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A new topographic map of Mograt Island

Sufficient maps are rare especially in remote regions. Mograt, the Nile´s largest island, was not yet mapped adequately. This new map presented here shows the island in a detailed scale never drawn before (see: folded map at the end of this volume).

Exploration along the Cataract Nile

Once the exploration along the river Nile intensified in the late 18th and early 19th centuries the number of descriptions of the Bilad es-Sudan – the "Land of the Blacks" – increased. Travelers mostly approaching from the north followed the river Nile. A schematic map of selected travel routes along the Cataract Nile is given by the author (Ritter 2012). Two routes were frequently taken at that time, probably prior to that as well. One route left the Nile valley near Korosko (today flooded by Lake Nasser, 180 km SSW of Aswan) and crossed the southern part of the Nubian Desert. This route entered after 350 km the Nile valley again at Abu Hamed where Mograt Island is located. It was taken e.g. by G. A. Hoskins, J. Russegger, R. Lepsius and A. E. Brehm.

The second route followed the river course south of Dongola and left the Nile valley only in a section between today Ed Debba and Merowe towards south, and Kirbekan (F. Cailliaud) respectively. Crossing the Bayuda Desert, this route rejoins the Nile valley between Berber (F. Cailliaud, A. T. Holroyd), Shendi (E. Rüppell, G. A. Hoskins, J. Russegger) and the Sixth Cataract (J. C. Poncet, A. T. Holroyd, A. E. Brehm) (Ritter 2012).

Existing maps of the Cataract Nile including Mograt

Along with the written descriptions, maps became more detailed. Until then some content of the maps derived from older maps, itineraries and to a quite large portion from phantasy. Therefore it can be difficult to read these old maps. Spatial relations between places were not represented properly. Nevertheless, they can serve as reference points. In this section of the Nile valley certain reoccurring toponyms can be found, such as Berber, Meroe and Shendi with a large variety of spellings.

The spelling of Mograt is also multifold. Referring to the Arabic spelling m-q-r-ā-t (مقرات), the following transcriptions can be found: Mograt (Burkhardt 1822; Hoskins 1835), Mograhd (Brehm 1855) Moghrat (Chélu 1891), Mokrat (Lapie 1829), Moqrat (Cailliaud 1826–27; Verdermaelen 1827), Morgrat (Chief administration of geodesy and cartography 1978). Further spellings are Mugrat, Mughrat and Muqrat.[1]

The name Mograt appeared on a topographic map for the first time in 1827. In that year, two maps were published mentioning Mograt as the name of an island which is located in the northernmost part of the Great Bend of the river Nile near Abu Hamed. The publications in question are the "Atlas universel de géographie physique, politique, statistique et minéralogique" published in Brussels and therein sheet 18 "Nubie" (Verdermaelen 1827), and the "Carte génerale de l'Égypte et de la Nubie, à laquelle on a joint la Cyrénaïque et l'Arabie Pétrée, une partie du Soudan, du Golfe Arabique, de la Palestine, de l'Abyssinie et autres pays adjacents" published in Paris by Frédérique Cailliaud (1827).

Further maps followed in the subsequent decades. Additional information about Mograt was added by Chélu 1891 showing a detailed view of the eastern part of the island. Rapids and adjacent islands are presented in their rough positions. The so-called "Quarter Million Sheets" in scale 1:250.000 initiated in the 1920s by the Sudan Survey Office consist of map series which were updated in the following decades. Mograt is contained on sheet NC-45-C "Abu Hamed" (Sudan Survey Office 1926). The map shows the names and positions of several settlement clusters, some small islands and a rough sketch of terrain. The U.S. Army Map service produced the Y502-series in scale 1:250.000 in 1960. Mograt can be found on sheet NE 36-3. The content refers to the Quarter Million Sheet updates from 1932 and 1949 and does not present any new information. From the late 1970s, the Soviet Military produced map series

1 The representation of the Arabic letter "q" (=qaf) as "g" is quite common in Sudanese Arabic.

in scales 1:200.000 and 1:500.000, but they were only published in the 1990s (Lee 2005). Mograt is shown on sheet E36-04 (1:200.000), with the irregular spelling "island Morgrat" (остров Морграт). The only improvement in terms of content is a detailed landscape representation with numerous contour lines. The map production is based on aerial and satellite images. Some neighboring sheets differ significantly in quality due to different cartographers. The richness of detail probably also varies according to the quality of the used imagery. Generally, these Soviet maps still represent the current state of mapping in that scale. Maps with a higher resolution are not available.

The new topographic map of Mograt

The need for an adequate cartographic representation of Mograt led to the task of producing the new map presented here (Ritter 2008 & folded map). During the 2008 field campaign of the Humboldt University Nubian Expedition (Näser 2008) the author surveyed of the whole island. The survey was accompanied by Khidir MohamedAbdelkarim Ahmed (then Nilein University, Khartoum). The results of this reconnaissance form a major part of the map content. All settlements were surveyed by DGPS and additional data were recorded by interviewing local people (Ritter 2008). The exact position of each settlement, hamlet or village as well as its name and its borders to neighboring settlements were recorded. Type locations of various kinds of land use were mapped to support concurrent and subsequent satellite image analyses. Finally the position of the villages and spelling of their names were reviewed with local dignitaries at a meeting in Magal on 9th March 2008.

The content of the map shows point, line and area features that are derived both from digitised remote sensing data and own recording during the 2008 field campaign. Point features show houses, hamlets, ruins, bridges and selected elevation points. Line features represent tracks, roads, railway tracks, irrigation channels and wadi courses. The area feature was chosen to map agriculturally used land. Visual interpretation of satellite imagery was used (GoogleEarth 2013). A multi-temporal analysis was applied to deduce annual or seasonal shift in the state of vegetation cover. Furthermore, the mapping of the distribution of land and water was done on the basis of satellite images. The exact position and width of the water courses of the river Nile, its countless islands and narrow channels depends on the recording date of the satellite images. In summer during high flood season channels are filled, low lying zones may be flooded and islands and rocks disappear underneath the water surface. In fall when the waters of the Nile recede and the river level decreases the landscape slowly changes. The main river as well as its smaller channels become more narrow and shallow. Some channels dry up completely. Rocks and islands appear to grow in size and often join with others or the main land. Along the southern Nile channel these annual changes are striking. The width of this part of the river bed varies between 100 meters during high flood season and 8 meters in low flood season. In the latter season this channel can be crossed by foot.

The mapping bases on satellite imagery that was taken on 25.09.2003 i.e. at a time, when the peak of the high flood already has passed and the waters recede. Along the riverbanks where the flood alters the appearance of the riverine landscape same date satellite data was used. Features distant from the river courses were additionally recorded on the basis of further images. Due to the shape of the Nile valley distant is meant both horizontally and vertically relating to the river. Infrastructural items were mapped on the basis of the latest available SPOT image (09.04.2013).

The terrain is displayed by a digital elevation model (DEM) which is based on SRTM data. The resolution of this DEM has a pixel size of 90x90 meters (Farr et al. 2007). This resolution appeared to be sufficient at that scale. The size of one pixel equals less than one millimeter on the map. Therefore SRTM data was regarded as sufficient for this purpose.

On the basis of these data, the region of Mograt island and its adjacent river banks is now mapped in much greater detail on the map presented here.

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Zusammenfassung

Besonders für abgelegene Regionen ist die Verfügbarkeit adäquaten Kartenmaterials gering. Das gilt auch für die größte Insel im Nil: Mograt. Die hier vorgestellte topographische Karte bildet die Insel Mograt in einer bisher nicht vorhandenen Detailtiefe ab (Karte im hinteren Einband dieser Ausgabe).

Die Zunahme der Reisen entlang des Nil am Ende des 18. und zu Beginn des 19. Jahrhunderts trugen zu einer erweiterten Kenntnis des Bilad es-Sudan - des Landes der Schwarzen - bei. Neben einer zunehmenden Zahl an schriftlichen Quellen verbesserten sich auch die kartographischen Darstellungen im Bereich des Katarakt-Nil. Die Insel Mograt wurde erstmalig im Jahr 1827 auf topographischen Karten dargestellt (Cailliaud 1827; Verdermaelen 1827). Doch mehr als eine längliche Insel im nördlichen Bogen des Nil namens Mograt war diese Darstellung nicht. In den folgenden einhundert Jahren wurden lediglich geringe Verbesserungen bei der Kartierung Mograts erzielt (Chélu 1891). Mit der groß angelegten Vermessung des Sudan ab den 1920er Jahren wurden die so genannten "Quarter Million Sheets" im Maßstab 1:250.000 erstellt und bildeten Mograt erstmalig mit einigen Orten und einer groben Geländedarstellung ab (Sudan Survey Office 1926). Die Karten der U.S. Army (1960) basierten mit geringfügigen Aktualisierungen auf den Quarter Million Sheets. Eine Verbesserung in der Geländedarstellung brachten erst die Sowjetischen Generalstabskarten (1:200.000 und 1:500.000) von 1978 und sind in diesem Maßstab bis heute noch die besten Reliefkarten (Lee 2005).

Während der Geländekampange der Humboldt-University-Nubian-Expedition (Näser 2008) wurde die gesamte Insel im Rahmen eines Geländesurveys vermessen. Dabei wurden sämtliche Orte, Landnutzung, Verkehrswege und weitere landschaftliche Elemente erfasst (Ritter 2008). Unterstützt wurde die flächige Kartierung durch ausgewählte Typuslokalitäten, die sehr detailreich erfasst und vermessen wurden. Sie diente bei der Kartierung mittels hochauflösender Satellitenbilder als Referenzflächen und ermöglichten die Übertragung auf weitere Landschaftsteile. Besonders der saisonal stark schwankende Wasserstand des Nil erschwerte die Darstellung der zahlreichen Inseln und Flutrinnen, wobei die Kartierung der Land-Wasser-Verteilung einem mittleren Wasserstand entspricht. Ein digitales Höhenmodell (SRTM) mit einer Auflösung von 90x90 Metern wurde für die Reliefdarstellung genutzt.