STRATIGRAPHY AND PALEOECOLOGY OF THE SUBSURFACE MIOCENE ROCKS IN THE ABU DARAG AREA, GULF OF SUEZ, EGYPT

BY

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NOTE

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

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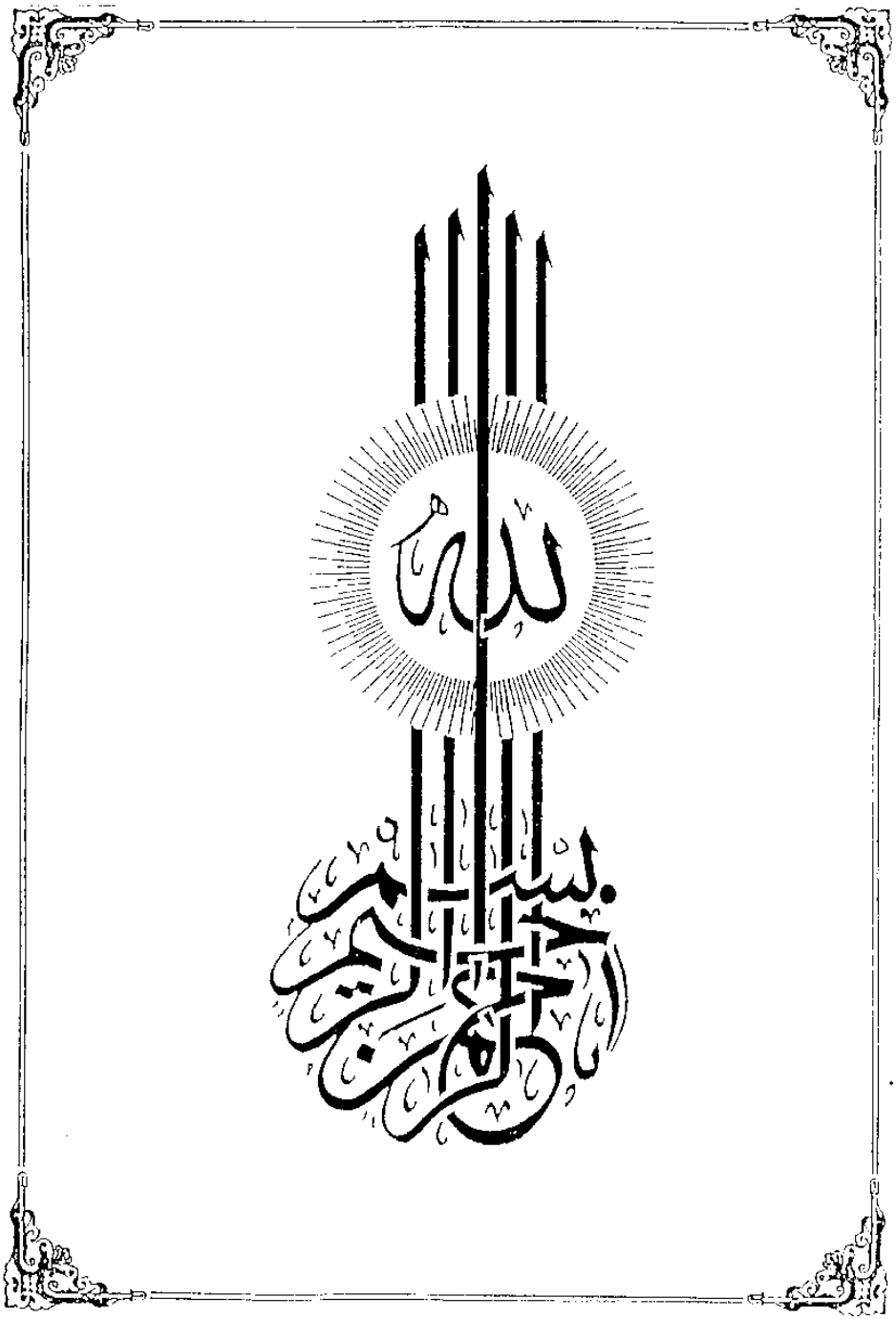

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ABSTRACT

The present work deals with the stratigraphy of the Miocene clastics of the offshore Abu Darag area in the northern part of the Gulf of Suez. This study was achieved by studying and investigating the samples of nine wells covering the study area to delineate the Miocene boundary. The main part of this work was devoted to paleontologic and stratigraphic investigations which represent the best tools for stratigraphic correlation between different regions. The highly fossiliferous rock units are dealt with paleontologically, while the poorly fossiliferous ones are dealt with lithologically by correlation with other areas. The identified microfossils (planktonic and benthonic Foraminifera) are illustrated by using the Scanning Electron Microscope (SEM) photographs.

The paleontologic studies include the quantitative evaluation of the foraminiferal assemblages (planktonic and benthonic) and the graphical representation of the numerical results which reflect a clear view about the paleoenvironmental conditions that prevailed during the deposition of the different rock units.

Finally, a taxonomic discussion was introduced for the foraminiferal species and includes some remarks for each species and its stratigraphic distribution (universally and in the area of study), as well as a range distribution chart for the Miocene sequence for each studied well.

CHAPTER I

INTRODUCTION

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INTRODUCTION

1. Location

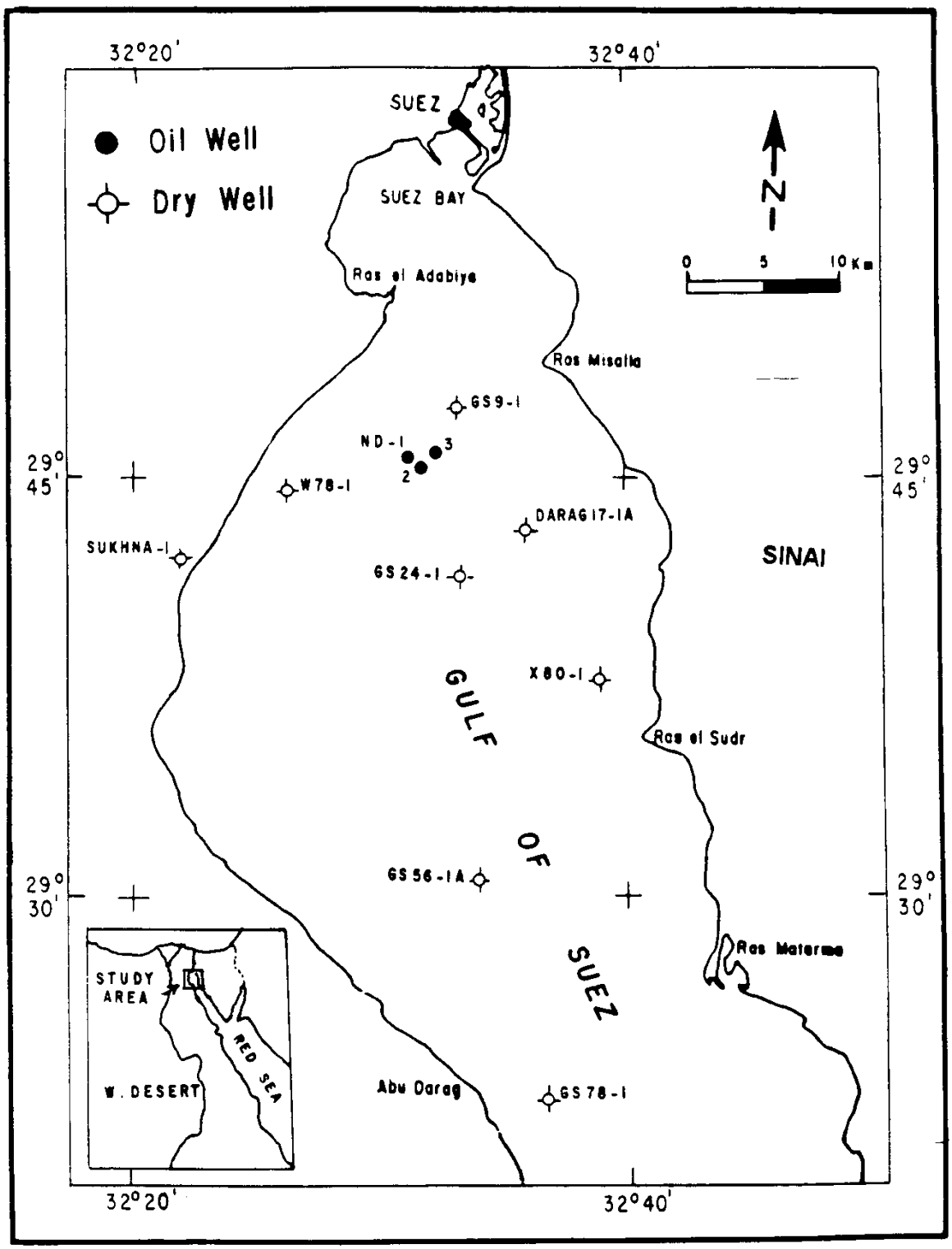
The Abu Darag area occupies the northern part of the Gulf of Suez and covers about 833 square Km. It lies between Latitudes 29° 25' to 29° 50' N, and longitudes 32° 20' to 32° 40' E (Fig.1).

Up to 1988, about 12 exploratory wells were drilled in this area by several oil companies (Gupco, Total, Suco, Conoco, Union, Petrofina and the General Petroleum Company). Most of these wells belong to Gupco, and most of the wells are dray holes, only slight oil and gas shows are recorded in some wells within the Pre-Miocene rocks. The first well was drilled by the General petroleum Company in 1964 (Sukhna-1), it was an onshore well.

In 1984, the Total oil company has discovered the North Drag-1 (NDR-1) offshore oil well, which attracted attention to re-evaluate the Abu Darag basin.

In this work detailed microscopic examinations were made to recognize the main elements of the stratigraphy and paleoecology of this area. The studies are based on ditch samples of nine wells. The chosen wells are:

- Sukhna-1 (Lat. 29° 42' 07.270" N, Long. 32° 21' 49.717" E),
- W78-1 (Lat. 29° 44' 28.000" N, Long. 32° 25' 58.000" E),
- NDR-1 (Lat. 29° 45' 46.250" N, Long. 32° 30' 53.990" E),
- GS9-1 (Lat. 29° 47' 34.247" N, Long. 32° 32' 57.151" E),
- Darag17-1A (Lat. 29° 43' 16.876" N, Long. 32° 35' 53.307" E),



(Fig. 1) Location map

- GS24-1 (Lat. 29° 41' 30.396" N, Long. 32° 33' 08.680" E),
- X80-1 (Lat. 29° 37' 49.231" N, Long. 32° 38' 57.324" E),
- GS56-1A (Lat. 29° 30' 32.700" N, Long. 32° 33' 55.100" E),
- GS78-1 (Lat. 29° 22' 50.140" N, Long. 32° 36' 45.090" E).

2. Exploration history of study area

The exploration effort in the offshore Abu Darag area has been carried out since 1976 with first Gupco holding the concession, followed by Suco, Total and again Gupco.

Seismic acquisition began in 1976 with the GS data set. Mapping of this data set resulted in recommendation and drilling of the GS 9-1, GS 24-1 and GS 56-1A wells. These were all plugged and abandoned as dry holes, with Gupco relinquishing area in 1977.

In 1977, Suco began exploration with a shallow water seismic program acquired in 1977, 1978 and 1979 (DEE data set). This resulted in the drilling of the X80-1 and W78-1 wells in 1980, both plugged and abandoned as dry holes, and the relinquishment of the concession.

Total then began an exploration effort shooting the TDG data set in 1980 and drilling the Darag 17-1A well in 1981 and North Darag-1 (NDR-1) well in 1984. Total relinquished the entire concession with the exception of three blocks at the North Darag discovery. Gupco next started exploration in 1987.