# GEOLOGICAL INVESTIGATIONS AND PHYSICAL BENEFICIATION OF SOME LOW-GRADE PHOSPHATE ROCKS IN EGYPT.

By

Hany Mohamed Abd El Moneim



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Degree of Master of Science.

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# GEOLOGICAL INVESTIGATION AND PHYSICAL BENEFICIATION OF SOME LOW-GRADE PHOSPHATE ROCKS IN EGYPT.

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Supervisors

Prof. M. I. Faris . . . . . .

Prof. E. M. El Shazly. . . . . .

Approved

Date / / 1971.

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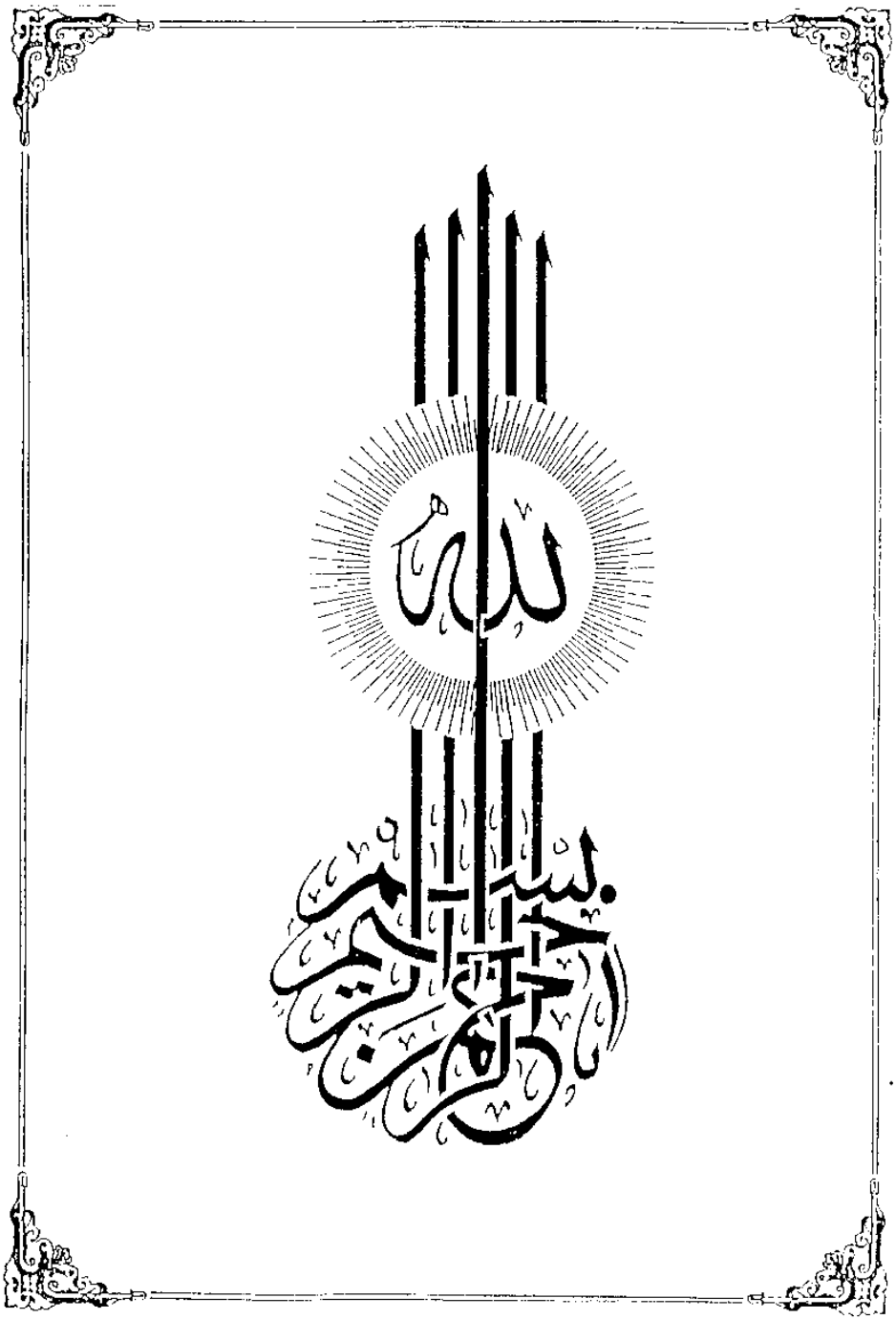

# A C K N O W L E D G M E N T.

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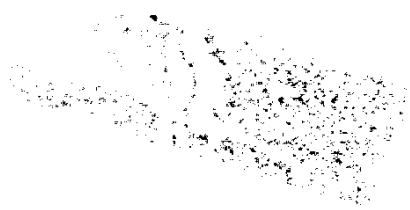

# I N T R O D U C T I O N.

Phosphate deposits has been known in Egypt for several decades where they are distributed in three regions namely the Red Sea, the Nile Valley and the Western Desert (Dakhla - Kharga Oases). The phosphate deposits on the Red Sea coast especially in Quseir district have been exploited for a long time due to their proximity to the Port of Quseir. Among the Egyptian phosphates those from Quseir area have been the main target of export to foreign markets, especially for grades of 64 % TCP and higher. The purpose of the present work is to focuss the attention on the lower grade phosphates in Quseir district, with especial emphasis on upgrading them to be suitable for export or for local industrialisation.

For this purpose, representative samples from the low grade phosphates at Quseir district have been collected for the purpose of their beneficiation. The geological and stratigraphical position of the sampled beds is given in relation to the Phosphate Formation. The mineralogy and radioactivity of the samples are also given especially those data of importance to their beneficiation.

For the purpose of the concentration of phosphates the technique of electrostatic separation is applied together with other supporting techniques. As far as the author is aware, this is the first time the low grade phosphates of Quseir district have been studied for concentration purposes, and the first time the electrostatic technique is applied to the concentration of phosphates in Egypt in general.

The present Thesis is divided into two parts; part I deals with the geology of the siliceous low-grade phosphate rock of Quseir district, while part II deals with the concentration of the same phosphate rock.

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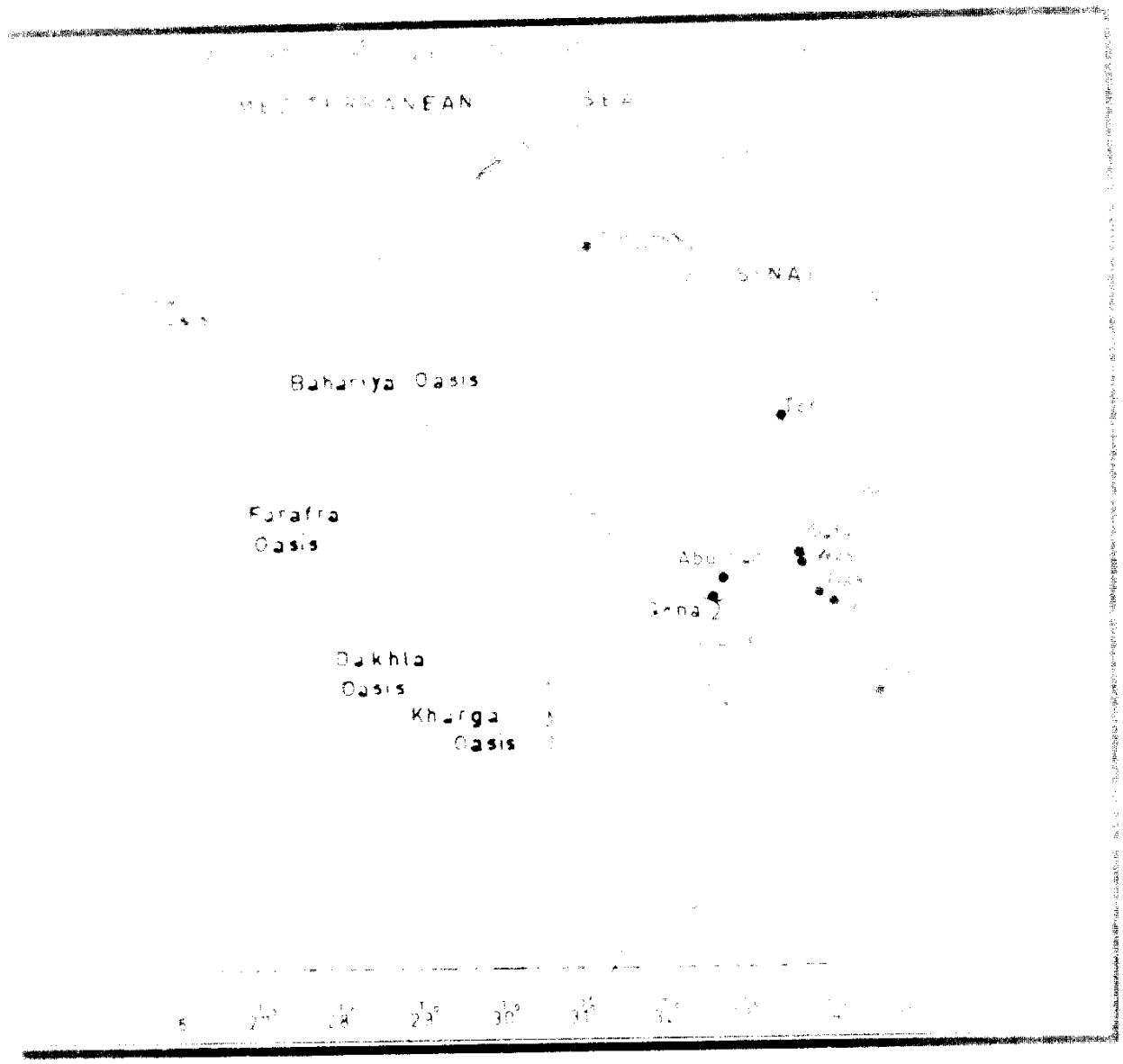
# P A R T - I

## GEOLOGY OF THE SILICEOUS LOW-GRADE PHOSPHATE ROCK OF QUSEIR DISTRICT.

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# C H A P T E R - I

## GEOLOGICAL MODE OF OCCURRENCE.

### - Geology and Stratigraphical Succession:

The studied part in Quseir district is in the form of a strip bordering the Red Sea with an average breadth of about 20 Km. It extends 50 Km to the south of Quseir town, and it is bounded roughly by latitudes 26° 05' N and 25° 55' , and by longitudes 34° 07' E and 34° 12' E.

Further research works were made in Quseir district which deal with the geology, stratigraphy, origin and the structure of the phosphate deposits.

Barron and Hume (1902), studied the topography, stratigraphy and structure of the central portion of the Eastern Desert including the Quseir district. They regarded the whole series of Esna Shales( Dakhla Shale and Chalk) as Eocene, and stated the existance of an unconformity between the Cretaceous and Eocene.

Beadnell (1924), dealt with the coastal plain of the Red Sea between Quseir and wadi Ranga. He classified the sedimentary rocks into two great divisions; the Cretaceous-lower Eocene group and the Newer