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Abstract: The medieval monastery at Ghazali in Sudan was excavated in part by the Sudan Antiquities Service in 1953 and 1954, and is one of the best preserved archaeological sites in the country. A new project of the Polish Centre of Mediterranean Archaeology, University of Warsaw, and the National Corporation of Antiquities and Museums of Sudan revisited the ruins with a site presentation project coupled with excavation geared to bringing out a final publication of the remains, which are of utmost importance for studies of medieval Nubian history. Site surveying (including geophysics) and mapping occupied most of the short season in 2012, but some unexpected discoveries were also made.

Keywords: Ghazali, monasticism, Nubia, Christianity, remote sensing, geomagnetic survey, epigraphy, architecture

الغزالي 2012 : التقرير الأولي .

Artur Obłuski, Grzegorz Ochała, Miron Bogacki, Wiesław Małkowski, Szymon Maślak, Zaki ed-Din Mahmoud

الملخص: تم تنقيب جزء من دير يعود إلى القرون الوسطى في الغزالي - السودان بواسطة الهيئة العامة للآثار السودانية في عامي 1953 و 1954 و هو يعتبر من أفضل المواقع الأثرية المحفوظة في البلد. هناك مشروع جديد للمركز البولندي لآثار البحر الأبيض المتوسط جامعة وارسو والهيئة العامة للآثار والمتاحف، لإعادة النظر و دراسة الأنقاض مع مشروع للموقع مقرون بعمليات تنقيب مجهزة للكشف عن المنشور النهائي لبقايا ذات أهمية قصوى لدراسة التاريخ النوبي في العصور الوسطى. إن مسح الموقع (بالإضافة إلى الجيوفيزياء : علم يختص بدراسة المتغيرات الطبيعية للأرض) ورسم الخرائط قد شغل معظم الموسم القصير في 2012 , ولكن أيضا تم إجراء بعض الاكتشافات غير المتوقعة .

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RESEARCH



ABBREVIATIONS

<i>AA</i>	<i>Archäologischer Anzeiger; Jahrbuch des Deutschen Archäologischen Instituts</i> (Berlin)
<i>ANM</i>	<i>Archéologie du Nil Moyen</i> (Lille)
<i>ASAE</i>	<i>Annales du Service des Antiquités de l'Égypte</i> (Cairo)
<i>AV</i>	<i>Archäologische Veröffentlichungen, Deutsches Archäologisches Institut, Abteilung Kairo</i> (Berlin–Mainz am Rhein)
<i>BAAL</i>	<i>Bulletin d'archéologie et d'architecture libanaises</i> (Beirut)
<i>BAH</i>	<i>Bibliothèque archéologique et historique</i> (Paris)
<i>BAR IS</i>	<i>British Archaeology Reports International Series</i> (Oxford)
<i>BASOR</i>	<i>Bulletin of the American Schools of Oriental Research</i> (Ann Arbor, MI)
<i>BCH</i>	<i>Bulletin de correspondance hellénique</i> (Paris)
<i>BdE</i>	<i>Bibliothèque d'étude</i> (Cairo)
<i>BIFAO</i>	<i>Bulletin de l'Institut français d'archéologie orientale</i> (Cairo)
<i>BSAA</i>	<i>Bulletin de la Société d'archéologie d'Alexandrie</i> (Cairo)
<i>BSFE</i>	<i>Bulletin de la Société française d'égyptologie</i> (Paris)
<i>CCE</i>	<i>Cahiers de la céramique égyptienne</i> (Cairo)
<i>EtTrav</i>	<i>Études et travaux. Travaux du Centre d'archéologie méditerranéenne de l'Académie des sciences polonaise</i> (Warsaw)
<i>FIFAO</i>	<i>Fouilles de l'Institut français d'archéologie orientale</i> (Cairo)
<i>GAMAR</i>	<i>Gdańsk Archaeological Museum African Reports</i> (Gdańsk)
<i>GM</i>	<i>Göttinger Miszellen</i> (Göttingen)
<i>IAMS</i>	<i>Institute of Archaeo-Metallurgical Studies</i> (London)
<i>JARCE</i>	<i>Journal of the American Research Center in Egypt</i> (Boston–Princeton–New York–Cairo)
<i>JEA</i>	<i>Journal of Egyptian Archaeology</i> (London)
<i>JGS</i>	<i>Journal of Glass Studies</i> (Corning, NY)
<i>JJP</i>	<i>Journal of Juristic Papyrology</i> (Warsaw)
<i>JRS</i>	<i>Journal of Roman Studies</i> (London)
<i>MDAIK</i>	<i>Mitteilungen des Deutschen Archäologischen Instituts, Abteilung Kairo</i> (Wiesbaden)
<i>OIP</i>	<i>Oriental Institute Publications</i> (Chicago)
<i>OLA</i>	<i>Orientalia lovaniensia analecta</i> (Louvain)
<i>PAM</i>	<i>Polish Archaeology in the Mediterranean</i> (Warsaw)
<i>PSAS</i>	<i>Proceedings of the Seminar for Arabian Studies</i> (London)
<i>SAAC</i>	<i>Studies in Ancient Art and Civilisation</i> (Kraków)
<i>SAK</i>	<i>Studien zur altägyptischen Kultur</i> (Hamburg)
<i>SAOC</i>	<i>Studies in Ancient Oriental Civilization</i> (Chicago)
<i>WVDOG</i>	<i>Wissenschaftliche Veröffentlichungen der deutschen Orient-Gesellschaft</i> (Berlin–Leipzig)

GHAZALI 2012: PRELIMINARY REPORT

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Abstract: The medieval monastery at Ghazali in Sudan was excavated in part by the Sudan Antiquities Service in 1953 and 1954, and is one of the best preserved archaeological sites in the country. A new project of the Polish Centre of Mediterranean Archaeology, University of Warsaw, and the National Corporation of Antiquities and Museums of Sudan revisited the ruins with a site presentation project coupled with excavation geared to bringing out a final publication of the remains, which are of utmost importance for studies of medieval Nubian history. Site surveying (including geophysics) and mapping occupied most of the short season in 2012, but some unexpected discoveries were also made.

Keywords: Ghazali, monasticism, Nubia, Christianity, remote sensing, geomagnetic survey, epigraphy, architecture

One of the most intriguing archaeological sites in Sudan is situated surprisingly not on the banks of the life-giving Nile, but about 15 km inland, down the Wadi Abu Dom. A satellite view of the area reveals the wadi like the winding brown body of a serpent basking in the sun between the volcanic rocks of the Bayuda Desert. On the ground, the serpent's body is a shimmering silver and gold from the abundant mica in the sand. In windy weather even visitors receive the golden touch.

This is the place where the Makurites built a monastery of a similar size to that of the St Catherine monastery in Sinai. The place was visited by all of the famous travelers of the 19th and early 20th century: Richard Lepsius (1853: 233–235; 1972: 291, Pl. 131), Louis Maurice Adolphe Linant de Bellefonds (1958: 169–170)¹, John Gardner Wilkinson (1848–1849: 99–100; 1849: 34), Pierre Trémaux (1854: Pls 53–55; 1862: 331–333) and Ugo Monneret de

¹ Drawings in pencil available online: <http://www.culture.gouv.fr/documentation/manuscripts/IMG/c269.htm> [accessed: March 2012].

Villard (1935: 253–256). There can be no underestimating the importance of the Ghazali monastery for studies on the history of Sudan, especially in the Makurian period, but neither should one forget its significance for a local economy seeking spectacular tourist destinations in the country. Exploration of the site on behalf of the Sudan Antiquities Service (now the National Corporation for Antiquities and Museums) started in the 1950s. Over two seasons, Peter and Margaret Shinnie, Neville Chittick and Sudan representative Sayed Nigm ed Din Sherif excavated the church, refectories and several other rooms (Shinnie and Chittick 1961). The potential of the site for further studies is still considerable as neither the adjoining settlement nor the cemeteries were investigated, not to mention an undisclosed part of the monastery itself.

In 2011, the NCAM expressed interest in the implementation of a project aimed

to excavate fully and prepare the site for the increasing volume of visiting tourists. The joint Ghazali Archaeological Site Presentation Project (G.A.S.P.) was established a year later with the Polish Centre of Mediterranean Archaeology, University of Warsaw (PCMA UW) taking out a concession for the area of the medieval monastery, neighboring settlement, surrounding cemeteries and nearby iron production sites.

The main objective of the project at the initial stage was to gain an essential overview of the site through geophysical surveying and mapping. Sand accumulated after the end of archaeological research in 1954 was cleared away to prepare for activities pertaining to conservation and site presentation. Surveying included traditional methods, magnetic prospection and kite photography, the latter applied also for photogrammetric documentation of the site.

MAGNETIC PROSPECTION

A noninvasive survey was carried out with an instrument which consists of three elements: two GPS (GPS RTK Topcon Hiper Pro) receivers (base and rover) and a cesium magnetometer (Geometrics G-858g Magmapper). The GPS receivers communicate using radio modems. The mobile GPS receiver (rover) connected

to the magnetometer obtains reference corrections from the base radio receiver. Data defined in CMR format (Compact Measurement Record) are sent from base to rover receiver. The information packet contains GLONASS signals in the L1 and L2 sub-bands, position (coordinates) and parameters of the base. The Mobile RTK

Team

Dates of work: 4–25 January 2012

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rover receiver is connected to a cesium magnetometer G-858 via an RS-232 serial, allowing an exchange of data between these two instruments. The NMEA (National Marine Electronics Association) output data format sent from the GPS contains GGA records (Global Positioning System Fixed Data) including longitude, latitude and altitude (above sea level) with 1 mm accuracy. Location data are stored simultaneously with magnetic data and assigned by the time factor synchronous with the magnetic field measurements. Then the data are transmitted with assistance of MagMap2000 software to a computer hard

drive for further processing, e.g., transformation from a system of coordinates of latitude and longitude values in degrees (BLH) to the metric system (UTM).

The survey carried out in the settlement area recognized locations with high magnetic anomalies of polar (dipole) readings [Fig. 1]. These are clearly visible on the magnetic map as color dots of low (light blue) and high (red) values. Hypothetically, the latter should be remains of iron ore, iron furnaces or deposits of industrial rubbish (not confirmed by excavations carried out since, in 2013 and 2014).

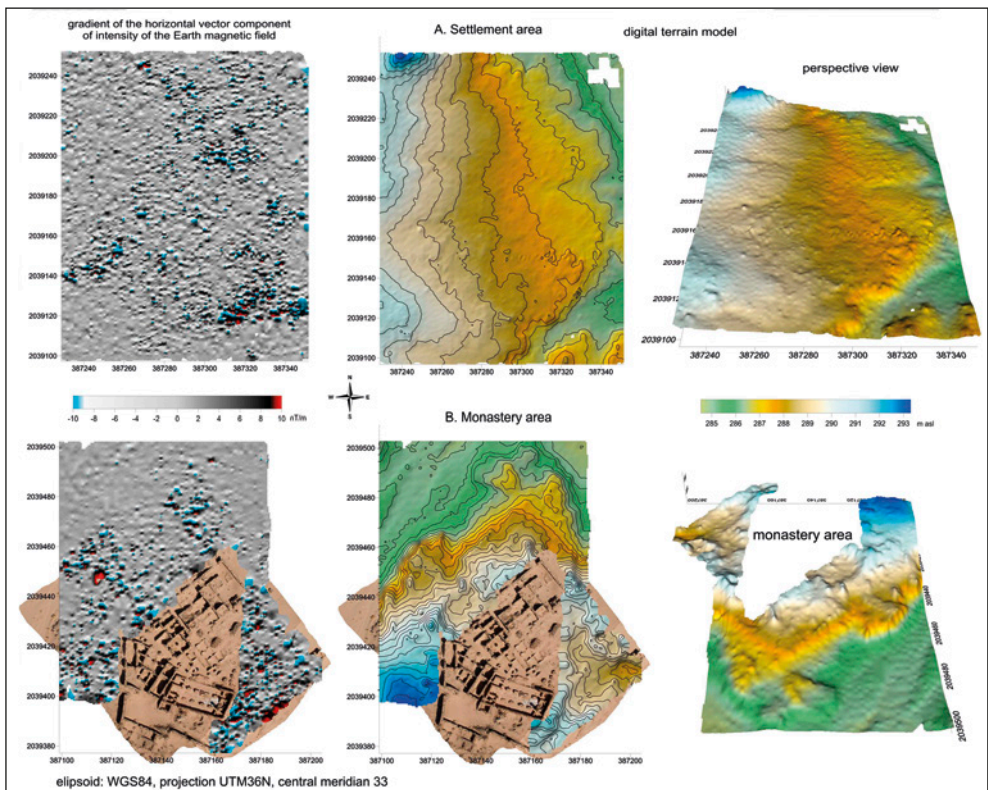


Fig. 1. Magnetic survey results from the settlement and monastic areas (Processing W. Małkowski)

KITE PHOTOGRAPHY AND PHOTOGRAMMETRY

Weather conditions for kite aerial photography in Sudan are generally favorable and this was the case all through the 2012 season. The wind blew every day at a speed

of 2–13 m/s. Structures of the Ghazali monastery, cemeteries and settlement were clearly visible from the air, especially in the early morning and late afternoon.



*Fig. 2. Orthophotomap of the concession (north at top)
(Photos and processing M. Bogacki)*

More than 2000 photographs were taken during several sessions, using three different-size “flowfoil” kites depending on wind strength (the smallest being used with the strongest wind). Kite height was controlled with 300 m of line. The highest flight altitude was about 150 m. A Canon 5D camera with Canon 35 mm 2.0 and Canon 24 mm 2.8 lenses was mounted on a self-constructed gimbal and controlled remotely for oblique and vertical photography. Picture taking was controlled by wireless connection via a 2.4 Ghz video transmitter with screen. Vertical photos containing GPS RTK data were processed in Image Master photogrammetric software and transformed into Digital Surface Models and orthophotos. Fourteen orthophotos and digital surface models of different areas of the concession within a rectangle of 700 m by 280 m were created. The orthophotomaps have a plane resolution

between 1 cm and 5 cm, depending on the size of the area they cover. A digital surface model of the monastery created from two photos has a plane resolution 3.7 cm and depth resolution of 15 cm. The 3D surface model of the church in the monastery was prepared from two photos taken from a height of 56 m. The plane resolution in this case is 1 cm and depth resolution 3 cm. All of this data were prepared in the same coordinate system (WGS 84 UTM 36N). Three-dimensional models were exported to VRML, OBJ and DXF file formats with texture. Orthophotomaps were saved in GeoTIFF standard.

Kite photos were used to revise the sketchy plan of the monastery once published by Peter Shinnie. The collected information in form of the photos and GPS data allows armchair prospection of the area away from the site [Fig. 2].

SITE CLEAN UP

During the short season the North Church of the monastery and attached building located north of the church with a tank sunk in its floor were cleared of sand as well as stone and brick rubble [Figs 3, 4]. The building has been interpreted as either a baptistery or a room used during celebration of the Epiphany, yet it is equally probable that this basin did not have any liturgical meaning and was used to accumulate water. The rubble contained elements of pillars flanking the apse and the sun-dried brick vaulting once springing over the southern aisle.²

Clearing of the stone rubble overlying the pillars and inner walls of the church

for the purpose of ensuring the safety of visitors to the monastery unexpectedly paid off in addition to the published plans of the church. Also three fragments of tombstones, two of sandstone and one of baked clay, were discovered. Two of them were sunk in the floor of the church, while the third was found in the western niche of the southeastern pastophorion.

The North Church of the Ghazali monastery was a basilica built of sandstone in the lower part of the walls and of baked brick in the upper. Its orientation did not follow the cardinal directions and since the course of the river could not have been used here to determine the position of the east,

² The pillars received a two-sign designation: letter (N or S) marking the row (either northern or southern) and number (1–4) counting from the east.



*Fig. 3. The presbytery of the North Church after cleaning
(Photo M. Bogacki)*



*Fig. 4. The water tank and associated building, looking north
(Photo M. Bogacki)*

the main axis of the church must have been traced based on sun movement (preferably) or astronomical observations.

All the characteristics of Makurian churches were featured in this building [Fig. 5]. These have been claimed to be typical of Nubian Christian architecture in general, but are so of architecture developed in the territory of Makuria (see Obłuski forthcoming). They are as follows:

- Tripartite western section with a staircase located in the southwestern room and a central western bay.
- Central part of the church divided into a nave and two side aisles. Two entrances were located in the north and south walls by the western end of the church.
- Tripartite eastern section consisting of an apse with a synthronon and two ancillary rooms on either side, connected by a passage behind the apse.

An unorthodox feature of Nubian church architecture was a western entrance to the church from the northwestern room.

The floor of the church was paved with pottery tiles in the pastophories, pottery tiles and baked bricks in the aisles, marble and granite in the sanctuary and sandstone slabs in the western and middle parts of the nave. Yet it was just an underlay for the lime plaster flooring identical to the plaster on the walls. It covered the floor in the entire building save for the sanctuary and probably the northwestern room. The walls of the church were decorated with paintings preserved only in the northeastern room and central western bay.

The western end of the church was divided into three separate rooms. The southwestern chamber contained a staircase consisting of three flights of steps [Fig. 5]. The entrance was located in its east wall and was crowned with an arch,



Fig. 5. Staircase room located in the southwestern corner of the church; visible remains of the baked brick structure of the upper walls (Photo M. Bogacki)



*Fig. 6. Kite photograph of the North Church
(Photo M. Bogacki)*

the capstone of which was decorated with a carved cross. The central bay was open to the nave and a bench ran all along its walls. The inner walls of the western part were made of well-dressed sandstone blocks up to a height of 1.40 m. Starting from that point the rest of the wall was built of baked brick, making the structure considerably lighter than if it were made of stone.

The central part of the church was divided into a nave and two side aisles by two rows of pillars, four in each row. The rectangular pillars were built of baked brick cushioned with horizontal wooden beams. The four central pillars were reinforced by pilasters on the side of the nave. They supported the arches on which the dome rested. The eastern part of the nave, from the point of the middle of the second pair of pillars was paved with marble and granite. Four meters from the mouth of the apse were four pots sunk in the floor in one line, spanning the width of the nave. The beams supporting a *templon* had been mounted in them. The pulpit was located against the southern and western faces of pillar N-2.

Filling the apse was a *synthronon* of baked bricks coated with lime plaster, same as that on the walls and floor of the church. Ancillary rooms on both sides of

the apse were accessible from the aisles. The entrance to the southern chamber might have been set off from the aisle by a screen similar to the one in the nave, considering that there was a pot sunk in the floor of the southern aisle immediately next to the south wall of the church in line with the screen in the nave. The west walls of both rooms were built in the lower parts of stone and in the upper of baked brick. Arches once spanned the entrances to these rooms.

In the northeastern room there was a niche and also a mastaba built against the northern face of the wall of the apse. After the monastery was abandoned, a shallow shaft was dug in the northwestern corner of the northern pastophorion. It was of oval shape aligned north-south and covered with a stone slab.

A passage behind the apse led from this room to the southern pastophorion. The latter was furnished with three niches in the north, west and south walls. There was a small mastaba against the wall of the apse, parallel to the one in the northern pastophorion. No traces of a baptismal font of any sort were ever recovered.

Mapping of the church revealed a fact that had so far escaped notice: the building was not rectangular but equilateral in plan, the north wall running slightly more to the east than the south one.

EPIGRAPHIC FINDS FROM THE FIRST SEASON

Despite no excavations being carried out in the first season of work, a number of epigraphic finds turned up. These were the three funerary stelae from the walls and pavement of the main monastic church, apparently not recorded by the previous excavators.

The first and best preserved was an irregular sandstone slab found at the top of the church wall. The fragment has preserved parts of the side and bottom margins; its upper part is broken off. The epigraphic field seems to have been placed in a shallow recess. Its border is best visible in the lower

part of the stone. The bottom part, below this border, was apparently left uninscribed, probably in order for the stone to be mounted in a tomb superstructure or dug into the ground. The inscribed surface of the stela is badly worn and hardly legible, especially in the bottom part of the epigraphic field. It was established, however, that the epitaph is in Coptic and that it was prepared for a certain *apa* Chael (only the beginning of the name has been preserved). After the name of the deceased, the opening words of the prayer for his soul's rest could be read. The state of preservation of the inscription does not allow a complete reconstruction of the text. It was noted, however, that the redactor of the epitaph used the Coptic word ⲙⲁⲛⲁⲛⲧⲏⲩⲓ, 'merciful', to describe the Godhead. This word is attested only in two other Coptic epitaphs from Ghazali.³ A comparative study of those tombstones may permit a reconstitution of the missing text of the present stela.

The other two epitaphs had both been reused as pavers repairing the church floor. Laid with the inscribed surface upwards, they are in a lamentable state. The first one is a rectangular stela made of sandstone. The original edges of the stone seem to have been preserved, apart from the lower left corner, which is broken off. The fragment now filling the hole in the pavement in this place may or may not have belonged

originally to the slab. The inscribed surface is almost entirely destroyed. A few letters have been preserved in the upper right corner, forming the ending of the first three lines of the epitaph. These remnants are enough to state that we are dealing here with a Greek epitaph containing the prayer 'God of the spirits and of all flesh', which was very popular in the funerary epigraphy throughout Christian Nubia, including Ghazali.

The third stela is by far in the worst condition. It is made of terracotta. Portions of the left-hand and the bottom margins have been preserved, showing that the epigraphic field was surrounded by an incised line. Regrettably, only a few letters survive, while the rest of the inscribed surface is completely destroyed. The remnants do not allow even the recognition of the language of the text.

The 2012 epigraphic discoveries at Ghazali are surely not very imposing, yet they have their significance in two respects. Firstly, they are an important addition to some funerary stelae (mostly in fragments) known from this site to date. This number makes the cemeteries of Ghazali the second most abundant in epitaphs, after the cemetery of Sakinya (Toshka West) with its 314 tombstones. Secondly, these findings give a hint of what may still lay undiscovered in the ruins of the monastery.

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³ The epitaphs of Pachom (= DBMNT 455; Donadoni 1986: 223–224) and of Mc[---], monk (= DBMNT 681; I. *Khartoum Copt.* 73). DBMNT = Database of Medieval Nubian Texts, available online at www.dbmnt.uw.edu.pl.

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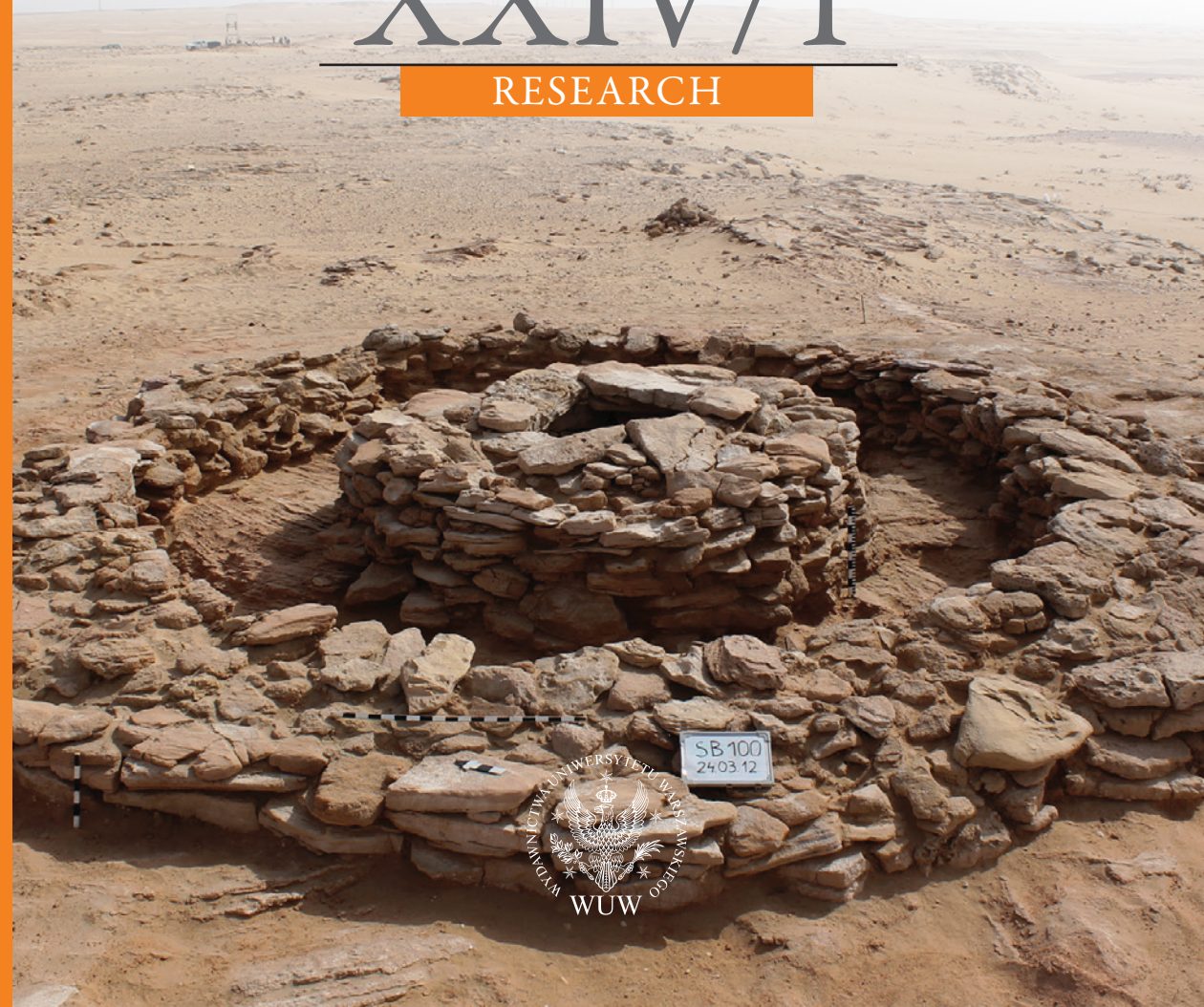
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