SEDIMENTOLOGICAL AND STRATIGRAPHICAL STUDIES ON THE MIOCENE SEDIMENTS IN WADI GHARANDAL AREA-SINAI

THESIS

Presented in Partial Fulfillment for the Requirements
of the Degree of
MASTER OF SCIENCE
in
GEOLOGY

By
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B. Sc. (Hons.)

To
The Faculty of Science
Ain Shams University

1987

NOTE

The present thesis is submitted to the Faculty of Science, Ain Shams University in partial fulfillment for the requirements of the degree of Master of Science in Geology.

Besides the research work materialized in this thesis, the candidate has attended ten post-graduate courses for one year in the following :

1- Field Geology.
2- Laboratory Techniques.
3- Mineralogy.
4- Geochemistry.
5- Lithostratigraphy.
6- Biostratigraphy.
7- Structural Geology.
8- Geotectonics.
9- Sedimentology.
10- Sedimentary Rocks.

He has successfully passed the final examination in these courses.

In fulfillment of the language requirement of the degree, he also passed the final examination of a course in the English Language.

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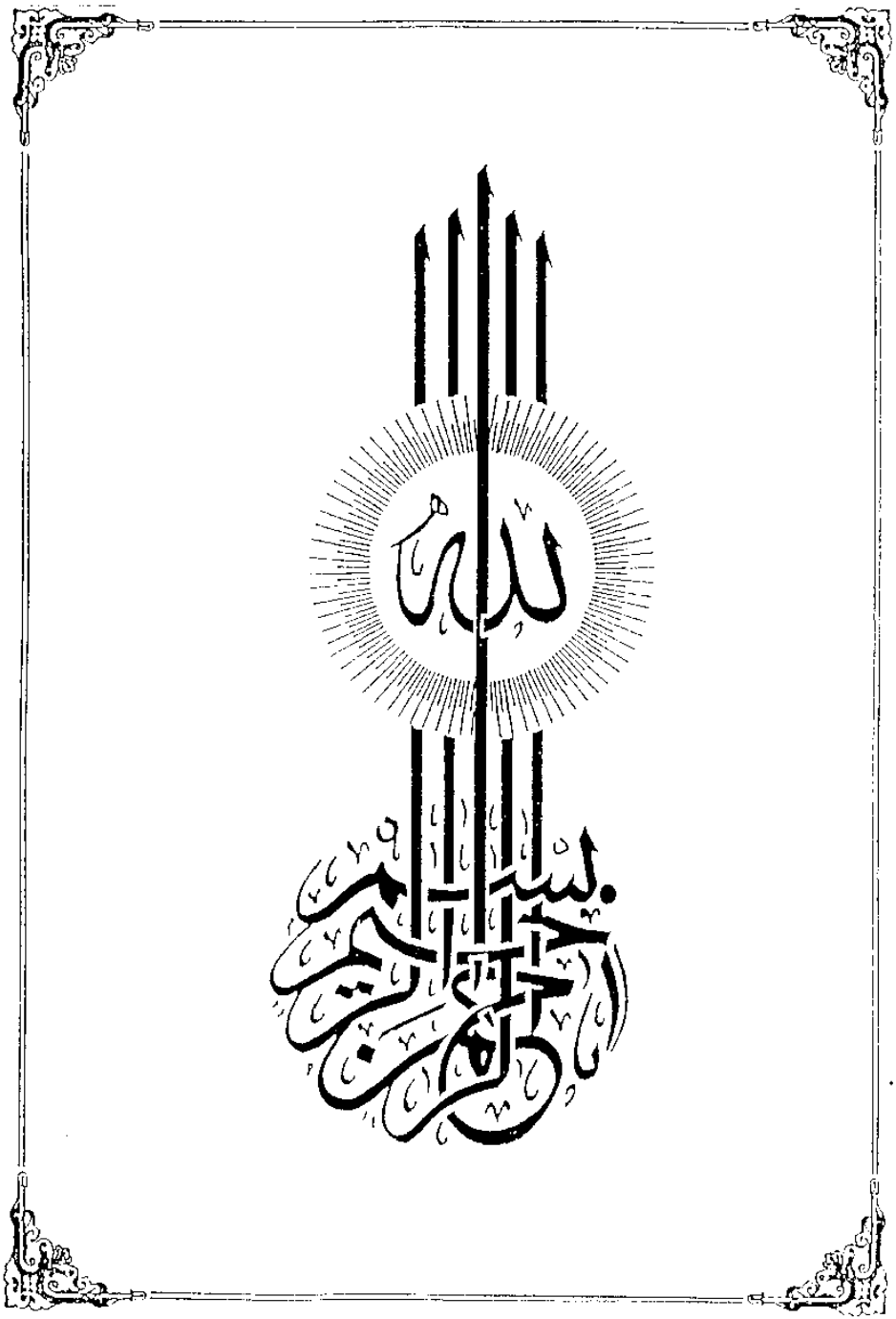

ACKNOWLEDGEMENTS

The author wishes to express his deep gratitude to Prof. Dr. M.A. Bassiouni, the Head of Geology Department, Faculty of Science, Ain Shams University for his kind encouragement.

Most sincerely thanks are to Dr. F.H. Hamza, Geology Department, Faculty of Science, Ain Shams University, who supervised, planed and helped in all the field works and for fruitful discussions around laboratory work and revision of the manuscript.

Many thanks are to Dr. Y.A. Ali, Department of Geology, Faculty of Science, Ain Shams University, for supervision and continuous guidance and help.

Thanks and high appreciation are to Prof. Dr. O. Cherif for his valuable discussions and identification of the microfossils.

I am particularly indebted to Mr. H. Garamoon and Mr. M.E. El-Wakeel, Department of Geology, Faculty of Science, Ain Shams University and to Mr. Abd El Moneim, Faculty of Education, Ain Shams University for their help during the field and laboratory work.

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ABSTRACT

The present thesis deals with the stratigraphy and sedimentology of the Miocene section at Wadi Gharandal area, W. Sinai. The recognized stratigraphic units are the Rudeis, Kareem and Belayim formations. Two facies types are sedimentologically defined, namely the evaporite facies and the non-evaporite facies. Origin and depositional environment of both facies types are approached by means of quantitative microfacies analysis, mineralogic and petrographic investigation.

CHAPTER 1

INTRODUCTION

1.1- INTRODUCTION

The Gulf of Suez region has a remarkable importance from the geological point of view due to its geologic history and economic potentialities. At some localities, there are many structural features explaining the rift tectonics of the Gulf of Suez and the Red Sea. Economic production of oil in Egypt is almost entirely from the Gulf of Suez oil fields. Gypsum, kaolin and manganese,on the other hand,are the most important exploitable minerals in the Gulf of Suez area. In spite of the frequent published studies concerning the Gulf of Suez region, there are certain topics still require more detailed work, as the age assignment of some rock units in the region, the sedimentologic characteristics and mode of formation of certain facies, as the evaporite facies. The present thesis deals with the Miocene succession at two areas namely, Gharandal area and Gebel Gushia area (fig. 1). Gushia section represents the most eastern extension of the Miocene rocks in this region, while Gharandal area represents a somewhat deeper parts of the Miocene sea. The present thesis includes two main parts; sedimentology and stratigraphy, in the first, a great deal was given to the evaporite facies in both the studied areas. However, the aim of the present work is the recognition and correlation of the different Miocene rock units, their environment of deposition, the mode of formation of the evaporites, the diagenetic processes affecting them since their lithification and finally the geologic

history of the areas under consideration. This was approached through the following points of research :

1- Revision of the previous literatures concerning the Miocene of the Gulf of Suez with special reference to West-Central Sinai.

2- Field work of four field trips of 16 days include lithologic description of the different rock units and their stratigraphic position, measurement of the amount and direction of dip of beds, thickness measurement and description of the collected representative samples; where about 120 samples were collected from Wadi Gharandal section, 17 samples from North Gharandal section and 46 samples from Gushia section. Sampling is carried out at equal heights in homogenous rock units and not confined to certain height in heterogenous rock units.

3- Laboratory work :- includes the following sedimentologic and stratigraphic treatments :

   a- Mineralogical identification through X-ray diffraction analysis, infrared spectral analysis and investigation of petrographic thin sections.

   b- Petrography : identification of the different petrographic features and the diagenetic processes through the study of the thin sections.

   c- Study of the insoluble residue of the nonevaporitic