Palaeontology. — *On a Dryasflora-bearing deposit in the Netherlands.* By F. FLORSCHÜTZ. (Communicated by Prof. L. RUTTEN).

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In 1891 the Swedish palaeobotanist A. G. NATHORST summarized his experiences about the occurrence of fossil remains of arctic plants within the area of the former North-European icesheet as follows:

"Bevor ich Norddeutschland verlasse, muss ausdrücklich betont werden, dass die arktischen Pflanzenreste in einer ganz bestimmten glacialen Süsswasserformation hier vorkommen. Diese Formation findet sich über die ganze Moränenlandschaft Norddeutschlands und Westrusslands verbreitet (ganz wie in Schonen und Dänemark) und man kann folglich dort die Zahl der Fundstätten nach Belieben vermehren" [1]).

The said "Formation" forms part of a complex of layers always resting upon the moraine and consisting in descending sequence of peat, "gytja", peatlime and freshwater-clay and -sand of which either the "gytja" or the peatlime or both may be wanting. According to this author only Betula nana L. sometimes occurs in the peat; for the rest the remains of arctic plants are confined to the "gytja", the peatlime, the clay and the sand, especially to the last-mentioned two sediments [2]).

Directed by this information I went in search of fossil arctic plants in the Netherlands. First of all my attention was drawn to the spots where peatlime occurs at a short distance from boulderclay, as it is possible that the moraine extends under the lime.

Two places, one near Markelo in the province of Overijssel and the other south-west of Winterswijk, were chosen for further investigation.

An inundation in the last months of 1926 provisionally eliminated the marshes of Markelo. I therefore first confined myself to the bog of Blekkink in the vicinity of Winterswijk.

VAN BAREN records lime under peat on that spot [3]).

On the 28th of December 1926 a profile was dug near a brook intersecting the field. From the top downwards the following order was to be observed: surface soil 10 cm.; sandy loam 20 cm.; peat 30 cm.; peatlime 35 cm.; clay 30 cm.; grey sand 50 cm.

The floor of the sand was not reached at that time neither when

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[1]) Ueber den gegenwärtigen Standpunkt unserer Kenntnis von dem Vorkommen fossiler Glacialpflanzen. Bihang till Kongl. Svenska Vetenskaps-Akademiens Handlingar. Band **17** Afd. III. N°. 5. p. 20.

[2]) Loco citato p. 5, 6 and 7.

[3]) De bodem van Nederland, p. 716.

further efforts were made especially owing to the high level of the groundwater and the insufficient boring-apparatus. The presumption that under the sand boulderclay is to be found, as in places quite near it rises to the surface, could therefore not be confirmed at that time.

On examining the collected material a topfragment of a leaf of Dryas octopetala L. was found in the layer forming the transition from peatlime to clay.

A further investigation of this sediment consisting partly of lime partly of clay yielded a great many endocarps of Potamogeton, some seeds of Myriophyllum spicatum L. and of Betula (probably not of Betula nana L.), many epidermisfragments of Phragmites, multitudinous Chara-oogonia, Diatomeae, insects-rests, shells of Ostracoda and freshwatermolluscs.

Considering the following facts I may presume here a findingplace of the so-called Dryasflora.

NATHORST records as parts of this former vegetation besides Dryas octopetala L. especially the waterplants Myriophyllum and Potamogeton [1]). Moreover he reports the occurrence of the following typical fauna accompanying the arctic plantrests: some Pisidia, Anodonta or Unio, Limnaea ovata and Cyclas cornea [2]).

VAN BAREN gives an enumeration of the shells found in the peatlime of Blekkink-bog, including some Pisidia, Limnaea ovata and Sphaerium corneum (syn. Cyclas cornea) according to the determination of M. SCHEPMAN [3]).

The review of the organic rests found in the "Dryashorizont" of North-Germany, given by PAUL RANGE, contains Betulae (also other ones besides Betula nana L.), Phragmites and Charae, and among the zoological remains Ostracoda [4]).

Besides the nature and order of the layers of the profile correspond with the general scheme composed by NATHORST.

The site of Blekkinkbog is about 40 m. above sealevel, 51° 55′ N. and 6° 40′ E. of Greenwich.

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Velp (*G.*), *Holland*, January 10th 1927.

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1) Loco citato p. 12.
2) „ „ p. 7.
3) „ „ p. 716.
4) Das Diluvialgebiet von Lübeck und seine Dryastone. Zeitschrift f. Naturwiss. Bd. **76**. 1903. p. 232—241.