October 1987 ISSN 0110-7658

Loess Letter 18

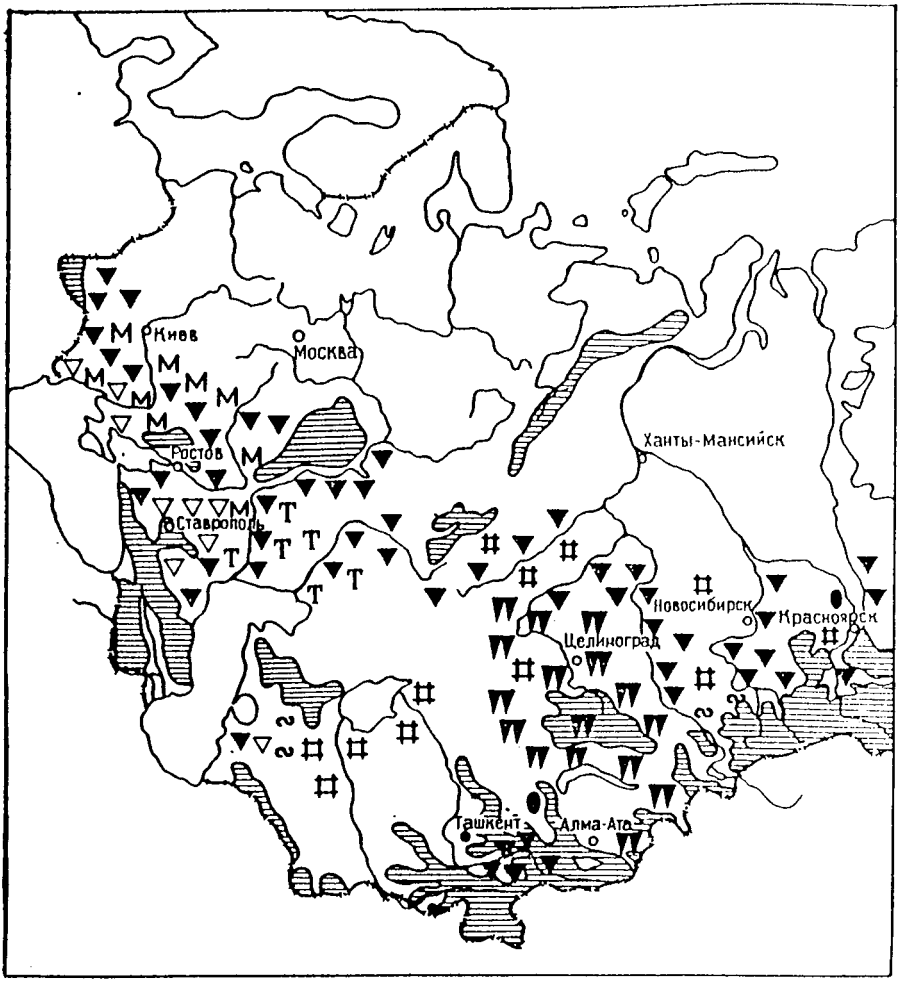


Рис. 1. Схема распространения древних криогенных явлений в лёссовых породах верхнего плейстоцена степной, полупустынной, пустынной (талых) зон СССР:

1 — псевдоморфозы по ледяным жилам; *2* — следы глубокого сезонного промерзания; *3* — изначально грунтовые жилы; *4* — полигональный микрорельеф; *5* — полигональные подземные пустоты; *6* — почвы мерзлотного ряда брянского интерстадиала (дерново-карбонатные, дерново-карбонатно-глеевые, глеевые); *7* — тундровые почвы; *8* — следы солифлюкции, пучения, гидролакколитов; *9* — области питания лёссовых пород

ЛЁССОВЫЕ ПОРОДЫ СССР

В ДВУХ ТОМАХ

I

ИНЖЕНЕРНО-ГЕОЛОГИЧЕСКИЕ
ОСОБЕННОСТИ И ПРОБЛЕМЫ
РАЦИОНАЛЬНОГО ИСПОЛЬЗОВАНИЯ

Под редакцией

акад. Е. М. Сергеева,
д-ра геол.-минер. наук А. К. Ларионова,
канд. геол.-минер. наук Н. Н. Комиссаровой

МОСКВА „НЕДРА" 1986

ISLL18P.87s

LL18 October 1987

Loess Letter LL is the newsletter of the Loess Commission. The Loess Commission is Commission 4 of INQUA. INQUA is the International Union for Quaternary Research, which is one of the scientific unions which go to make up ICSU. ICSU is the International Committee of Scientific Unions - which serves to correlate and encourage world-wide scientific research. INQUA is affiliated via IUGS - the International Union of Geological Sciences.

LL is published by the Documentation Working Group of the Loess Commission; the contact address (for enquiries, requests, submission, etc.) is Loess Letter, Geography Department, Leicester University, Leicester LE1 7RH, England. Phone 44 (England) 0533 (Leicester) 523822 (Note Leicester is pronounced Lester; Loess is pronounced Lerss).

LL appears twice a year, normally in April and October, but publication dates may be adjusted to coincide with major loess events. Back numbers of most of the recent issues are available and LLs 1-10 have been republished as a book 'Loess Letter 1-10 Reprints' edited by Ian Smalley, published by Geo Books, Norwich, England, distributed by Elsevier, (published 1987, price £15.00). Supplements are published from time to time and most of the recent issues are still available; supplements 8-19 were produced specially for the 1987 Ottawa INQUA Congress.

LL18 is the second of two special LL isues for the 1987 Ottawa INQUA Congress. The first (LL17) was largely devoted to a review of recent European loess research by H. J. Mucher; the second (LL18) is mainly concerned with discussions and presentations at Ottawa, and Loess Commission plans for the next inter-congress period. The next full scale INQUA Congress will be in Beijing, China in August 1991 - and it is expected that various important loess events will occur at this Congress - including the'John Hardcastle Centenary Symposium; 1890-1990 A Hundred Years of Loess Stratigraphy'. LL18 also contains extracts from three major volumes of loess studies:

Aspects of Loess Research. Ed. Liu Tung-sheng. China Ocean Press 1987.

Problems of the Stratigraphy and Palaeogeography of Loesses. Ed. H. Maruszczak. Ann.Maria Curie-Sklodowska University vol.41, 1986.

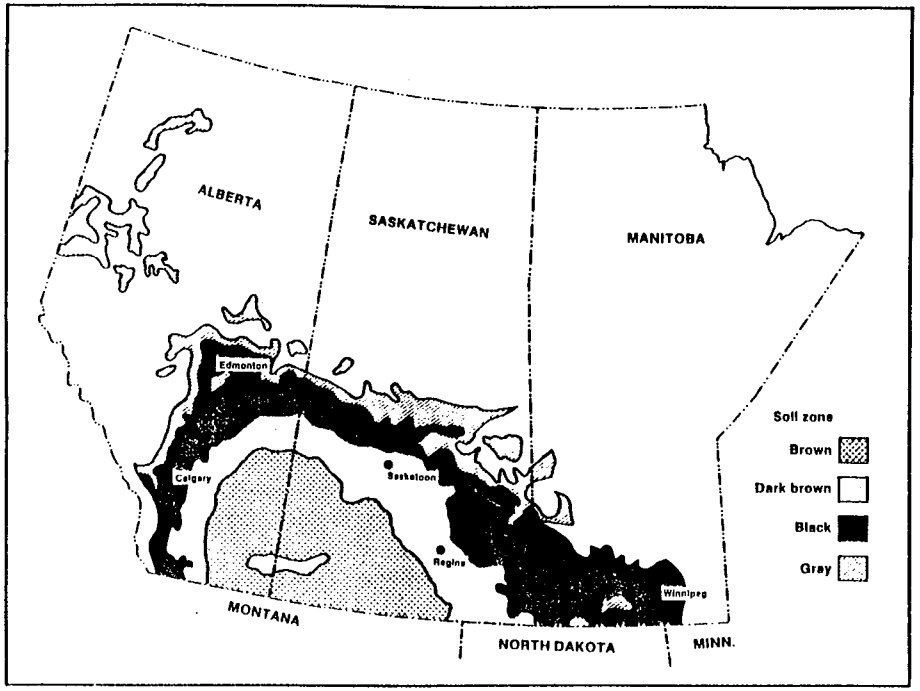
Anthropogene of South Tajikstan. A. E. Dodonov Nauka, Moscow 1986.

In the last few years, as a consequence of the great vitality of the loess research field, there have been many books and special journal issues devoted to loess. Readers of LL should note: special issues of CATENA, and GEOJOURNAL for the Ottawa INQUA

Congress; Loess Inform no.1 'Engineering Geological Research of Loess and Loess-like sediments in the USSR' edited by N. I. Kriger and M. Pecsi, Budapest 1987; and 'Aeolian Dust and Dust Deposits' by K. Pye, Academic Press 1987. A major geotechnical work has recently appeared 'Loess Soils in the USSR' 2 vols. ed. E. M. Sergeev, A. K. Larionov and N. N. Komissarova, Nedra Moscow 1986 (the front cover of LL18 is taken from volume 1, fig.1 - a sketch map showing the distribution of fossil cryogenic features in Loess rocks of the Upper Pleistocene steppe, semi-desert, and desert (Talik) zones of the USSR).

INQUA 87

CANADA



Soil zones in the Praire provinces.

INQUA Congresses are important events in the loess world because it is there that the Commission officers are selected, working groups are set up, and inter-congress research targets set and discussed. At Ottawa eight working groups were established/confirmed and it is through these groups that the major research programmes will be conducted.

Officers 1987-1991

President: Prof. Dr. Marton Pecsi,
Geographical Research Institute,
Hungarian Academy of Sciences,
Nepkoztarsasag utja 62, PF 64,
H-1388 Budapest VI, Hungary.

Vice-President: Dr. J.-P. Lautridou,
Centre de Geomorphologie du CNRS,
Rue des Tilleuls,
1400 Caen, France.

Secretary: Dr. A. E. Dodonov,
Geological Institute,
USSR Academy of Sciences,
Pyzhevsky per. 7,
Moscow 109017, USSR.

List of Full Members - October 1987

Dr. D. P. Agrawal,
Archaeology and Hydrology,
Physical Research Laboratory,
Navrangpura, Ahmedabad 380009
India.

Dr. M. Cremaschi,
Dep-to Di Scienze
Della Terra C.N.R.C.,
Via Mangiagalli 34,
20133 Milano,
Italy.

Dr. N. Fedoroff,
Dep.des Sols,
I.N.A.P.G.,
78850 Thiverval-Grignon,
France.

Dr. Han Jiamao,
Institute of Geology,
Academia Sinica,
POB.634, Beijing,
China.

Dr. T. D. Morozova,
Institute of Geography,
USSR Academy of Sciences,
Staromonetny per 29,
109017 Moscow, U.S.S.R.

Dr. H. J. Mucher,
Laboratory of Physcial Geography
and Soil Science,
University of Amsterdam,
Dapperstr. 115,
1093 B5 Amsterdam,
The Netherlands.

Dr. A. Palmer,
Department of Soil Science,
Massey University,
Palmerston North,
New Zealand.

Dr. J. Sajgalik,
Katedra geotechniky SvF SVST,
801 00 Bratislava,
Radlinskeho ul.11,
Czechoslovakia

Dr. H. Maruszczak,
Dept. of Physical Geography,
Ul.Akademicka 12,
Lublin,
Poland.

Dr. M. Zarate,
Centro De Geologia De Costas,
Universidad Nacional De
Mar Del Plata,
Argentina.

Working Groups and Group Leaders 1987-1991

China: Dr. An Zhi-sheng,
Xian Laboratory of Loess and Quaternary Geology,
Academia Sinica, P.O. Box 17, Xian, Shaanxi, China

North America: Dr. Leon Follmer,
Illinois State Geological Survey,
615 Peabody Drive, Champaign, IL61820, USA.

Geotechnical: Dr. N. I. Kriger,
PNIIIS, Okruhnoy proezd 18,
Moscow 105058, USSR

Dr. B. Grabowska-Olszewska,
University of Warsaw,
Institute of Hydrogeology and
Engineering Geology,
Al..Zwirki i Wigury 93,
02 089 Warsaw, Poland

Geochemistry: Dr. Otto Franzle,
Institute of Geography, University of Kiel,
Olshausenstr. 40,D-2300 Kiel 1, Germany BRD

Chrono-stratigraphy: Dr. George Kukla,
Lamont Geological Observatory,
Palisades, NY 10964, USA

Palaeogeographic Maps: Dr. M. Pecsi,
Geographical Research Institute,
Hungarian Academy of Sciences,
Nepkoztarsasag-utja 62,
H-1388 Budapest, Hungary.

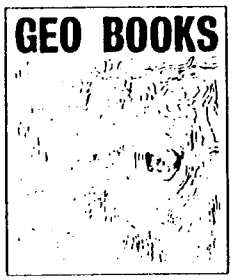
Dr. A. A. Velichko,
Institute of Geography,
USSR Academy of Sciences,
Staromonetny per.29, Moscow 109017, USSR

Land Use: Dr. Edward Derbyshire,
Geography Department, Leicester University,
Leicester LE1 7RH, England.

Documentation: Dr. Ian Smalley,
Geography Department, Leicester University,
Leicester LE1 7RH, England.

ISBN 0 86094 218 X

LOESS LETTER I-IO



REPRINTS

Edited by

IAN SMALLEY

Geo Books
Regency House
34 Duke Street
Norwich
UK
NR3 3AP

Enquiries about the work of the Loess Commission should be addressed to the President: contact the group leaders about the activities of the various working groups. Professor Pecsi has outlined the proposed further activities of the Commission as follows:

1) We intend to follow the fundamental research trend of loess genesis, chronology and palaeogeography.

2) We try to make applied loess research more comprehensive from the viewpoints of geotechnics, geochemistry and environmental protection.

3) The description and classification of loess properties and types for engineering practice with the help of new working groups.

4) The analysis of the mineral and petrographic composition of loess for land use and amelioration studies.

5) The completion of maps for the atlas of loess and palaeogeography, and the preparation of an explanatory text and publiction of the complete atlas.

6) Preparing an explanatory text for the 'Loess Map of Europe': interpretation of loess types, joint publication of the explanatory text and the map sheets.

7) Preparing a multilingual dictionary on loess terminology and a manual on loess - in collaboration.

8) In the publication plan (in addition to entries 5-7) we mean to continue to publish documentation (Loess Letter, Loess Letter Supplement) and other informative volumes (Loess Inform). The papers presented at our conferences and symposia are published in collections.

9) We indicated our participation in the MAB project 'Global Change', in the reconstructions of changes in the palaeoenvironment, using the results of research mentioned under entries 1 and 2.

10) The planning and implementation of complex projects are contemplated which involve surveys and concrete suggestions for the rational and environmentally optimal use of loess soils and loess regions.

Obituaries

Ed. Gill

Ed. Gill died suddenly of a heart attack at his home in Australia in July 1986. This brief obitary notice is based on a much larger piece by John Sherwood of the Warnambool Institute of Advanced Education which was published in Quaternary Australasia for October 1986. Ed had a long career in the earth science business (Museum of Victoria 1948-1973; CSIRO Applied Geomechanics Division 1974-1979) and made some significant contributions to the study of loess. In Ken Pye's recent book 'Aeolian Dust and Dust Deposits' (Academic 1987) there are three Gill papers cited in the bibliography illustrating the current relevance of his work. It's pleasing to observe that two of these papers were published in 'Loess Letter': 'Loess in Western Victoria' by Gill and Reeckman in LL4 (1980) and 'Strata of carbonate loess in southeastern Australia' by Gill and Segritt in LL8 (1982).

At the time of his death EG had 388 publications, with some of his work still to be published. These papers covered a broad range of topics in the Earth Sciences and led to fruitful collaborations throughout Australia and the world. Ed served for many years in executive positions for various scientific bodies including the Royal Society of Victoria, Anthropological Society of Victoria, ANZAAS Quaternary Shorelines Committee and with various international committees on the Quaternary.

Bob Miller

Bobby Joe Miller, professor of agronomy at Louisiana State University, Baton Rouge, died on April 12th 1987. He was 53. This notice is based on the obituary which appeared in U.S. Agronomy News for June 1987. Dr. Miller received his B.S. in 1961 and his M.S. in 1967 from the University of Missouri. He held a two-year position as extension agronomist from 1967-69 at the University of Missouri. He received his Ph.D. in 1972 from the University of Tennessee. Since 1972, he had been on the faculty of the Agronomy Department, Louisiana State University, Baton Rouge.

Dr. Miller had an illustrious soil science career. He had developed a reputation as both an outstanding researcher and teacher. He worked closely with the Cooperative Soil Survey and was the author of major sections in the parish soil survey reports. His academic research interest centred on studies in soil mineralogy, land reclamation and geochemistry. Dr. Miller was recognized as an authority on the loessial deposits of the Lower Mississippi River Valley. He led the FOP field trip to this region which was featured in LL13. He was also recognized as an authority on soil acidity and mineral components in Louisiana soils. His work concentrated on soils containing high levels of exchangeable sodium and aluminium, and their effects on mineralogical and chemical properties. He also investigated pedogenic processes in soils containing large quantities of ironstone, and conducted studies on the characteristics of fragipans in soils.

AEOLIAN DUST AND DUST DEPOSITS

KENNETH PYE

Department of Earth Sciences
University of Cambridge

1987

ACADEMIC PRESS

Harcourt Brace Jovanovich, Publishers

London · Orlando · San Diego · New York
Austin · Boston · Sydney · Tokyo · Toronto

Loess Letter Supplements: the Complete List

1 Loess and Agriculture - 1975-1981 A bibliography J. Kwong & I. Smalley 28p. October 1983.

2 Dust Mantles in Australia. Article by A. J. Dave-Edwards; note by E.D. Gill 16p. December 1983.

3 Loess as a Deep Soil Formation. B. V. Pyaskovskii (LPB742) - a translation into English of the paper in Pochvovedenie 1946. In preparation - to be published in 1988.

4 The Loess Formation in Bulgaria. K. G. Stoilov. 12p. April 1984.

5 The Hydrogeology of Loess 1883-1982 A Partial Bibliography S. J. Sweeney & I. J. Smalley. 8p. April 1984.

6 Loess in Pleistocene Soils on Mount Kenya, East Africa. W. C. Mahaney. 20p. September 1984.

7 Bibliographic Review of Geotechnical Investigations of Loess in North America. A. J. Lutenegger. 12p. February 1985.

8 Lyell on Loess. Extracts from 'Principles of Geology' (vol.4, 1835) 8p. May 1986.

9 Dokuchaev and the Russian approach to the study of Loess. I. J. Smalley. Reprint of 1978 paper (LPB 866) 12p. May 1986.

10 Loess, its characteristics and relation to the geographical environment. N. I. Kriger. A reprint of chapter 3 of the book published by Nauka in Moscow 1965 (in Russian). 32p. June 1986.

11 Loess and its Significance. V. A. Obruchev. The 1952 Novyi Mir (LPB 688) paper translated and edited by Julie Wise and I. J. Smalley. Obruchev obituary by S. I. Tomkeieff. 24p. June 1986.

12 The Quaternary of the Great Hungarian Plain. A. Ronai. 28p. July 1986.

13 Loess, its characteristics and relation to the geographical environment. N. I. Kriger. A reprint of the bibliography of the book published by Nauka in Moscow 1965. 44p. July 1986.

14 On the loess soils of Middle Asia and Kazakhstan. V. I. Yeliseyev (LPB 1015). Translated from the Russian. 16p. August 1986.

15 Quaternary of Slovakia. I. Vaskovsky. 36p. August 1986.

16 A. Tutkovskii Sampler. Two papers by P. Tutkovskii (in German and English), with commentary (LPB 952, 953, 869) 24p. September 1986.

17 Stories of Arctic Lands - The Book of Loess. A. M. Kondratov (in Russian). 24p. September 1986.

18 Particle-sizes as basic criteria for distinguishing between loess and loess-like deposits. M. P. Lysenko. 8p. October 1986.

19 Loess in Czechoslovakia & Siberia. Two papers by J. Pelisek (1972, 1974) 24p. October 1986.

Numbers 8-19 are still available from the LL office at Leicester. LLS3 is still in preparation and it is hoped that it will be published sometime in 1988. Two further supplements are in early stages of preparation, LLS20 'Twenty Books on Loess' (another bibliography) and LLS21 which will be a special publication of the inaugural lecture delivered by Professor Edward Derbyshire at Leicester University in April 1987. Interested groups are invited to publish supplements on the topics of their choice - circulation can be organized by the LL office.

Flowslides: Call for Papers

A special edition of the journal 'Engineering Geology' is to be produced which will be devoted to Flowslide-type landslides. The editor is Dr. Colin Moon, Department ofCivil Engineering, Sheffield City Polytechnic, Pond Street, Sheffield S1 1WB. The Land Use Working Group of the Loess Commission has a special interest in this enterprise since one of the specific problems which the group (directed by Professor E. Derbyshire) is investigating in North China is that of the large catastrophic flowslide failure. It is hoped that a comparative study of flowslides will allow critical factors to be identified and landslide control to be contemplated. Papers on all aspects of flowslides should be sent to Dr. Moon at Sheffield: for EG manuscript requirements consult any issue of the journal, or contact Dr. Moon.

LL18 was produced by Ian Smalley and Susan Haywood in the Geography Department, Leicester University, and printed by the Reprographic Services Unit. Publication date October 1987; 200 copies produced. LL19 is due to be published in April 1988; send material to LL office in Leicester as soon as possible.

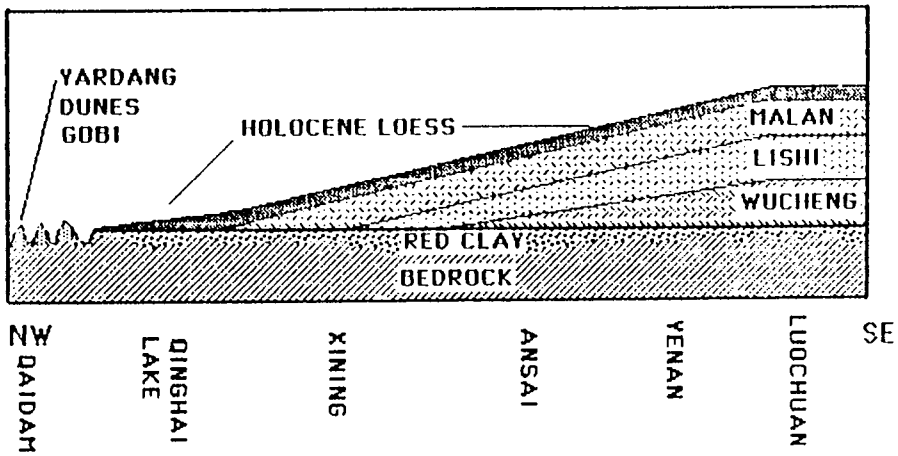
INQUA Loess Commission Documentation Working Group.

Aspects of Loess Research

Editor-in-Chief

Liu Tungsheng

With 173 Figures



China Ocean Press

Contents

Part III Mineralogy, Geochemistry and Isotopic Composition

Part IV Physical, Mechanical properties and Engineering Geology

Part V Geomophology and Soil Erosion

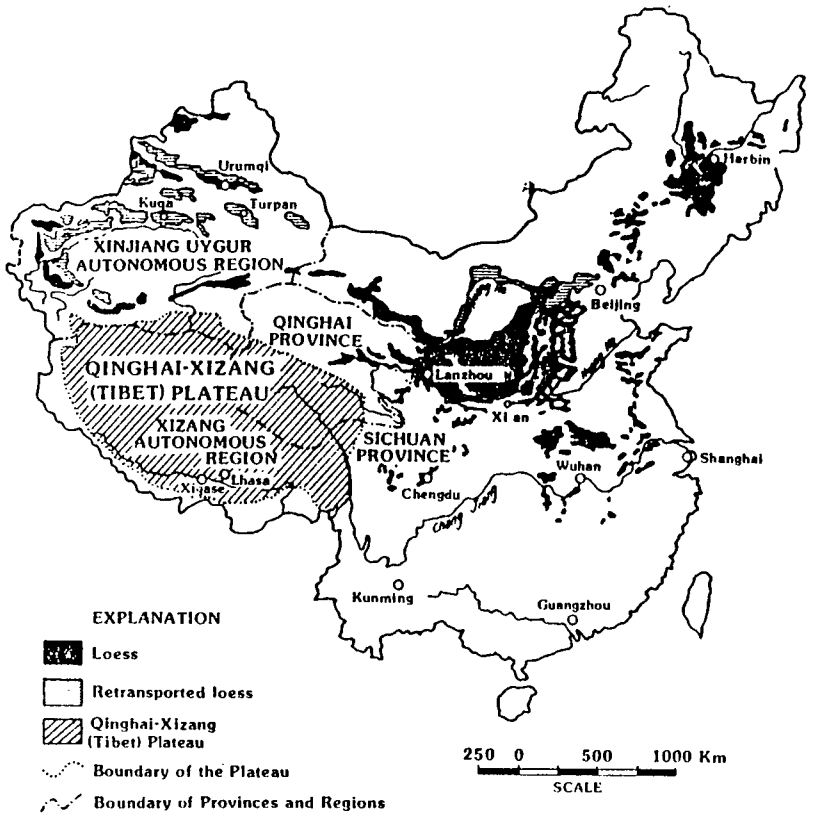


Fig. 1. Distribution of loess in China and location of Qinghai-Xizang (Tibet) Plateau. (Loess data from Liu and others, 1981, 1985; retransported loess data from Wang and Song, 1983; Mu, oral communication, 1986; Pewe, 1987)

Gully Changes in the Loess Plateau of China During the Historical Period

Shi Nianhai[1]

There are a great number of gullies in the Loess Plateau of China before the historical period. Afterwards in the historical period, the gullies have been forming and developing, and these processes are, to some extent, more intensive than those before historical period. The main cause for the formation and development of gullies is that the loess is loose and easy to be eroded. Besides natural factors, the artificial ones are important in the formation of gullies in historical period. For example, the increasing of loess erosion caused by vegetation ruin is one of the reasons. Up to now, The Loess Plateau appears to be in criss-cross forms, affecting not only the local production but also the safety of the lower reaches of the Yellow River.

The formation and change of the gullies have gonethrough certain processes, which may be calculated if the historical sites with absolute or relative ages near the gullies have been found. On the basis of the absolute or relative age data, the monuments from the former cities, the imperial palaces, the ancient passes and the Great Wall existing may be calculated for the developing processes of the gullies, because the length of upward extention of the gullies through these monuments with ages can be determined. According to the calculation results, the characteristics of the gullies development can be gained.

Now such ascertained ruins are discovered in more than ten places, scattered in different directions. If we arrange the neighbouring ruins in several groups, they consist of 4 lines from south to north. The definite degrees of the yearly progress of the gullies are acquired through several times of scientific research and investigation. Sometimes such research work is conducted with the aid of historian and antiquarian studies. The present paper presents herein the real lengths of the yearly progress of some gullies for the convenience of comparison.

The southernmost line

(1) The gully of Wangduocun along the city wall of old Hanguguan, Linbao County of Henan Province is 2.2 metres.
(2) The gully between Yangjiazhuang and Chengbeican of Tongguan County in Shaanxi Province is 1.58 metres.

1 Shaanxi Teachers University

Stratigraphy and Chronology of Seaview Formation, Awatere Valley, South Island, New Zealand

Dennis N. Eden[1]

Abstract: Loess mantles tectonically uplifted and tilted river terraces in the lower Awatere Valley in the north-east of the South Island and comprises seven layers totalling 20 m near the mouth of the Awatere River. The seven layers are defined as members of the Seaview Formation and were distinguished by morphology and abundances of major elements especially potassium and titanium. The base of each member is marked by a clear downwards transition from relatively few to many soil features and a decrease in potassium and increase in titanium concentrations. Four tephras interbedded within the Seaview Formation were identified following a comparison of their glass chemistry with North Island tephras. The most important of these is the c.21 000 years B.P. Kawakawa Tephra which occurs as a widespread marker within Starborough Loess and its age indicates loess accumulation under cold climate conditions. The three older tephras have fisson-track ages of 145 000, 220 000 and 240 000 years B.P. and these provide time-planes within the lower part of the Seaview Formation. Ages for the various loess members were estimated, from the interbedded tephras, by matching loess episodes with cold climates in the marine oxygen isotope record and from height relationships of terraces. The tephras allow direct correlation with North Island loesses or paleosols containing the same tephras. The upper part of the chronology is compared with the northern South Island glacial sequences and the limitations of the latter discussed.

Introduction

The Awatere Valley, in the north-east of the South Island (Fig. 1) is a fault angled depression (Lensen, 1962) which strikes north-east along the major transcurrent Awatere Fault and is within the active tectonic zone related to the oblique-slip margin of the Pacific and Australian crustal plates in which there are high rates of deformation and uplift.

Older uplifted and tilted river terraces in the lower Awatere Valley are mantled in loess; the loess is thickest on the highest terraces (Fig. 1).

The study was initiated after the discovery of the Kawakawa Tephra, which was erupted from the central North Island volcanic zone (Fig. 1), within the uppermost loess layer. This implied that other North Island tephras might be detected within the loess column which could provide a time framework similar to that established for the Rangitikei valley loess in the south-west of the North Island (Milne, 1973,

1 New Zealand Soil Bureau, Department of Scientific and Industrial Research, Private Bag, Lower Hutt, New Zealand

Late Pleistocene Loess in Southern North Island, New Zealand

Alan S. Palmer[1]

Abstract: The southern North Island of New Zealand has a varied and interesting Late Quaternary terrestrial sedimentary record. During cold phases the mountains at the headwaters of the major rivers were devegetated, but there were no significant glaciers. The tightly folded and extensively faulted greywacke-argillite was readily shattered by frost action, and eroded by wind and water. Steadily this material was moved by rivers to form extensive aggradational fans. Silt and lesser amounts of sand and clay were swept from the bars and abandoned channels of the braided surface to be deposited as loess on higher surfaces.

During warm phases vegetation substantially recolonised the mountains and loess source areas. Rivers then cut down through the aggradational gravels.

Careful interpretation of the loess record, aggradation gravels and buried soils allows a close comparison to the eustatic sea level and oxygen isotope curves.

Three sets of fluvial aggradation surfaces and three loess units were deposited during the Last Glacial (oxygen isotope stages, 2,3 and 4). Older cycles, less well preserved may be similarly related to the oxygen isotope and eustatic sea level curves.

The loess parent material is low in calcium, and in the present humid temperate climate the loess contains no carbonate. It does contain varying amounts of volcanic ash from catastrophic rhyolitic eruptions and intermittent andesitic eruptions from volcanic centres in Central North Island. The lack of carbonate, and presence of volcanic ash imparts certain properties to the loess and soils that are seldom found in loess from other regions.

Introduction

Loess has a long history of investigation in the South Island of New Zealand, starting from the work of von Haast (1878), and Hardcastle (1890). The study of loess in the North Island did not begin until the work of Cowie (1964a; 1964b) in Manawatu, although references to "loess-like silts" had been made a decade earlier. Significantly it was the distribution of a widespread rhyolitic tephra marker bed, the c. 20,000 yr B.P. Aokautere Ash by Cowie that confirmed the identification of loess. Loess studies in the southern North Island received a sudden impetus in the years that led

1 Soil Science Department, Massey University, Palmerston North, New Zealand

PROBLEMS OF THE STRATIGRAPHY AND PALEOGEOGRAPHY OF LOESSES

Edited by
HENRYK MARUSZCZAK

XII
INTERNATIONAL
CONGRESS

TABLE OF CONTENTS
SPIS TREŚCI
СОДЕРЖАНИЕ

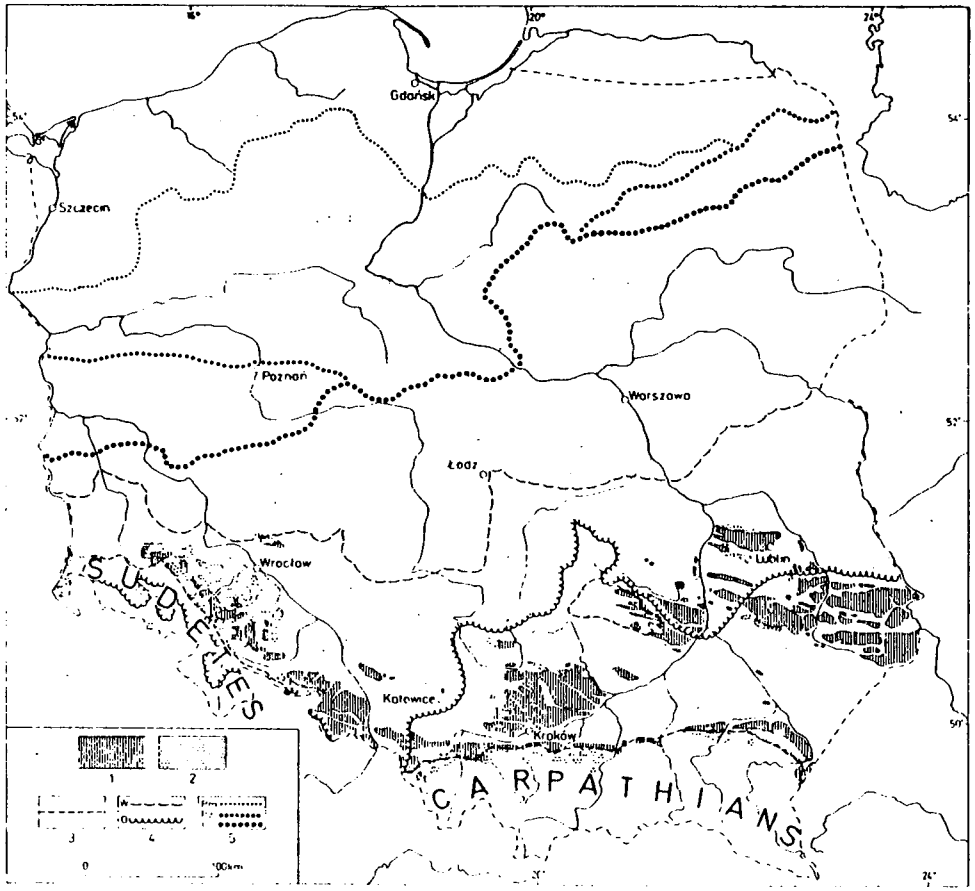


Fig. 1. Distribution of loesses in Poland (according to H. Maruszczak 1976, partly supplemented) and limits of the Saalian and Vistulian inland ice

ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN—POLONIA
VOL. XLI, 2, 15—54 SECTIO B 1986

Department of Physical Geography, Maria Curie-Skłodowska University,
Akademicka 19, 20-033 Lublin, Poland

Henryk MARUSZCZAK

Loesses in Poland, Their Stratigraphy and Paleogeographical Interpretation *

Lessy w Polsce, ich stratygrafia oraz interpretacja paleogeograficzna

Лёссы в Польше, их стратиграфия и палеогеографическая интерпретация

ABSTRACT

The development of conceptions on the stratigraphy of loesses in Poland was discussed with particular consideration of a correlation with the glacial cycles. Against this background, the newest version of the stratigraphic scheme was presented. This version takes into consideration the latest paleomagnetic investigations and datings by the radiocarbon and thermoluminescence methods. This scheme was correlated with corresponding elaborations for loesses in West and East Europe. There are distinguished: a) residua of weathered oldest loesses (LN) from the periods previous to the Mazovian=Holsteinian→Mindel/Riss Interglacial; b) older loesses (LS) dated for 310/300—135/130 ka BP, from the periods of the Odranian and Wartanian glaciations=Saalian I and II→Riss I and II, which were correlated with ^{18}O stages of deep-sea deposits: 8—7—6; c) younger loesses (LM), dated for 100—15/12 ka BP, from period of the Vistulian→Würm glaciations, which was correlated with ^{18}O stages: 5—4—3—2. Paleogeographic analysis of these units of the first and also of second rank was carried out mainly on the basis of the results of lithologic and paleopedologic investigations of loesses and cryogenic structures occuring within them. An analysis of LM proves that their deposition with many breaks took place, i.e. as a result of extreme events mainly. Stages of the development of permafrost, and also the average deposition rate of LM and its changes in the glacial cycle were determined; indices of LM thickness and of the deposition rate were compared with those determined for other Eurasia regions.

* This work was partially financed by the Committee of Quaternary Researche of the Polish Academy of Sciences. This grant was designed for datings of loess samples.

ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN—POLONIA
VOL. XLI, 3, 55—65 SECTIO B 1986

* Geotechnical Laboratory of the Bulgarian Acad. Scis., Acad. G. Bonchev str. 24, Sofia, Bulgaria
** Experimental Station of the Bulgarian Acad. Scis., V. Levski 3, p.o. box 433

Minko MINKOV*, Peter DONCHEV**,
Jordan EVLOGIEV**

Loess Stratigraphy of North-East Bulgaria

Stratygrafia lessów północno-wschodniej Bulgarii

Стратиграфия лёсса Северовосточной Болгарии

ABSTRACT

A complex analysis based mainly on geomorphological, paleopedological, paleontological and paleomagnetic researches has been accomplished to work out the eolian loess stratigraphy in north-east Bulgaria. The results of this analysis have allowed us to accept the three upper loesses (L_1, L_2, L_3) Würm age, the following two (L_4 and L_5) Riss and the oldest (L_6 and L_7) Mindel age. The position of the Neogene-Quaternary boundary has been defined and it determines the Quaternary. A morphostratigraphic scheme of the Quaternary in the region has been elaborated which includes sediments of river, lake-river and eolian origin.

We can find the first information about loess stratigraphy in north Bulgaria in G. Gunchev's (1935) and I. Boykov's (1936) works, where three loesses and two fossil soils are described. G. Gunchev referred the two upper loesses to Würm and the third to Riss. I. Boykov for the first time made detailed descriptions of the fossil soils. Later on D. Yaranov (1956, 1961), K. Mishev (1959), L. Filipov and L. Mikova (1967, 1977), N. Popov and L. Filipov (1982) worked on different problems of the Quaternary and connected loess accumulation in north Bulgaria with Würm glacial. Only M. Minkov (1968) assumed the presence of loesses not only of Würm but also of Riss and

АКАДЕМИЯ НАУК СССР
ОРДЕНА ТРУДОВОГО КРАСНОГО ЗНАМЕНИ ГЕОЛОГИЧЕСКИЙ ИНСТИТУТ

А. Е. Додонов

АНТРОПОГЕН ЮЖНОГО ТАДЖИКИСТАНА

УДК 551.782

Academy of Sciences of the USSR
Order of the Red Banner of Labour Geological Institute

A.E. Dodonov

ANTHROPOGENE OF SOUTH TAJIKISTAN

Transactions, vol. 409

Додонов А.Е. **Антропоген Южного Таджикистана.** М.: Наука, 1986. 168 с. (Тр. ГИН АН СССР; Вып. 409).

На основе применения комплекса методов составлена детальная стратиграфическая шкала верхнеплиоцен-четвертичных отложений Южного Таджикистана. Рассмотрены закономерности строения четвертичных отложений аридной области Средней Азии в предгорьях Памира и Тянь-Шаня. Показаны временные и пространственные соотношения в проявлении геологических событий. Установлена продолжительность и последовательность формирования лёссово-почвенных образований. На основании широких межрегиональных корреляций дан анализ степени синхронности и диахронности проявления основных геологических событий. Кратко освещены некоторые вопросы геологии палеолита.

Табл. 6, ил. 49, библиогр. 371 назв.

МОСКВА
"НАУКА"
1986

ВВЕДЕНИЕ

При изучении антропогена Средней Азии внимание исследователей часто привлекает территория Южного Таджикистана, где расположены важные геологические объекты, познание которых обогащает наши представления о геологии и истории четвертичного периода. Южная часть Таджикистана — это обширная тектоническая депрессия, заключенная между высокогорными сооружениями Тянь-Шаня на севере, Западного Памира на востоке, рекой Пяндж—Амударья на юге и юго-западными отрогами Гиссарского хребта на западе. В пределах Южного Таджикистана распространяется система горных хребтов с абсолютными высотами в центральной части депрессии до 1,5—2 тыс. м и повышающимися на северо-востоке до 3—3,5 тыс.м. Между хребтами находятся долины крупных рек — Вахша, Кафирнигана, Кызылсу и их притоков — Явансу, Таирсу, Яхсу, Обимазар и др. Виргация хребтов и понижение абсолютных высот водораздельных поверхностей происходят в направлении с севера и северо-востока на юг—юго-запад. На площади Таджикской депрессии известны богатые местонахождения костных остатков млекопитающих, расположены относительно полные разрезы субаэральных и субаквальных верхнеплиоцен-четвертичных отложений, в лёссово-почвенных разрезах открыты памятники древних палеолитических культур (рис. 1). Положение Южного Таджикистана на стыке Северной Евразии и южной части Азиатского континента, а также относительная близость Черноморско-Каспийской области — все это обусловливает ключевое значение Южного Таджикистана при разработке вопросов стратиграфии, палеогеографии и геологической корреляции.

Геологические объекты Южного Таджикистана позволяют широко использовать при их изучении комплекс геологических, геоморфологических, литологических, биостратиграфических, физических и археологических методов. В четвертичной геологии Южного Таджикистана на первых этапах работ превалировали геоморфологические методы исследований. На основе прослеживания главным образом геоморфологических уровней были созданы первые литостратиграфические схемы, которые в дальнейшем разрабатывались и детализировались. Некоторые недостатки этих схем выявились, когда началось детальное изучение лёссово-почвенных образований, формирующих мощные покровы на различных элементах рельефа. Отсутствие четких представлений относительно возраста, условий залегания и генезиса лёссово-почвенных образований затрудняло корреляцию субаквальных и субаэральных отложений. Согласно прежним взглядам, лёссы рассматривались как сравнительно молодые отложения, венчающие разрез антропогена, а их распространение на водоразделах объяснялось чаще всего проявлением тектонического фактора. В наши задачи входило выявление пространственно-временных соотношений субаквальных и субаэральных отложений, уточнение возраста отдельных литофациальных комплексов, а также их региональная и межрегиональная корреляция.

Для создания биостратиграфической основы верхнеплиоцен-четвертичных отложений были проведены детальные геологические работы на разрезах, где известны находки фаунистических остатков. В процессе работ открыты новые местонахождения костных остатков млекопитающих. Эти исследования проводи-

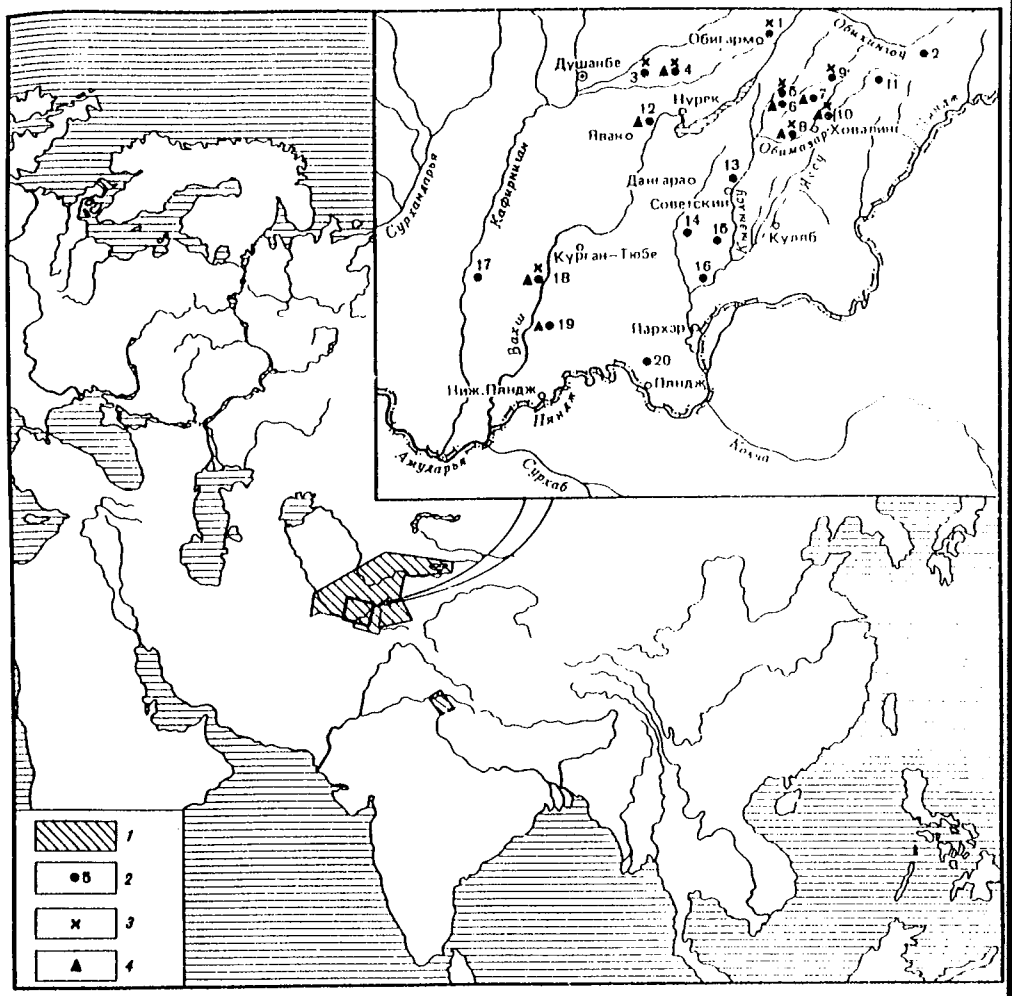


Рис. 1. Схема расположения опорных разрезов верхнеплиоцен-четвертичных отложений Южного Таджикистана

1 — районы исследований; *2* — геологические разрезы; *3* — находки костных остатков млекопитающих; *4* — палеолитические находки.

Цифры на карте: 1 — Обигарм, 2 — Хыргодара, 3 — Зильфи, 4 — Карамайдан, 5 — Куруксай, 6 — Кайрубак, 7 — Чашманигар, 8 — Лахути, 9 — Тутак, 10 — Хонако, 11 — Даштако, 12 — Каратау, 13 — Советский, 14 — Шургузар, 15 — Учкол, 16 — Саманчи, 17 — Каттасай и Тангузар, 18 — Ак-Джар, 19 — Карабура, 20 — Камышлагы

лись в комплексе с палеомагнитным изучением разрезов, осуществлявшимся А.В. Пеньковым, Л.Н. Гамовым, Е.И. Жидковым. Благодаря получению палеомагнитных характеристик разрезов и определению геологической позиции местонахождений костных остатков удалось установить стратиграфический уровень большинства костеносных горизонтов. Изучение костного материала проводилось палеонтологами Геологического и Палеонтологического институтов АН СССР и Института зоологии и паразитологии АН ТаджССР. Сбор нового материала и детальная обработка коллекций костных остатков млекопитающих позволили обосновать возраст изучаемых толщ.

INQUA Loess Commission

Documentation Working Group

LL18

October 1987