

The conference started with opening session on 20th May 2002. A world-renowned Geologist-Prof. J.N. Hutchinson, of Imperial College, University of London, delivered the only keynote address of the conference. His deliberation focused on the problems of instabilities on coastal and inland areas of Isle of Wight. Based on his detailed study Prof. Hutchinson suggested planning and management measures for the instabilities existing in the area.

In all forty-nine presentation were made covering all seven themes of the conference. At the end of presentation in each session, there was a fifteen-minute time allotted for discussion for all the papers presented in a session.

The conference also included a mid-conference one-day field excursion. The participants were free to choose any one of the proposed visits. Following four field study visits were proposed by the organizer: (i) Instability investigations, monitoring and remediation; (ii) Living with

landslides; (iii) Isle of Wight landslides – mechanisms and impacts; (iv) Instability – problem solving and management

The books and instruments related to the conference subject were also exhibited at the conference venue.

A comprehensive “Instability–Planning and Management” Proceedings volume edited by Robin G. McInnes and Jenny Jakeways, published by International Scientific publisher – Thomas Telford, London containing 81 papers covering seven sessions was also brought out on the occasion.

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TEN YEARS OF PALAEOSEISMOLOGY IN ILP

The Conference “Ten Years of Palaeoseismology in International Lithosphere Programme (ILP): Progress and Prospects” was held at Kaikoura, a small tourist town situated on the northeast coast of the South Island of New Zealand during 17-21 December 2001. The conference cum ILP meeting was sponsored by ILP II-5, the NZ Institute of Geological and Nuclear Sciences-GNS, University of Canterbury, Instituto Nazionale di Geofisica e Vulcanologia-INGV, Italy, the Royal Society of New Zealand - Earthquake Commission-EQC, Wings over Whales and Ocean Wings the Albatross Encounters.

Free interaction and communication amongst the palaeoseismologists of the world was the prime objective of the conference. It was also held to share the ideas and methodologies used by different workers in the world working in different tectonic environments. It was also aimed at preparation of a common database for the possible earthquakes of greater than 5.5 M all over the world. Dr. Daniela Pantosti and Dr. Kelvin Berryman were the conveners of the conference and also the co-leaders of the ILP II-5 project. They were also the hosts along with Jarg Pettinga from Canterbury University.

Many well-known palaeoseismologists from Israel, New Zealand, Jordan, USA, Sweden, Norway, Mongolia, Korea, China, Portugal, Spain, Japan, Turkey, Italy, Nepal, India, France, Australia and Philippines participated in the conference. They presented various techniques used in

palaeoseismological studies in their respective countries. Thirty-four full papers and thirty-eight posters were presented in ten oral sessions and five poster sessions during the conference held at Kaikoura Memorial Hall. Yoshihiro Kinugasa, Daniela Pantosti, Kelvin Berryman, Ran Yongkang, Buddy Schweig, Yasuo Awatta, Caröl Prentice, Hugh Cowan, Desmond Darby and Richard Norris were the Chairpersons for different sessions of the conference.

The organizers of the conference Kelvin Berryman and Daniela Pantosti in their introduction highlighted the academic importance of the conference for the community of palaeoseismologists. They felt that techniques such as trenching, earthquake modelling, use of statistical methods, use of GIS, preparation of database etc. should be popularized amongst all workers in this field, so that the areas of high risk can be delineated. An active group of palaeoseismologists in Italy have successfully prepared a complete database of potential sources for earthquakes larger than M 5.5 in Italy. The leader of the group Daniela Pantosti suggested that a similar database could be prepared for all other regions of the world and a common global database can emerge. She presented to all the participants a CD containing the complete earthquake database for Italy. Kelvin Berryman and Richard Norris presented their work on the major Indo-Australian and Pacific Plate Boundary Fault, the Alpine fault rupture and

landscape evolution in Westland, New Zealand. Seismic hazard evaluation is based on a proper understanding of how large earthquakes recur through time, and thus the seismic cycle. In recent times, physical and statistical modelling has been attempted to adequately describe the earthquake recurrence behaviour of faults; but one of the main problems encountered in attempting recurrence models and their verification is the lack of data (of the dated earthquakes) due to the short time window within which we can observe recurrence of earthquakes in the past. In general, by using the instrumental record, spanning no more than the past 100 years, we are not able to figure out more than the occurrence of one event on a few of the existing seismogenic faults. Even using the historical record, that may span time windows extremely variable between a few centuries to a few millennia, we have low probability to catch more than one or two events on the same fault. This is because, with the exception of fast deforming active plate boundaries, large events may recur in intervals of several centuries to millennia. Palaeoseismology can extend the record of earthquakes of the past up to several millennia. Thus, it represents a great opportunity to study how earthquakes recur through time and thus provide innovative contributions to seismic hazard assessment.

Seismologists from Japan, China and Korea presented several papers and posters regarding active faults in Japan, their characteristics and their complete database. Yoshihiro Kinugasa and Y. Awata presented characteristics of behavioural segments in the surface ruptures in Japan and northwestern N. Anatolian Fault System, Turkey and Izumi Fault Zone of Kyusyu Island, Japan. Complete papers were also read on the status of Quaternary faulting, SE Korea; progress in palaeoseismological studies in China and seismic hazard assessment of Ulaanbaatar city, Mongolia.

J.R. Arrowsmith of Arizona State University presented his work on the tectono-geomorphic study that provides important information about the timing and distribution of past earthquakes when used as a part of integrated studies. Ronald Arvidsson of Sweden presented his new findings on the micro-earthquake concentration in the areas of post-glacial receding ice-fronts. These micro-earthquakes are reported mainly on the hanging wall where the ice-load is released. Hugh Cowan of GNS, New Zealand presented new developments on geological hazard monitoring network in New Zealand. GNS currently operates the national network of permanent seismographs for earthquake research at approximately 30 locations, with denser array of simple sensors in Wellington region and in the Taupo Volcanic Zone of the North Island. A pilot modern network comprising two sites in South Island and two

sites in the North Island have been operating since 1988. The GPS network for measuring regional strain along the active faults covers a large part of New Zealand. Another technique – strain meter and/or tilt meters installed in deep boreholes are 100 to 1000 times more sensitive to strain changes than continuous GPS. These are point measurements of strain that are best suited to local areas and short time scales. They are therefore an important component of a modern volcano monitoring system, but their utility for monitoring strain build-up associated with earthquakes is less well established. He also made a presentation on InSAR (Interferometric Synthetic Aperture Radar) – another new remote sensing technique which can measure sub-centimeter motions with a high resolution on the ground. This is complimentary to continuous GPS; while GPS provides very precise measurements at relatively few points, InSAR can provide a complete regional picture of deformation at somewhat lower accuracy. The Geo-net project in New Zealand encompasses all of the principle geological perils: earthquakes, volcanoes, landslides, tsunamis and geothermal activity.

The work of N.L. Hill of Victoria University, Wellington suggests that diatom studies of lacustrine sediments deposited in fault controlled basins (particularly those with small catchments, low surface water inflow and little terrigenous sedimentation), can provide a potentially complete and extensive palaeoseismic record. This method, if used in conjunction with trenching studies, can significantly enhance the dating precision and completeness of palaeoseismic chronologies for strike-slip faults. The USGS scientists Carol Prentice, E.S. Schweig, C.J. Crosby and Michael Rymer presented their study on palaeoseismology and Quaternary tectonics along San Andreas Fault, California; Los Bajos Fault, South American-Caribbean plate boundary, Trinidad; Earthquake hazard mapping in the Central US; Lavic Lake Fault, Mojave Desert, South California and Quaternary faults in western Puerto Rico.

E.S. Schweig gave glimpses of a comparative study of 1811-1812 New Madrid earthquakes and 2001 Bhuj earthquake. He stressed the importance of looking at all the indicators of the rate of recurrence of damaging earthquakes in intraplate areas. The author presented work through a large poster showing the deformational features of the 2001 Bhuj-Kachchh Earthquake and its relation to the neotectonics and regional structures of Kachchh basin. Studies on active faults and Quaternary deformations along Himalayan Frontal Faults in Garhwal and Nepal regions were presented by Dr. J.N. Malik of IIT, Kanpur

and Dr. B.N. Upreti of Nepal respectively. Dan Clark of Australia narrated the palaeoseismological investigations on the Hyden fault scarp of seismically active area within the Australian intra-plate region. The group European palaeoseismologists and their project popularly known as EUROPALEOS has a unique function to train young researchers in palaeoseismological studies. The status of palaeoseismic studies in Portugal, Spain, UK, Italy, Greece and other European countries were elaborated at the conference.

The conference cum ILP meeting included a field excursion to Hope Fault and Marine terrace at Kaikoura Peninsula and the Conway coast, organized by Dr. Mrs. Jocelyn Campbell and Dr. Kelvin Berryman respectively. The ~220 km long Hope Fault is a part of Marlborough Fault Zone which is one of the most active elements of this Zone. The Jhikurangi Subduction Zone where downbuckling Pacific Plate forms the accretionary margin along the east coast of the North Island extends past Kaikoura to terminate close to the mouth of the Conway River. The trench site at the Hope Fault shows excellent event horizons and obvious strike-slip and oblique slip displacements. The area is one of the most promising ones for the study of almost all palaeoseismological features related to the tectonics of strike-slip environments. The field trip to Kaikoura Peninsula and the Conway coast aimed to introduce participants to the spectacular Late Quaternary coastal geology characterized by the episodic upliftment of the coastal landscape in the vicinity of Kaikoura and south of the Conway coast, including the important Haumuri Bluff locality. The rugged coastline and the high Kaikoura

Ranges reflect the rapid tectonic uplift. Recent integrated work included geomorphology, detailed stratigraphic observations, accurate altitude data, radiocarbon dating and amino acid as well as thermo-luminescence (TL) geochronology to calculate terrace ages and deformation rates.

The scientific and geological study of the past (historical) earthquakes is palaeoseismology, which is a fast developing discipline in geological sciences all over the world. The science of palaeoseismology is still evolving and has to yet build up a global database of the palaeoearthquakes using various modern techniques. It includes the geological field-study using trenches and also geochronology, which can date the seismic events. The accuracy of the field study on the size and the recurrence of the past earthquakes is based on the availability of reliable geological records, materials where liquefaction and surface ruptures occur and also on the season when earthquake strikes. By studying all these factors, a complete database can be prepared, and the recurrence time for each active fault can be calculated. Ultimately the probability of large earthquake in a given area is assessed which is extremely important in urban and semi-urban conglomerations. Therefore, the science of palaeo-seismology and its applications assumes paramount importance not only for scientists but also for the town planners, architects, engineers and builders.

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REPORT ON THE INTERNATIONAL CONFERENCE ON DIAMOND AND GEMSTONES, 9-15 FEBRUARY 2002, RAIPUR, CHHATTISGARH

Introduction

The 'Conference on Diamond' was proposed in view of recent discoveries of diamondiferous kimberlites in Mainpur Kimberlite Field (MKF) and the confirmation of the ultramafic body at Tokapal as kimberlite. This conference was approved in the Annual General Meeting of the 'South Asian Association of Economic Geologists' (SAAEG) and the author was given the responsibility of organising the conference as Convenor.

The Venue

Raipur, the Capital of newly formed Chhattisgarh State

was identified as the suitable venue to organize this conference due to its nearness to the newly discovered kimberlite fields. As approved, a headquarter activity of the SAAEG the "International Conference on Diamond & Gemstones" along with allied programmes was organized during February 9-15, 2002 under the joint auspices of the Geological Survey of India (GSI), Directorate of Mining and Geology (DMG), Chhattisgarh and the Government Engineering College, Raipur.

Programme

The Conference on the diamond and gemstone