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## ON THE PERIGLACIAL CHARACTER OF THE UKRAINIAN LOESSES

In spite of the fact that the majority of workers who investigated the Ukrainian loesses were of the opinion that their formation took place during the Pleistocene glaciation, there were many gaps as far as the explanation of their structure, mineralogical composition and properties were concerned. The engineering and geological works in the last twenty years made it necessary not only to demonstrate but also to explain the regularities of the changes in structure, composition and properties of loesses of various regions.

Investigations in that period revealed essential shortcomings of the existing views on the glacio-eolian and glaciofluvial origin of Ukrainian loesses (as far as conventional and long-surviving concept of their origin was concerned).

During the last few years the concept of periglacial origin of the loess formations has gained a strong position, because it is capable of providing as satisfactory explanation to all the facts relating to these formations. This concept can be summarized as follows:

Loesses are a product of the periglacial climatic environment. Their mineralogical and grain-size composition is a result of weathering processes of loess. This kind of weathering has a special position among the numerous processes of periglacial weathering because comprises mechanical, chemical and biological weathering. The properties of loesses resulted from the conditions of transportation and accumulation of the material which underwent afterwards compaction, water-saturation, weathering and soil-forming processes.

Loess, which is polygenic in origin, should be considered within single particular facies. It contains, in the extreme case, three genetic groups of loess formations: loess, loess-like deposits and „loessic” deposits.

The deposits belonging to the first and second groups were developed predominantly as a result of primary loess-forming processes. The third group comprises the „loessic” deposits. It is also reasonable to distinguish the secondary loess formations which were accumulated as a result of colluvial (delluvial) and alluvial processes in post-glacial time.

The thickest and stratigraphically full series of loess occur in flat depressions

on the poorly dissected accumulational surfaces. In the area on the northern coast of the Black Sea, in Zaporozhe region and in the southern part of the Poltavian Plain, 3—4 loess rhythms can be found in the loess series. Within each full loess rhythm the following elements are distinguished (from bottom upwards):

1. loess-like silts, which began to form in the cryohyrotic phase and were finally formed during the first half of the cryoxerotic phase of the glaciation;
2. loesses which were formed under the optimum cryoxerotic conditions;
3. fossil soils formed during the interglacials.

The conditions assumed for each of the mentioned phases have been confirmed not only by lithology but also by the palynological and malaco-faunal material.

It is also interesting to note presence of frost disturbances in loess deposits; pseudomorphoses of ice wedges (mostly on the boundary between loesses and loess-like silts), traces of solifluction processes (on the boundary between loess-like silts and fossil soil) are often encountered; it is most probably that some depressions are of thermokarst origin.

In other Ukrainian regions though some periglacial phenomena are present, the number of full loess rhythms decreases, in some places they become indistinct, in some other places they are absent. This can be observed particularly within the erosional surfaces, where the continuous denudation or its particular distinctly marked phases caused the essential changes in the accumulation conditions of loess deposits.

*Translated by M. Duraj*