GEOPHYSICAL INVESTIGATION OF GRAVITY AND MAGNETIC ANOMALIES OF EAST-ELOWEINAT AREA-WESTERN DESERT, A-R-E

By

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B. Sc.

THESIS

Submitted for the M. Sc. Degree

Geology (Geophysics)

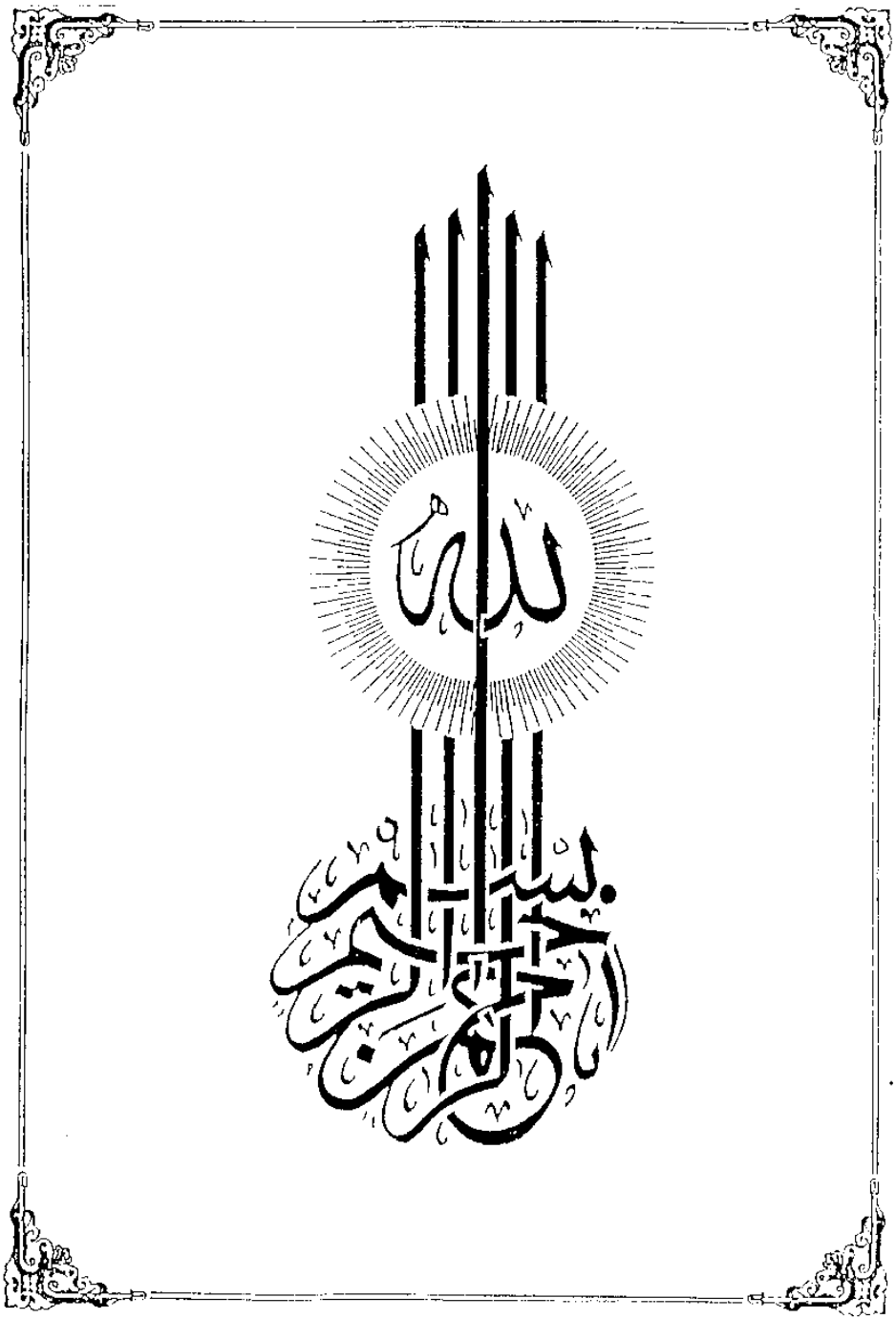
To

Department of Geology

Faculty of Science

Ain Shams University

1986



ACKNOWLEDGEMENTS

The author wishes to express her deep gratitude to Prof. D. AHMED-SABRI, Professor of Geophysics, Faculty of Science, Ain Shams University, for his faithful guidance and supervision, and also for fruitful discussions and criticism in the computation of the maps, magnetic and gravity trend analyses, depth determination for the basement surface.

I am especially grateful to Dr. MAHDY ABD EL RAHMAN, Assistant Professor of geophysics, Faculty of Science, Ain Shams University, for his encouragement and generous advice in the preparation of the thesis.

The author is deeply indebted to Mr. Mohamed Said, Institute of Geophysics and Astronomy- Helwan, for continuous help during the research.

I'm also grateful to Mr. Mohamed Hamed and Mr. ABD El Moneim Ahmed, Natural-History Dept. Faculty of Education, Ain Shams University.

I'm also grateful to Prof. Dr. M. El-Amin Bassiouni, Head of the Geology Dept. for the use of Departemental Facilities, and to Prof. Dr. Amin Dowidar, Head of the Natural-History Dept. Faculty of Education, Ain -Shams University for his support.

I am also immeasurably indebted to my parents my parents in law and my husband to whom I dedicate this work.

NOTE

The present thesis is submitted from Wafa Abdel-Aziz Ali to Ain Shams University in partial fulfilment of the requirements for the degree of Master of Science in Geophysics.

Besides the research work materialized in this thesis, the candidate has attended nine graduate courses for one year in the following topics:

- Geologic laboratory techniques.
- Geological mapping
- Geotectonics,
- Elasticity.
- Petrophysics
- Magnetic method
- Gravity method
- Filtery Technique.
- Data processing
- English language

She has successfully passed the final examinations of these courses in September 1981.

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ABSTRACT

Geophysical studies are carried out on East El-Oweinat Area to delineate the subsurface structural features and tectonics.

The structural elements are determined upon analyzing the potential field data (mainly gravity and magnetic, on the base of such analysis the following results are obtained:

a) Faults are the main controlling factor of the structural pattern of the area under investigation.

b) The faults affecting the basement are profound and trending East-west, other trends, however, are beside the N 65°W, N 45°W and N-S trend are predominant at the shallow depths.

c) The fault and dyke parameters are carefully calculated by using Fourier and Hilbert transform techniques.

d) The depth to the basement intrusions and depth to the basement surface are precisely determined either by spectral analysis or analysis of magnetic profile.

e) The depth to basement intrusions calculated from spectral analysis techniques range between 0.55 km and 0.76 km while the depth of the basement complex ranged between 0.67 km and 1.10 km.

CHAPTER I

INTRODUCTION

CHAPTER (I)

INTRODUCTION

The area under investigation lies in the Western Desert of Egypt between latitudes 23° 00' and 23° 30' N and longitudes 30° 00' and 30° 30' E see fig (1).

This area is intensively studied by means of the previously mentioned available potential field data in an attempt to reveal the subsurface geology and to solve problems related to tectonics.

To achieve this goal the following analyses are carried out:

a) Delineation of the subsurface structural features in the area by analyzing the measured potential field data;

b) Calculating the fault and dike parameters using Hilbert and Fourier transform techniques;

c) Determination of the depth to the basement intrusions and depth to the basement surface applying the following techniques:

1- The method introduced by Durantuy and Kars, 1963), using the two component (Z) and (H) of the Earth's magnetic field. Further development was made by El Diasty (1969), using the total force (T).