in oblique Strata, dipping most generally to the South. Among these Strata are veins of white Quartz & sometimes of a greenish

kind of Stone, which is lamellated & of a filamentosis Structure, nearly related as I believe to the Asbest-kind. Here & there on the Shingly beaches there are some small black smooth Stones of the Flinty order; & now & then I found large detached pieces of *Basaltes*, which the Natives employ to make their *Imèttees* or Instruments for engaging their enemies quite close: it is of an oval Shape, flat edged away on both sides, so as to form a sharp edge, & it ends into a handle with a kind of head or knob at its extremity; it is perforated & commonly a string run through it, to hold it by. Among the lose Shingles on the beach two pieces of *Pumice-Stone* were found. Whether they were carried hither by the Sea, or are the produce of this Island I cannot say.

Hoare, in footnotes, explains Forster's terminology as follows;

> The 'striated black particles' are probably hornblende.
> 'Daze' and 'glist' are old names for mica.
> 'Glimmer'is mica and 'Icing-glass' (isinglass) also mica from its resemblance to the gelatin fish-product of the same name.
> 'Sherl' is schorl or black tourmaline.
> 'Ruddle' is a term meaning red, for a red iron ore.

Hoare (1982, p.227) mentions that Forster's mineral and rock collection at Halle included his specimens from the South Seas. He also states (p.60) that under Forster's will his mineral collection was to go to his wife. In his biography of Forster (1976, p.332) Hoare states that she sold the collection to a certain Landrat Wedel. He does not mention the present whereabouts of the collection but this information may be contained in one of the German references that he quotes

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The information in this article comes entirely from the following publications of Michael Hoare:

1976 'The Tactless Philosopher': Johann Reinhold Forster (1729-98)

1979 'Enlightment and New Zealand, 1773-1774. (This is a series of essays on the Forsters)

1982 'The Resolution Journal of Johann Reinhold Forster; 1772-1775'

CYRIL FIRTH

A NINETIETH BIRTHDAY TRIBUTE

On 25 January this year Cyril Firth celebrated his 90th birthday so it is appropriate that in this issue of the Historical Studies Group Newsletter we should review his contribution to engineering geology, particularly in the Auckland area.

Cyril began his education at Epsom Primary but in 1913 he moved to Mangawhau (Mt. Eden) where he and Frank Turner were both foundation pupils. (Cyril and his elder brother, Reg. were the first to be enrolled on opening day.)

Cyril and Frank were close friends at school but competitors in contending for the top of the class position. Cyril admits that Frank usually won. On the other hand Cyril made the First XV (as winger) but Frank's spectacles hampered his chances at rugby.

They parted company when Frank moved on to Auckland Grammar School and Cyril went to Seddon Memorial Technical College (on a scholarship) to study engineering.

They met up again in 1921 in the 'old tin shed' which in those days housed the Auckland University College Department of Engineering. (It was elevated to the status of School of Engineering in 1923) Frank had enrolled for engineering as well as B.Sc. (chemistry) but he soon gave up his engineering to concentrate on his science courses.

Cyril stayed with engineering and his courses at 'Seddon Tech.' had been so thorough that Sydney Lamb, lecturer in the Department, granted him liberal exemptions and he, too, was able to start a B. Sc. course as well (in physics)

Geology 1 (Physical) was compulsory for Civil Engineering so Cyril and Frank enrolled accordingly. Aided by Bartrum's presentation they both became 'hooked' on geology and in due course both switched to geology for their Master's degrees although Cyril's B.Sc. had been in Physics and Frank's in Chemistry.

In the early 1920's there was a marked increase in the numbers studying geology at Auckland. These included two lady students, the first in the Department's history. Cyril remembers that this created a problem for Bartrum on field trips and he always insisted on a chaperone – usually Mrs Bartrum. He also tells us that Frank Turner set a 'cracking pace' and his enthusiasm and drive infected the rest of the class.

Former students remember Professor Bartrum not only with affection but as one of the last of the general geologists. As Frank Turner puts it in the centennial history of the department

"Bartrum left his stamp on every one of us, his students. We emerged from his teaching and guidance, not as paleontologists, geomorphologists, or petrologists – just as geologists.'

But Frank also points out that there was one severe deficiency in Bartrum's teaching – a lack of training in field mapping.(All Bartrum graduates remember the problems they had when they started thesis field mapping 'cold'.) However, Frank goes on to say–

"The one man who came nearest to appreciating the essential value of such exercises was C. W. Firth."

(We have had reports of Cyril's proficiency as a field geologist from other sources)

Cyril's progress at Auckland University College was slowed when he had to join the work force. In 1923 he was indentured to Arthur Gray, an engineering consultant, and from then on he studied on a part-time basis.Gray,a noted 'Varsity graduate and sportsman, recognized the importance of geology to civil engineering and readily allowed time for Cyril to continue his studies. Both Cyril and Gray realized that the then infant science of Soil Mechanics, with all its geological connotations was to play a significant part in civil engineering. Cyril's interest in, and knowledge of Soil Mechanics was to be a major factor in his appointment in 1943 to supervise the construction of the Auckland City Council's trend setting Lower Nihotupu Dam.

Cyril graduated B.Sc in Physics in 1925 and Associate Auckland School of Engineering in 1926. He was then able to concentrate on Geology and he graduated M. Sc. with equivalent First Class Honours in 1929. His thesis selection 'Geology of N.W. part of Manukau County' paid off: in early 1929 he was appointed Technical Assistant,Manukau County,specifically to develop a water supply system for Mangere Riding. This involved a detailed study of Mangere volcanics and Pleistocene aquifers.

Cyril resumed his studies in 1933 to gain a Diploma in Public Administration. . Later Qualifications included the following Fellowships :

New Zealand Institution of Professional Engineers (1954)
Institute of Civil Engineres, London (1957)
Institution of Water Engineers and Scientists, London (1961)

In 1959, Cyril received the Furkert Award of the New Zealand Institute of Engineers for his paper, "The Auckland Metropolitan Water Supply'.

In the early 1920's Cyril had been associated with a group of 'natural science buffs' comprising his cousin Raymond Firth

(later Sir Raymond , Dean of Social Anthropology, London), Raymond's close friend, Bob Falla (later Sir Robert, Director of the Dominion Museum), Baden Powell, and the La Roche brothers. Through them he met Gilbert Archey, Director of the Auckland Museum. Also, Cyril's employer, Arthur Gray, was Engineering Consultant in the construction of the new War Memorial Museum. Thus it was that in mid 1929 Archey asked Cyril to assist with the preparation of the Geology Hall in the new Museum which was to be opened later that year.

Cyril's connection with the Auckland Museum was to continue for another ten years as Associate Geologist - 'definitely unpaid', Cyril points out. . He was married late in 1929 and for the next few years he and his wife spent most Saturdays sorting exhibits, drafting labels etc. As the Centennial History of the Museum puts it -

> 'Mr. Firth gave most generously of his time in a splendid presentation of the geological exhibits, which included hundreds of meticulously hand lettered labels, diagrams, and maps. He also devoted considerable time to the classification of the research collections.'

Cyril remarks, and he does so more with regret than pride, that many of his displays are still there 60 years later.

In 1935 Cyril moved from Manukau County to Franklin County, based in Pukekohe. As Assistant County Engineer he established a Soils Mechanics Laboratory - the first in Auckland apart from MOW/DSIR - to facilitate a major main roads programme in country ranging from sand hills (Awhitu) to the volcanics and greywackes of Bombay and Hunua.

In August 1939 Cyril 'went geological' as engineer and field geologist with the Superior Oil Co. (NZ) Ltd. Superior's manager, Ed Turner, a one time faculty colleague of Frank Turner at Berkeley, had been referred to Cyril by Professor Bartrum. Superior, a 'private' Californian production-only company had prospecting licences in Hawke's Bay, Rangitikei, Manawatu, and north Westland, with headquarters in Palmerston North. A.E. Feldmeyer headed a field team of four Americans, an Australian, a Canadian and Cyril, operating from Palmerston North, Wanganui, Taihape, Dannevirke and Greymouth. They worked closely with Finlay and Marwick,and on several occasions met up with with Arnold Lillie who was then working in Dannevirke Subdivision.

Company micropalaeontologist G. Y. Wheatley ran a well-equipped laboratory at headquarters in Palmerston North. There was also a geophysics survey unit outfitted with the very latest Schlumberger gear - a company specialty. It covered the whole of the Pleistocene/Recent lowland area from Foxton north to Turakina and Fielding, and located promising 'domes' at Marton and Mt. Stewart which provided the basis for Manawatu and Rangitikei activity.

Cyril Firth at the Kotuku oil seep, north west of L. Brunner, 1942.

Early 1940 Cyril was in the army with a commission in the Royal New Zealand Engineers but he was seconded back to the oil company for high priority surveys and prospect drilling operations.

By mid 1943 the Japanese advance had been stopped, the oil crisis had ended and Superior's activities in New Zealand were being wound up. Technically, Cyril was still in the army but Auckland City Engineer, James Tyler facilitated his discharge so that he could help deal with Auckland's water supply crisis.

(We will be giving more information on Cyril's time with Superior in a future issue of the newsletter in our series on the wartime activities of New Zealand geologists – Editor)

In August 1943 Cyril left Palmerston North to join the Auckland City Council. New headworks for Auckland's water supply were long overdue and as Design and Resident Engineer, Cyril had to finalise surveys and design for an earth dam at Lower Nihotupu. Wartime shortages had obliged Arthur Mead, city waterworks engineer, to discard his concrete design in favour of an earth dam and this is where Cyril, with his knowledge of geology and soil mechanics, came into the picture. A detailed geological survey had to be made, also a soil mechanics assessment of available material – stream terrace gravels and Waitemata Series soil profile. Testing material had to be designed and built from scratch; here valuable assistance came from Jack Brooke of DSIR.

Completed in 1948, Lower Nihotupu was the first major rolled-fill dam in New Zealand with material technically selected, placed and compacted. It set the pattern for all subsequent Auckland water supply dams.

After the war ended the Auckland University School of Engineering shifted from the 'old tin shed' on the Princes St. site to a disused airfield at Ardmore, 20 miles south of Auckland. This move made it difficult for Professor Bartrum, already overloaded, to continue his lectures on engineering geology for the B.E.(civil) degree and he asked Cyril Firth to take the course. It so happened that Cyril was, at the time, engaged several days a week on site surveys for water supply headworks in the Hunua Ranges, near Ardmore, so he took the job

on by giving evening lectures - not particularly popular with the students - on his way home.

It was meant to be a temporary arrangement (with City Council agreement), but Cyril continued to lecture in Engineering Geology until the Department of Engineering moved back to the city in the late 1960's. For some years he was an examiner in engineering geology for the University of Canterbury

Arising from this University connection, Cyril became the profession's representative on Faculty. In the early 1950's he was President of the Auckland District Court of Convocation and was Foundation President of the Auckland University Graduates Association.

In 1945 Cyril was appointed Assistant Engineer,Water, to the Auckland City Council and in 1953 he succeeded A. D. Mead as Chief Engineer, Water Supply Division. With the latter appointment he became responsible for the administration of the distribution system for Auckland City and the bulk water supply system for Metropolitan Auckland

His knowledge and field experience in geology came into play once again in expanding the region's water supply. Surveys and testing throughout the Hunua Ranges demonstrated the suitability of material in the weathered greywacke soil profile for rolled fill construction and resulted in the building, by the 1970's, of four dams of this type, all much larger than the Lower Nihotupu one,viz. Cosseys, Wairoa, Upper Mangatawhiri and Mangatangi, with plans for a fifth, Lower Mangatawhiri. During the same period, a composite rock/soil rolled fill dam was constructed from Waitakere volcanics residuals at Lower Huia.

Apart from the application of soil mechanics, geology played a significant part in planning aqueduct routes (tunnels and pipelines) for the Hunua headworks. Detailed surveys were also made of the country between Mercer/Tuakau and Papakura together with studies of river flow regimes ,to investigate possible water supply from the Lower Waikato River.

In 1966, the newly established Auckland Regional Authority took over control of the bulk water supply system and Cyril was appointed its first Director of Works. In addition to bulk water supply, he was responsible for main drainage, regional roads and general engineering service to all divisions of the Authority.

Some of Cyril's extra-curricular activities have already been mentioned but there were others such as -

Auckland Metropolitan Drainage Board: Geology Consultant 1945-54.

New Zealand Institution of Engineers: Auckland Chairman 1949-50.

Auckland Centennial Park Board: Member 1953-65.

Cyril retired from the Auckland Regional Authority in 1970 but this was not the end of his working life. From 1970 to 1973 he was consultant on water supply loan assessment missions for the Asian Development Bank, Manila. After nine missions in three years to Singapore, Malaysia, Korea. Taiwan, and Sarawak he decided to end this phase of his life when his wife got caught up in one of Manila's 'revolutions'.

For the next three years (1973-6) he was engineer and geologist to an Auckland Regional Authority study of water supply from the Waikato River. There then followed five years (1978-82) on the Newhook committee of the New Zealand Forestry reviewing 'Public Access to Forested Water Supply Catchments'.

Cyril's public life finally came to an end in 1987 when, in his eighty fourth year. he resigned from the Wesley College Trust Board, having been a member for sixteen years.

His association with Auckland geology and Auckland civil engineering now goes back over 70 years. As the Auckland Regional Authority House Journal for December 1969 puts it:

> 'Remember the concrete strip of the Great South Rd., It comes as a surprise to find that Cyril Firth, our retiring Director of Works, was involved in the plan preparation, and also for the Whau Bridge.'

Even our Auckland readers would now have to be in retirement if they remember that concrete strip on the Great South Road.

In the field of geology we could add to the ARA House Journal comment:

> 'Remember the geology displays in the Auckland War Memorial Museum when it was first opened in 1929? Cyril Firth was involved in those too.'

(Even earlier, Cyril was involved in the construction of the Museum building.)

Cyril is still active well beyond his years: he comes from a long living family - his mother died a few days short of her 108th birthday.

We wish him well.

* *

A Thought for Today ? -

I am only too painfully aware how increasingly difficult it is to find time for a careful study of the work of our predecessors, and also to keep pace with the ever-rising tide of modern geological literature. The science itself has so widened, and the avenues to publication have so prodigiously multiplied, that one is almost driven in despair to become a specialist, and confine one's reading to that portion of the literature which deals with one's own more particular branch of the science. But this narrowing of the range of our interests and acquirement has a markedly prejudicial effect on the character of our work. There is but slender consolation to be derived from the conviction, borne in upon us by ample and painful experience, that in the case of geological literature, a large mass of the writing of the present time is of little or no value for any of the higher purposes of the science, and that it may quite safely and profitably, both as regards time and temper, be left unread. If geologists, and especially young geologists, could only be brought to realise that the addition of another paper to the swollen flood of our scientific literature involves a serious responsibility; that no man should publish what is not of real consequence, and that his statements when published should be as clear and condensed as he can make them, what a blessed change would come over the faces of their readers, and how greatly would they conduce to the real advance of the science which they wish to serve!

- Archibald Geikie, The Founders of Geology Second Edition, 1905, pp.471,2.

THE DICTIONARY OF NEW ZEALAND BIOGRAPHY

The editors of this Historical Studies Group Newsletter (yours truly) and of the Society Newsletter are having trouble 'getting it right'.

First of all, in my editorial in the last HSG Newsletter I omitted the names of Phil Andrews and Roger Cooper as contributors to volume 2 of The Dictionary of New Zealand Biography. Then my efforts to correct the information in my annual report in Society Newsletter 102 were frustrated by comparable mistake.

A complete list of member's contributions to the first two volumes of the Dictionary is given below :

Phil Andrews	Thomas and Anne Chapman Camille Malfroy
Roger Cooper	Alexander McKay
Ron Keam	Alfred Warbrick
'Sam' Maling	Julius von Haast Jean Francois Langlois
David Stanley	Laurence Cussen Harry Haszard
Bill Watters	George Virich

In addition, the late Charles Fleming, a former convenor of our group, contributed the article on Ferdinand von Hochstetter.

I hope that we have got it right this time ; if not, then my Alzheimers is worse than I thought.

We are only a small group (just over 40 members) so we can be proud of the fact that of the 1200 biographies published so far 10 have been contributed by members of our Historical Studies Group.

And there is more to come - we will be represented in volume 3 of the Dictionary due to be published early in 1996.

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THE DEVELOPMENT OF THE NEW ZEALAND CENOZOIC CLASSIFICATION

(In May 1990 the New Zealand Geological Survey celebrated its 125th anniversary with a seminar at which several members, past and present, of the Survey staff reviewed its history. In Newsletters 1,3, and 4 we printed Norcott Hornibrook's contribution to that seminar. We are now pleased to be able to print George Scott's talk at the function.

Several members of the Historical Studies Group also gave talks at the seminar. Perhaps they could blow the dust off their notes and provide us with an article for our newsletter.)

Biostratigraphy has been used since the time of Hochstetter in the 1850's to try to resolve time but I am going to dismiss the nineteenth century effort very rapidly by saying that they made little progress in the Cenozoic. There was considerable dissension on how to do it and there was considerable acrimony between the people doing it. The result was, I think, that by the end of the century they had not got far. McKay used the terms Miocene and Pliocene but in a very broad fashion that did not necessarily relate to the European usage.

I am now going to forget the nineteenth century - perhaps I am doing it a disservice - and jump immediately to 1911 when Morgan, shortly after taking over from Bell, appointed J. A. Thomson. It was a brilliant appointment primarily because Thomson at this stage was a petrologist and Morgan appointed him as the Survey's first paleontologist.

Thomson was a brilliant man. He was a Rhodes Scholar and described by Burton in her centennial history of the Survey as one of the leading scholars in the natural sciences of the early 20th century. It reflects very well on Morgan that he made this appointment.

Thomson, being the man he was, was not with the Survey for very long. He went on to higher places and became

J. A. Thomson as petrologist

director of the now National Museum. However he was with the Survey from 1911 to 1914 and he left a legacy which is particularly important to the subject of my talk.

In his 1916 paper, ' On Stage Names applicable to the Divisions of the Tertiary in New Zealand', he indicated how Cenozoic stratigraphy should be done. The important point about Thomson is not that he resolved Cenozoic stratigraphy or produced the ultimate classification. He laid out a programme as to how it might be done and this is the essential thing. Now if you look at the points he made :

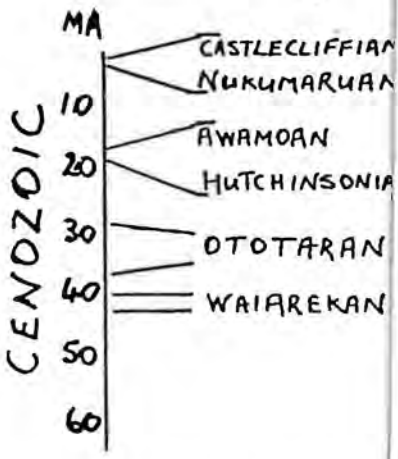
(a) Clear distinction between lithostratigraphy and biostratigraphy, which is really a fundamental point.

(b) Next, local faunal events to be used in biostratigraphy. Local nomenclature, local reference points, - stratotypes.

(c) Finally, when you had worked out the local pattern then attempt to work out the international relationships.

Now this contrasts fairly vividly, I think, with the attempts made in the nineteenth century to make direct comparisons Pliocene here / Pliocene Europe.

Thomson recognized very clearly the provincialism of the New Zealand fauna, especially in the Cenozoic, and realised that you could not go from New Zealand provincial areas to European provincial areas and make reasonable correlations and reasonable estimates of time. You had to invent something local. This is the essential point about Thomson. He set out a programme for local biostratigraphy and he attempted a prototype classification (at right). You will see that he had six units that he could recognize locally. I have fitted them in to the modern concept of the Cenozoic time scale and you will see that there are very large gaps that could not be classified at that stage



In his 1916 paper Thomson left a prescription of how to make progress. An interesting one - 'Collecting, more collecting and still more collecting'. What Thomson was saying really was that despite McKay's whisky cases full of fossils, the data base just was not there. The first thing

to do was to get the data in.

So that is the legacy of Thomson. He set the path to follow. He did not solve the problem. He just put up a case for how to do it.

Thomson left in 1914, the war intervened and there was a period of essentially little progress. The next step came in 1920 with the appointment of John Marwick to the Survey. Marwick effectively guided the Thomson programme for the next thirty years and whether the Thomson programme could have been done as well without Marwick is debatable. I would suggest not. A very crucial, pivotal figure was John Marwick. He was an expert in molluscs and, in fact, Thomson had been thinking purely in terms of molluscs and brachiopods. These were going to be the data on which the classification was built : the megafossils - the things you could see in the field.

A lot of collecting was done but very little progress was made. The molluscs seemed to be sparse in distribution especially in the East Coast flysch basins. They tended to be rather local; events recognizable throughout the country were not found. So, despite having the prescription for what to do and despite having an expert to guide the programme, there was little progress.

In Pal. Bull. 13, ' The Tertiary Mollusca of the Gisborne District ',1931, Marwick reported that correlations were still mainly by stratigraphy and lithology. In other words, he was not having success with fossils.

JOHN MARWICK

Now, just at this time, the Gisborne area was being investigated by American oil companies. They, too, tried out Marwick and molluscs. They tried hard and Marwick tried hard, but with little result. The stratigraphic resolution, the local correlations were not to be had.

At this point, the Americans, recollecting the success obtained with microfossils on the United States oil scene in the '20's, decided that microfossils might help in New Zealand. It is an interesting fact that progress in science sometimes comes purely from industry push and this appears to have happened in this case.

There was another benefit for New Zealand in the American's approach to the problem. They could have employed a micropaleontologist from the States. They could have sent material to the States - there were eminent specialist there, such as Cushman, who ran servicing institutions

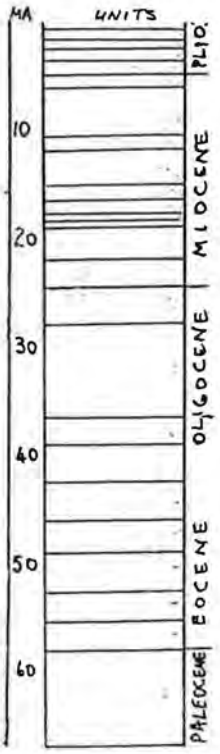
They did not do either of these things. They looked for a local expert and that is a crucial part of the tale.

There was no local expert so John Marwick wisely recommended to them Harold Finlay who at that stage knew nothing about microfossils but was an expert in Molluscs. I think that it is to Marwick's credit that he realised the enormous potential of Finlay to shift into another group of which he knew nothing and make progress.

So there were two coincident factors. An American push in industry realizing that there were possibilities in microfossils to do local stratigraphy and John Marwick realizing who might do the work.

Harold Finlay

So Finlay started off in the '30's working for an oil company in Gisborne. But the oil companies moved out and Finlay was left unemployed for some time. In 1937, no doubt again due to Marwick, he moved into the Survey and there was close collaboration with Marwick on the Cenozoic classification, again using foraminifera. Principally foraminifera, and molluscs where possible.



By 1940 things had really started to move and Finlay and Marwick had an interim classification. In 1947 they published a classification that tied up the Cenozoic into 26 units (above right) compared with Thomson's six and the coverage was essentially complete. The classification that they put in is basically that in use today. Very rapid progress had been made in very short time. Full classification: no gaps.

Now, how was this achieved. They certainly followed Thomson's prescription. This was the guiding light all the time. Thanks to the oil companies they got on to the right fossil group. It was not necessarily the only group but it was a group capable of doing the job. Also the research content was right. This was an extremely important factor - the research into the classification was going hand in hand with active stratigraphical research by a group of young and vigorous geologists. The Wellmans, the Willetts, the Gages, the Lillies, were firing material in to Finlay and Marwick and if the right results didn't come back, Finlay and Marwick knew about it. This interaction was, I think, extremely important. Left to themselves, without this research context, the progress made by Finlay and Marwick would not have been nearly so rapid and a lot more mistakes would have been made.

Finally, the fourth ingredient - the event selection: the selection of events that enabled the correlation to be made around the country and enabled the classification to be put together. And here we really have to go back and look at the brilliance of the person that Marwick recommended, first to the oil companies and then to the Survey - Harold Finlay.

The brilliance of Finlay was essentially a 'boot strap' effort. He went in without knowing foraminifera. He had nobody to consult. He had limited literature. His learning curve strikes me as absolutely amazing. Also, he had the ability to sift through a large amount of data, pick out the essentials, and build a classification from them.

Very much, this research gets back to one person in a direOctive situation following the right prescription. The programme was there and it was seized on.

The effect that the Finlay and Marwick classification had on the field staff of the time was such that mapping was done directly in time units. The tool had been invented and it went out for immediate use. We can see that the 1:250,000 map series would have been a very peculiar map series had it not been for this classification. It was sitting there, Willett picked it up and it was built into the mapping programme.

So far, I have attempted to describe a period of rapid and brilliant research. What has happened since? It is interesting that at this stage, forty years on, and in contrast, very little appears to have happened. The classification today looks very much like the classification then.

In a period of very rapid progress in research the progress gets ahead of the data or rather, the documentation of the

data. Finlay moved very fast and the documentation did not catch up. In the programme since, the documentation has been put in place. A lot of testing has gone on. Everytime somebody collects a sample and fires it in, effectively it tests the classification. If it is not in the right order, which is all biostratigraphy is - putting things in the right order - you soon learn about it from the field and you know the classification is wrong.

The Finlay and Marwick classification may have been put up as an hypothesis but it has been extremely thoroughly tested. It has been documented and it has been revised. Superior events have been put in the place of some for which Finlay did not get the best possible. It has been expanded. Plant microfossils have come in and extended the application of the classification . In certain cases the resolution has been improved although this has not shown up in the classification yet. The international correlation has been considerably improved and we have the start of interaction between biostratigraphy and geochronology. Over the last forty years we have been bulking out the background work in which Finlay made the big leap.

To change direction for a moment, let us look at the science behind it all.

The general belief is that science pushes back the barriers gradually but there are other views on this point. One of them comes from Thomas Kuhn, an American, who sees science as a series of leaps forward. After a period of frustration when you cannot make progress a breakthrough happens and there is rapid progress. There then follows a period of filling out. On the megascale, plate tectonics suits that sort of theory beautifully. I want to point out here that on a more local scale you can still get the same sort of pattern. In the subject which we are discussing, a frustrating period in the nineteenth - early twentieth century right up to the late thirties, and then a brilliant leap forward followed by a period of filling out.

Finally, what do we learn from all this? In this cost-cutting age how do you do biostratigraphy at the best possible value for money? There are lessons in the past if you look at the pattern that I have attempted to trace. To recapitulate -

The programme specification:

If we had not had Thomson we would not have made progress. If Thomson had put up the idea of using European stages, not series, in the New Zealand classification, it would not have been achievable. But Thomson got it right.

The data selection:

That took some time to work out but we were pointed in the right direction by industry and it was followed up from there.

The research context:

This is very important. It is clear that biostratigraphy needs to be done within the framework oif an active stratigraphic programme. The Coal Survey can, I think, be labelled as one. Perhaps the current CCP programme is the right sort of research stratigraphic programme in which biostratigraphy could make progress but it is interesting that in fact little progress appears to be being made at this stage.

Finally, the personnel:

The personnel are absolutely essential.

It is this mix of programme specification, research context, data, and personnel that makes it go.

In this account I have attempted to record a piece of research of which the Survey can be very proud and I think we should salute the gentlemen who made it possible

– George Scott

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One of palaeontology's many blessings –

On being told he was incurably ill, James Dairon resolved to pass the remaining three months of his life collecting graptolites. Outdoor activity improved his health and over the next thirty years he amassed an extensive collection from the Southern Uplands of Scotland.

– R.J.Cleevely, World Palaeontological Collections, 1983.

THE NEW ZEALAND GEOLOGICAL SURVEY IN WORLD WAR II

Some contributions by Geological Survey personnel, in or out of uniform, to national security and the prosecution of the war were widely enough known at the time ; for example Charles Fleming's coast watch duties on the outlying islands and their geological and ornithological by-products. Other activities were highly secret, so much so that some, perhaps, never came to light. My brief involvement concerned what is now familiar to everyone as radar but then could not even be breathed about in public. The objective at the time was advance warning of hostile aircraft approaching our long coastline, although what our slim defences could have done about them is a different question. Apart from some Wellman reminiscences, little has been heard about these hush-hush doings which for me were a nice change from mapping in the Greymouth coalfield and a chance to see a lot of coastal South Island for the first time.

As a rule, scientific staff were automatically being held back from war service, but about September 1942, in a sort of "oh, by the way" postscript to a letter from our Director, John Henderson, I was told that the Department had failed this time in its appeal against my call-up and that I was to be seconded as a civilian to the Air Department. So Molly Rose and I packed for an indefinite absence from Greymouth. She went home to Napier while I reported in Wellington to Dr. Marsden who was then Head of DSIR and chairman of the committee co-ordinating special defence investigations with the Armed Forces. Under sworn secrecy, Marsden briefed me on the physical basis and limiting conditions of radar, crude as it then was and sent me on to the Air Department in Stout Street where Air Force officers explained what they wanted done. It boiled down to finding sites for a screen of radio-location stations around the South Island. Besides considering the terrain, angle of view seawards and other operational factors, I had to report on access, water supply and potential sites for buildings and other structures. Apart from that, geology didn't come into it. Later I found that Harold Wellman was on a similar mission, but we never worked together.

Phase one was aerial reconnaissance of coastal stretches that would suit the Air Force operationally. I was flown in a single-engined light plane down the west coast to about Okarito and then over to Wigram, having marked likely spots for future ground inspection on NZGS Bulletin maps, taken photos, made notes, and fought off air sickness. After overnight accommodation on station (not easy for a civilian) I went down to Taieri and transferred to a twin-engined Airspeed Oxford to reconnoitre Foveaux Strait and Stewart Island. It was my first sight of the southern shores. The weather was normal for down there. Coming back to Invercargill up the east side of Stewart Island under low cloud, we never seemed far above the vast kelp beds. Afterwards (fortunately), the pilot said he had been

fighting downdraughts under full power most of the way. Oxfords, as bomber trainers, being acceptably underpowered so as to give the feel of a full bomb load.

Next phase.back to Wellington for briefing on ground inspections. I was to avoid attracting attention and on no account to disclose the purpose of my mission, not even to the police. I could say I was checking possible sights for 'signalling' stations for the Air Force,, but was given no official papers. If I got arrested and jailed as a suspected spy, that was my bad luck. The Department would not intervene. By arrangement, in Christchurch I teamed up with John Banwell of the Radio Development Laboratory at Canterbury College where a lot of secret defence-oriented research was going on. Armed with such maps as then existed (NZMS1 had not yet gotten far), Brunton Compass, aneroid and petrol ration coupons to run my V8 Ford, we headed for Akaroa and the eastern bays of the Peninsula. Several flat spur-end cliff tops were inspected. Some of the roads were pretty hair-raising. One diverting moment was when we found a local magnetic anomaly strong enough to swing the needle 45 degrees over a short distance. Then we crossed over to South Westland, where my most vivd memory is of sloshing across swamps, wading armpit-deep lagoons, swiping sandflies, and fighting our way up through the infamous coastal jungle to check the angles of view seawards from some of the morainic bluffs south of Ross.

My final sally, solo this time, was to potential sites east and west from Invercargill. There I ran out of funds, and having to borrow from an uncle of my wife while unable to explain to his satisfaction why I was not in Greymouth was a bit tricky. People down there were convinced that if the Japs tried to land anywhere, it would be in Southland and to make it tough for them, all signposts had been taken down. Trying to return to Dunedin round the Catlins, I baulked at crossroads near Fortrose where the option seemingly in the right direction (as it indeed proved to be) was just a grass track overgrown from wartime lack of traffic. When I asked a farmer working in a paddock if that was the road to Owaka, he didn't answer so I took a chance and hurried on in case he tried to arrest me as a spy.

Phase three for me should have been more of the same but up in the Pacific. It never happened because (1) on the way back to Wellington I went down with the mumps: (2) Japanese reverses in the Pacific war were reducing the threat to the islands as well as New Zealand; (3) recovered from mumps, I met C.H.Benney (then Undersecretary for Mines) on Lambton Quay; he exploded with expletives on hearing why I was not getting on with it in Greymouth, and within a few days I was back with the Coal Survey.\

Amongst the many things I learned during this diversion was the lack of information- sharing between the services, even in wartime. Twice, when checking out a possible radar station site for the RNZAF we found the Navy or the Army already had one up and running.

- Maxwell Gage

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In sending the above article to us, Max has pointed out that several other geologists may have had secret involvements in the war effort. He hopes that his article will encourage them to put their recollections of those times on to paper.

To start the ball rolling, brief mention can be made of the contribution made by undergraduate geology students at Auckland University College in the early 1940's. Hugh Battey, Larry Harrington, Alan Mason and Peter Wong welcomed the opportunity of getting experience in field geology when they obtained vacation employment with the New Zealand Geological Survey, under Jim Healy in North Auckland.

There was considerable consternation in the group when, on arrival at Whangarei for their first field season, they were equipped with post-hole borers, not geological hammers.

The assignment was to survey clay resources in North Auckland by boring holes at regular intervals on known deposits. In the first season the work was in the Kamo area and accommodation was at the 'James Temperance Hotel' in Whangarei - a surprising choice for New Zealand geologists.

In the second season they were based first at Whangarei Heads and then at Waipapa in the Bay of Islands where they were joined by Alan Beck (from Otago), and Helen Pirie (who was later to become Mrs Robin Oliver). Also with them was Charles Fleming, taking a break from paleontology at the Survey Head office.

The undergraduates may not have got the anticipated training in field geology but they did return to their studies with extremely well developed arm muscles. The record post-hole depth was 26 feet - a two man operation.

Yet, such was their dedication to earth science that they were not put off by this first experience in the field and all but one of the students went on to graduate M. Sc. in Geology

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THE MINERALOGIST AS MURDERER

John White Webster (1793-1850) was Professor of Chemistry and Mineralogy at Harvard from 1827 to 1850. His publication (over thirty) indicate that he was a thoroughly competent mineralogist. He accumulated two very large mineral collections, the first of which, said to contain over 20,000 specimens,he sold to Harvard in 1824 for four thousand dollars. He was also interested in popularizing science and gave public lectures including an "evening course to the ladies of Cambridge".

Today, however, Webster is remembered for the fact that on August 30,1850 "before a large audience", he was hung for murder.

Professor John Webster.

Webster's problem was the not uncommon one of living beyond his means. To cover the shortfall, in the early 1840's he borrowed from Dr. George Parkman who, curiously enough, appears to have been to a large extent responsible for his original appointment to Harvard. The debt eventually totalled 2432 dollars, more than Webster's annual salary, and was secured by a mortgage over his private mineral collection.

Parkman took money matters, like everything else in his life, very seriously and his stern and insistent dunning extended to the practice of standing at the back of the hall when Webster was lecturing, obviously not listening, just glaring at the lecturer.

Things came to a head on November 23, 1849 when the formidable Parkman confronted Webster in his lecture room and, it was alleged, was struck and killed by Webster. A week later, Ephraim Littlefield, janitor and general factotum, discovered (?) the dissected body scattered in various parts of Webster's laboratory.

At his trial in March 1850 Webster was convicted and sentenced to be hanged. The case is still one of the most frequently cited in American criminal courts, principally in connection with circumstantial evidence, and recent analyses suggest that Webster may have been innocent. Ephraim Littlefield, a key witness, was an old enemy of Webster. He was a disreputable character who eked out his modest wages by digging up fresh graves and selling cadavers to the students at $25 each. In fact, after Webster was executed, the authorities made sure that his body would not be exhumed and sold back to the University.

(It should be emphasized that, as far as mineralogists in general are concerned, circumstances such as outlined above are the exception rather than the rule - janitors also, for that matter)

PATRICK MARSHALL (1869-1950):

SOME NEW SIDELIGHTS

As one of his biographers has noted (Gregg, 1966), Patrick Marshall "was one of New Zealand's outstanding geologists during the first 50 years of this century." When we think of Marshall we may recall his work not only in historical and structural geology (remember the "Marshall Line" ?) but also his interests in entomology (as succinctly noted by a contemporary obituarist; Benson, 1951: 152) and in fossil molluscs, and, as Gregg reminds us, petrologists know his coining of the the name "ignimbrite." I always think of him (for some reason I can't recall) for his paper on the wearing of beach gravels (1938, TNZI 58). Now we are being given some new things by which to remember him.

Recently, a really delightful book has come my way which casts some new light on Patrick Marshall and his family background - which may interest future historiographers of New Zealand geology. This is Kerry Carman's spendidly illustrated and skifully edited version of "*My New Zealand Garden by a Suffolk Lady*", a true New Zealand classic, first published in 1902 (Carman, 1990). Those who enjoy the pleasures of gardens and gardening, combined with the excitement of unravelling the tangled skeins of family history, will like this book very much - a real treasure to own or to give to someone special!

Patrick Marshall comes into this book because the "Suffolk Lady" who remained cloaked in anonymity until Kerry Carman was able to do her horticultural detective work was, in fact, his mother, Emily. Patrick, born in December 1869 at Sapiston, northeast of Bury St Edmunds (where his father had just been appointed vicar), was her fourth child. He was named after Emily's uncle, Admiral Patrick John Blake, R.N., who, as Kerry Carman tells us, "was not above reprimanding Emily in quarterdeck terms if he thought her conversation or behaviour too forward." Emily had, in fact, "six hale old uncles, free from artifice and malicious microbes." Kerry Carman calls them "full blooded old gentlemen" and gives us a vivid picture of Emily's extended family of the time (see Emily's story also, pp 51-52!). They must have had quite an influence on the development of Emily's character as we see it revealed both in her own writings and in Kerry Carmans analysis of her life.

In Kerry Carman's pages we follow the fortunes of the members of the Marshall family as they went to New Zealand, the death of Emily's first husband, the family return to England, Emily's "disastrous and fortunately brief" second marriage to Mr Hamilton Blanco White, the move back to New Zealand, and the whole of the family's subsequent life here.

It is interesting to note, at this time of the celebration of Women's Suffrage in New Zealand, that "Emily, as might be expected when one considers her history, was an ardent advocate of rights for women and in the vanguard of the suffrage movement" which resulted in 1893 of the passing of a bill which allowed women the "basic human right of voting in an election." Kerry Carman notes that by 1890 "Patrick was very active in the Horticultural Society and, with his mother, was planting trees to beautify the streets of Wanganui long before the official Beautifying Society started in the City." Many of the oldest pohutukawas, cabbage trees and scarlet-flowering gums still existing in Wanganui, especially the long rows of gum trees in Victoria Park, owe their existence to Patrick Marshall and his mother. Much of interest lies in the following pages about Patrick Marshall's sporting achievements and scholastic successes, his interest in collecting native flora, as well as his youthful election to the Executive Committee of the Horticultural Society in 1890 in company with such distinguished plant men as H.C. Field, the fern specialist for whom Emily acted as helper with his book on New Zealand ferns. Emily's friendship with leading botanists of the day as well as her own family background which included "notable botanists, plant hunters and Fellows of the Linnean Society" probably had a significant impact on the young Patrick as as he grew in his mother's charge. It could, in fact, have just as easily diverted him to become as great a botanist as he was a geologist, had the fates so directed! Patrick Marshall's wedding in June 1900 to Ruth Dudley, daughter of Archbishop Dudley of Auckland, is recorded in the photograph on page 34. Another photograph (p. 33) shows Dr Marshall with Ruth, his sister Jessie, brother George and friends on the field trip to Ruapehu. The "Suffolk Lady," died in 1936 at the age of 97 (as relatedly anecdotically on page 42).

Patrick Marshall's wedding photograph, 1900. His mother, Emily, sits at the right

"*Emily's Garden*" is a really lovely book (hackneyed though that word has become by common use, I can't think of a truer or more sincere adjective!), and it's all the better for the insight it gives us into some aspects of Patrick Marshall's formative years and the influences that the "Suffolk Lady" undoubtedly had upon him.

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Elliot W. Dawson, Museum of New Zealand Te Papa Tongarewa

MALCOLM MACLAREN : A FORGOTTEN NEW ZEALAND GEOLOGIST

> "Among distinguished men of science who have concerned themselves with the application of geological knowledge to the problems of mining, James Malcolm Maclaren stood pre-eminent. By his death economic geology has lost one of its ablest exponents and the mineral industry a competent and faithful servant. His services and technical advice had been continually sought for more than a generation and the breadth of his travels and experience, coupled with the soundness of his observations and conclusions, gave to his professional opinions a significance and authority well-nigh unique."
>
> Q.J.G.S., 1936

"Amongst distinguished men of science....he stood pre-eminent'

His professional opinions had a "significance and authority well-nigh unique"

Strong words - not to be used lightly.

Yet the person to whom they have been applied in that extract is today unknown to the vast majority of geologists in his own country.

.....

Malcolm Maclaren was born at Thames on 23 October 1873 and that makes him the first New Zealand born geologist. He was educated at Thames High School and in 1892 became a student of James Park at the Thames School of Mines .In 1895 he transferred to the Otago School of Mines on a University Scholarship

After two years at Otago he transferred to Auckland University College where he was an early member of a quite brilliant group of students who graduated in geology under Thomas at the turn of the century.

However, Maclaren's studies at Auckland did not run smoothly.

In those days, all University of New Zealand degree examinations at all levels were set and marked in the U.K. Well and good if you are in favour of external examinations. They don't come more external than that.

Now, Maclaren' troubles started when all the degree examination scripts for 1897 were lost in a shipwreck off Cape Horn and never reached the examiners in the UK. Then, in the substitute

examinations held by the constituent colleges of the University of New Zealand he failed Latin, at the time a compulsory subject for all degrees.

So Maclaren almost missed out on being the world's top mining geologist because his Latin wasn't good enough, but he did go on to get his Latin and, eventually, his several degrees .prizes and scholarships, culminating in a D.Sc. in 1907,Auckland's first in geology

Detail from Otago School of Mines class photograph for 1896. Maclaren is third from left, middle row. (Photo kindly provided by Bill Vance, University of Auckland.)

Whilst he was having these degree problems Maclaren, early in 1898 became the first Director of the Coromandel School of Mines and then in 1900 he was.for a short time. Assistant Geologist to the Queensland Government.

In April 1901 he arrived in London to take up an 1851 Exhibition Science Scholarship under Judd at the Royal School of Mines. The scholarship was for three years but Maclaren was a man of indefatigable and restless energy and within a month of his arrival at London he had decided that he would not hold his scholarship for more than a year.

Towards the end of that twelve month period, back in New Zealand, Alexander McKay was declared medically unfit for field work. Now, if you took field work away from McKay you took away a great deal so the Minister of Mines started looking for his replacement as Government Geologist. The man he chose was Malcolm Maclaren who was offered the position at a salary of 600

pounds per annum but about the same time Maclaren was offered 1000 pounds a year by the Geological Survey of India and so it was to India that he went in September 1902.

The New Zealand Government, however, would not take 'No' for an answer and offer and counter-offer continued to flow between India and New Zealand until early 1904 when the Minister of Mines (McGowan) decided to call open applications for the position. Maclaren gave his final answer in this letter :-

Geological Survey of India,

Calcutta,

16th May, 1904.

Dear Mr McGowan,

I have to acknowledge receipt of your letter of 16th March containing details of position with regard to the vacant post of N.Z. Govt. Geologist. In reply I may state that I have decided not to make application at either £600 or £700. The latter figure meant at the time of offer a sacrifice of at least £300 a year, and more at the present time but as I have pointed out before, I am under a sense of deep obligation to the N.Z.Govt. It seems to me, however, that the action of Govt. in calling for applications releases me from any obligation with respect to my last offer, and as £600 will be only half my prospective salary for the next year or so, I cannot reasonably be expected to apply at that figure.

While I am naturally extremely gratified that you ~~shoul~~ should have offered the appointment to me I yet think that calling for applications, and widely advertising the vacant position, is the best method of securing the best man.

Yours Sincerely,

J. Malcolm Maclaren.

In November 1904 James Mackintosh Bell was appointed to the position of Government Geologist, from 57 applicants, at a salary of 600 pounds per year. Shortly after his arrival in New Zealand Bell's title was changed to Director of the New Zealand Geological Survey. So - if the salary package had been big enough the first director of the re-formed Survey would have been James M. Maclaren not James M. Bell. As it was, it was to be a further 25 years before the Survey got its first New Zealand-born Director

Actually, it would have been difficult for the Minister to meet Maclaren's salary requirement - he himself was earning only 800 pounds per year. In fact, his problem went even deeper. Whilst the negotiations were taking place Maclaren received an offer of 1500 pounds per annum from the Belgian Congo . At the time the salary for the Prime Minister was 1600 pounds and New Zealand does not pay its geologists the same salary as it pays its Prime Minister.

Maclaren left the Geological Survey of India in 1906. One of his reasons for doing so was his confident belief that he could earn 2500 pounds or more per annum in private practice. He appears to have done just that, which makes the Ministers offer of 600 pounds seem rather paltry.

For the next two years , Maclaren devoted his time to writing his book (refer next page). It ran to almost 700 pages and Economic Geology for 1909 ended its five page review of the work with the following statement :

> "Dr. Maclaren is heartily to be congratulated on the production of what is undoubtedly the best general work in any language on the geological and geographical distribution of gold. It is likely to remain the standard for many years."

It was during this period that Maclaren gained a D.Sc. from the University of New Zealand for his work on the Coromandel Goldfields.

James Malcolm Maclaren
(1873 - 1935)

(from 'Diamond Jubilee Souvenir. Thames Goldfields.' Thames Star, 1927.)

GOLD:

ITS GEOLOGICAL OCCURRENCE AND GEOGRAPHICAL DISTRIBUTION

BY

J. MALCOLM MACLAREN, D.Sc.

FELLOW OF THE GEOLOGICAL SOCIETY; FELLOW OF THE ROYAL GEOGRAPHICAL SOCIETY; MEMBER OF THE INSTITUTION OF MINING AND METALLURGY

LATE MINING SPECIALIST, GOVERNMENT OF INDIA; FORMERLY ASSISTANT GOVERNMENT GEOLOGIST, QUEENSLAND; ETC.

SOMETIME NEW ZEALAND GOVERNMENT MINING SCHOLAR, SENIOR SCHOLAR, NEW ZEALAND UNIVERSITY, AND 1851 EXHIBITION SCHOLAR

WITH ONE COLOURED PLATE AND 278 ILLUSTRATIONS

LONDON:

The Mining Journal.

1908

With his book behind him, Maclaren, now in his mid thirties, began his main career, that of a consulting mining geologist, based in England, and this unfortunately, is where the curtain falls on his research activities.

These were the days when confidential reports were not leaked to the media and even by the standards of the time, Malcolm Maclaren was a man of high principles and integrity. This meant that he had the complete confidence of those who enlisted his services. But it also meant that much valuable information that he could have contributed to the science of mining geology remained, unpublished, in confidential company files

For over a quarter of a century Maclaren was almost constantly on the move and by 1929 he was a mileage millionaire and this in the days before air travel and before metric measurement. Shortly before his death in 1935 he claimed, justifiably, to be the world's most travelled man.

He studied most of the larger mining fields and made journeys, often several times, to many countries. In detailing these it is easier to specify the countries that he did not visit. In the course of his career he covered –

All of Europe
All of the Americas except Ecuador
All of Africa
All of Asia except Indo-china
All of Australasia

and ,it should be emphasized, this statement takes in countries such as Sardinia, Estonia, Serbia,Corsica, Sierra Leone,Alaska, Tibet, Korea etc. etc.

Only Russia stands out as a country that Malcolm Maclaren never visited.

Furthermore, most of the mines he studied were in very isolated areas. For example: the Bawdwin mine in Burma which he visited on four or five occasions was in the jungle 800 kms north of Rangoon.

In the course of a journey Maclaren would often receive several successive telegrams from London instructing him not to come home but to proceed elsewhere on another assignment and thus it was that in the 28 months from August 1930 to the end of 1932 he spent only two months at home

Maclaren acted not only for many of the great mining groups but was also frequently employed on behalf of governments. His enquiries were often of great moment, calling for decisions that involved financial and political consequences of the first importance.

During his last journey he took ill in Western Australia but his sense of duty was such that he went on to fulfil a further contract in Victoria. In January 1935 he returned home to England to recuperate but did not recover and he died on 13 March that year.

Obituaries have been located in six overseas journals but there were probably more. There were none in New Zealand journals. He also made the obituary columns of the Times of London and he was the only New Zealand born geologist ever to gain that recognition until Frank Turner got it just a few years ago.

Extracts from some of the obituaries are given below

"Indefatigable as a worker, concise in his reports, courageous in his convictions, his ripe judgement and integrity earned the unshaken confidence of the large groups who esteemed themselves fortunate in counting on his advice."

"Amongst distinguished men of science who have concerned themselves with the application of geological knowledge to the problems of mining, James Malcolm Maclaren stood pre-eminent."

"Maclaren was so averse from publicity, that the fact of his recent serious illness was probably not widely known, any more than the decisive part which he played in the destinies of many great mines, where his reports and advice were accepted as decisive by the big mining groups in whose service he passed most of his extra--ordinarily active career."

" ...his striking ability and unique personality marking him as a leader in his profession."

"...gave to his professional opinions a significance and authority well nigh unique."

"He is a man whose work must be judged not by what he published but by the influence which he exercised in the counsels and on the policy of the leaders of the industry whom he advised."

"To a world-wide circle of mining engineers Dr, Maclaren was known as perhaps the most eminent and widely-travelled of present-day economic geologists."

"...his outstanding work on the Rand forming a fine climax to a remarkable career."

Readers will note the frequent use of superlatives such as 'unique','remarkable','outstanding','pre-eminent','extra-ordinary', 'striking ability'.

Yet if you ask geologists in this country today what they know of a New Zealand geologist by the name of Malcolm Maclaren almost without exception the response will be "Malcolm Who?"

Of course, it was, in a way, unfortunate for Maclaren that his outstanding scientific career was spent as a consulting geologist. Apart from his one book which, naturally, is now well outdated, he left no great body of published papers to be quoted and requoted by successive generations of geologists. His reputation amongst contemporary geologists was lost with the passing of his generation and may now be revisited only through the obituaries.

A final observation -

Malcolm Maclaren was born at the centre of one of New Zealand's most important mining districts. He became the world's leading mining geologist. In 1912 he married into one of the

great mining families of Cornwall and today he lies buried, in Cornwall, at the heart of one of the oldest mining areas in the world.

.....

This article has been based on a talk given at the 1993 Conference of the Geological Society of New Zealand. Much of the information on Maclaren' activities in the early 1900's comes from the Mellard Reade correspondence file at the University of Liverpool (ref. 1285-1303). I am grateful to Ron Keam for drawing my attention to this file. I am also grateful to the National Archives of New Zealand for their permission to reproduce Maclaren's letter to Mr. McGowan (Ref. Mines 1904/741)

Research on Maclaren continues and I am now in contact with several members of the Maclaren family who are providing information that will be incorporated in a more detailed article now in preparation.

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Pages 653 to 655 of 'The Life and Times of Sir Julius von Haast' recounts the negotiations that took place between Haast and the American vertebrate palaeontologist O.C.Marsh regarding the supply of Moa bones. Haast's friend, Professor Macmillan Brown, was fond of narrating the following story of an encounter he had with Marsh :

> On a visit to America he happened to meet Marsh. The latter hearing that he came from Christchurch asked him if he knew Dr. Haast. "Very well," replied Brown, "he's a friend of mine." "Well, I have a bone to pick with him," said Marsh. "A moa bone I suppose?" queried Brown. "Yes, he wrote to me and said that a large number of moa skeletons had been found in a swamp in the district, and that if I remitted him £50, he would send me a complete skeleton when the swamp was drained. I sent him the money, and instead of sending me a skeleton he sent me only a heterogeneous lot of bones." "Oh," chuckled Brown, "so *you* were the *Marsh* he was draining."

WHITE ISLAND DISASTER

TERRIFIC THERMAL ERUPTION

NO SIGN OF LIFE REMAINS.

BUILDINGS BURIED IN DEBRIS.

TEN MEN DISAPPEAR.

A DISASTROUS thermal eruption has occurred at White Island, in the Bay of Plenty, and there is grave reason for supposing that ten lives have been lost. It is practically certain that damage amounting to about £20,000 has been done to the works and plant of the New Zealand Sulphur Company on the island. There is some uncertainty as to the actual date of the disaster, but it would seem to have occurred either on Thursday, September 10, or Friday, September 11.

The names of the men whom it is feared have been killed are as follows:—

A. J. C. McKIM, Manager	R. LAMB
R. WALKER	H. WILLIAMS
STEPHEN H. YOUNG	A. ANDERSON
J. BYRNE	R. WARING
W. J. DONOVAN	— KELLY

The whole of the first seven men named were from Auckland, and it is believed that all but Byrne were unmarried. With regard to Andersou, Waring, and Kelly, there is some doubt whether they were on the island, but it is thought probable that they were. An eleventh man, who had been engaged by the manager in the capacity of cook, is known not to have kept his engagement. All the employees, other

DESCRIPTION OF ISLAND.

A DYING VOLCANO.

SULPHUR IN THE CRATER.

OPERATIONS OF COMPANY.

White Island is really little more than the summit of what has been regarded as an extinct volcanic mountain sharply cleaving the deep waters of the Bay of Plenty. Until the yellowish-green lake that until recently occupied the crater was drained away, the island appeared to be little more than a mere sholl with only one breach in the towering cliffs that guarded the crater from the inroads of the heavy seas that beat constantly upon the shores.

Roughly speaking, the island is circular, with a diameter of about one mile and a-half. The only landing was on the south-western side of the island, at what was known as Crater Bay, and which was really the beach referred to. In this vicinity a wharf was erected, and gave access to a stretch of flat land, running in to the shores of the old lake—formerly a distance of somewhat over 100 yards. To the right or south of the wharf was a high bluff, known as Troup Head, while to the left commenced the almost complete circle of cliffs running around the northern portion of the island to end in a cliff 1000ft high at the north-east side. Formerly a steaming sulphurous lake occupied the greater portion of the floor of the crater, but the company's draining operations have resulted in a larger area of flat land on which have been secured rich deposits of sulphur.

Numerous Fumeroles.

The newcomer stepping ashore and looking through the breach and across the crater bed was confronted with sulphur-yellow clouds beating their way up the black cliffs on the far side; more often than not the clouds were so thick that the hill tops were blotted out. Particularly

The above comes from the New Zealand Herald for Monday, September 21, 1914. The full article runs to four complete columns of the newspaper. Tradition has it that the only survivor of the disaster was the camp cat.

White Island was named on 2 November 1769 during Cook's first voyage -

> On the 2d, in the morning, we diſcovered three ſorts of land; but, as the weather was hazy, could not make many obſervations. We alſo paſſed three other iſlands: one of them was rocky, high and barren, which we called White Iſland.
>
> – S. Parkinson. A Journal of a Voyage to the South Seas, 1773

We can conjecture as to the nature of the 'haze'. Do we have here the first record of a volcanic eruption in New Zealand ?

Parkinson also makes the following comment in reference to Poverty Bay -

> A vaſt quantity of pumice-ſtone lies all along upon the ſhore, within the bay, which indicates that there is a volcano in this iſland.

In this matter Parkinson is a great deal more enthusiastic than Hawkesworth who, in his official account of thevoyage refers merely to

> a large piece of pummice ſtone floating upon the water; a ſure ſign that there either is, or has been a volcano in this neighbourhood.

Hawkesworth's official account of Cook's first voyage was published on June 10,1773, followed two days later by Parkinson's account which had been completed earlier but withheld from publication by an injunction obtained by Hawkesworth. However it seems likely that, in defiance of the injunction, some copies of Parkinson's journal were issued prior to June 10. This would make Parkinson's Poverty Bay comment above the first reference to volcanism in New Zealand. Also, his would be the first mention of White Island.

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Charles Lyell, 1797–1875

Eduard Suess, 1831–1914

510 — La plus grande, la plus long[ue] portante crevasse se trouvait du nord [au] bien visible et déjà large à l'aurore du [sixième] n'empêchait pas la communication des [deux] l'autre. Cette crevasse aura été peut-être [primitive] largeur; elle divisait la terre presqu'à [partir] indiquée. On pouvait pressentir qu'une [séparation] manquable; que la masse la plus grande [flotterait] en raison de sa pesanteur, et que la [masse] serait repoussée à une distance [proportionnelle] un équilibre proportionnel.

511. — La masse la plus forte [est] à l'est, et elle y est restée.

Nous ne savons pas de quel nom on appelait, à l'[époque] du sixième jour, le continent de cette masse; [plus] on l'appela, comme de nos jours, l'Asie, l'Afrique et l'Europe.

La grosse masse partielle, dont la crevasse s'étendait du nord au sud de l'aride, était à l'ouest, et dans l'éloignement qu'elle a subi, sa surface s'est portée plus à l'ouest encore; cette masse forma elle-même un grand continent, que nous appelons aujourd'hui l'**Amérique**.

Arthur Holmes, 1890–1965

Alfred Lothar Wegener, 1880–1930

Sir Harold Jeffreys, 1891–1985

Preuves de la formation de l'Amérique.

Sommaire. — Les faits toujours appuyés de leurs preuves, 522. — *Preuves physiques*; correspondance des caps et des golfes, 523. — Preuve tirée du système des volcans, 524. — Nomenclature des principaux volcans, *note* U, *id.* — Tremblement de terre de Lisbonne, 525. — Tremblement au Pérou, 526. — Cataclysme au Kamtschatka, 527. — Cataclysmes partiels; effets à attendre du prochain cataclysme général, 528. —

James Alexander Logie Du Toit, 1878–1948

Harry Hammond Hess, 1906–1969