

## **BURIED CRYOGENIC DEFORMATIONS IN BANK EXPOSURES OF THE MIDDLE STREAM LENA RIVER**

SPEKTOR, V.B., SPEKTOR, V.V. Melnikov Permafrost Institute, SB RAS, Yakutsk, Russia

Thick strata of loose, substantially sandy Quaternary deposits which contain buried cryogenic deformations are exposed along high (20-80 m) bank scarps located predominantly on the right bank of the middle Lena river valley. Structural approach was used both to classify these deformations, and determine more precisely directions of forces which induce layer deformations, and causes of deformations. All the forms are of exogenic origin, depending considerably on gravitation, hydrodynamic and water crystallization pressure, and soil thixotropic properties. Some forms originated by these forces have no analogs in structural geology. For instance, these are discontinuous folded blocks comprising dislocated layer fragments or fixed jet fragments - the so-called cryoturbation. Cryogenic deformations may be divided into two large groups: disjunctive and folded. Disjunctive deformations are presented by tension cracks and faults, while folded by gentle troughs, and uplifts, shallow disharmonic folds, horizontal folds, diapir-like forms. Conclusions: 1) All the deformations observed had cryogenic origin. 2) Middle and Upper Pleistocene deposits were accumulated in severe climate under upward movement of the lower permafrost border. Repeated thawing of these strata is explained by change of water level in the sedimentary basin rather than climate fluctuations. Regressions formed the conditions for strata freezing, while thawing of upper frozen deposits occurred under transgressions. 3) Cryogenic deformations present continuous series of simple disjunctive to complex folded and fold-blocked forms, or even ground with completely lost original structure.