

Geological map of Libya 1:250,000

Sheet Tarabulus

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Explanatory Booklet

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TRIASSIC — JURASSIC ROCKS

BIR AL GHANAM FORMATION

This rock unit was first described by Christie (1955) as Bir al Ghanam Group, comprising the two lateral equivalent members, Abu Ghaylan Limestone and the Bir al Ghanam Gypsum.

In this work the Abu Ghaylan Limestone and the Bir al Ghanam Formation are considered as separated rock units. The Bir al Ghanam Formation is classified into the following three successive members from top to base (fig. 3) : Abreghs Gypsum, Bu en Niran Member and Bir al Ghanam Gypsum.

Bir al Ghanam Gypsum . This member is well exposed along the scarp between Kaf al Kalaya and Bir Ayyad in the west where it disappears below the Bu en Niran Member. The Bir al Ghanam Gypsum is underlain by the Abu Ghaylan Formation in the area between Kaf al Kalaya and Wadi Zaggut while westwards they are interfingering.

It is unconformably overlain by the Kiklah Formation along the scarp between Kaf al Kalaya and the eastern side of Wadi al Mazayidah. In the area between the western side of Wadi al Mazayidah and Bir Ayyad it is conformably overlain by the Bu en Niran Member.

The Bir al Ghanam Gypsum consists mainly of a thick sequence of white to grey gypsum and anhydrite with frequent dolomitic limestone interbeds. The absence of good outcrops at the base and at the top of the member hender an accurate description of the type section.

The fossils recorded by Desio (1963) from the carbonate interbeds of the Bir al Ghanam Gypsum do not permit a definite age for this member but as stated before its age can be attributed to post-Carnian – pre-Bajocian, based on its stratigraphic position.

Bu en Niran Member. This member was first mentioned by Burollet (1963-a) at a very small village named Bu en Niran, at the foot of the scarp between Bir al Ghanam and Yafrin.

The Bu en Niran Member crops out along the scarp face between Wadi al Mazayidah and Bir Ayyad to the west. It thins out and disappears in the gypsum sequence east of Wadi al Mazayidah. It lies conformably between the Abreghs Gypsum at top and the Bir al Ghanam Gypsum below. The type section was described at Kaf al Ghuraf promontory (3 km north of Takbal village) at which the member consists of basal limestone overlain by a succession of green and red clays with gypsum bands.

The lithofacies characteristics of this member and its stratigraphic position between two gypseous members at base and top may indicate an oscillating environmental conditions of deposition varying from open marine, though shallow to lagoonal.

The age of the Bu en Niran Member, according to Burollet (1963-a) is Lias-Bajocian. His conclusion was based on the occurrence of echinoid fragments, rare *Valvulinids* and *Ophtalmiides*, in the carbonate part of the member. Desio (1963) from the same horizon recorded the presence of : *Astarte douvillei* Mathieu, *Avicula* sp., *Pseudomorphia* sp., *Rhabdocolpus* sp. which assigned a Bajocian age to this member. Desio's conclusion is more supported by well identified fossils than that of

Burollet, therefore it is feasible to assign a **Bajocian** age to the **Bu en Niran Member**.

Abreghs Gypsum. This rock unit was first described by **Burollet** (1963-a) as **Abreghs Formation**, from **Abrehg Deba** hill to the northwest of **Nalut**. It is differentiated from the **Bir al Ghanam Gypsum** by virtue of the presence of the **Bu en Niran Member** in between.

The **Abreghs Gypsum** is overlain by the **Takbal Formation** with a seeming conformity. It makes a part of the scarp between **Wadi al Mazayidah** and **Yafrin**. At **Khashm az Zarzur** promontory (5 km to the west of **Yafrin**), it crops out at the foot of the scarp below the **Takbal Formation**. Two outcrops were noticed at the midway of **Bir Ayyad-Qasr al Haj** asphaltic road. Also it covers patches of the **Jeffara Plain** north of **Qasr al Haj** village.

The **Abreghs Gypsum** is made of two lithologic units, a lower thick succession of gypsum and anhydrite with dolomitic and clayey interbeds and an upper green to yellowish green clays with minor limy and gypseous bands. The clays are occasionally black and carbonaceous in some parts. The total thickness of this member as measured at its type locality at **Takbal** village is 77.6 m.

The occurrence of limestone and carbonaceous clays in the **Abreghs** sequence is an indication of occasional invasions of marine and lacustrine environments within the overwhelming lagoonal conditions.

The fossil content of this member does not permit an accurate age determination since they are badly preserved.

The stratigraphic position of this member above the **Bajocian Bu en Niran Member** and below the **Bathonian Takbal Formation**, helps to determine its age as belonging to the **Bajocian-Bathonian**.