

A GEOLOGICAL INTERPRETATION OF AN AIR PHOTOGRAPH OF BRITISH SOMALILAND*

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FIGURE 1 shows an air photograph of part of British Somaliland and Figure 2 is a photogeological interpretation of this photograph.

Three overlapping air photographs, about 1:35,000 in scale, were used in order that the area could be examined stereoscopically.

The interpretation shows the structure and structural interrelationships of a series of sedimentary beds. In addition, it has been possible to separate the sediments into three main formations and to determine their order of superposition.

The area of the photograph consists of a central zone of low, dissected hills, flanked by massive and rugged hills with prominent scarps. The central zone has an intricate, dendritic drainage in contrast to the simple and widely spaced drainage of the flanking hills. The main water courses traverse alluvial valleys and are braided in places. The morphology in general is characteristic of a desert climate, although the drainage system suggests periods of heavy rains. There is an absence of overburden and vegetation from the rocks forming the hills, accumulations of scree and talus on steep slopes, and strong differential erosion of beds of varying hardness. Dip slopes are well developed and major geological contacts are mostly clear.

* Paper read at Nineteenth Annual Meeting of the Society, Hotel Shoreham, Washington, D. C., January 14 to 16, 1953. This paper was a part of the Report of the Photo Interpretation Committee.



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FIG. 1. Air photo of part of British Somaliland.

The geological interpretation was greatly assisted by the fact that the main formations present each have a contrasting lithology and mode of morphological expression.

The oldest formation, number 1, is characterized by a combination of fine and massive bedding, uneven and dissected dip faces and a tone rather darker than that of the other two formations. Formation 2 can be identified by its large, slabby and smooth dip faces, which are little dissected and by its steep scarps. Formation 3 is easily identified by its dendritic drainage and fine bedding with imperfectly developed dip faces.

The direction of dip within the formations having been established, it was apparent that the relationships of the three formations to each other was not straightforward. Evidence in the form of erratic dips and scarps and abnormal contacts showed that extensive faulting was present, and the problem resolved itself into determining which contacts were normal and which were faulted.

LEGEND

(Uncertain forms of Symbols are broken.)

Geological Scarp	
Horizontal Bedding	
Slight Dip	
Gentle Dip	
Moderate Dip	
Steep Dip	
Major Lithological Boundary	
Minor Lithological Boundary	
Anticlinal Axis	
Synclinal Axis	
Fault Showing Downthrow Side	
Fault	
Alluvium	
Formation 3.	
Formation 2.	
Formation 1.	



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FIG. 2. A photogeological interpretation of photo in Fig. 1.

The interpretation presented explains the relationships between the three formations in a logical manner, and appears to be the only one that can satisfactorily reconcile all the geological observations.

The structure of the area is controlled by normal faulting. Folds can be recognized within formation 3, but they are of a minor importance and may be related to small faults where the reversals are abrupt.

Reference was made to a 1:1,000,000 geological map of British Somaliland and its accompanying report* in order to establish the age of the formations recognized on the photograph. Although the scale of the map is too small to allow any direct comparison of the structure, it appears probable that the succession is as follows:

Formation 3—Anhydrite Series.

Eocene

(Banded anhydrite interbedded with limestone layers)

Formation 2—Arnado Limestone.

(Hard, massive and thick bedded limestone.)

Formation 1—Nubian Sandstone.

Cretaceous

(Sands and quartzites.)

An additional series, the Allahkajid beds (limestones and shales), occurs between the anhydrite and the Arnado limestone. From an examination of the photographs it appears probable that this series occurs near the base of the scarps that bound Formation 3.

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REPORT OF UNCLASSIFIED MILITARY TERRAIN STUDIES SECTION†

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A SUBJECT heading such as this is almost meaningless for the various military agencies. With few if any exceptions all terrain studies carry a security information classification of some kind.

The members of this section have investigated their respective agencies and to the best of their knowledge there are no unclassified military terrain studies. In a few instances they do have however some associated projects which may be of interest. These can of course be mentioned only briefly in this section report. Each paper will be published in full at a later date.

Captain Ethan Churchill of the Reconnaissance Branch, Directorate of Intelligence, U.S.A.F. has prepared two manuscripts for later publication. One, titled "Principles of Plant Ecological Aerial Photographic Interpretation," will probably be published in the official journal of the Ecological Society of America. The other paper with a tentative title of "Principles of Vegetation Type Aerial Photographic Interpretation" is expected to be published at a later date,

* "The Geology of British Somaliland." W. A. Macfadyen. Gov. of Somaliland Protect. 1933.

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