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Excursions
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SOME PERIGLACIAL FEATURES IN THE E- AND CENTRAL NETHERLANDS

TERRACES, CRYOTURBATIONS, EOLIAN DEPOSITS, ALLUVIAL FANS AND DRY VALLEYS BETWEEN MAASTRICHT AND NIJMEGEN

BAARLO, SOUTH OF VENLO

Demonstration of 3 low terraces of the river Meuse (terraces II, IIa and III). Correlation and dating of the terrace by: (a) the presence or absence of coversands on the terraces, (b) pollen analysis of the deposits of former channels, (c) different soils on the terraces, (d) archaeological finds, (e) the occurrence of cryoturbation, (f) the morphological position of the different terraces.

The formation of terrace II took place during the Allerød. Terrace IIa represents the incision stage caused by a tectonic movement of 1.5 m of the Peel Boundary Fault during the Allerød. Terrace III has been formed in a part of the Preboreal.

BROEK, J. M. M. VAN DER, MAARLEVELD, G. C., 1963 — The Late-Pleistocene terrace deposits of the Meuse. *Med. Geol. Stichting*, 16; p. 13—24.

TEGELEN, SOUTH OF VENLO

Deformations in the deposits of the Kedichem Formation overlying the Tegelen Clay. According to VAN STRAATEN (1956) there are drop-like structures and frost cracks. Age: Eburonian.

STRAATEN, L. M. J. U. VAN, 1956 — Structural features of the "Papzand" Formation at Tegelen (Netherlands). *Geol. en Mijnbouw*, 16; p. 416—420.

ARCEN, NORTH OF VENLO

Gravel pit with large deformations. Middle Pleistocene terrace deposits of the river Rhine underlying a layer of fine sand and loam. In this layer and in the terrace deposits the deformations occur to a depth of 2.5 m. On the surface they form large polygons (GOLTE and HEINE, 1974). The polygons are covered by a thin layer of sand and gravel (solifluxion) forming the base of the coversands. In the Netherlands this type of polygons is only found in the Middle Pleistocene and older deposits. The genesis of these polygons is still under discussion.

GOLTE, W., HEINE, K., 1974 — Fossile Riesen-Eiskeilnetze am Niederrhein. *Eiszeitalter u. Gegenwart*, 25; p. 132—140.

TUINDORP, NORTH OF VENLO

Parabolic dunes consisting of river sands and coversands. The deposition of the coversands took place during the Younger Dryas and the formation of the dunes mainly during the Preboreal.

The longest transport distance of the eolian sand took place during the Older Dryas, the distance during the Younger Dryas was shorter and the shortest was during the Holocene.

TEUNISSEN, D., 1973 — Een laatglaciale veen- en leemlaag op het landgoed de Hamert (Midden--Limburg) en de betekenis van deze laag voor de hydrologie van het gebied. *Med. Afd. Biol. Kath. Univ. Nijmegen*, 5.

MOOK, SOUTH OF NIJMEGEN

Scarp, alluvial fans and dry valleys in an ice-pushed ridge.

The ice-pushed ridge which was formed during the Saalian is mainly characterized by periglacial slopes ($< 6°$). The much steeper scarp was formed by the undercutting of river water and is younger or as old as the periglacial phase. Dry valleys with a niche-like upper part are developed in the scarp. In front of these valleys lie alluvial fans probably of Holocene age.

LOCATION KOOTWIJKSE ZAND

A major part (230 km^2) of the eolian drift sand areas of the Netherlands is to be found in the Veluwe. The largest still active drift sand area within the country is situated in the Kootwijkse Zand at the western side of the large, so-called ice-pushed ridges of the eastern Veluwe.

ICE-PUSHED RIDGES AND PERIGLACIAL DEPOSITS IN VELUWE

STOP NEAR EDE

View of ice-pushed ridges and sandr plain. The landscape has been formed during the Saalian and eroded under periglacial conditions during the last part of the Saalian and during the Würm.

A desert pavement lies on top of the coarse deposits, consisting of many wind-worn stones and polished gravels and stones.

SCHÖNHAGE, W., 1969 — Note on the ventifacts in the Netherlands. *Biuletyn Peryglacjalny*, 20; p. 355—360.

MEULUNTEREN (NORTH OF EDE)

Sandpit in ice-pushed deposits with on top fluvio-glacial deposits, underlying till. The till partly merges into the fluvioglacial material. The top of the deposits of a more than one metre thick zone with chaotic cryoturbation where there are some cracks.

Detailed analyses of the grain-size distribution, the mineralogical composition and the roundness distribution of the sand-size fractions of the highly uniform sediments indicate that Late-Glacial (Würmian) cover sands have locally been redeposited as drift sands. The drift sands display a very irregular topography and during their redeposition an inversion of the relief took place.

Palynological investigations, confirmed by radio-carbon datings, of "blown-over" peat layers and podzol profiles in cover sand prove that the drift sand position took place during the Subatlantic, mainly after 1150 to 1250 A.D., as a result of the destructive activity of man.

Differences in grain packing, humus layers, cryoturbation structures and soil profile development within the sands, together with geomorphological differences in dominant and maximum heights and slopes enable cover sands and drift sands to be distinguished.

KOSTER, E. A., 1978 — De stuifzanden van de Veluwe; een fysisch-geografische studie (summary: The eolian drift sands of the Veluwe, Central Netherlands; a physical geographical study). Diss. Univ. of Amsterdam.

UDDELERMEER, NEAR UDDEL

Lake in the central part of the glacial depression between two ice-pushed ridges (Saalian). The depression is infilled by varved clays, underlying snow meltwater deposits of the last glacial.

The lake lies in the snow meltwater deposits and varved clays and has a depth of more than 7 m. The infilling material has a Late glacial age. There is a very indistinct rim round the lake, composed of coarse material. Genesis of the lake is uncertain.

POLAK, B., 1959 — Palynology of the "Uddeler Meer". *Acta Bot. Neerl.*, 9; p. 547—571.

EERBEEK, SANDPIT "HEIDEROOS"

The sandpit is in a large alluvial fan in front of a funnel-shaped dry valley. There are two zones with chaotic cryoturbation and frost wedges longer than 2 m. There are 4 peat layers. An Early Glacial age may be deduced for the oldest peat layers and a Middle Pleniglacial age for the younger ones. For the lower cryoturbated zone is suggested a Lower Pleniglacial age and for the upper cryoturbated zone an Upper Pleniglacial age.

MAARLEVELD, G. C., 1976 — Periglacial phenomena and the mean annual temperature during the last glacial time in the Netherlands. *Biuletyn Peryglacjalny*, 26; p. 57—78.

POSBANK, NEAR RHEDEN

View-point on the ice-pushed ridge, intersected by snow meltwater and the occurrence of asymmetrical valleys infilled by loessy material.

The gently sloping sides of the dry valleys contain a rather thick layer of solifluxion material. In our opinion this must have been due to snow, which was delivered

by westerly winds and remained sheltered under the lee of the western valley sides. After the formation of the asymmetrical valleys loess deposition took place mainly on the gently sloping valley side.

MAARLEVELD, G. C., 1962 — The Veluwe. *Med. Geol. Stichting*, 15; p. 49—54.

RHEDEN, EAST OF ARNHEM. SANDPIT

Ice-pushed sediments with on top loess and sandy loess deposits.

In this part of the Veluwe and also near Nijmegen there are small regions with loess, related to be steep slopes of ice-pushed ridges. The deposition of loess took place either because of the occurrence of vegetation due to the aspect of the slopes or because of lee effect of north-western winds. The loess is characterized by a distinct decalcification. Age: Upper Pleniglacial, younger than the Beuningen Complex.

VINK, A. P. A., 1949 — Bijdrage tot de kennis van loess en dekzanden, in het bijzonder van de zuidoostelijke Veluwe. Thesis Wageningen.