

RESUME

1. *Education and Personal Details*

Full Name: David Vere-Jones
Born: 17th April 1936, London, England.
Marital status: Married, Mary To Kei Vere-Jones (nee Chung); 3 children.
Nationality: British (U.K). Resident in New Zealand.
Academic qualifications: MSc (Hons) (New Zealand); D Phil (Oxon)

2. *Experience*

1962-64 Scientific Officer (1962-3) and Senior Scientific Officer (1963-4),
Applied Mathematics Laboratory, DSIR, New Zealand.
1965-69 Fellow (1965-7) and Senior Fellow (1967-9), Department of Statistics,
Institute of Advanced Studies, ANU, Canberra.
1970-2000 Professor of Mathematics, with special responsibility for statistics,
Victoria University of Wellington.
1999-present Director, Statistical Research Associates Ltd
2000-present Emeritus Professor, Victoria University of Wellington

3. *Honours/distinctions/etc*

1969 Fellow of Royal Statistical Society
1974 Foundation member and President, NZ Maths Society.
1976 Japan Society for Promotion of Science, Visiting Professor,
Inst. Stat. Math., Tokyo
1978-85 Convenor, Mathematics Steering Committee, New Zealand
Universities' Entrance Board;
1979 Member, International Statistical Institute. Council Member 1984-7;
Chairman of Education Committee 1987 - 1991.
1980-81, 1987-8 Consultant to Italian National Commission for Nuclear and
Alternative Power Sources (ENEA)
1981-83 President, New Zealand Statistical Association
1982 Fellow, Royal Society of New Zealand; Council Member 1984-87;
Chairman of Education Committee 1987 - 90
1983-7 Member, New Zealand Universities' Entrance Board.
1986 Royal Society Visiting Professor, Imperial College London and Oxford.
1991-2 President of Interim Executive of International Association for Statistical Education.
1994, 1997 Workshop Leader, Workshops on Statistical Seismology,
State Seismological Bureau, Beijing and Hanzhou.
1995 Visiting Professor, Tokyo Institute of Technology.
1995 ISI Henri Willem Methorst Medal
1997 International Journal of Forecasting Prize for best paper in 3 years.
1998 Team member and main Editor for MoRST Review
"Mathematics in New Zealand, Past, Present and Future."
2000 Honorary Member of NZ Maths Society.
2002 Senior Researcher and Board member, New Zealand Institute of Mathematics and its

4. *Present research/professional specialities*: Statistical modelling and analysis for earthquake

forecasting. Markov chain and point process theory. Statistical Education.

5. *Research Grants:*

- 1994-1995, 1995-1996 FRST Contracts “Stochastic Processes” (with P.J.Thomson, T. Mikosch, R.B.Davies, D.S.Harte, M. Bebbington, Wang Q)
1996-2003 Subcontracted to IGNS on FRST Contract “Natural Hazards”.
1996-1997 ASIA 2000 grants “Statistical Methods for Earthquake Prediction and Earthquake Risks”, for collaboration with Centre for Analysis and Prediction, State Seismological Bureau, Beijing, China.
1997-1999 Marsden Fund Grant “Non-linear modelling of fracture mechanisms” (with D.S.Harte, M.Bebbington).
2001-2003 Marsden Fund Grant “Statistical Models and Observational Evidence for the Approach to Criticality in Earthquake Occurrence” (with R. Robinson, D. Harte, M. Bebbington)

6. *Publications*

Number of refereed publications: About 100.

7. Recent publications:

- Schoenberg, F.P. and Vere-Jones D. (2004) Rescaling marked point processes. Australian and New Zealand Journal of Statistics, 46, 133-144
Daley, D.J. and Vere-Jones D. (2004) Scoring probability forecasts for point processes: entropy score and information gain. *Journal of Applied Probability* 42A 297–312.
Vere-Jones D. and Ogata, Y. (2003) Statistical Principles for Seismologists. Chapter 82 of ‘International Handbook of Earthquake and Engineering Seismology,’ Eds W. H. K. Lee, H. Kanamori, P. C. Jennings and C. Kisslinger. Part B, 1573-1586.
Daley, D. J. and Vere-Jones, D. (2003) Introduction to the Theory of Point Processes (2nd Edition) Vol 1: Elementary Theory and Applications Springer (Probability and its Applications), New York, etc.
Harte, D., Li, D.-F., Vreede, M. and Vere-Jones, D. Quantifying the M8 prediction algorithm: reduction to a single critical variable and stability results. *New Zealand Journal of Geology and Geophysics*, 46, 141-152
Zhuang, J., Ogata, Y. and Vere-Jones, D (2002) Stochastic declustering of space-time earthquake occurrences. *Journal of the American Statistical Association*. 97, 369-380.
Vere-Jones, D., Robinson, R. and Yang, W. (2001) Remarks on the accelerated moment release model: problems of model formulation, simulation and estimation. *Geophysical Journal International* 144, 517-531.
Yang, W., Ma, L. and Vere-Jones D. (2001) A proposed method for locating the critical region of a future earthquake using the critical earthquake concept. *Journal Geophysical Research*, 106 B.3, 4121-4128.
Vere-Jones, D, MacKinnon, M.J. and Silverstone, B.(2001) Harold Silverstone: a perspective. *Australian and New Zealand Journal of Statistics*, 43, 393-398.
Vere-Jones, D. (2001) Modeling and communication issues in the development of probabilistic earthquake forecasts. In Pal, M. and Bharati, P.(Eds) Proc. Golden Jubilee Celebrations of the International Statistical Education Centre, 101-122.
Vere-Jones, D. (2001) Official Statistics and the university statistics programme. In Pal, M. and Bharati, P.(Eds) Proc. Golden Jubilee Celebrations of the International Statistical Education Centre, 159-166.
Vere-Jones, D. (2000) Seismology - a statistical vignette. *Journal of the American Statistical Association*. *Statistics in the Physical and Engineering Sciences*. 95(451), Vignettes 975-978.

- Borovkov, K. and Vere-Jones, D. (2000). Explicit formulae for stationary distributions of stress release processes. *Journal of Applied Probability*, 315- 321
- Feng, D., Chun, J. and Liu, X., and Vere-Jones, D. (2000) Application of fuzzy statistical methods in earthquake hazard assessment of New Zealand. *S. China Journal of Seismology*, 20, 1-5.
- Lu, C. and Vere-Jones, D. (2000) Application of linked stress release model to historical earthquake data: comparison between two kinds of tectonic seismicity. *Pure and Applied Geophysics*, 157, 2351-2364
- Shi, Y.L.L, Liu,J., Chen Y. , and Vere-Jones D. (1999) Coupled stress release models for time-dependent seismicity. *Journal of Pure and Applied Geophysics* 155 649-667.
- Vere-Jones, D., (1999) On the fractal dimensions of point process data, *Adv. Appl. Prob.*, 31, 643-663.
- Lu, C., D. Vere-Jones, H. Takayasu, A. Yu. Tretyakov, and M. Takayasu, (1999). Spatio-temporal seismicity in an elastic block lattice model, *Fractals*, 7 (1999) 301-311.
- Lu, C., Vere-Jones,D. and H. Takayasu,(1999). Avalanche behavior and statistical properties in a microcrack coalescence process, *Phys. Rev. Lett.*, 82 (1999) 347-350.
- Harte, D. and Vere-Jones, D.(1999) Differences in coverage between the PDE and New Zealand local network catalogues. *N.Z. Jl Geol. Geophys.*, 42, 237-253.
- Vere-Jones, D. (1999). Probabilities and information gain for earthquake forecasting. *Computational Seismology*, 30 ("Geodynamics and Seismology"), 248-263.
- Harte, D. Kozuch, M. and Vere-Jones, D.(1998). Operational requirements for an earthquake forecasting programme in New Zealand. *Bull. N.Z. Nat'l Soc. Earthq. Engineering*, 31, 194-205.
- Liu, J., D. Vere-Jones, L. Ma, Y. Shi, and J. Zhuang (1998). The principle of coupled stress release model and its applications, *Acta Seismol. Sinica*, 11 273-281.
- Shi, Y., J. Liu, D. Vere-Jones, J. Zhuang, and L. Ma (1998) Application of mechanical and statistical models to study of the seismicity of synthetic earthquakes and the prediction of natural ones, *Acta Seismol. Sinica*, 11 (1998) 421-430. .
- Vere-Jones, D. (1998) Background influences on the development of statistical education. *Proc 5th Int. Conf. on Teaching Statistics*, Vol 1, 27-42 (Invited plenary address).
- Vere-Jones, D., Ma L., and Matthews, M.(1997) On the application of the M8 algorithm to New Zealand earthquake data. Ye Hong(Ed), *Proc 30th Int'l Geol. COngr.* vol 5, 171-181.
- Vere-Jones, D. (1997) Alpha-permanents and their applications to multivariate gamma, negative binomial and ordinary binomial distributions. *N.Z. Jl Maths* 26, 125-149
- Vere-Jones, D. Davies, R.B, Harte, D, Mikosch,T, and Wang Q. (1997) Problems and examples in the estimation of fractal dimension from meteorological and earthquake data. In T. Subba Rao, M.B.Priestley, O.Lessi (eds.), *Applications of Time Series Analysis in Astronomy and Meteorology*, Chapman and Hall (London),359-375.
- Vere-Jones, D. (1997) Boris Vladimirovich Gnedenko, 1912-1995. A personal tribute. *Austral. J. Statist.* 39, 121-128.
- Vere-Jones, D. (1997) Statistical development within the Centre for Analysis and Prediction (CAP). *Recent Developments in World Seismology*, 4, 8-12 (Translated into Chinese, with English abstract)
- Vere-Jones, D. and Li., M. (1997) Application of M8 and Lin-Lin algorithms to New Zealand earthquake data. *N.Z. Jl Geol. Geophys.* 40, 77-89
- Vere-Jones, D. (1996) Statistical education in the next 10 years: past perspectives and future prospects. *N.Z. Statistician* 31(1) 2-12.
- Vere-Jones, D. (1996) Statistical education: an international perspective. *Statistical Mathematics Institute Proceedings (Japanese Series)* 44(2) 263-274 (Invited address to Science

- Council of Japan, translated into Japanese with English abstract).
- Vere-Jones, D. (1996) Some open problems involving alpha-permanents. In L. Cavalieris, F.C.Lam, L.a. Roberts, J.A Shanks (Eds), Proc. A.C.Aitken Centenary Conference (Otago Conference Series, 5) 341-348
- Kagan, Y.A., and Vere-Jones, D.(1996) Problems in the modelling and statistical analysis of earthquakes. In C.C.Heyde, Yu.V.Prohorov, R.Pyke, S.T.Rachev (Eds), Athens Conference on Applied Probability and Time Series, Vol 1: Applied Probability, 398-425.
- Vere-Jones, D. (1995) Forecasting earthquakes and earthquake risk (invited review paper). International Journal of Forecasting, 11, 503-538
- Vere-Jones, D. (1995) The coming of age of statistical education. ISI Review, 63, 3-23
- Zheng, X., and Vere-Jones, D. (1994) Further applications of stress release models to historical earthquake data. Tectonophysics 229 101-121
- Vere-Jones, D. (1994) Statistical models for earthquake occurrence: clusters, cycles and characteristic earthquakes. H.Bozdogan (ed.), Proc. 1st US/Japan Conf. on Frontiers of Statistical Modeling: an Informational Approach, Kluwer,105-136.
- Vere-Jones, D. and Musmeci, F. (1992) A Space-Time Clustering Model For Historical Earthquakes. Ann. Inst. Stat Math. 44, 1992, pp 1 - 11.
- Vere-Jones, D. (1992) Statistical Methods for the description and display of earthquake catalogs. Statistics in the Environmental & Earth Sciences, ed. Walden A.T. and Guttorp P., pp 220 - 246.
- Zheng, X. and Vere-Jones, D. (1991) Application of stress release models to historical earthquakes from North China, Pure and Applied Geophysics, 135, 559-576.
- Wang A.L., Vere-Jones, D. and Zheng, X. (1991) Simulation and estimation procedures for stress release models, Celebration Volume for Professor S K Srinivasan, 11-27, Springer-Verlag, Berlin.
- Bebbington M., Vere-Jones, D. and Zheng, X. (1990) Percolation theory: a model for earthquake faulting?, Geophysical Journal International, 100, 215-220.
- Herzberg, A. and Vere-Jones, D. (1990) Some notes on design sensitivity to changes in covariance structure. Utilitas Mathematica 37 13-28.
- Vere-Jones, D., and Deng, Y.L. (1989) A point process analysis of historical earthquakes from North China.4 8-19 (English translation: Earthquakes Research in China 2 (2) 165-181.
- Vere-Jones, D. (1989) On the variance properties of stress release models. Australian Journal of Statistics 30A 123-135.Proc 4th Int. Conference Statistics Climatology, 4-12.
- Vere-Jones, D(1989) Statistical aspects of the analysis of historical earthquake catalogues. In (Margottini and Serva (Ed))Historical Seismicity of Central-Eastern Mediterranean Region ENEA-IAEA Rome.
- Vere-Jones, D. (1989) (with A J C Begg) Some emerging changes in Statistics education in New Zealand Schools. ISI 47th Session, Paris.
- Vere-Jones, D. (1989) Remaining Unsettled? Some personal impressions of weather and climate statistics. Proc 4th Int. Conference Statistics Climatology, 4-12.

8. Selection of some earlier publications

1. *Markov chains and matrix theory.*

Kendall, D.G. and Vere-Jones, D (1959) A commutativity problem in the theory of Markov chains. Probability Theory (Russian), 4, 97-100.

Vere-Jones, D. (1962) Geometric ergodicity in denumerable Martkov chains. Quart. Jl

Math (Oxford, Series 2) 13, 7-28.

E. Seneta and D. Vere-Jones (1966) Quasistationary distributions in discrete Markov chains with a denumerable infinity of states. *Journal Applied Probability*, 3, 403-434.

Vere-Jones, D. (1967) Ergodic properties of non-negative matrices I *Pacific Journal of Maths*, 22, 361-386.

Vere-Jones, D (1968) Ergodic properties of non-negative matrices, II. *Pacific Journal of Maths*, 26, 601-620.

Vere-Jones, D (1969) Some limit theorems for evanescent processes. *Australian Journal of Statistics*, 11, 67-78.

Vere-Jones, D (1971) Finite bivariate distributions and semigroups of non-negative matrices. *Quarterly Journal of Maths (Oxford, series B)* 22, 247-270.

Vere-Jones, D (1984) An identity involving permanents. *Journal of linear algebra and applications*, 267-270.

2. *Point processes*

Daley, D.J. and Vere-Jones, D.(1972). A summary of the theory of point processes. In P.A.W.Lewis (Ed) "Stochastic Point Processes." Wiley, New York, 299-383.

Vere-Jones, D. (1974) An elementary approach to the spectral theory of random measures. E.F.Harding and D.G.Kendall (Eds) "Stochastic Geometry." Wiley, New York, 405-435.

Vere-Jones, D. (1975) On up-dating algorithms and inference for stochastic point processes. J.Gani (Ed) "Perspectives in Probability and Statistics"

Athreya, K., Tweedie, R., and Vere-Jones, D. (1981) Asymptotic behaviour of a point process with Markov-dependent intervals. *Mathematische Nachrichten* 99, 301-313.

Vere-Jones, D. (1982) On the estimation of frequency in point process data. E.J.Hannan (Ed.) "Essays in Statistical Science", Applied Probability, Sheffield.

Daley, D.J. and Vere-Jones, D. (1987) The extended probability functional, with applications to mixing properties of cluster processes. *Mathematische Nachrichten*, 131, 311-319.

Daley, D.J. and Vere-Jones, D (1988) "The Theory of Stochastic Point Processes" Springer (New York and Berlin).

3. *Earthquake mechanism and statistical models for earthquake occurrence.*

Vere-Jones, D. (1966) A Markov model for aftershock occurrence. *Journal Pure and Applied Geophysics* 64 31-42.

**Vere-Jones, D. (1970) Stochastic models for earthquake occurrence. *Journal of Royal Statistical Society, Series B* 32 1-62

Vere-Jones, D. (1975) Stochastic models for earthquake sequences. *Geophysical Journal of the Royal Astronomical Society* 42, 811-826.

*Vere-Jones, D. (1976) A branching model for crack propagation. *Journal Pure and Applied Geophysics* 114, 711-725.

**Vere-Jones, D. (1977) Statistical theories of crack propagation. *Math. Geol.* 9, 455-481

*Bebbington, M., Vere-Jones, D., and Zheng, X. (1990) Percolation theory: a model for rock fracture? *Geophysical Journal International* 100, 215-220.

4. *Seismicity, seismic hazard and earthquake prediction.*

* Vere-Jones, D., Turnovsky, S. and Eiby, G.A. 1965. A statistical study of earthquakes in the main seismic area of New Zealand. Part I: Time trends in the pattern of recorded activity. *NZ Journal of Geology and Geophysics* 7, 722-744.

- **Vere-Jones, D. and Davies, R.B. 1966. (1966) A statistical study of earthquakes in the main seismic area of New Zealand. Part II: Time series analyses. *NZ Journal of Geology and Geophysics* 9, 251-284.
- Vere-Jones, D, Dickinson G and Adams, R.B. (196?) A statistical study of earthquakes in the main seismic area of New Zealand. Part III: *NZ Journal of Geology and Geophysics*—
- Vere-Jones, D. (1973) The statistical estimation of earthquake risk. *N.Z.Statistician* 8, 7-16; reprinted in *Bull. NZ Society for Earthquake Engineering* 6, 122-127
- **Vere-Jones, D. (1983) What are the main uncertainties in estimating earthquake risk? *Bull. NZ Society for Earthquake Engineering* 6, 122-127
- **Vere-Jones, D. (1978) Earthquake prediction - a statistician's view. *Journal Physics of the Earth* 25, 129-146.
- **Vere-Jones, D. (1995) Forecasting earthquakes and earthquake risk. *International Journal of Forecasting* 11 503-538
- Harte, D., Kozuch, M., and Vere-Jones, D (1998) Operational requirements for an earthquake forecasting programme in New Zealand. *Bull. NZ National Society for Earthquake Engineering*, 31, 194-205.

5. *Mathematics and Science Education.*

- Vere-Jones, D. (1966) Mathematical Education in the USSR. *Education (N.Z.)* 15, 20-26 and 27-32
- Vere-Jones, D. and Cochrane, W. (1967) "Essays on Mathematical Education" (translation of Essays by A.Y.Khinchin, with a supplement on Soviet Mathematical Education.) English Universities Press, London.
- Vere-Jones, D. and N. Livshits (1981) Dialogue with a Soviet mathematics teacher, Part 1, *New Zealand mathematics Magazine*, 18, 79-85, Part 2, *ibid*, 19, 4-9.
- Vere-Jones, D (1986) On recent changes in the mathematics curriculum in New Zealand upper secondary schools. *Mathematics Education*, 15th Conference on Stochastic Processes and Applications, Nagoya, Japan.
- Clark, M. and Vere-Jones, D. (1987) Science education in New Zealand: present facts and future problems. *Royal Society of New Zealand, Miscellaneous Series*, 15.
- Begg, A.J.C. and Vere-Jones, D. (1989) Some emerging changes in statistics education in New Zealand schools. *ISI 47th Session*, Paris.
- Vere-Jones, D., assisted by Dawkins, D. and Carlisle, S. (Editors) (1991) "Proceedings of the Third International Conference on Statistical Education (ICOTS 3), Volumes 1 and 2." I.S.I., Voorburg.

6. *Biography*

- Vere-Jones D. (1983) Emeritus Professor J.T.Campbell. *New Zealand Statistician*, 18, 34-38.
- Vere-Jones, D. (1986) Probability, earthquakes and travel abroad. J.Gani (Ed) "The Craft of Probability Modelling - A Collection of Personal Reminiscences." *Applied Probability*", 222-235.