

# **CURRICULUM VITAE**

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## **Web Pages**

- <http://www.jepspectro.com>
- <http://www.jepspectro.homelinux.com>

## **Tertiary Education**

Degrees, qualifications, awards and professional membership

- PhD Victoria University (1988)
- MSc Victoria University (1968)
- MNZIC

## **Distinctions/Honours**

- NZIC 1981 Golden Jubilee Rocklabs-Prochem Award, Runner up.
- Geological Society of New Zealand 2000, J T Kingma Award for excellence recognising the important contribution made by technicians in the earth sciences in New Zealand.

## **Employment Record**

- 2009 - 2011 Post Doctoral Fellow, School of Chemistry and Physics, Victoria University of Wellington.
- 1997 - 2009 Senior Technician and Research Associate, School of Earth Sciences, Victoria University of Wellington.
- 1992 - 1997 Scientist, Industrial Research Limited
- 1974 - 1992, Scientist, DSIR Chemistry Division
- 1974 - Colombo Plan Secondment to Malaysia and Indonesia.
- 1969 - 1974 Scientist, Water and Soil Division, Ministry of Works.
- 1965 - 1968 Tutor, English Language Institute, Victoria University.

## **Experience**

- Mass spectrometry.
- Analytical/Physical chemistry.
- Atomic spectrometry.
- Instrument development, computerisation and software writing.
- Electronic design.

- Antarctic field experience including 9 weeks unsupported on Polar Plateau.



**Polar Plateau, 1990**

- Commercial applications of portable mass spectrometry (Tasman, Ceilcote, Robert Chemicals, Feltex Rubber, W R Grace, JNL Triboard, NZ Army, Allflex, Moa Point, Geogas sampling, Penstock pipe coatings, Wall board fumes)
- Oxidation catalysis at low temperatures.
- Titanium alloy nitriding, thermal and plasma based methods.
- Thermogravimetric methods with evolved gas analysis.
- Field instrumentation Portable gas chromatograph, Sensitive downhole light sensor.

- Electron microscopy.
- Xray fluorescence.
- Electron microprobe operation, analysis and maintenance.



**Electron Microprobe laboratory, 2009**

- Sample treatment and coating.
- Laser light scattering from aerosols.
- Mass spectrometry - calorimetry.
- Macro and micro photography
- Digital image capture and image processing.
- Gas Chromatography.
- Gas phase infrared spectrometry

### **Publications to 2010**

Trace Metal Partitioning in a Nearshore Tropical Environment: Geochemistry of Carbonate Reef Flats Adjacent to Suva Harbor, Fiji Islands, John D. Collen Jane E. Atkinson and John E. Patterson, Pacific Science (2011), vol. 65, no. 1:95–107.

Two unusual Diatoms from New Zealand: Tabularia Variostriata a new species and Eunophora Berggrenii. Margaret A. Harper\*, David G. Mann and John E. Patterson, Diatom Research (2009), Volume 24 (2), 291-306.

Alexander McKay and development of the telephoto lens, John Patterson, New

*Zealand Journal of Geology & Geophysics*, 2009, Vol. 52: 349–365

New diatom taxa from the world's first Marine Bioblitz held in New Zealand: *Skeletomastus* a new genus, *Skeletomastus coelatus* nov. comb. and *Pleurosigma inscriptura* a new species. Margaret A. Harper\*, John E. Patterson, John F. Harper, *Acta Botanica Croatica* 68 (2) 2009.

The following photo, taken in near darkness, was published in the recent book “A Continent on the Move: New Zealand Geoscience into the 21<sup>st</sup> Century” Ian Graham (Chief Editor), GSNZ Miscellaneous Publication 124, 388 pp. Geological Society of New Zealand 2008.



**Luminescence Laboratory 2008**

Monitoring and mapping of hydrogen sulphide emissions across an active geothermal field: Rotorua, New Zealand. C.J. Horwell, J.E. Patterson, J.A. Gamble, A.G Allen. *Journal of volcanology and geothermal research*. Volume 139, Issues 3-4 , 15 January 2005, Pages 259-269

Evaluation of a novel passive sampling technique for monitoring volcanic hydrogen sulfide. C.J. Horwell, A.G. Allen, T. A. Mather, J.E. Patterson. *J. Environmental Monitoring*, 2004, 6,1-7.

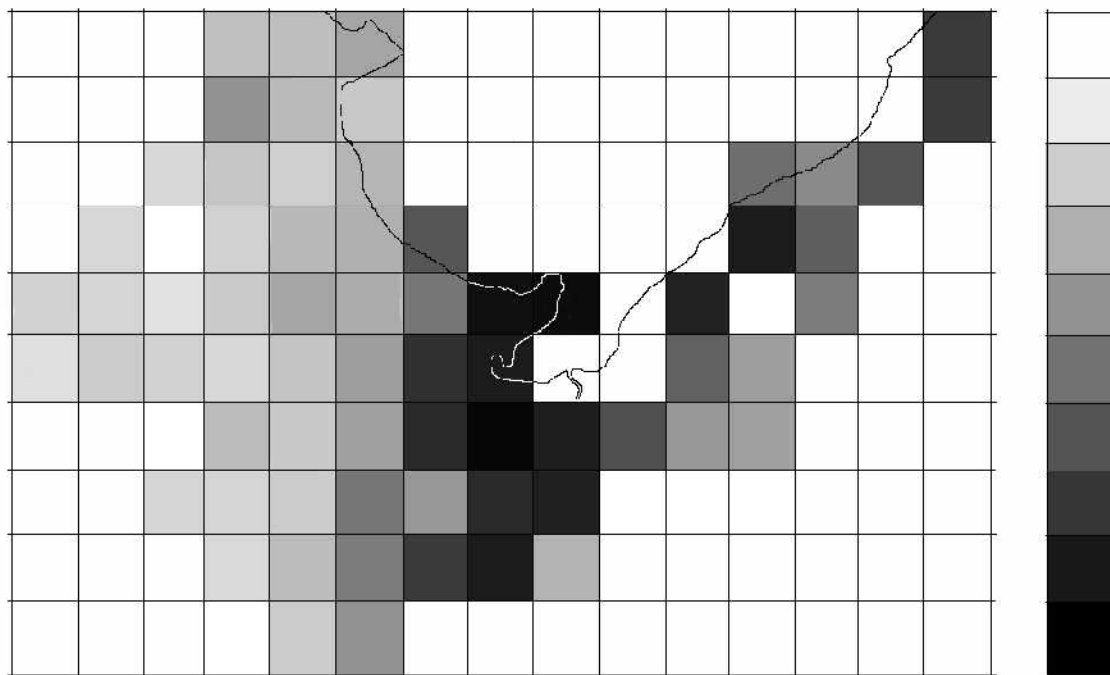
Sedimentology and Geochemistry of reef flat sediments, Suva, Fiji: Implications for cement manufacture. M.J. Morris, J.D. Collen, R. Smith, J.E. Patterson. *Environmental and Engineering Geoscience*, vol IX, No 4, Nov 2003, 295-304

A low cost technique for H<sub>2</sub>S monitoring, with implications for health hazard research. C,J,Horwell, A.G. Allen, T.A. Mather, J.E. Patterson. Poster, Cities on volcanoes conference, Hilo, Hawaii., 2003

Trace element geochemistry of mantle peridotites from the Antarctic Rift System: a laser ablation ICP-MS study, Gamble, J.A., **Patterson, J.E.**, Eggins, S.E., Wysoczanski, R.J., *Geological Society of New Zealand Annual Conference: Programme and Abstracts*, Geological Society of New Zealand Miscellaneous Publication 107A (Lower Hutt, Geological Society of New Zealand, 1999), p. 47 (abs).

Structural and metamorphic geology of the Alpine Schist: implications for tectonic processes, brittle-ductile transition, fluid release and electrical conductivity. Grapes, R., Little, T., Ilg, B., Vry, **J.**, **Patterson, J.**, *Pre- and post-workshop volumes for the South Island Geophysical Transect (SIGHT), New Zealand Workshop*, (Hawaii, University of Southern California, 1999), pp. 1-15.

A method for assessing exposures to geothermal air contaminants in Rotorua, John Patterson and Claire Horwell. Invited talk to workshop on Exposure Assessment Methodologies, SIRC'98, the 10th Annual Colloquium of the Spatial Information Research Centre, Otago University, 19 November 1998.



**H<sub>2</sub>S map of Rotorua, 1998**

Improvements to a roadside remote emission measurement system. R Gong, U Grimm and J Patterson. Presented at IPENZ Conference 98, Auckland, February 1998.

Garnet and Spinel from rock pools, Princess Bay, south Wellington coast. R H Grapes, J E Patterson, J Thornton, Mineralogical Society of New Zealand Newsletter, 7, 12-14 (1997).

Atmospheric H<sub>2</sub>S monitoring in Rotorua - a novel approach. C Horwell, J Patterson, J Gamble, P Shoemack and P Weinstein. Poster presented at the Geological Society of New Zealand Annual Conference, Wellington, November 1997.

Structural Evolution in Gel-Derived Mullite Precursors. K J D MacKenzie, R H Meinhold, J E Patterson, H Schneider, Maria Schmücker and D Voll, Journal of the European Ceramic Society 16, 1299-1308 (1996).

Nuclear reaction analysis of nitrided Ti and Ti<sub>6</sub>Al<sub>4</sub>V. I C Vickridge, W J Trompeter, I W M Brown and J E Patterson. Nuclear and Instrumental Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms. 99 (1995) 454-457.

A Thermogravimetric Analysis System for metals and Alloys Exposed to Corrosive Gases in the Temperature Range 100°C to 700°C. P G H McIlhone, K A Lichti, R Lankshear and J E Patterson, IRL confidential Report 18925.03, 1995.

Low Temperature Oxidation catalysts for the Removal of Volatile Organic Carbon. L M Parker and J E Patterson, IRL Confidential Report No. 426, ISSN 11-9281, 1995.

Portable mass spectrometer measurements at the Moa Point milliscreening plant. J E Patterson Report to ESR. 1 June 1995

TRS scrubber performance - observations. J E Patterson, Report to Tasman Pulp and Paper Limited. 18 January 1995.

Low Temperature Oxidation Catalysts. L M Parker and J E Patterson, Annual Report 1993/94, IRL Report 241, 1994.

Second reduced sulphide odour reduction trial at Tasman Pulp and Paper Ltd. J E Patterson. IRL Confidential Report 252, June 1994.

Reduced sulphide odour reduction trial at Tasman Pulp and Paper Ltd. J E Patterson, IRL Confidential Report 183, April 1994.

Air measurements at Kenepuru Hospital using portable mass spectrometers. J E Patterson, Report to Capital Coast Health, June 1994.

Construction of a Photoacoustic Mercury Detector. J E Patterson, CD 2339, DSIR Chem Div, June, 1994



Applications of the photoacoustic effect in mercury vapour. J E Patterson. Presented at the 1995 International Chemical Congress of Pacific Basin Societies, Hawaii, December 1995.

Preparation of low temperature oxidation catalysts by decomposition of platinum ammine complexes inside zeolites. L M Parker and J E Patterson. Presented at the 1995 International Chemical Congress of Pacific Basin Societies, Hawaii, December 1995.

Preparation of low temperature oxidation catalysts by decomposition of platinum ammine complexes inside zeolites. L M Parker and J E Patterson, Presented at the NZIC Inorganic specialist symposium, Massey University, February 1995.



Mass Spectrometer at Tasman Pulp and Paper Ltd., 1994

## Older Publications

### Theses

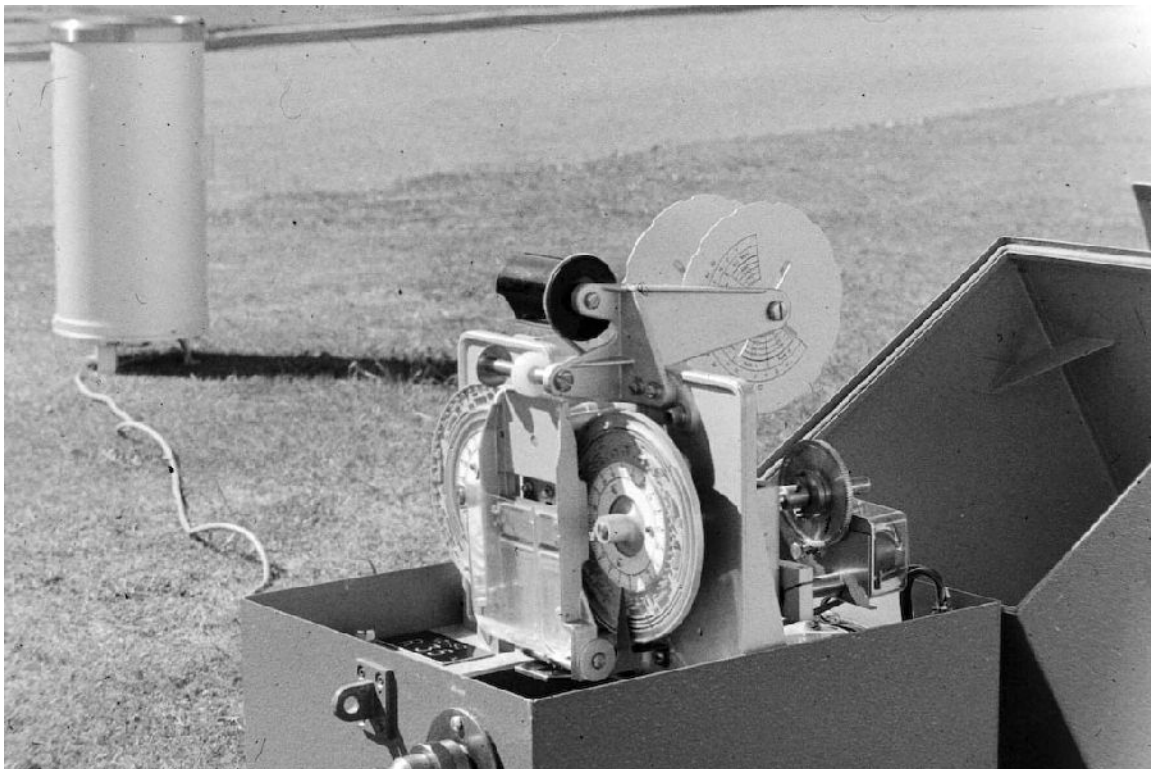
A Raman Spectrograph. J. E. Patterson, MSc Thesis, Victoria University, Wellington, 1970.

The Photoacoustic Effect in Mercury Vapour. J. E. Patterson, PhD Thesis,

Victoria University, Wellington, 1988.

### **Papers**

Digital event recorders for representative and experimental basins. A. Chandler and J. E. Patterson. Symposium on the results of research on representative basins, IASH-Unesco, Publication No. 96, 1970, 700-707.



**Event Raingauge 1972**

A combined event and fixed-time recorder. J. E. Patterson. Journal of Hydrology (NZ), 10(2), 1971, 141-144.

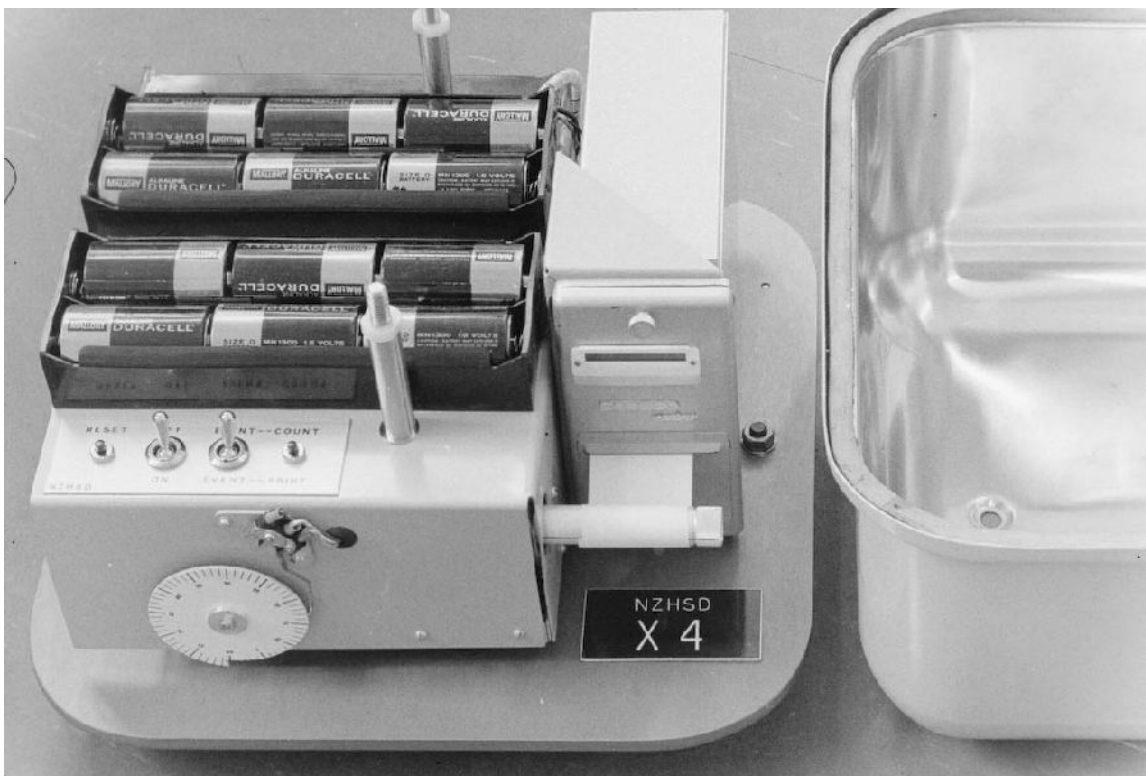
A multichannel event recorder for hydrological research. J. E. Patterson. Journal of Hydrology (NZ), 11(1), 1972, 55-61.

A 10 channel adaptor for use with a battery powered chart recorder. J. E. Patterson. Journal of Hydrology (NZ), 11(2), 1972, 88-93.

A printing counter for the field recording of events. J. E. Patterson. Journal of Hydrology (NZ), 17(1), 1978, 31-38.

**Printing Counter 1974**





A simple interface for a scientific calculator. J. E. Patterson. N Z Electron, 4(4), 1978, 5-6

Atomic absorption spectrometric determination of cyhexatin in apples. J. L. Love and J. E. Patterson. Journal of the Association of Official Analytical Chemists, 61, 1978, 627-628

Oxygen Plasma Asher. J. E. Patterson. Analytical Chemistry, 51, 1978, 1087-1089.

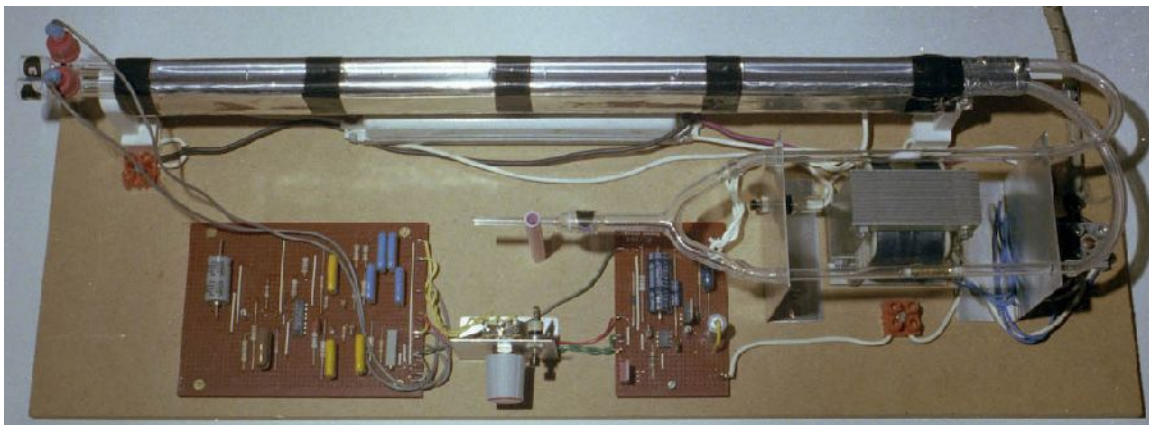
Algorithm for the determination of sodium, potassium, calcium and lithium over wide concentration ranges by flame emission spectrometry. J. E. Patterson Anal. Chim. Acta, 107, 1979, 201-209.

Rotary sample comparison valve for flame specrometry. J. E. Patterson. Analytica Chimica Acta, 125, 1981, 193-198

A sensitive photoacoustic mercury detector, J. E. Patterson, Anal. Chim. Acta, 136, 1982, 321.

Comparison of the levels of the trace metals in a health food extract, "Seatone", and in other preparations of the green-lipped mussel Perna Canaliculus. R. J. Weston and J. E. Patterson, NZ J. Sci. 26, 1983, 21.

A differential photoacoustic mercury detector, J. E. Patterson, Anal. Chim. Acta,

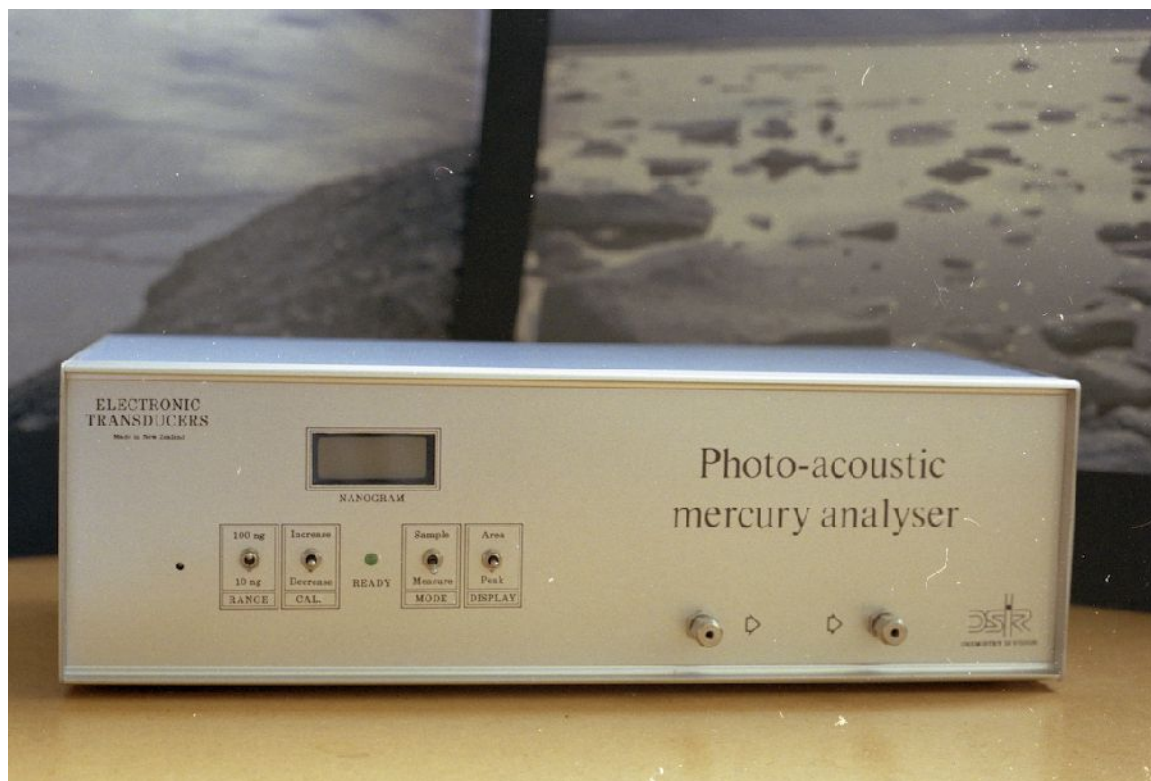


164, 1984, p119-126.

### **Prototype photoacoustic mercury analyser, 1982**

Thermal decomposition of ZSM-5 and silicalite precursors. L. M. Parker D. M. Bibby and J. E. Patterson *Zeolites*, 4, 1984, 168-174.

Mercury in Human Breath from Dental amalgams, J. E. Patterson, B. G. Weissberg and P. J. Dennison. *Bull. of Environ. Contam. And Toxicol.* 34, 1985, 459-468.



### **Commercial Photoacoustic mercury analyser**

Relation between Photoacoustic Amplitude and Quenching of Mercury 3P1 --- 1S0 Fluorescence by hydrogen in Argon, J. E. Patterson, J. Chem. Soc., Faraday Trans. 2, 83, 1987, 255.

Atmospheric Mercury Concentrations inside Scott Base. S. J. De Mora, J. E. Patterson and D. M. Bibby, New Zealand Antarctic Record, 8, 1, 1987, 5.

Levels of Atmospheric Mercury at Two Sites in the Wellington Area, New Zealand. D. M. Bibby and J. E. Patterson, Environmental Technology Letters, 9, 1988, 71.

Gas Chromatographic Detector Based on Enhancement of Mercury 253.7 nm Photoacoustic Signals by Hydrocarbons in a Hydrogen Carrier. J. E. Patterson, Anal. Chim. Acta, 226, 1989, 99.

Mercury Content of Antarctic Surface Snow: Initial Results. Dick, A.L., Sheppard, D.S. and Patterson, J.E. Atmospheric Environment 24 A(4) 973-978 (1990).

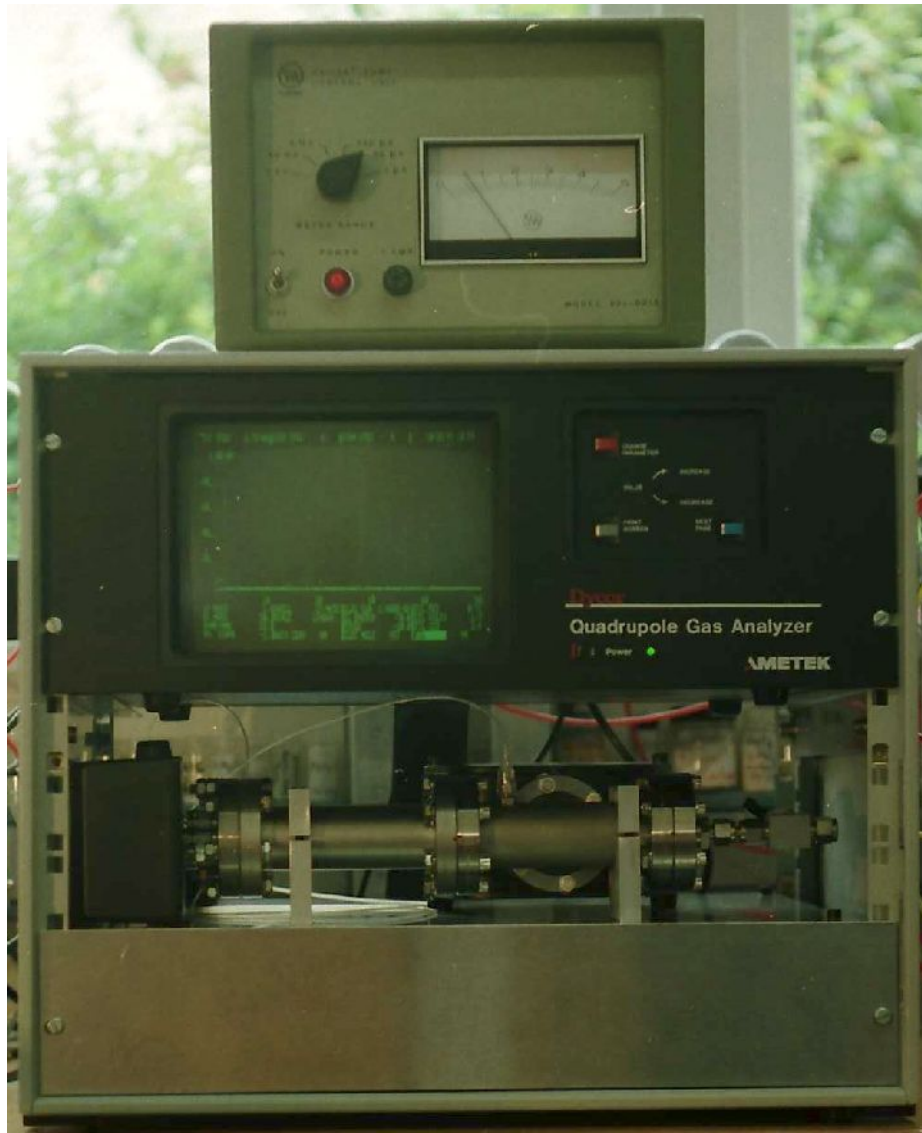
Mercury content of Antarctic Ice and Snow: Further results. Sheppard, D.S., Patterson, J.E., Lyon, G.L. and McAdams, M.K. Atmospheric Environment, 25A (8) 1657-1660 (1991).

Baseline atmospheric mercury studies at Ross Island, Antarctica. de Mora, S.J., Patterson, J.E. and Bibby, D.M., Antarctic Science 5 (3), 323-321 (1993)/

Conducting Soil Gas Surveys of New Zealand Geothermal areas with a Portable Mass Spectrometer. Finlayson, J.B. and Patterson J.E., , Proceedings, 14th New Zealand Geothermal Workshop, November (1992).

Developed membrane inlet ion pumped mass spectrometer for portable applications. Wrote software which controls mass spectrometers and captures data from devices such as the Mettler thermobalance, the Elatec controlled atmosphere furnace, kilns, and a minifurnace developed for catalysis studies (1991).

Synthesis of submicron b-SiC from Colloidal Silica Precipitated from Geothermal discharge water. Barris, G.C., Brown, I.W.M. and Patterson, J.E., "Ceramics, adding the Value". Proceedings of the International Ceramic Conference, Australia, p481. Editor M.J. Bannister (1992).



**Portable ion pumped mass spectrometer 1996**

## **Reports**

A general purpose event water level recorder. J. E. Patterson. Ministry of Works, Hydrological Research Progress Report, No. 14, 1973.

A general purpose event water level recorder (Capricorder model 1598). J. E. Patterson. Ministry of Agriculture and Fisheries (Malaysia) Hydrological Procedure No. 3, 1973.

Report to Foreign Affairs on Colombo Plan secondment to Malaysia and Indonesia 15/2/1974 to 18/4/1974.

Report to Dominion Analyst. ALCOLMETER - a description of components and mode of operation, P. T. Wilson and J. E. Patterson. July 1978.

Atomic Spectrometry Programs for the HP9815 Computing Controller. J. E. Patterson. Report CD2309 DSIR Chem Div 1980.



**Perkin Elmer AA403 atomic absorption spectrometer, 1976**

Report of visit to Australia March-April 1982 J. E. Patterson CD5649 Jan, 1983

Control and data processing software for a thermobalance-mass spectrometer system. L. M. Parker and J. E. Patterson CD2330, DSIR Chem Div, Jan, 1983

Construction of a Photoacoustic Mercury Detector. J. E. Patterson CD 2339, DSIR Chem Div, June, 1984

Programs for the DYCOR Portable Mass Spectrometer MASSPORT (Version 3.3). Patterson, J.E., IRL Report, March (1993).

AAFLAME: programs for atomic absorption and flame emission. Patterson, J.E., IRL Report, March (1993).

Reduced sulphide odour reduction trial at Tasman Pulp and Paper Ltd. J.E. Patterson, IRL Confidential Report 183, April 1994.

Second reduced sulphide odour reduction trial at Tasman Pulp and Paper Ltd. J.E. Patterson, IRL Confidential Report 252, June 1994.

Air measurements at Kenepuru Hospital using portable mass spectrometers. J.E. Patterson, J.E. Patterson, report to Capital Coast Health, June 1994.

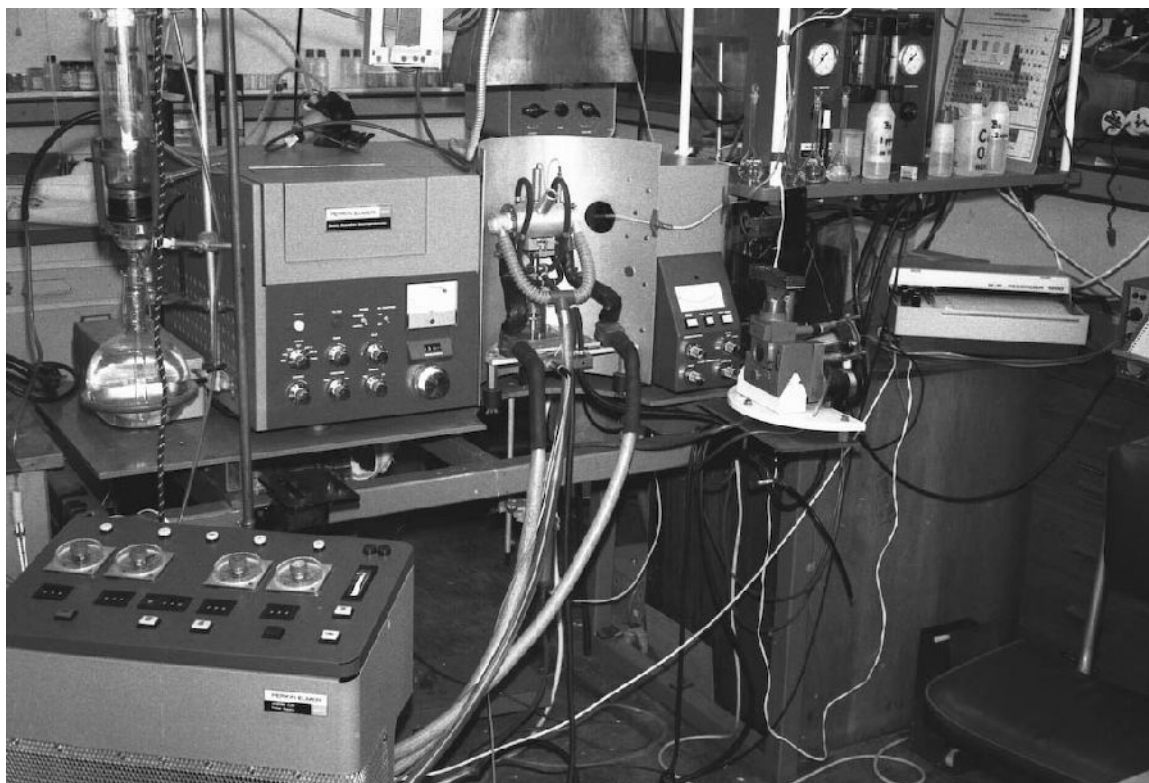
Catalytic Oxidation of Gases: First Annual Report. Parker, L.M. and J.E. Patterson, DSIR Chemistry Report, No. 5058 (1992).



Low Temperature Oxidation Catalysts", Annual Report 1993/94. L.M. Parker and J.E. Patterson, IRL Report 241, 1994.

**Conference papers and posters**

Rapid heating in flameless atomic absorption analysis. J. E. Patterson. paper 9, 35 NZ Institute of Chemistry conference, August, 1975.



**Perkin Elmer 303 AA spectrometer with graphite furnace. 1976**

Flame emission over wide concentration ranges. J. E. Patterson, Atomic spectrometry seminar, N Z Institute of Science Technicians, Wellington, August, 1979.

Thermal analysis mass spectrometry of Zeolites and their precursors. L. M. Parker, D. M. Bibby and J. E. Patterson NZIC Conference Poster, August, 1983.

Photoacoustic Detection of Mercury. J. E. Patterson NZIC Conference Poster, August, 1984.

Atmospheric Mercury, D M Bibby and J E Patterson, Atmospheric Chemistry Workshop Poster, Wellington, 23-24 May, 1985.

A preliminary investigation of inorganic minerals in coal by electron microscopy. D M Bibby, G D Walker and J E Patterson. Coal Research conference paper 15-17 Oct. 1985, Wellington, NZ.



The Photoacoustic Detection of Mercury. J E Patterson, Conference poster presented at a meeting entitled "Flash photolysis and its applications" in honour of Sir George Porter P.R.S. at the Royal Institution of Great Britain, London, 1986.

Mercury in Antarctic Snow. D S Sheppard, J E Patterson and A L Dick. NZIC conference paper, Wellington, 20-23 August, 1990.



**Bad weather, Polar Plateau, 1989**

Real Time Gas Analysis by Mass Spectrometry. J E Patterson and L M Parker. NZIC conference poster, Wellington, 20-23 August 1990.

Catalysts for the low temperature oxidation of volatile organic contaminants. L.M. Parker and J.E. Patterson, NZIC Conference Paper, Auckland, December 1993.

Manganese oxide spinels as catalysts for the oxidative coupling of methane. Bhula, R., Burns, G.R., Collier, S. and Patterson, J.E., Methane conversion Conference, Sydney (1993).