

MICROPALEONTOLOGY AND
BIOSTRATIGRAPHY OF THE EOCENE ROCKS
IN THE SOUTHERN FAYUM AREA

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree

of
Master of Science
in
GEOLOGY

By
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CAIRO

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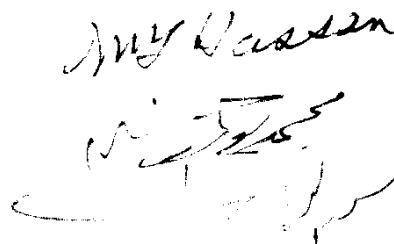
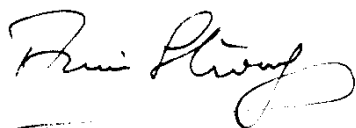
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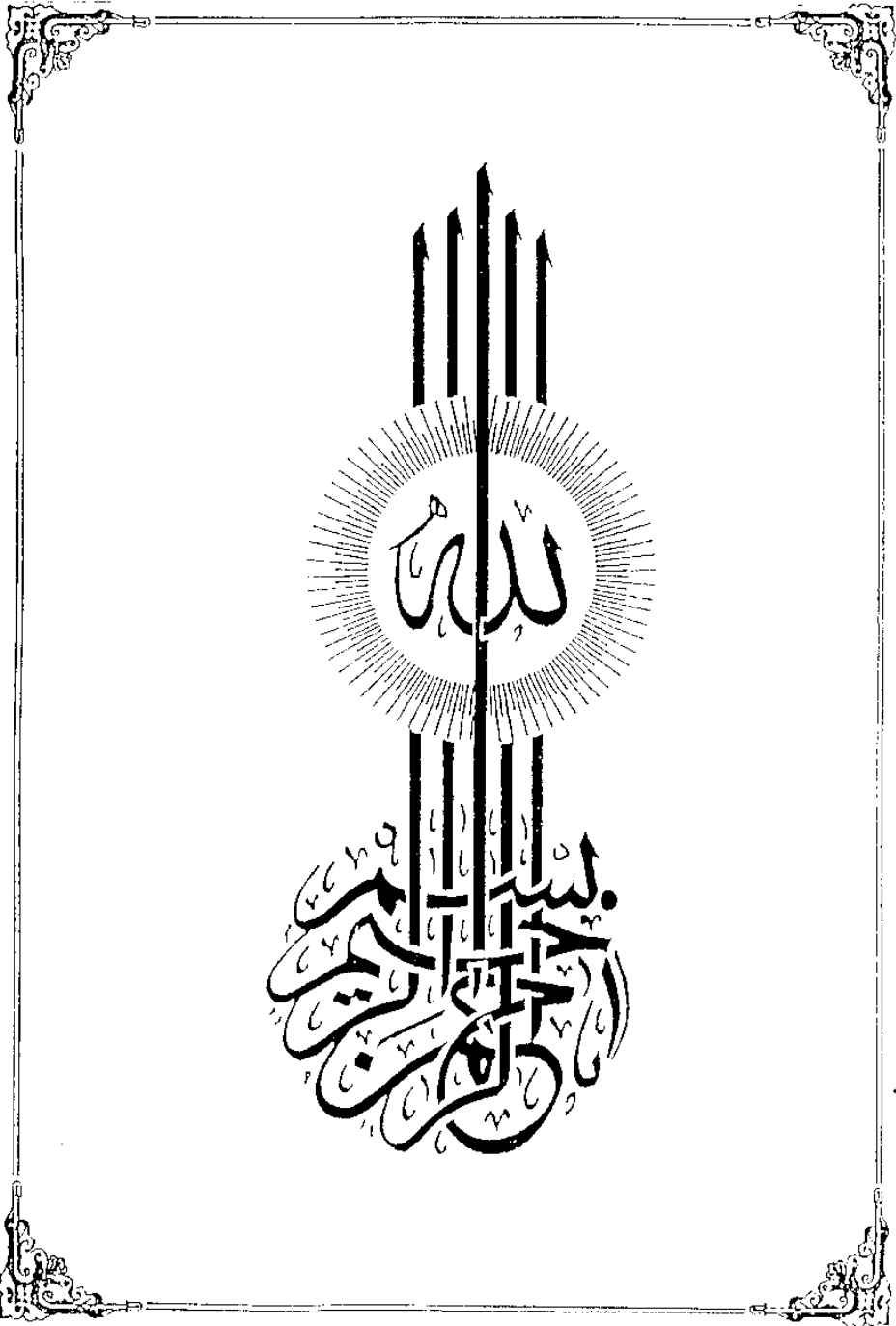
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N O T E

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

Besides the research work materialized in this thesis the author attended ten post graduate courses for one academic year in the following topics :

- 1- Field Geology and Geologic maps.
- 2- Statistical Geology and Computer.
- 3- Micropaleontology.
- 4- Paleoecology.
- 5- Lithostratigraphy.
- 6- Biostratigraphy.
- 7- Sedimentary Petrology.
- 8- Sedimentation.
- 9- Structural Geology.
- 10- Geotectonics.

He has successfully passed the final examination of these courses, besides an English Language Course.

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CHAPTER I

PREVIOUS WORK
ON
THE MIDDLE EOCENE SUCCESSION OF
THE NILE VALLEY AND FAYUM

PREVIOUS WORK ON THE MIDDLE EOCENE SUCCESSION OF THE
NILE VALLEY AND FAYUM

There is a voluminous literature dealing with the Eocene succession of the Nile Valley and Fayum Province.

Zittel (1883) divided the Eocene rocks of Egypt into two local stages namely the Libysche Stufe or (Libyan stage) and the Mokattam Stufe or (Mokattamian stage). The Libyan was equated by Zittel with the Lower Eocene (Suessonian and Ypresian of Europe) and the Mokattamian with the Middle Eocene (Lutetian of Europe). The Upper Eocene according to Zittel is restricted to the area between the oases of Bahariya and Siwa.

Blanckenhorn (1900, 1921) divided the Lower Mokattamian beds into 5 levels (I1-I5, in ascending order) and the Upper Mokattamian into 8 levels (II1-II8, in ascending order). He still regarded the (Mokattamian) as of Middle Eocene.

Beadnell (1905) distinguished several units in the Eocene rocks of the Fayum Depression and named them as shown on figure (1).

Hume (1911) proposed a tripartite division of the Mokattamian based on the faunal assemblages as follows :

Upper Mokattamian (Upper Eocene ?)

Represented by the Qasr el-Sagha beds (Carolia beds) of Beadnell (1905) and equivalent to II3-II8 of Blanckenhorn (1900, 1921).

A g e		Rock Units	Lithology with characteristic fossils
Lower Oligocene	Tongrian	Fluviomarine Series (Jebel el Qatrani beds). Sandstones and sandstone-grits with silicified trees and Basalt sheets, interbedded and contemporaneous.	
Upper Eocene	Bartonian	Variegated sands, clays and marls with silicified trees at base contain <u>Unio sp.</u> , <u>Lanistes bartonianus</u> , Blanck. <u>Turritella pharaonica</u> .	
MIDDLE EOCENE	Parisian	Upper Mokattam	Qasr el-Sagha Series. (<u>Carolia beds</u>) Alternation of limestones, marls, shales and sandstones, they included <u>Carolia placunoides</u> & <u>Ostrea fraasi</u> , <u>Cardita fajumensis</u> .
		Lower Mokattam	Birket el-Qarun Series (<u>Operculina-Nummulite beds</u>) Sandstones and clays with sandy limestones, <u>N. fraasi</u> & <u>N. beaumonti</u> , <u>Operculina discoidea</u> Schwager
			Ravine Beds Marls and marly limestones with gypseous clays. <u>Tellina tenuistriata</u> , Desh.
			Wadi Rayan Series (<u>Nummulites gizehensis</u> beds) <u>Nummulites gizehensis</u> Ehrenberg, <u>N. curvispira</u> , <u>Carolia placunoides</u>

Fig.(1) Showing the succession and classification of the Eocene and Oligocene strata in the Fayum according to Beadnell, 1905.

Middle Mokattamian (Middle Eocene).

Represented by the Birket Qarun Beds of Beadnell (1905) and equivalent to III-II2 of Blanckenhorn (1900,1921)

Lower Mokattamian (Middle Eocene).

Represented by the Wadi el Rayan and Ravine beds of Beadnell (1905) and equivalent to the Lower Mokattamian II-15 of Blanckenhorn (1900, 1921).

Cuvillier (1930) introduced the following classification of the Eocene rocks of Egypt.

Upper Eocene	Upper Bartonian- Beds with <u>N. fabiani</u> and <u>N. chavennesi</u> of the North Western Desert.
	Lower Bartonian -The Upper Mokattam beds of Gebel Mokattam

Middle Eocene	Upper Lutetian - Building Stone horizon with <u>N. gizehensis</u> .
	Lower Lutetian-Beds with <u>Alveolina frumentiformis</u> , <u>Orbitolites complanatus</u> of Minia.

Lower Eocene (Ypresian) - Beds between Esna Shales and Lower Lutetian of Minia with Orbitolites complanatus.

The Eocene exposures of the southern Fayum province were studied by Iskander (1943, 1944). He introduced several rock units to designate the succession in this area as follows :-

Stages	Rock-Units	Main lithology with characteristic fossils	
Upper Eocene	Qasr el-Sagha beds.	Non-nummulitic brown beds.	
	Gehannam Formation. New name given to Ravine and Birket el-Qarun Series (Operculina-Nummulite beds) of Beadnell (1905).	Gypseous clays, clayey marls and white marly limestone contain Echinoids, <u>Lucina</u> , Bryozoa, <u>Porocidaris schmidelli</u> , small size of <u>Nummulites</u> and large Oysters.	
Middle Eocene	Wadi el-Rayan Group	El-Gharag Formation.	Highly nummulitic limestone with large size <u>N. gizehensis</u> , <u>Lucina sp.</u> , <u>Turritella sp.</u> , Echinoids, and <u>Ostrea sp.</u>
		Sath el-Hadid Limestone.	Snow white limestone with nodular flints and shales at the top <u>N. gizehensis</u> , <u>Lucina pharaonum</u> , <u>Gisortia gigantea</u> and Bryozoa.
		Midawara Formation.	Gypseous, saliferous paper shales with brown sandy limestone at the top. With <u>N. gizehensis</u> , <u>N. curvispira</u> , <u>Cardita sp.</u> , <u>Carolia planicunoides</u> and <u>Ostrea multicostata</u> .
		Muweilih Formation	Gray colored highly nummulitic limestone having petroliferous odour with <u>N. gizehensis</u> , <u>N. curvispira</u> , <u>Turritella sp.</u> , <u>Cardita sp.</u> , <u>Lucina</u> , Oysters and Corals.
		Ghada Limestone	Hard gray crystalline limestone with large siliceous concretions. It is the lowest formation exposed in the area with a few nummulites.