GEOLOGY OF THE PALEOGENE EAST OF BIR GANDALY AROUND THE QATTAMIYA ROAD, NORTH EASTERN DESERT, EGYPT

A Thesis Submitted for the Degree of Doctor of Philosophy in Geology

By

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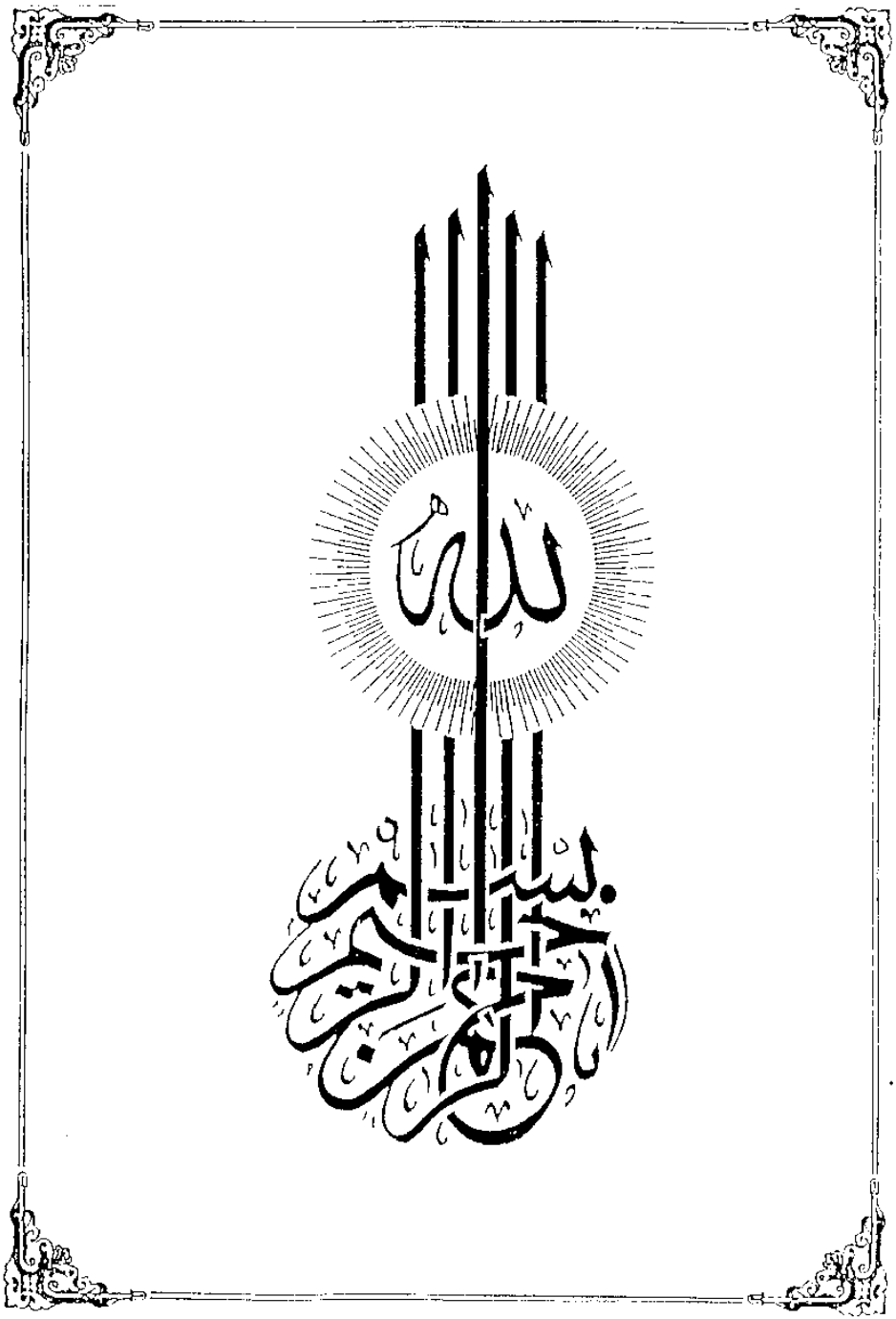

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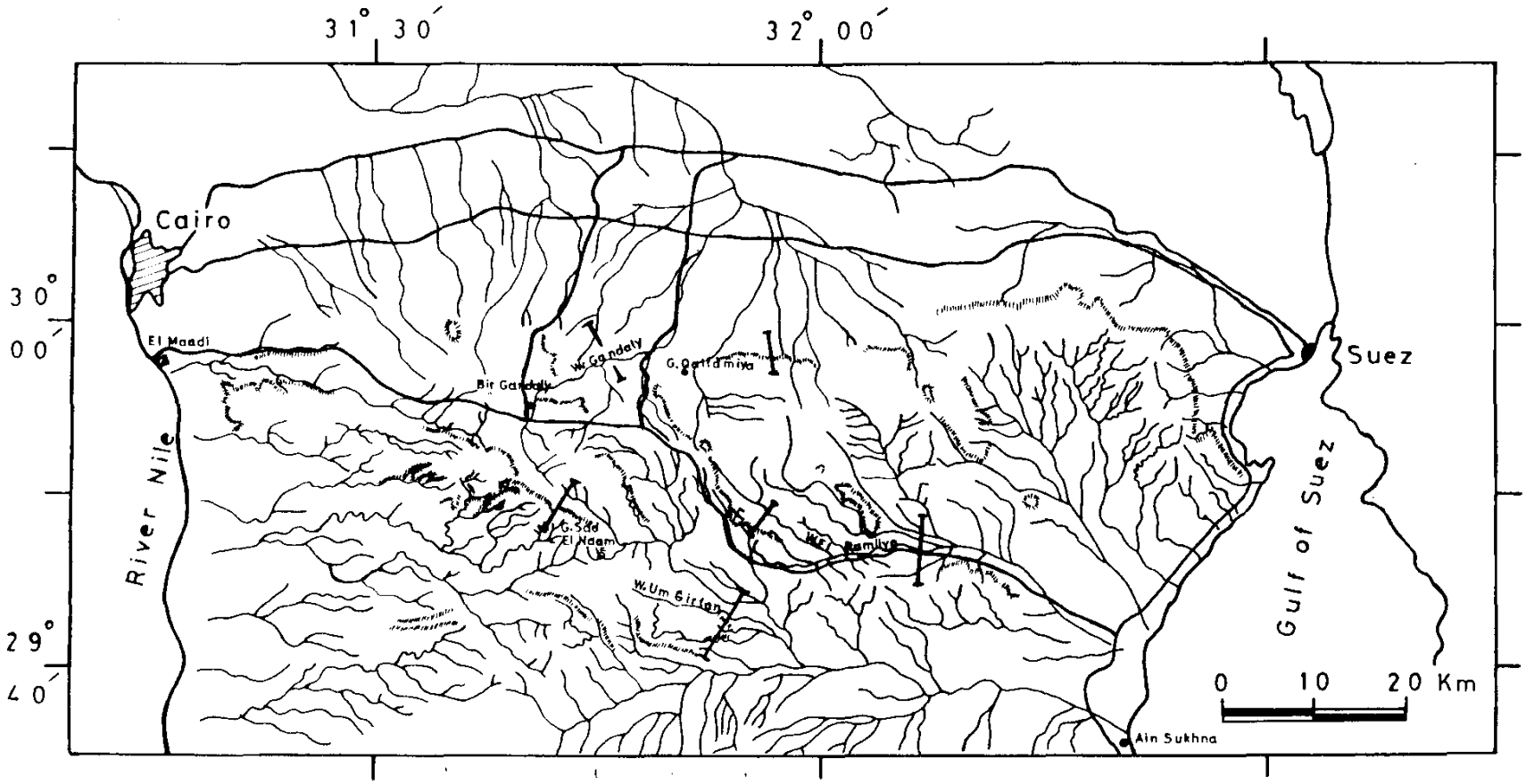
INTRODUCTION

The area selected for the present study lies to the east of Bir Gandaly between latitudes 29° 40' and 30° 00' N and longitudes 31° 30' and 32° 10' E (Fig. I.1). As shown in Figure 1, the south western and southeastern parts of the study area are occupied by Gebel Sad El Naam and Wadi Ramliya, respectively. Wadi Gandaly and Gebel Qattamiya are located in the northeastern part of the study area.

Topographically, most of the Eocene outcrops are arranged generally in elongate topographic highs that are trending E-W, ENE-WSW to NW-SE or occasionally NE-SW. The topographically high lands are mainly occupied by Middle Eocene rocks whereas the intervening low lands and plains are floored by faulted down upper Middle to Upper Eocene rocks. It seems that the major topographic features are structurally controlled as the trends of the strikes of beds and the fault planes are compatible with those of the topographic bodies. Details of the geomorphology and structural framework of the study area are given in Chapters II and VI. The results of geomorphology and structural geology investigated in these two chapters complete the picture of those drawn for the neighbouring areas by Moustafa and Abdallah (1991) and Abdallah (1993).

The area under investigation represents the eastern part of a larger region that extends from Cairo to the western coast of the Gulf of Suez, a region which is dominated by Middle to Upper Eocene rocks. Unlike the Eocene rocks in Egypt, the study area did not receive much



attention until quite recently. This is one of the reasons for selecting the area east of Bir Gandaly for the present investigation.

Stratigraphically, Moustafa (1975) referred the whole Eocene succession in Gebel Qattamiya to the Mokattam Formation of Said (1962), with the lower part belonging to the upper Building Stone Member and the upper part to the Guishi Member.

Comparison with Greater Cairo which have been investigated by Strougo (1985 a&b), Strougo and Abdallah (1990) and Morsi (1991) showed that the Eocene rocks of the Maadi-Qattamiya area can be subdivided into four units. From base to top, these units are the Observatory Formation, the Qurn Formation, the Wadi Garawi Formation and the Wadi Hof Formation. This rock unit classification is also adopted here. However, the Observatory Formation in the eastern part of the study area, particularly at Wadi Ramliya (Fig. I.1), exhibits a radically different facies (coralline bafflestone). Hence, the term Observatory Formation is used loosely in this part of the region. The overlying three units, on the other hand, are rather consistent with insignificant changes in facies, fossil content or thickness.

The Middle-Upper Eocene biostratigraphy of the north-central Eastern Desert was reviewed and investigated in detail by Strougo and Abdallah (1990), Strougo (1992) and Strougo et al. (1992). Based on the megafossils and nummulites contents and the correspondence of these units to those of Greater Cairo, these authors suggested that the units in question range from upper Lower Mokattamian to Upper Mokattamian, a stratigraphic scale suggested by