

# LOESS

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# LETTER

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## Loess Letter

*Loess Letter is the informal newsletter of the Western Pacific Working Group of the INQUA Loess Commission. Please send news or short reports of work in progress to Ian Smalley, DSIR, Soil Bureau, Lower Hutt, New Zealand. Two issues a year are planned; if you would like to be on the circulation list send your name and address to Ian Smalley at address above.*

## INQUA Loess Commission

Commission 4 of the International Union for Quaternary Research is the Loess Commission. It came into being as a subcommission at the 1961 INQUA meeting in Warsaw and was upgraded to full commission status at the 1969 Paris meeting. Julius Fink (Austria) was its first president and he has steered the commission to the virtual completion of its initial tasks. At the 1977 Birmingham INQUA meeting Marton Pecsí (Hungary) took over as president and a new set of aims was discussed.

Since then two circular letters have been published (1978/1 & 2) and the commission's aims for the period up to 1981 are fairly well delineated:

1. The map of European loess will be published. It is in two sheets and the western part should be completed by the time this newsletter is in circulation. Fink and G. Haase (DDR) are in charge of the map project.
2. The loess-stratigraphic programme continues. This has always been central to commission activities and many detailed European studies have been produced. As part of this programme it has been proposed that a few important loess profiles of the most typical loess regions should be analysed in detail, and these sections treated as specific stratotypes. Pecsí suggested that the Paks section be so considered, and the Stewarts Claim formation has been proposed as a New Zealand representative.
3. Initiation of technically oriented applied loess research. This is a new aim for the commission which now hopes to encourage studies on foundation problems, slope stability, irrigation problems etc. and to aid in the appreciation of loess as a valuable natural resource.
4. Support for world-wide loess research. The commission has been essentially a European organisation in its early period and an attempt is now to be made to widen the geographical scope. Working groups for North America and the Western Pacific region have been set up, and a specific aim of the WPWG is to promote the reintroduction of the Chinese loess into the loess investigation scene. J. Bowler of ANU Canberra is the convenor of the WPWG (see ANZAAS Auckland report below).

## Publications

Loess papers from Birmingham INQUA. At the 1977 meeting M. Pecsí proposed that a volume of papers dealing with loess topics should be published and all those who had presented such papers at the INQUA meeting were invited to submit them to Budapest by 30 March 1978. There is no definite news on the progress of this volume but its publication date should be near.

Liu Tung-sheng translation. An English translation is being prepared of 'Composition and textures of the Loess of China' edited by Liu Tung-sheng and published by the Science Press of Academia Sinica in 1966. The translation will be published by Australian National University Press, and should be available by the end of 1979.

Loess Bibliography. A fairly comprehensive loess bibliography is being prepared by I. Smalley at the DSIR Soil Bureau, Lower Hutt. This covers all countries and all languages and should be completed and published during 1979. Any authors who suspect that they might have been overlooked are requested to send reprints.

Slope Stability and Urban Development. A seminar with this title was held at the University of Canterbury in February 1978 and much of the discussion concerned geotechnical problems associated with the loess of the Banks Peninsula and the Christchurch region. The New Zealand Geomechanics Society is publishing a version of the seminar proceedings and this could be available by mid-1979. It contains a long and detailed paper by D.H. Bell of the University of Canterbury on 'The Engineering Geology of Banks Peninsula Loess Deposits'. Bell concludes that the principal types of slope failure in Banks Peninsula loess deposits are slide-avalanche-flow

mass movements and tunnel-gully formation: the former are more frequent on the wetter, south-facing slopes, and the latter on the seasonally dry, northwest-facing slopes. Other topics covered include soil mapping - particularly applied to the Port Hills area; vegetation and slope stability; chemical stabilisation of loessial soils; case studies of slope failure on the Banks Peninsula, and legal and planning problems.

Lessovye Porody (Sostav i inzhenerno-geologicheskie osobennosti). A new book by M.P. Lysenko, published by 'Nedra' Leningrad in 1978. Like most of his previous publications it deals with engineering-geological aspects of loess rocks, with a heavy concentration (inevitably) on loess within the Soviet Union. This volume is essentially an updating of his earlier 'Loessial Rocks of the European USSR' which was published in an English translation by the Israel Program for Scientific Translations in Jerusalem. The earlier work was published in Russian in 1967 and in English in 1971.

#### New Map

Loess Content of Soils: South Island, New Zealand; scale 1:1 000 000 by J.G. Bruce; to accompany Otago Catchment Board Publication No. 4, 1978. The map shows soils in which loess is the dominant constituent of the parent material; soils in which loess is a co-dominant or subdominant constituent of the parent material; and soils in which loess is a minor constituent of the parent material.

#### ANZAAS at Auckland

A joint session of section 3 (geology) and section 21 (geography) was held on Friday, 26 January at the ANZAAS conference in Auckland on 'Quaternary Airborne Dust'. Three topics were discussed: 'Desert Loess' introduced

by I. Smalley, 'Tephric Loess in the North Island' by N. Kennedy, and 'Airborne Sediments in Australia and China' by J. Bowler. The problem of correlating research on loess soils and other airfall deposits in the Western Pacific region was also considered. It was decided to establish a New Zealand committee to participate in the Western Pacific Working Group of the Loess Commission.

The New Zealand committee is J.D.G. Milne (Soil Bureau, Lower Hutt), J.G. Bruce (Soil Bureau, Gore), P.J. Tonkin (Lincoln College), W.A. Pullar (Soil Bureau, Rotorua), N.M. Kennedy (Soil Bureau, Rotorua) and I.J. Smalley (Soil Bureau, Lower Hutt - who will act as convenor).

It is hoped that three major national groups will participate in WPWG activities; from Australia, New Zealand and China. Academia Sinica has authorised the Chinese participation in the project and with the setting up of the Australian and New Zealand committees the main tasks of the WPWG can be initiated. It has been proposed that a conference should be held, perhaps towards the end of 1980, but certainly well before the next full scale INQUA meeting in 1982, at which results and ideas on loess research and related topics could be exchanged. A wide range of topics could be covered at the conference: these would include Chronology & Correlation, Provenance & Origin, Practical problems related to agriculture, irrigation, slope stability, foundations and soil properties (as recommended by the main Loess Commission), Transportation & Deposition, Mineralogy & Soil Formation, Paleosols, Paleoclimatic implications etc. Any suggestions or proposals about the conference should be sent to Dr J. Bowler, Dept of Biogeography & Geomorphology, Australian National University, Canberra ACT or Dr I. Smalley, DSIR, Soil Bureau, Lower Hutt, New Zealand.

The Australian & New Zealand Association for the Advancement of Science (always called ANZAAS for obvious reasons) will hold its next annual meeting in Adelaide in May 1980; this will be a special 50th anniversary meeting. The 51st meeting will be in Brisbane in May 1981 - at which there should be a special session on aeolian sediments.

### Conferences

The next full scale INQUA meeting will be in Moscow in 1982. If the four year cycle had been observed the meeting would have been in 1981 but it has been held back a year to fall on the fiftieth anniversary of the first INQUA meeting in 1932. It has been proposed that one of the field trips associated with this meeting should be to look at the desert loess deposits in Uzbekistan and surrounding regions. If this field trip does actually take place (and it has been proposed and postponed before) it will provide a good chance to see and sample some loess deposits which are normally inaccessible.

The next meeting of the Loess Commission will be in the last week of August 1979 in Hungary, in association with an IGCP meeting of Project 128 Late Cenozoic Magnetostratigraphy.

### Research Report

Mass Movement Erosion in the Wairarapa district of the North Island of New Zealand. A paper on this topic was presented at the ANZAAS conference in Auckland in January 1979, by M.J. Crozier, R.J. Eyles, S.L. Marx, J.A. McConchie and R.C. Owen. This part of the North Island is in McCraw's loess region 2 which extends roughly from Wellington to Napier, the loess material being derived from greywacke rocks. The area

investigated by Crozier et al. was east of Masterton and included the majority of severely affected properties identified in the Wairarapa Catchment Board's initial survey of damage from the July 1977 storms. During a period of seven weeks from the end of July 1977 a large area of hill country in southern Hawkes Bay and Wairarapa experienced severe flooding and mass movement erosion which damaged pastures, farm tracks, dams and fences and caused large stock losses.

The Soil Conservation and Rivers Control Council subsequently entered into a three year research contract with Victoria University of Wellington. This research is part of a larger project being coordinated by the Aokautere Science Centre of the Ministry of Works and Development which is investigating the extent of mass movement erosion, the processes involved, and possible control and preventative measures. The University part of the project involves (a) a general study of the distribution pattern of landslips occurring in the Wairarapa during 1977 and (b) a more detailed analysis of the causes of slope failure, involving instrumentation of drainage basins on the two most susceptible rock types.

The major conclusions to emerge so far suggest that slope aspect has a strong influence on the occurrence of landslips and the most unstable locations during 1977 were the upper segments of slopes facing north. The suggested mechanism for the majority of mass movements which occurred in the Wairarapa during the winter of 1977 involves saturation of the hill soils to a point at or beyond their liquid limit resulting in flowage when the restraining turf mat broke. This mechanism was suggested by J.G. Hawley and M. King and is supported by the great distances (up to 0.8 km) travelled by the debris and the number of observed examples of a

turf mat splitting with a loud bang heralding the release and flow downslope of the underlying liquid soil.

### Observation

From Geological Newsletter (IUGS) 1977 No. 4: Report on the 10th INQUA Congress. "Closer links between the INQUA Congress and the activities of the IAEG would provide the Congress with a very important aspect of Quaternary geology". (IAEG International Association of Engineering Geology).

### 100 Years Ago

"Beginning at the southern of Lyttleton side of the tunnel, we observe that a large bed of loam has been deposited upon the volcanic rocks, being thickest on the lower third of the caldera wall. This peculiar rock, which, when in small pieces, is easily pulverised between the fingers, has a remarkable consistency and solidity when in large masses, and is of subaerial origin. It may be designated as loess, an expression now extensively used in Europe for similar deposits. It owes its origin to various processes, of which rain, wind and vegetation are the principal factors. This bed of loess, which in some localities is more than 100 feet thick, changes gradually before we reach the volcanic rock ... "

Julius von Haast 1878  
 On the geological structure of Banks  
 Peninsula. Trans. & Proc. N.Z.  
 Inst 11, 495-512

Is this the earliest reference to loess in New Zealand?