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"Call upon Me in the day of trouble;
I well deliver you, and you shall glorify Me"

Ps 50:15

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CHAPTER 1
INTRODUCTION

CHAPTER 1

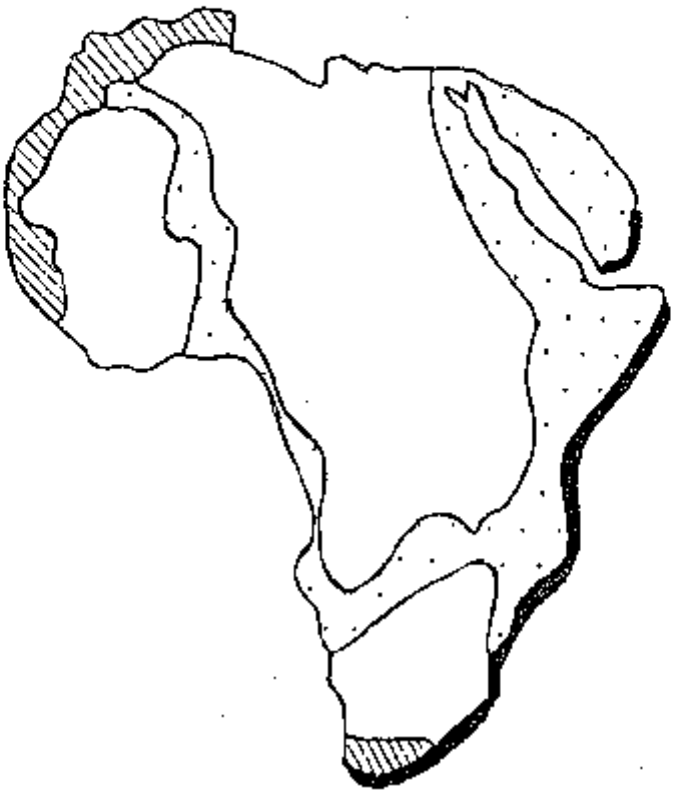
INTRODUCTION

1.1. General statement

The basement rocks of Egypt crop out mainly in the Eastern Desert and southern Sinai, as well as small outcrops in the southern part of the Western Desert. They constitute the western part of the Arabo-Nubian Shield which represents the NE limb of the U-shaped Pan-African orogenic belt that griddles the continent of Africa (Fig. 1.1). Kennedy (1964) believed that this belts was developed as a result of tectono-thermal events (the Pan-African orogeny) which took place throughout the African continent. Kennedy (op.cit) believed that the Pan-African orogeny had led to the structural differentiation of the entire continent into cratons and orogenic areas.

The basement rocks of Egypt cover about 10% of the total area of Egypt. In the Eastern Desert, the Precambrian rocks extend as a belt parallel to Red Sea coast for a distance of about 800 km between latitudes 22° 00′ and 28° 40′N. In Sinai, the Precambrian rocks crop out in its southern part. In the Western Desert, the Precambrian rocks crop out at Gebel Oweinat and some other exposures (Fig. 1.2).

The tectonic evolution of the Egyptian Basement is still a matter of controversy. It was first interpreted in the light of the geosynclinal theory (e.g. Hume, 1935; El Shazly, 1964; Akaad and El Ramly, 1960; Sabet, 1961, and 1972; El Ramly,1972 and Akaad and Noweir,1969 and 1980). Since the seventies, the concepts of the plate tectonic theory were applied



Phanerozoic fold belts

Pan-African (1100-450m.y. age)

Archean-old Proterozoic

Fig. 1.1: The African orogenic belts.

After Engel et al. (1980)

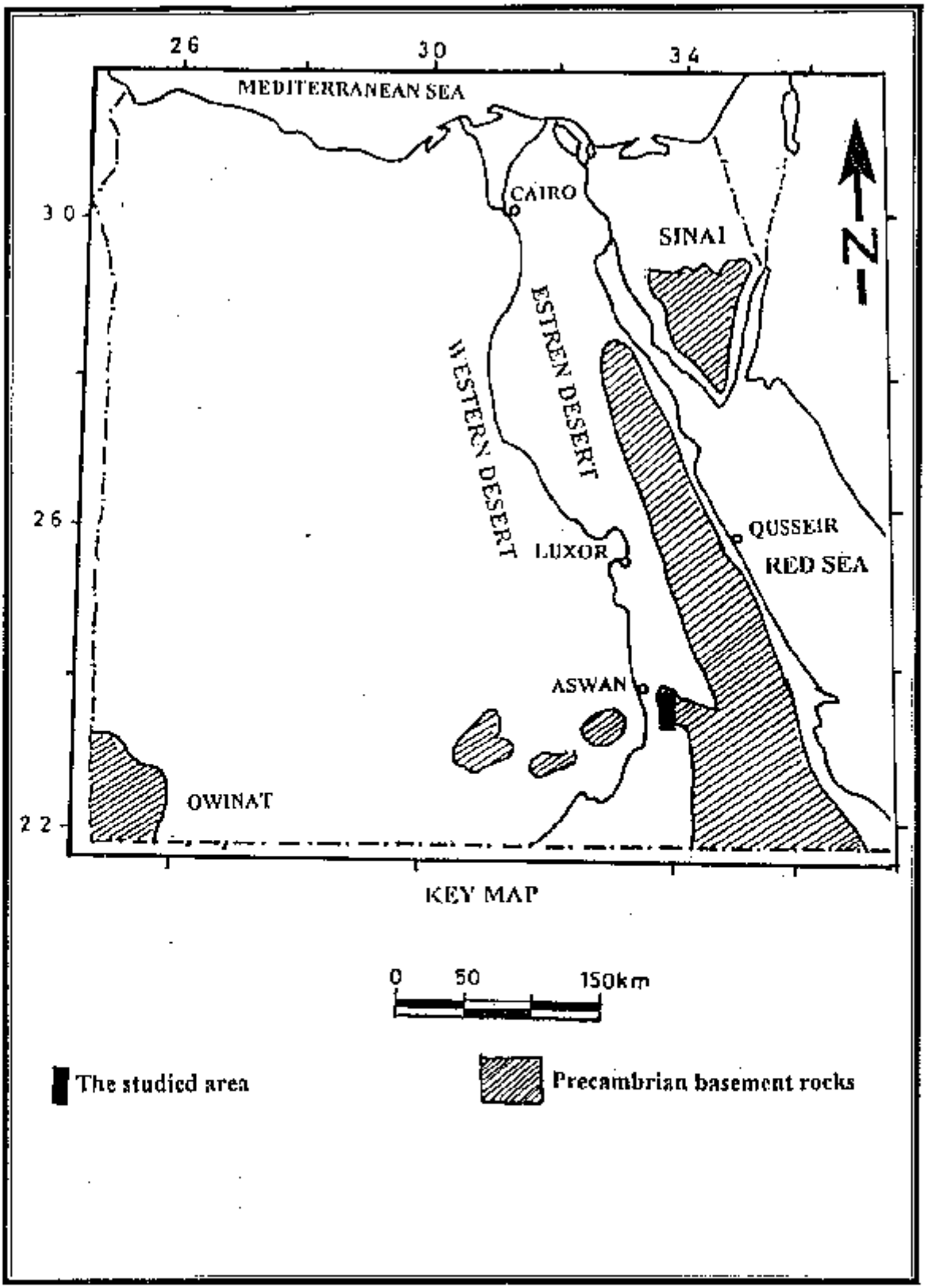


Fig. 1.2: Distribution of the basement rocks in Egypt.

to the evolution of the Arabo-Nubian Shield (e.g. Garson and Shalaby, 1976; Gass, 1977, and 1981; El Sharkawi and El Bayoumi, 1979; Engel et al., 1980; Church, 1980 and 1983; Takla et al., 1982; Basta, 1983; El Gaby et al. 1984; Bentor, 1985; Kröner, 1985; Kröner et al., 1987; Greiling et al., 1984; El Gaby et al.,1988 and 1990; Hamimi, 1992; Basta et al., 1996; Takla et al., 1996a, Basta et al., 2000). Most of these studies were applied to the Central Eastern Desert, especially between Idfu - Mersa Alam and Qift - Quseir roads and Sinai. Little attention has been given to the southern part of the Eastern Desert.

1.2. Synopsis on the basement rocks of the Eastern Desert of Egypt

Stern et al. (1984) classified the Eastern Desert of Egypt into three domains (Fig. 1.3) based on the differences in lithologic units and tectonic styles.

The Northern Eastern Desert Domain (NED), extends from Qena- Safaga road northward till the end of exposed basement at Um Tansib. The crustal evolution of the northern part of the Eastern Desert during the interval 670-550 Ma. was characterized by rapid formation of continental crust. This domain is separated from the Central Eastern Desert by a major structural discontinuity trending southwest down the Gulf of Aqaba across the Eastern Desert to the great bend of the Nile at Qena. The basement here are different, the ophiolitic ultramafic, low-K pillowed tholeiite melanges, banded Fe-formation as well as NW trending shear zones that characterize the Central Eastern Desert are absent (Stern, 1981; Sturchio et al., 1983; Reis et al., 1983) .On the other hand, this domain is characterized by the type locality of Dokhan