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LITHO- AND BIOSTRATIGRAPHICAL STUDY OF QUATERNARY DEEP MARINE DEPOSITS OF THE WESTERN BELGIAN COASTAL PLAIN

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SUMMARY. - Elaborate deep borings for hydrogeological purposes in the western part of the Belgian coastal plain revealed the presence of deep marine sediments with different facies.

A combined diatom-, mollusc- and pollen investigation procurred many new and interesting data about the diatom flora and the mollusc fauna as well as about the environment and the age of the sediments. The absence of direct reference investigations preventing uniform conclusions at this stage of the investigations. A radio-carbondating and the pollen analysis showed the presence of boreal sediments at the same depth of probably older (Eemian) deposits.

RESUME. - Une série de sondages dans le cadre d'une exploration hydrogéologique dans la région de De Panne (plaine maritime belge) a démontré la présence de sédiments marins quaternaires à des profondeurs de plus de 30 m. Une explication pour les grandes différences de facies de ces sédiments ne s'avérait possible que par des recherches paléontologiques détaillées.

Ainsi, les examens des diatomées, des mollusques et des pollens ont livré un grand nombre de données nouvelles sur les compositions paléontologiques, le milieu et l'âge des couches. A l'état actuel, l'absence de recherches de références directes n'a pas permis de réunir complètement les résultats des différentes disciplines dans une même conclusion. Néanmoins, une datation C_{14} et l'analyse pollinique ont prouvé la présence de sédiments boréals à la même profondeur que des sédiments plus anciens, probablement d'âge Eemien.

INTRODUCTION.

An hydrogeological study of an unconfined aquifer was conducted in the western part of the Belgian coastal plain. Twenty mechanical drill holes and sixty auger holes werd dug in order to place piezometers. The location of these holes is shown on fig. 1. The mechanical drill holes reach the Eocene clay substratum between 30 and 40 m depth; the augering only dug into the upper part of the unconfined aquifer with a depth ranging between 6 and 10 m. The main objective of the hydrogeological study was to identify the lithostratigraphical units, to determine their areal extend and to estimate their hydraulic conductivity. In this way the pervious and semi-pervious layers in the unconfined aquifer were recognised.

In order to obtain an accurate borehole log the macroscopic features of the obtained samples were described during the drillings. The elevation of the ground surface was measured by water levelling. Grain-size analyses were conducted on selected ground samples that were representative for the different layers. In this way a lithostratigraphical profile was constructed and some informal lithostratigraphical units werd described. A possible age and genesis was deduced from the existing literature on the quaternary deposits in the western coastal plain (L. LEBBE, 1980) although there still exist many problems on this subject. The lithostratigraphical profile shows a surface lying between the levels -16 and -18. Above this surface rather homogeneous sediments (layer 4) prevail while below this level the lithological composition can change laterally very abruptly (layer 2, layer 3.1 and layer 3.2). In this study this surface is called level -17. According to the present literature the sediments above level -17 correspond to Calais deposits. The age and the genesis of the sediments below level -17 are more difficult to determine. To obtain more insight in their age and genesis a palynological, diatomic and malacological study was carried out.