

# LOESS

# 黄土

NO. 3  
APRIL  
1980

# LETTER

*Published by DSIR Soil Bureau  
on behalf of the Western Pacific  
Working Group of the INQUA Loess Commission*

## 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.*



This is a special issue of 'Loess Letter' to mark the occasion of the 3rd Australia-New Zealand Geomechanics Conference which is being held in Wellington in May 1980. The theme therefore of LL3 is 'Loess and Geomechanics' and it gives us the opportunity to publish a modest memorial to Alfred Scheidig, who laid the foundations for the engineering study of loess, and to commemorate a

famous newsletter which has had a great influence on subsequent producers of similar publications. From 1957 till 1964 'Screenings from the Soil Research Lab' issued steadily from Ames in Iowa for the delight and edification of soil engineers (and others) and we are pleased to be able to pay tribute to this influential newsletter by publishing an excerpt from vol.1, no. 4 entitled 'The Loess Problem, the Great American Tragedy, or the War between the States'. Screenings had a tradition of anonymity as regards contributors but we are fairly certain that the piece reproduced here was penned by RLH, alias R L Handy, currently professor of civil engineering and director of the Soil Research Laboratory at Iowa State University and, with M G Spangler, author of 'Soil Engineering' (Intext 1973).

Alfred Scheidig was the author of 'Der Löss und seine geotechnischen Eigenschaften', published by Theodor Steinkopf in Dresden and Leipzig in 1934. For many years this was the only source of geomechanical data on loess and the early chapters on the formation and distribution of loess were cited and quoted by investigators on all aspects of loess. For example, the lasting influence of Scheidig's work can be seen from the fact that R F Flint in his book 'Glacial and Quaternary Geology' (Wiley, 1971) is still citing Scheidig 1934 as a general loess reference. We reproduce a reassembled title page, and the dedication to Karl Terzaghi.

In 1951 Terzaghi stated that: "Loess ranks among the most treacherous foundation soils to be encountered in nature because its appearance is deceiving and the breakdown of its structure after saturation is associated with temporary liquefaction and subsequent important shrinkage. Since loess covers large areas on every continent its properties are of general interest ...." He may not have been quite right about the New Zealand loess, but we support his view on the general interest of the material.

### THE LOESS PROBLEM, THE GREAT AMERICAN TRAGEDY, OR THE WAR BETWEEN THE STATES

The question of the origin of loess is one wide open to scientific argument. Loess is a widespread soil deposit found in our own Midwest and Far West as well as in China, Russia, Germany, Argentina, New Zealand, and a few other places like Nebraska. Also most of Iowa is mantled with loess, which increases the importance quite some little bit. The question is how it got there.

#### Pronouncement

Loess is a German word, Löss, pronounced "looerss" with the "oer" deep down in the throat like a gargle. When most people say it, it sounds like a shallow "lurss," or else they give up altogether and say "low-ess" or even "luss." Of these, Webster approves the first two; many professional men are naturally inclined to prefer the last. In Iowa we usually say "luss" to rhyme with "lust." But we bow to regional preference. (Ed: in N.Z. its lerss.)

#### Definition

The loess battle is a very serious one because the debators aren't even agreed as to what they're talking about. Many would prefer to tie the definition of loess in with origin, but others say this is not conducive to scientific objectivity. In fact, some people have gone to the term loessoid to avoid the question of origin. Loess is so variable in different regions that a definition broad enough to cover all loess deposits, if they are deposits, and narrow enough to exclude everything else is almost impossible.

Therefore, loess is characteristically a tan, unstratified silt with a variable percentage of clay, and very little sand. The mineral composition can be almost anything but seems to remain fairly consistent over any one area. The thickness of loess varies from zero to over 150 feet, although with zero thickness it is most logically called something else. This zero is

mentioned only to establish the lower limit.

#### Appreciation

The areas of deep loess in the United States have been eroded into topographic magnificence with a grandeur, artistry, and spectacle that easily inspire awe. Not only do we have the superbly sculptured landforms with sharply defined drainage patterns, we see the high, almost vertical cliffs cut and standing in this friable, compacted "dirt," and the innumerable cat-steps tracing the approximate contour lines around the hills.

And then some look at our beautiful hills and say, "Students, loess is a wind deposit. Notice the dune shaped hills." This is still in some books, but most of those who should know say that the topography is erosional, which means the hills were carved by running water. Frankly we don't see how they could look dune shaped, except possibly to verify that they are a wind deposit.

#### Earthworms and the Outer Cosmos

By the year 1900 the guesses on origin of loess already included being washed in by the ocean, carried about by water from melting glaciers, blown in by wind, or descended from a cosmic dust cloud such as encircles Saturn. One scientist proposed that loess emerged from mud volcanoes and was then distributed by a great post-glacial flood. A favorite is the suggestion that loess deposits represent gigantic accumulations of earthworm castings, the earthworms gobbling up glacial till at the front end and leaving a trail of loess behind them.

#### The Wind Blew and the Silt flew

The aeolian theory is one of the oldest and is still the most popular. In the 1880's a Baron F. von Richthofen studying some of the widespread deposits of loess in China concluded that wind was responsible - that Chinese loess was an accumulation from countless dust storms flowing from the deserts of interior China. In 1897 T. C. Chamberlin applied the aeolian hypotheses

of loess to the central U.S. He reasoned that this loess did not blow off the deserts but from nearby glacial outwash areas. His evidence was that the mineral composition of loess approximates that of the regional glacial deposits.

#### Taking in the Outwash

To understand the theory of a glacial source for dust storms one needs to know something about glaciers. A glacier is either a creeping river or a creeping flood of ice, depending on whether it is confined in a valley or not. As it creeps it incorporates gravel and other debris in the basal ice. At the margin of the glacier where the final ice melts, the melt water forms a river with a very heavy load of sediment. Because of this the river develops a braided channel with extensive sand and gravel bars. The channel continually shifts about, divides and recombines as if not sure where it's going. The river bars swept by wind form a ready source for sand and silt.

#### Salt and Pepper

Particles picked up by wind and carried in air ordinarily tend to settle out. The larger the particles the more rapidly they settle. Sand particles carried in air are large enough that they skip along over the ground, a mechanism called saltation and responsible for the peppering one gets in a sand storm. Saltation is a major factor in the building and migration of sand dunes, and the need for sand to bounce on something means that sand dunes gradually grow outward from the source area.

Silt does not need that extra added lift from bounce, because air turbulence is enough to hold it in flight. Unlike sand, some of the silt can be carried hundreds of miles without settling. It comes down by gravitational settling or with rain.

#### Facies Change

A favorite with aeolian theorists is that loess changes gradually with distance downwind from the source. Some say distance can not be the major controlling

factor, because the rate of change is variable at different places. As a general rule loess does thin out and is finer as one travels away from a logical source. A theory is that the coarse silt settles out faster and is concentrated in deposits near the source. Farther away the amount of coarse silt in the air is depleted, and finer materials become the major constituents in the deposit.

For the budding geologists such a change is called a sedimentary facies change. (This is Latin, but there's no other word for it.) The complete facies change would be from sand dunes adjacent to the source area to loess that is first a silt, then farther away a silt loam, a silty clay loam and a silty clay, as the clay content increases and the silt content decreases. If the depletion theory is correct, the rate of change is not so dependent on distance as it is on other things such as source area, wind velocity, height or blowing, etc.

#### Fossils, Root Tubes and Paleosols

Minor features of many loess deposits include fossil snail shells, often given in evidence that loess is a wind deposit because the snails are land snails. That is, they lived in air, not in water. Other dead things in loess include occasional mice, gophers, and broken-headed geologists who chose the wrong time to argue. Fossil animal holes, denoted by educated as paleo-crotovina, (jargon) occur occasionally. Tiny vertical holes believed to be root channels infiltrate the loess, improve its vertical drainage, and act as tiny cylindrical surfaces for the deposit of carbonates and iron oxides. The resulting tubes are called "pipestems."

Much of the recent work on loess has been to identify and correlate fossil soil profiles. Soil at the surface of the ground becomes discolored, forming a dark topsoil. Somewhat deeper in the ground it becomes clayey, forming a subsoil. Similar layers occur buried within the loess, where they are interpreted as

representing weathering which took place when loess deposition temporarily halted. Material then exposed at the surface of the ground had time to weather. Later on deposition was renewed so that the soil profile was covered up. These pauses in deposition are believed related to different glacial advances. And a buried soil is called a paleosol, meaning ancient soil.

#### Is Loess a Soil?

Finally we can jump in on another argument, this time between engineers, geologists, and agricultural soil scientists. Let's assume for the moment that loess is a wind deposit. Is loess a soil? The engineer says "yes," because he can dig it. Some soil scientists say "yes," because it will grow things, but others emphatically say "no;" loess is the parent material for the true weathered soil profile, or solum, which forms near the ground surface. Geologists, if they believe in wind, say loess is properly called a sediment. Who's right? They're all correct, considering the uses to which they want to put it. Here is the difference between scientists and engineers; the scientist wants to know about something, but the engineer's main concern is how he can use it. Loess behaves like a soil, therefore it is a soil. For scientific value this definition is about like saying kerosene is water because you can drink it. If the processes of formation are different, the materials are different. Clay formed by weathering is not the same as clay laid down by a river. The latter is a sediment; the first is a soil.

#### LOESSIFICATION, Y'ALL

In loess as in life it's hard to buck the wind, but some people do so. Most recently Dr. R. J. Russell of Louisiana State University, after working extensively with river deposits of the Mississippi, reasoned that from its position on the hills loess could be slumped terrace deposit. Loess in the south-central United States is close to the river on terraces, although there

is again some disagreement on nomenclature. Hence the theory of "loessification."

According to Russell, loess has the same particle size and minerals as floodwater deposits of the Mississippi called backswamp deposits. Older backswamp deposits exist higher up on river terraces that represent former floodplains. Weathering leaches the carbonates and removes much of the clay, the carbonates later being replaced when the loess sits at a lower level. Snails and gravel are incorporated into the loess as it churns and mixes during its creep downslope. A strong point in the argument is that it explains how gravel could be mixed in the basal portion of the loess. Gravel found in basal loess is a little hard to explain if you blow everything in on the wind.

#### Retorts and Reverberations

Gravel? replied the aeolinists - carried in by animals; and as for loessification, where did the clay go? How did all that clay get washed out? And what about the increase in loess fineness away from the river? Loessificationists replied, of course loess changes away from the river floodplain - what do you expect when it grades into the unaltered clay-rich backswamp deposits? As for those minor discolored zones, they are not "paleosols;" they are clay zones, although most of the clay was left behind when the loess moved downslope. Furthermore the loess is always thicker on the flanks than on the crests of hills - how do you explain that by wind?

On the other hand the evidence is not all in agreement. Recent work by Iowa geologist Dr. R. V. Ruhe shows that in Iowa the loess is commonly thicker on crests of divides, and gravelly basal portions are not loess but are a result of slope erosion and sedimentation prior to major loess deposition. Ruhe believes in wind.

Perhaps a major source of trouble lies in extending results of studies in one area to other areas. Yet wind-blown loess of the northern U.S. can be traced

hill by hill into the south, and the loessified loess of the south can be traced hill by hill up north. If everyone is correct, somewhere there is a sudden shift in the mode of origin, probably at some arbitrary boundary like a state line. Geologists have a little trouble accepting this.

#### The Far North und der Nederland

In the U.S. we're either all wet or full of wind, but people in Alaska are full of frost action. A theory advanced by Stephen Taber, an authority on permafrost, is that the common upland loess in Alaska is nothing more than local bedrock which has been disintegrated by frost action. Most Alaskan geologists and soils men say the major evidence still points upwind, and the silts are wind-deposited loess. However, downslope movements associated with frost action account for much thickening of the deposits in the valleys. Some of these translocated valley silts are highly organic, have a rather undelicate odor and are called "muck."

A major argument in favor of Taber's theory is that the mineral composition of the silt corresponds to that of the supposed parent rock. A major argument against the theory is that the mineral compositions do not always correspond to those of bedrock. And so the story goes.

A Netherlands geologist named van Rummelen has been talking against the wind for some thirty years, his conversation somewhat resembling the words of Taber and Russell. Van Rummelen's loess, which he prefers to call "loessoid" to keep in out of the wind, is derived from weathering of Cretaceous age bedrock followed by soil creep and mixing. Most Dutch geologists and soils men still stick with the wind, but they will go along with the idea of slight soil creep incorporating gravel or boulders in the basal loess.

#### Majority Accuracy

If scientific questions could be reliably decided by a vote - which they can't or the world would still be flat - loess would unquestionably be wind blown, other

theories notwithstanding. But a new theory is at least partly a success if it causes critical re-examination of the old ones. So let's not stop the argument.

*Dem Begründer*

*der wissenschaftlichen Baugrundlehre*

*Herrn Prof. Dr.-Ing. K. v. Terzaghi*

*in Wien*

*in Verehrung und Dankbarkeit*

*gewidmet*

Im sächsisch-thüringischen Lößgebiet sind zahlreiche unterirdische Gänge und künstliche Höhlen bekannt. O. Kaubisch (Bautzen) und O. Apel (Berlin) haben sich um die Erforschung große Verdienste erworben. Unterirdische Wehranlagen befinden sich in Glauchau, Penig, Rochsburg und Lunzenau, ein Teil davon im Löß. Keller und Gänge im Löß finden sich in Lichtenstein, Lommatzsch, Staucha bei Riesa, Käbschütz und in Altenburg i. Thür., zum Teil liegen die Keller in zwei Etagen übereinander. Sie sind größtenteils verfallen, abgemauert oder zugeschüttet, so daß man nur aus Bruchstücken auf den früheren Zustand schließen kann. Abb. 91 zeigt den Stadtkern von Lommatzsch mit den von O. Apel vermessenen Kellern, die größtenteils unter die Hauptstraße reichen.

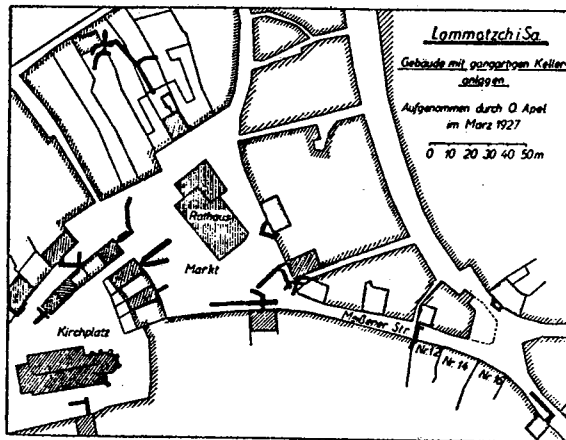


Abb. 91. Gebäude mit gangartigen Lößkellern in Lommatzsch (Sa.).

# DER LÖSS UND SEINE GEOTECHNISCHEN EIGENSCHAFTEN

Geologie und Verbreitung, Erdstoffphysik, Erdbaumechanik  
und Geotechnik der Löße und Lößlehme, Schluffe, Silte  
und anderer Stauberden, Aschen und Staube

VON

DR.-ING. ALFRED SCHEIDIG

Regierungsbaumeister, Wissenschaftlicher Assistent am Erd-  
baulaboratorium der Sächsischen Bergakademie Freiberg

Mit einer Einführung von

PROFESSOR DR.-ING. F. KÖGLER

Vorstand des Erdbaulaboratoriums der Bergakademie  
Freiberg i. Sa.

Mit 132 Abbildungen und 6 Tabellen



VERLAG VON  
THEODOR STEINKOPFF  
DRESDEN UND LEIPZIG 1934



### Observations

"Most New Zealand soils are what one would expect them to be. The only exception that comes readily to mind is the presence of fragipans in the loess in the dry parts of the South Island. The only genetic difference I can see is that the loess here is acid, while in North and South America, Europe, and Asia, it is calcareous. Compaction is not easy if 20 to 30% of the loess is lime which dissolves and increases the pore space...

Perhaps my most vivid impresssion is of the failure to adapt farming practices in New Zealand to the soil's potential, as the farmers of most of the older settled countries have done. The hill lands and steep lands, which are very extensive, are suited only to grazing and forestry and are very well used. The easy lands, which are locally extensive, have much greater potentials if used for crops or horticulture. I have read almost daily about problems of markets for dairy products and for beef and sheep meat. I do not read about marketing problems for fruit or grain. The world demand for soybeans appears insatiable."

Guy D. Smith  
in 'Soil Survey Horizons'  
Vol.19, No. 4, Winter 1978

Ed Gill retires. On November 11th 1979 Edmund D. Gill retired from CSIRO. Loess fanciers who were at the 1973 INQUA Congress in Christchurch may remember the EDG contribution on 'Loess in South Eastern Australia' (see 9th Congress Abstracts pp.123-124; its publication 284 on the mammoth list of Gill publications). He proposes to continue his research; anybody who wants to send him a reprint should despatch it to 1/47 Wattle Valley Road, Canterbury, Victoria 3126, Australia. He will be

looking out for his international friends at the International Geological Congress in Paris in July.

"When was it that this catastrophe of the disappearance of the megafauna took place in Victoria? We limit the question to this area. Between 40,000 and 30,000 years ago the megafauna were well represented in the valley of the Maribyrong River at Melbourne. Their bones occur in the Chocolate Clay at Dry Creek below the loess with the Keilor Cranium. The base of the loess is a little older than 18,000 years, but in it no giant marsupial remains have been found."

Edmund D. Gill  
Palaeoecological changes in Victoria and Bass Strait as a backdrop for the Marsupial megafauna and the Aboriginal Invasion. The Artefact 3(2), 67-75 (1978)

Julius Fink appreciation. Julius Fink: das Werk eines Geographen, Quartärund Bodenforschers (Würdigung zu seinem 60 Geburtstag). (Julius Fink: his work as a geographer, a quaternary, and soil scientist: an appreciation of his sixtieth birthday). Hubert Nagl, Mitteilungen der Osterreichischen Geographischen Gesellschaft, 120(1), 1978, pp.143-148.

Abstract by D.J. Davis (Geo Abstracts 79A/1072): Born in Vienna, Fink turned post-war to soil science: in 1969 he became professor of physical geography in the University of Vienna. He did much for the F.A.O. soil map in the Central European section. 1961-77 he led the INQUA commission on loess. He was leader of the Austrian programme in 'Man and the Biosphere' and the chairman of the DEUQUA conference, 1978 in Vienna. He was, in 1961-65, president of the Austrian Soil Science Society: 1969-72 of the Austrian Geographical

Society. Includes a bibliography.

LL sends greetings and best wishes to the 'Founding Father' of the INQUA Loess Commission.

Gastropods in loess. Dr G.H. Miller of the University of Colorado and Dr A.R. Nelson of the U.S. Bureau of Reclamation at Denver have been dating terrestrial gastropods from alluvial and lacustrine deposits in the western United States using amino acid techniques. They would like to hear from anyone working in loess sequences containing gastropods in the range 8000 to 500 000+ B.P. who would be interested in amino acid dating of the gastropods in their deposits. Please contact Alan R. Nelson at U.S. Department of the Interior, Bureau of Reclamation, Engineering & Research Center, P.O. Box 25007, Denver, Colorado 80225, U.S.A.

Visitors. Dr David Q Bowen of the University College of Wales at Aberystwyth, and current president of the Quaternary Research Association (of the U.K.), is visiting New Zealand until about June 1980. Interested quaternologists may contact him at the Department of Geography, University of Canterbury. DQB sounded the quaternary trumpet resoundingly in Nature a year ago (Nature 277, 171, 18 January 1979) when he stated: "For the foreseeable future the major challenge confronting Quaternary research must be correlation of the oceanic and continental records".

Dr Dan H Yaalon of the Hebrew University of Jerusalem will be visiting Australia for the second half of 1981; he will be working with Jim Bowler at the Australian National University in Canberra.

Liu Tung-sheng of Academia Sinica in Beijing (Peking) - and doyen of Chinese loess investigators: visiting New Zealand briefly from 2nd to 10th February 1980, in response to a visit to China by Dr R.P. Suggate, Director of the New Zealand Geological Survey. The visit to New Zealand is embedded in a longer visit to Australia where Liu will have a chance to confer with Jim Bowler about the plans and activities of the WPWG.

### Report

#### Stratigraphy of Loess and Alluvial Deposits in HUNGARY

In August 1979 a busload of Quaternarists examined, under the leadership of M. Pécsi and co-workers, the impressive Upper and Middle Pleistocene loess sections at Mende (30 m thick) and Paks (55 m), the fluvial clayey silt at Bodmezövasarhely (8 m) and cores of the Devavanya deep bore hole (1116 m) which penetrates the Pliocene. Dating and local correlation have advanced considerably with the aid of magnetostratigraphy, thermoluminescence and radiocarbon. Sedimentation rate averages 500  $\mu\text{m}/\text{y}$ . Detailed data on granulometry, carbonate content, molluscan fauna, clay and heavy minerals were presented. The sections contain several well preserved paleosols and pedocomplexes, usually of the chernozemic to brown forest associations with calcic horizons and krotovinas. Hydromorphic soil features also occur. Pedogenic and environmental interpretation of soil- and sediment-forming intervals is somewhat less thorough. The recent micromorphological data by A. Bronger of some of the profiles are not referred to by the Hungarian workers. An integrated pedo-climatic interpretation of the environmental conditions is thus still incomplete.



The field workshop was part of the international conference on the Stratigraphy of Loess and Alluvial Deposits organised by the INQUA Loess Commission in conjunction with IGCP 128 Programme on Mangetostratigraphy. Proceedings of the paper presentation sessions will be published by the Geographical Research Institute of the Hungarian Academy of Sciences.

(D.H. Yaalon (Jerusalem))

### Publications

Another Iowa Bibliography. Lutenecker, A.J.; Hallberg, G.R. & Handy, R.L., 1979. Review of geotechnical investigations of loess in North America. Iowa Geological Survey Open File Report, September 1979 (Iowa Geological Survey is at 123 North Capitol Street, Iowa City, Iowa 52242, U.S.A.). This paper in a slightly modified form, was compiled as part of the North American Committee Report to the INQUA Loess Commission. Loess is an important engineering material in Iowa - consequently the paper is being reproduced by the Geological Survey for limited distribution.

Glacial loess - is it really glacial? J.M. Moran, Trans. Illinois State Academy of Science 69(4), 1977, pp.479-484, Fig. 15 refs (see Geo Abstracts 79A/1331).

"In the Central United States, loess owes its origin primarily to wind erosion of glacial outwash floodplain deposits. Hence, loess is intimately associated in time and place with continental glaciation. Because generation of meltwater is a key requisite to floodplain deposition, however, it is likely that loess was generated primarily during non-glacial climatic episodes. Further, it is likely that the bulk of loess was deposited long after the glacial

to non-glacial climatic shift and that loess was deposited primarily by autumnal winds."

Design consideration and evaluation methods for collapsible soils. S.P. Clemence & A.O. Finbarr. This is a state of the art report prepared for the Shallow Foundations Committee of the American Society of Civil Engineers; it is due to be presented to a session of the Annual ASCE meeting to be held in Portland, Oregon in April 1980. The report should be published in the ASCE Geotechnical Journal during 1980.

Other papers to be presented at Portland in April 1980 include:

Foundation design for loessial collapsible soils - C.O. Riggs & N.O. Schmidt.

Construction of a large canal on collapsible soils - P.C. Knodel.

Hydro consolidation of Palouse loess - B.O. Olsen.

The formation of silt from quartz dune sand by salt-weathering processes in deserts. A.S. Goudie; R.U. Cooke & J.C. Doornkamp. Journal of Arid Environments 2, 105-112, 1979.

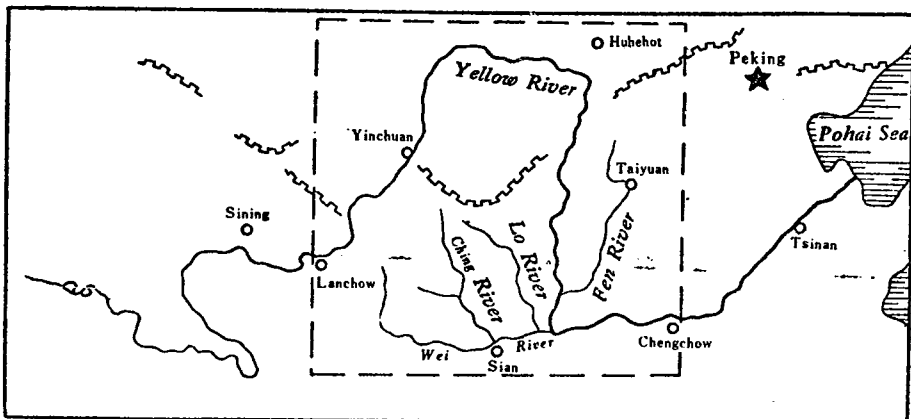
"However, although there are relatively few well-reported loess deposits within deserts, they do exist ... Recently, indeed Smalley & Krinsley (1978) have recognized this fact. In addition, and despite Smalley & Vita-Finzi's arguments, it remains possible that some loess deposits marginal to deserts could have been derived from them ..."

Chronostratigraphy of loessic and lacustrine sediments in the Kashmir Valley. D.P. Agrawal, R.N. Athavale, R.V. Krishnamurthy, Sheela Kusumgar, C.R.K. Murthy & V. Nautiyal. Paper presented at the Loess Commission meeting in Hungary in 1979 (Stratigraphy of loess and alluvial deposits/Szeged). The meeting is reported by D.H. Yaalon in this issue of LL and the papers are

due to be published as a special volume.

"A 8-10 m thick loessic deposit caps the exposed Karewa beds on the Himalayan margins of the valley. On the Pir Panjal side, the loessic accumulations have a thickness up to 40 m at some sites. We invariably found at least 2-3 dark bands of about a meter thickness running across the loess exposures. On Central Asian analogy we suspected the dark bands to be palaeosols. Our sedimentological (Agrawal *et al.*, in press) and SEM analysis (Pant *et al.* 1978:ed - see LL2 for a note on this paper) on these dark bands (palaeosols) indicate that they represent buried, weathered soil horizons."

On the hydrogeology of loess in the middle reaches of the Yellow River. Research Group of the Hydrogeology of Loess in the Middle Reaches of the Yellow River. Peking, China 1976 (publisher not listed; possibly Academia Sinica). 14pp.



A sketch map showing the location of the middle reaches of the Yellow River.

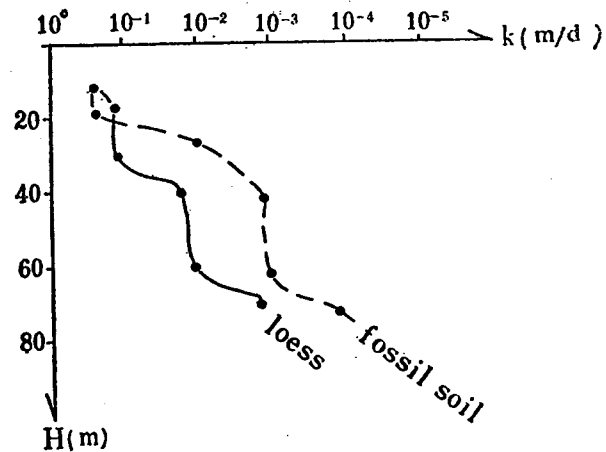


Fig. 7. Variation of permeability coefficient (K) with depth (H) in loess and fossil soil of Sifeng yuan (Q<sub>2</sub>).

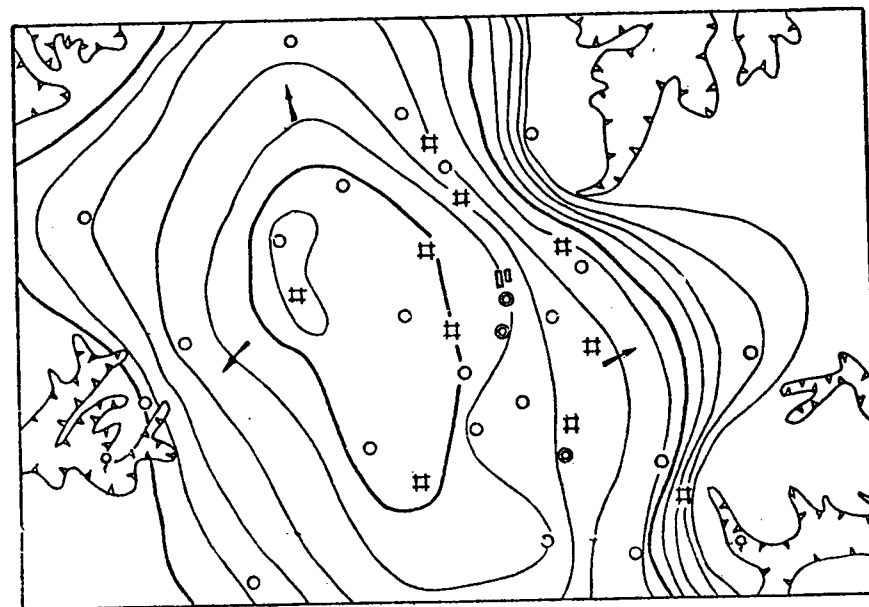


Fig. 11. Schematic contour of ground water table in loess yuan.

1—yearly operating well; 2—seasonal operating well; 3—civil well; 4—descending spring; 5—ground water contour (m); 6—loess gullies; 7—direction of underground run-off.

## A World Map of Loess Distribution: Part 2

Part 2 of the LL outline map of loess distribution concerns North and South America: this region contains at least five definable loess deposits. The best known and most thoroughly investigated of these is the Great Plains deposit in the middle of the U.S.A.; geologists and others in Illinois and Iowa and the adjacent states have provided many thorough investigations of this material. The lower Mississippi deposit is given a separate marker, although it was obviously derived from the northern material and might be considered as a linked deposit. It gets its separate status as an acknowledgement to R.J. Russell and his remarkable 1944 paper. He may have been quite wrong about the origin of the Lower Mississippi loess (and it seems very likely that he was) but he certainly gave a remarkable stimulus to loess investigation in the U.S.A. (and in other countries). To the west we have the deposit in the Washington State region (Palouse country) and the loess of Alaska. The Alaska material owes its recognition largely to the work of Troy Péwé of Arizona State University who has laboured long to bring the northern deposits into the loess register. Hopefully, he will soon be providing some definitive works on the Siberian loess.

In South America there is only one well defined deposit: this really is a neglected continent from the point of view of loess studies. The 1957 paper by Mario Teruggi still appears to be the only substantial work on the South American deposits. He calls these deposits "the most important in the southern hemisphere" which is a statement which might be contested in New Zealand but there is no doubt that the South American material is important and interesting. The deposits could contain much volcanic material which might be a real aid to dating. An interesting comparative study of the Washington State deposits, the Argentinian deposits and



the New Zealand North Island deposits could be carried out - and it might reveal some interesting facts about loess intermixed with volcanic materials.

Actually, it's possible that a sixth deposit should be located in this region. Hobbs in 1931 described some loess in Greenland; Scheidig's 1934 sketch map of world distribution shows a scattering of loess along the south-west coast, but there does not appear to have been any recent investigation of this material.

### Conferences

Arid Soils, Israel 1981: see LL2 for details.

N.Z. Soil Bureau Golden Jubilee. A conference will be held to mark the 50th Anniversary of the Soil Bureau. It will be held at the Soil Bureau Headquarters at Taita Experimental Station from the 24th to 27th June, 1980. All aspects of Soil Bureau activity will be discussed; in particular: What has been achieved? What's going on now? and What does the future hold? Discussions and workshops rather than formal scientific papers, plus a few distinguished guest speakers.

Pacific Science Association: 15th Congress at Dunedin in 1983. The congress will be early in February, probably 1st to 11th. The New Zealand National Organising Committee has agreed to the proposal that a joint symposium be held between the WPWG of the INQUA Loess Commission and the Earth Sciences Section of the Congress: subject - Loess in the Pacific Region.

Aeolian Landscapes in the Semi-Arid Zone of South-Eastern Australia. A conference on this topic, organised by the Riverina Branch of the Australian Society of Soil Science, was held at Mildura, Victoria in October 1979.

The Conference proceedings will be published and should be ready early in 1980. Details from M.E. Stannard, P.O. Box 156, Leeton, N.S.W.2705, Australia.

International Conference on Soils with Variable Charge. February 11-18 1981 at Massey University, Palmerston North, New Zealand. Details from Les Molloy, Soil Bureau, Lower Hutt, New Zealand. It looks as though most of the talk will be about Oxisols, Andosols, Spodosols, Alfisols and Ultisols. Loess may just creep in if we do a bit of definition stretching and look at Alan Pullar's tephric loess - which probably contains quite enough allophane to be a soil with variable charge.

1982 promises to be a busy year: INQUA in Moscow (delayed a year from 1981 in order to fall on the fiftieth anniversary of the first Quaternary Conference in Leningrad in 1932); IAEG (Engineering Geology) and ISSS (Soil Science) in New Delhi.

ISSMFE (Soil Mechanics): next in Stockholm in 1981 and then in San Francisco in 1985. Deadlines are fast approaching for the 1981 Meeting: 250-350 word abstract required by 1 May 1980; completed paper required by 1 September 1980. To New Zealand readers - the National Society has been allocated 48 pages which looks fairly generous; Australia has 62, The Netherlands 48, U.K. 122, U.S.A. 174 and U.S.S.R. 84.

### 100(+2) Years Ago

"In reading the descriptions of the Chinese Loess, derived from Baron von Richthofen's great work, one in Western Iowa wonders at the close resemblances to his own region. The same language might be used to describe it, word for word, sentence for sentence, except that a few diminutives must be thrown in when altitudes are given

....

... When we consider how the features which led the Baron to his conclusion, although apparently equally promising at first in the case of the American Loess, are when better seen found to face the other way; when we think of the vast depth of the Chinese Loess which renders the proposed explanation so much the more inadequate; when we reflect upon our comparative ignorance of Asiatic geology; when we remember Prof. Pumpelly in his quite extended observation of the region saw nothing inconsistent with a lacustral origin, we may express our confident expectation that ere long Richthofen's theory will be shown utterly inadequate to explain the formation which first suggested it. Even now, we probably express the opinion of many students of the Loess, when we say that the sub-aerial theory has received attention and consideration, mainly because of the boldness and novelty of its conception, and the high rank and well-deserved reputation of its author, rather than on account of its real merits."

J.E. Todd (of Tabor, Iowa)  
Richthofen's theory of the loess, in the  
light of the deposits of the Missouri.  
Proc.Amer.Assoc.Adv.Sci.27, 231-239, 1878.

