

heavy minerals in sediments. Admittedly I never looked for them, but when present they tend to be conspicuous. They should be present even in older sediments. But perhaps they don't survive in sea water. They must weather faster in our NZ environment; there must be as many hitting our region as Australia, and you have shown that they do come to NZ (at any rate to Dunedin!).

I made a very brief passing reference to them at a forensic science conference in Melbourne in 1969, published in 1973 - The examination of paint flakes, glass and soils for forensic purposes, with special reference to electron probe microanalysis. Journ. Forensic Science Soc. 13(1):5-15.

*Best wishes,
David Smale*

28 Bronte St, Nelson 7010

.....

Michael J. Selby (1936-2018) ONZM. BA(Hons). MA. DipEd. DPhil. DSc.

David J. Lowe, Campbell S. Nelson and Peter J.J. Kamp
School of Science (Earth Sciences), University of Waikato, Private Bag 3105,
Hamilton 3240 (david.lowe@waikato.ac.nz)



Figure 1. Michael Selby (left) with colleagues Peter Kamp and David Lowe, with whom he undertook a sledging expedition in Antarctica's Britannia Range in the 1978-79 field season, at a function in December, 1987. (Photo: Ross Clayton).

Michael Selby died in Auckland on 21 January 2018 aged 82. In his professional career as an Earth scientist at the University of Waikato for nearly 40 years, Michael began as a junior lecturer and ended as deputy vice chancellor (Fig.1). He played a pivotal role in helping to establish the Department of Earth Sciences, and its unique, integrative multi-disciplinary approach, at the University of Waikato from 1970.

Michael was a geomorphologist/geographer trained at Oxford University (after a two-year stint in the Military Police of the British Army, based in Berlin), receiving an MA as well as a BA(Hons) and a DipEd. Following a job teaching at Christ's College in Christchurch, Michael was appointed as a junior lecturer in physical geography at the Waikato Branch of the University of Auckland (in Hamilton). After its founding in February, 1964, Michael transferred to the University of Waikato in 1965 when the first students were enrolled. He was then appointed in 1969 to the new Department of Earth Sciences with foundation professor John McCraw, helping to prepare the department in the School of Science to open its doors to students in 1970 (McCraw 2002). Harry Gibbs joined McCraw and Selby soon after and the three set out to teach Earth sciences, with new staff being appointed as student numbers grew rapidly.

Michael's DPhil thesis was on the erosion of Pumice Soils in central North Island using different vegetation cover, rainfall, etc, together with factor analysis, in an experimental and novel computing approach (Selby and Hoskins 1973). His DPhil thesis, conferred in 1972, was the first to be awarded in Earth Sciences, and one of the first three doctorates to be awarded (on 2 March 1972) by the University of Waikato.

Studying landsliding processes and drivers in the Whitehall hills area near Cambridge early in his career, Michael had already made a name for himself by writing two text books, "Surface of the Earth" volumes 1 (1967) and 2 (1971). The books were used in some high schools as well as universities, and were responsible for attracting a number of students to the fledgling department. Awarded a personal chair in 1980, Michael's career morphed into rock and soil mechanics, bringing together geomorphology (making it more quantitative) and engineering geology. Michael developed simple portable equipment to assess the mass strength of rocks and, from this and a number of other easily assessed parameters, he established a 'Rock Mass Strength Index' which has been adopted internationally, not only by geologists and geomorphologists, but also by engineers (Selby 1980; Selby et al. 1988).

Michael wrote what is now regarded as a definitive textbook, "Hillslope Materials and Processes" (Selby 1993). It was named in 2005 as one of the 10 'classic' books of geomorphology and its author as one of the 20 most-cited geomorphologists in the English language, highlighting the fact that Michael's reputation extended well beyond New Zealand (Doyle and Julian 2005). Michael published seven books in all, including "Landforms of New Zealand" (Soons and Selby 1992), the first synthesis of New Zealand geomorphology and landscapes since the seminal books of Sir Charles Cotton of the 1940s, and "*Earth's Changing Surface*" (Selby 1985), *written in part to support the first-year papers in Earth sciences that Michael helped to teach (among others) at Waikato.*

Michael undertook four expeditions to Antarctica, leading three of them. In 1984 he was awarded a DSc from Oxford University in recognition of publication of his highly regarded texts and papers on rock slope stability.

Michael became deputy vice chancellor of the University of Waikato in 1986, and his work in this role included leading negotiations for the Tainui settlement for the campus lands on behalf of the university. He retired in February 2002 (as emeritus professor) (Lowe and Kamp 2002) and also became an Officer of the New Zealand Order of Merit (ONZM) for services to education in 2005. An obituary for Michael appeared in the *Waikato Times* on Saturday 10 February, 2018; a more comprehensive obituary is in preparation.

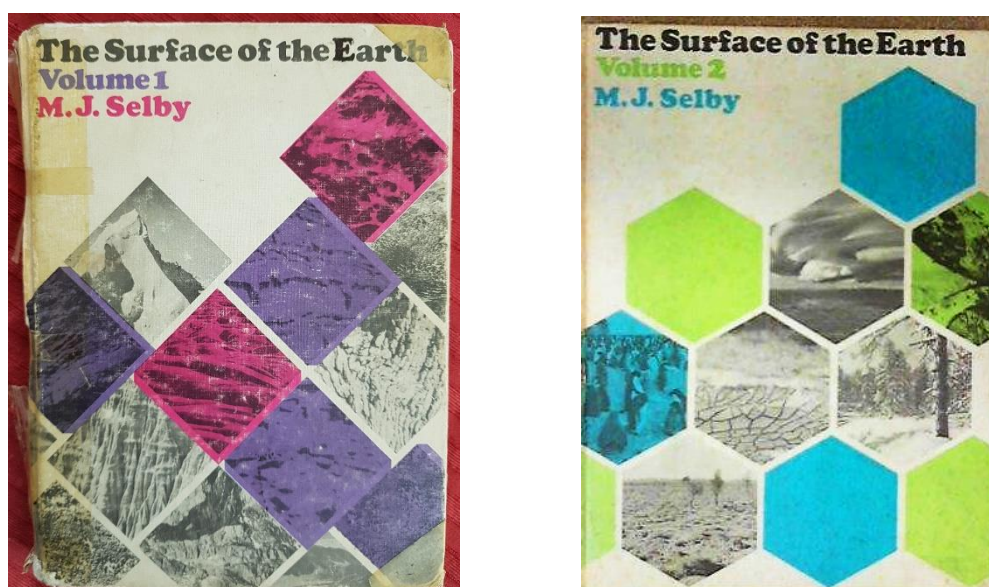


Figure 2. Michael Selby’s influential geomorphology in 2 volumes (Cassell) which finally superseded that of Charles Cotton in the school geography curriculum of the late 1960s. Thank you Michael Selby for influencing hundreds of students.

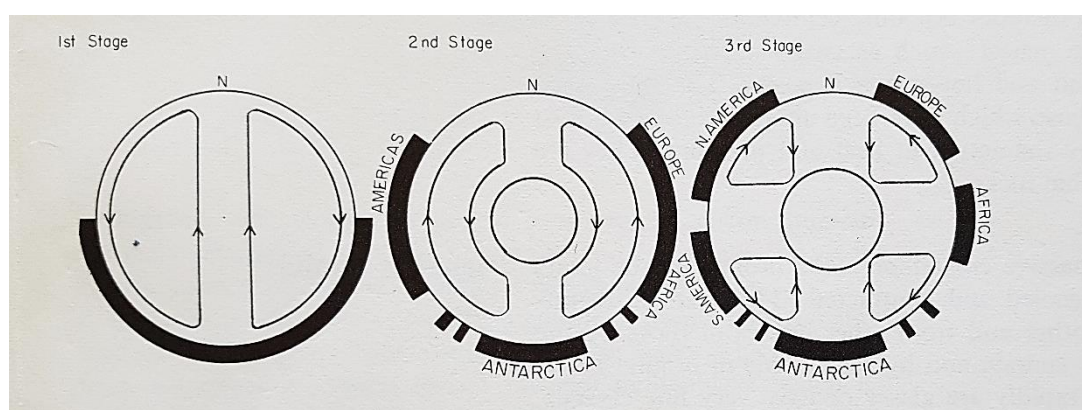


Figure 3. Cropped from Vol.1. p15 showing the ‘convection current hypothesis’ of Meinesz and De Sitter. It was all about sial and sima in the 1960s!



Figure 4. David Burns alongside an exposure of Te Ranga Ignimbrite (with carbonised logs) near Tauranga in April, 1980. (Photo: David Lowe).

David Burns (known as “Davey” to many), died in Auckland on 27 January 2018 at the age of 64. David was the chair of the New Zealand Geotechnical Society from 2011-13 and immediate past-chair 2013-15. Earlier he was an elected committee member, treasurer, and vice-chair from 2008-11 (serving eight years in all on the society’s executive). David played a significant role in developing a route for engineering geologists to gain professional status as chartered members in Engineering New Zealand (formerly Institution of Professional Engineers New Zealand, IPENZ). He also helped to revise the guidelines for field description of rocks and soils for engineering purposes (Williams et al. 2005). David was a foundation member of the Waikato Branch of the Geological (now Geoscience) Society of New Zealand that was formed in 1975, and a member of the local organising committee for the society’s annual conference held in Hamilton in 1976.

A graduate of Waikato University’s Department of Earth Sciences after initial enrolment in 1972, David completed an MSc with Cam Nelson in 1980 on carbon and oxygen stable isotope geochemistry of Cenozoic calcareous sedimentary rocks (Burns and Nelson 1981; Nelson and Burns 1982; Nelson et al. 1983). He then embarked on his career in engineering geology, initially in Tauranga (Fig. 4) and then in Auckland, finishing as a highly respected,

experienced technical director in ground engineering at AECOM (Auckland), despite having no formal training in the discipline other than his Waikato degrees in Earth sciences. David spent considerable time overseas including in Belize, Indonesia, Bangladesh, Lao PDR, and Vietnam as well as throughout New Zealand, working on a wide range of projects in engineering geology.

Towards the end of his career, as ill-health slowed him down, David undertook a lot of editing, helping colleagues with less experience to knock their reports into excellent shape.

References

- Burns, D.A., Nelson, C.S. 1981. Oxygen isotopic paleotemperatures across the Runangan-Whaingaroan (Eocene-Oligocene) boundary in a New Zealand shelf sequence. *New Zealand Journal of Geology and Geophysics* 24, 529-538.
- Doyle, M.W., Julian, J.P. 2005. The most-cited works in *Geomorphology*. *Geomorphology* 72, 1-4.
- Lowe, D.J., Kamp, P.J.J. 2002. Retirement of Michael Selby. *Geological Society of New Zealand Newsletter* 129, 44-45.
- McCraw, J.D. 2002. Geology or Earth sciences? *In: Adams, J.A. (editor), "Jubilee Reminiscences: Fifty years of soil science memories". New Zealand Society of Soil Science Occasional Publication* 3, 40-42.
- Nelson, C.S., Burns, D.A. 1982. Effect of sampling interval on the reliability of oxygen isotopic paleotemperatures – an example from the New Zealand Early Miocene. *New Zealand Journal of Geology and Geophysics* 25, 77-81.
- Nelson, C.S., Burns, D.A., Rodgers, K.A. 1983. The taxonomic status, and isotopic evidence for paleoenvironments, of giant oysters from the Oligocene Te Kuiti Group, South Auckland, New Zealand. *New Zealand Journal of Geology and Geophysics* 26, 289-299.
- Selby M.J. 1980. A rock mass strength classification for geomorphic purposes: with tests from Antarctica and New Zealand. *Zeitschrift für Geomorphologie* 24, 31-51.
- Selby, M.J. 1985. *Earth's Changing Surface*. Clarendon Press, Oxford, 607 pp.
- Selby, M.J. 1993. *Hillslope Materials and Processes*, Second Edition. Oxford University Press, New York, 451 pp.
- Selby, M.J., Hoskins, P.J. 1973. The erodibility of pumice soils of the North Island, New Zealand. *Journal of Hydrology (New Zealand)* 12, 32-56.
- Selby, M.J., Augustinus, P.C., Moon, V.G., Stevenson, R.J. 1988. Slopes on strong rock masses: modelling and influences of stress distributions and geomechanical properties. *In: Anderson, M.G. (editor), Modelling Geomorphological Systems*, 341-374.
- Soons, J.M., Selby, M.J. (editors) 1992. *Landforms of New Zealand*, 2nd edition. Longman Paul, Auckland, 531 pp.

Williams, A., Burns, D.A., Farqhar, G., Mills, M. 2005. *Field description of soil and rock. Guideline for the field classification and description of soil and rock for engineering purposes*. New Zealand Geotechnical Society, Wellington, 39 pp.

Society Awards 2017

McKay Hammer:

Competition for the McKay Hammer was incredibly fierce in 2017 and as such a joint award was made.

Nicholas Golledge

Our first awardee was Associate Professor Nicholas Golledge from the Antarctic Research Centre at Victoria University of Wellington. Nick was nominated on the basis of not one but three papers published in *Nature*, *Nature Climate Change* and *Nature Communications* respectively.

Golledge N.R., Kowalewski D.E., Naish T.R., Levy R.H., Fogwill C.J., Gasson E.G.W. (2015) The multi-millennial Antarctic commitment to future sea-level rise. *Nature*, **526**, 421-425

Davies, B.D., Golledge, N.R., Glasser, N., Carrivick, J., Ligtenberg, S., Barrand, N., van den Broeke, M., Hambrey, M. & Smellie, J. (2014) Modelled glacier response to centennial temperature and precipitation trends on the Antarctic Peninsula. *Nature Climate Change* doi:10.1038/nclimate2369

Golledge, N.R., Menviel, L., Carter, L., Fogwill, C.J., England, M.H., Cortese, G. & Levy, R.H. (2014) Antarctic contribution to meltwater pulse 1A from reduced Southern Ocean overturning. *Nature Communications* **5**, 5107. DOI:10.1038/ncomms6107

These papers showcase Nick's world leading modelling of the Antarctica Ice Sheet, calibrated in the latter two papers by geological evidence of paleo-glaciation. The 2015 *Nature* paper covers simulations of the Antarctic Ice Sheet's response to a warmer ocean and climate as dictated by a suite of greenhouse gas emission scenarios. All but one of the scenarios (that of much lower emissions beyond 2020) would cause a marked decline in sectors of the Antarctic ice-sheet, accompanied by rises in global sea level that could reach 3 m by 2300 and continue to rise for millennia thereafter. This is a substantive contribution to what is a very topical issue on the international stage.

Daphne Lee

The second awardee was Associate Professor Daphne Lee from the Department of Geology, University of Otago. Again this nomination was based on a body of work over the last three years rather than a single contribution and