Introduction to the Harre borehole, Denmark.

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The Harre borehole is situated close to the village Harre in the peninsula Salling in the Northwestern part of Jylland (Fig. 1). It is drilled by the drill-company, Poul Christiansen A/S, Højslev and performed with continuous cores of a diameter of 10 cm in plastic coreliners at a length of 1.5 m. The main purpose for the borehole was to measure the temperature profile in the hole and thermal parameters such as heat conductivity in three dimensions in the cored material as part of a geothermal project, directed by Niels Balling, at the Department of Geology, supported by the European Economic Community.

The drilling operation was completed succesfully with almost 100 % recovery and with a unique quality without drilling disturbances of any importance, and therefore an intensive sampling and analyses program was established. In the borehole a gamma ray and a resistivity wireline log was produced by Terraqua A/S. Spectral natural gamma measurements, enabling a distinction between the contribution to the total gamma emission from K, U and Th was produced by the Department of Electrophysics, the Technical University of Denmark on selected cores and individual samples. Results from these measurements are included and discussed in the first paper in this volume.

The geographical location of the borehole is interesting as it might be influenced by four nearby salt structures, namely the Batum, the Nykøbing Mors, the Uglev and the Skive structures, and by the regional tectonic active Fennoscandian Border Zone. Furthermore, the cored material comprises a well developed Paleocene and Oligocene sequence and some units representing the older part of the Eocene. A detailed study of the material was believed to contribute to a better understanding of the Tertiary history of the region and to a correlation of different biostratigraphic tools and their correlation to the magnetostratigraphy and the lithostratigraphy as elucidated by descriptions and analysis of the sediments and by the wireline logs and gamma ray measurements performed on cores and samples. The material of this core is also well suited for localization of stratigraphical gabs and for the identification of intervals characterized by high concentrations of reworked fossils and consequently also other reworked non-biogenic particles, not so easy to define as reworked. This information might be very important when analysing cuttings samples, for instance in North Sea wells, where the risk for severe caving not always can be excluded, and has to be considered as an uncertainty for biostratigraphic interpretations. The papers here presented mainly document the age, the provenance, the depositional environment etc. of the recovered intervals of this particular borehole. Because of the high quality of the cores and samples the results will hopefully be incorporated in regional and stratigraphic studies of any kind in the future.

Immediately after the drilling operation had ceased the thermal parameters were measured and the cores were described and several sets of samples taken. Contacts to specialists in Denmark, Norway, England and Germany were established and the samples distributed. The deadlines for submitting manuscripts to what has no become the first volume of *Aarhus Geoscience* have been difficult for many of the contributors to keep. Some of the contributions are therefore originally written a few years ago while others are relatively new. Yet, all authors have had the opportunity in 1993 to update their first version, and no one wanted to withdraw their contribution. As the one who has had the pleasure to collect the manuscripts and to encourage the authors during the process, it is satisfactory for me that the results of the various investigations finally is published in one volume, and I want to use this opportunity to thank the authors, some for their patience, some for their persistent work with the material and hope that some kind of cooperation between us also in the future is an obvious possibility.

Looking backwards it is evident that also other kinds of investigations might have been usefull to perform on the Harre material. Some things that I miss most is a biostratigraphy based on dinoflagellates and some high resolution seismic profiles in the vicinity of the borehole, but some of these analysis might be performed in the future.

During his visit at the Department of Earth Sciences,

Aarhus University, Istvan Veto from the Hungarian Geological Survey, Budapest, became interested in the organic material from the Oligocene part of the Harre cores. He arranged some Rock-Eval analysis performed by Dr. M. Hetenyi, Jozsef Attila University, Dept. Miner. Geoch. Petrogr. in Szeged, Hungary. The results are listed in Appendix A, p. 167. Istvan Veto's conclusion is that the samples contain too little amounts of marine kerogen to justify a further analytical program comprising carbon isotopic studies. The efforts of these two Hungarian colleagues are highly appreciated.

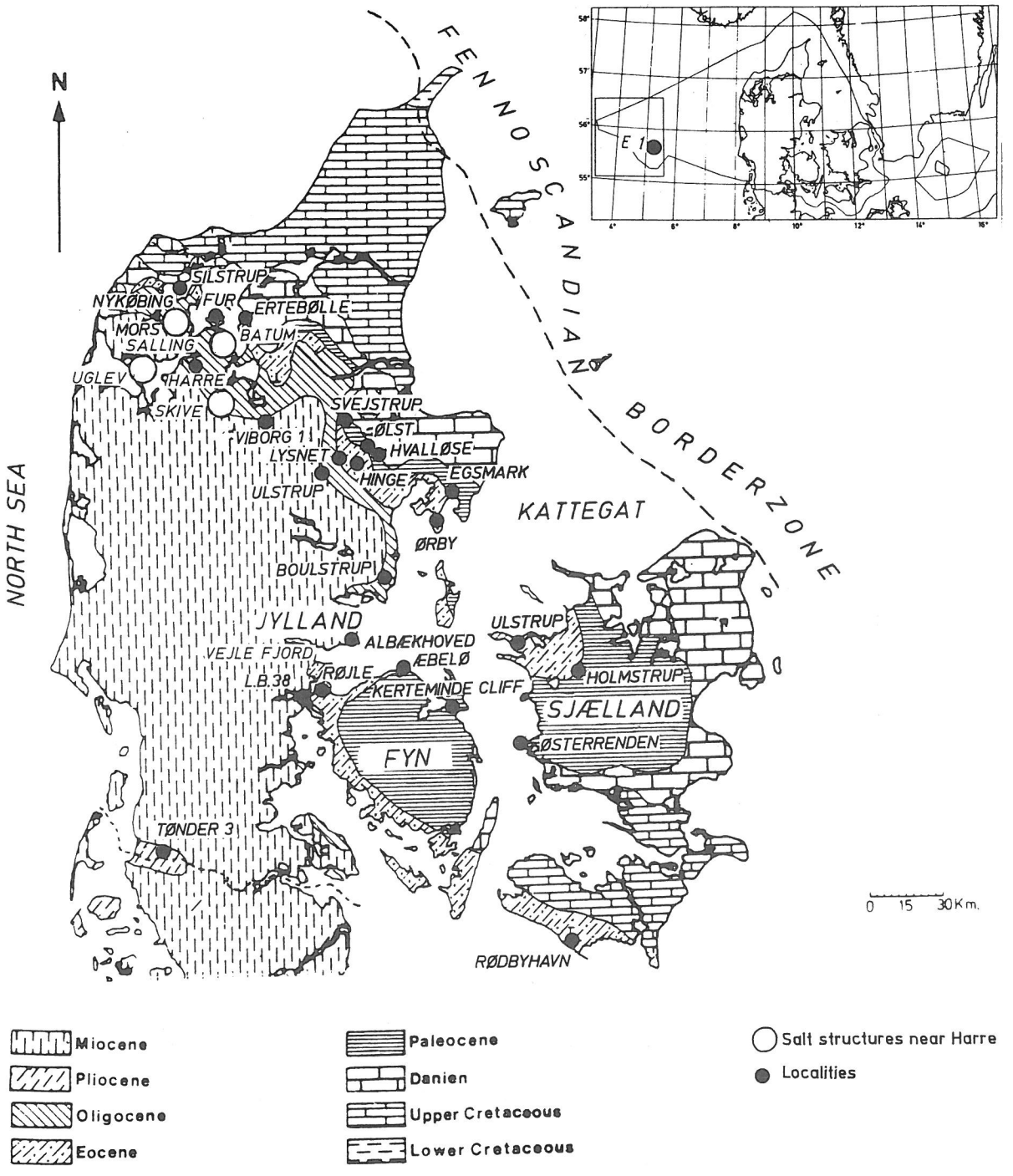

Fig. 1: Location map