Testing and Fitting a Stress Release Model for Earthquakes

D. Vere-Jones, *Victoria University, Wellington, New Zealand*

This paper extends recent work by Vere-Jones (1978) and Ogata and Vere-Jones (1983) on point process models for large historical earthquakes.

This model is governed by a conditional intensity of the form

$$\lambda(t) = \exp\left\{ \alpha + \frac{\beta t}{\tau} + \frac{\gamma}{\sqrt{\tau}} X(t) \right\}$$

where $X(t) = t - \rho S(t)$ is a measure of accumulated stress, assumed to increase linearly between events, and to decrease by a (random) amount at each event, representing the stress release from the earthquake. Testing this model against the Poisson leads to nonstandard results and unresolved distributional problems. The model will be illustrated with historical data from Japan and China.

A Stochastic Model for Estimating Species-Specific Malaria Incidence and Recovery Rates and Transition Probabilities Considering 'Lost to Follow-Up' as Competing Risk

B.L. Verma, S.K. Ray and R.N. Srivastava, *Department of Social and Preventive Medicine, M.L.B. Medical College, Jhansi, India*

An attempt has been made here to suggest a model for estimating species-specific malaria parasite incidence and recovery rates and transition probabilities from longitudinal data in the presence of risk of 'lost to follow-up' in a homogeneous population. In longitudinal studies on malaria, individuals at each time may be negative or positive for one or more malaria species; some of them may be 'lost to follow-up' owing to obvious reasons. Accordingly, seven mutually exclusive states of health have been defined. The model, *inter alia*, considers two assumptions—(i) only one type of transition either from 'negative' state to 'positive' state or vice-versa for each species is possible in a unit of time and (ii) probability of the transfer of individuals' state between two time-points, depends upon the period of the two subsequent follow-ups. The estimation of the intensity function matrix in the model is quite easy. It is considered for assessment of malaria situations in a population subject to the availability of sufficient data of appropriate nature.