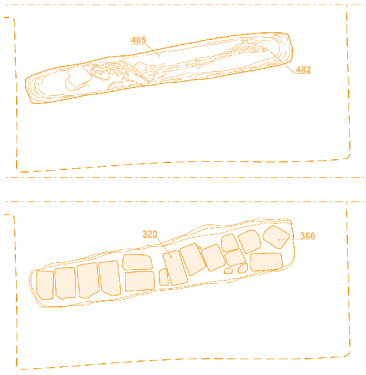
The question of Anna: radiocarbon dating of a person believed to have been Saint Anna of Tungul (Old Dongola)



Abstract: The so-called hermitage or sanctuary of Anna, located in Room H.B.2.2 of Building H.B.2, is a part of the broader monastic complex on Kom H, which functioned from around the 6th/7th to the 13th or early 14th centuries CE. This burial represents one of the most unique contexts identified to date at Tungul, the capital of Makuria, from no later than the 6th to 14th centuries CE. Epigraphic evidence suggests the name "Anna" for the individual buried in the south room of the sanctuary. The dating of this burial has so far remained speculative, placed only within the broader chronology of structural developments in this part of the site. AMS radiocarbon dating of femur collagen from this individual places the life of this proposed "saint" in the 12th–14th centuries CE. This result calls for a re-evaluation of the epigraphic and associated archaeological evidence, which had previously placed the life of Anna in the 11th century CE.

Keywords: Tungul, Old Dongola, Kom H, Sanctuary of Anna, burial chronology, Makuria, Nubia, Christianity, monasticism, medieval Sudan

INTRODUCTION

Tungul (N 18.223056, E 30.743889; approximately 242 m a.s.l.), located between the Third and Fourth Cataracts on the east bank of the Nile in Sudan, was founded in the 5th century CE (Godlewski 2014b). It is unclear

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when Tungul became the capital of the Kingdom of Makuria, although it is attested in this role at least from the 6th to 14th centuries CE. During the 14th to 15th centuries, it was transformed into a smaller political entity known as the Kingdom of Dongola, before being subjugated by the Funj Sultanate in the early 16th century (Łajtar 2013; 2020; Obłuski 2021: 1–5) [*Fig. 1*]. Excavations at Old Dongola have been conducted continuously since 1964 by the Polish Centre of Mediterranean Archaeology at the University of Warsaw (PCMA UW), in collaboration with the National Corporation for Antiquities and Museums of Sudan (NCAM). Over this period, extensive structural remains have been identified, including numerous churches, a citadel, a monumental building originally proposed to be a throne hall —though likely a church later converted into a mosque— cemeteries, monasteries on Kom D and Kom H, defensive walls, as well as numerous preserved wall paintings and a wide array of artifacts (Michałowski 1966; Godlewski and Medeksza 1987; Jakobielski 2001; Martens-Czarnecka 2011; Godlewski 2013b; Obłuski et al. 2013; Obłuski and Dzierzbicka 2021; 2022). Old Dongola, which covered an area of approximately 200 hectares (Obłuski 2021), functioned as a major center of culture, political authority, and trade in the region (Jakobielski and Scholz 2001; Obłuski 2021).

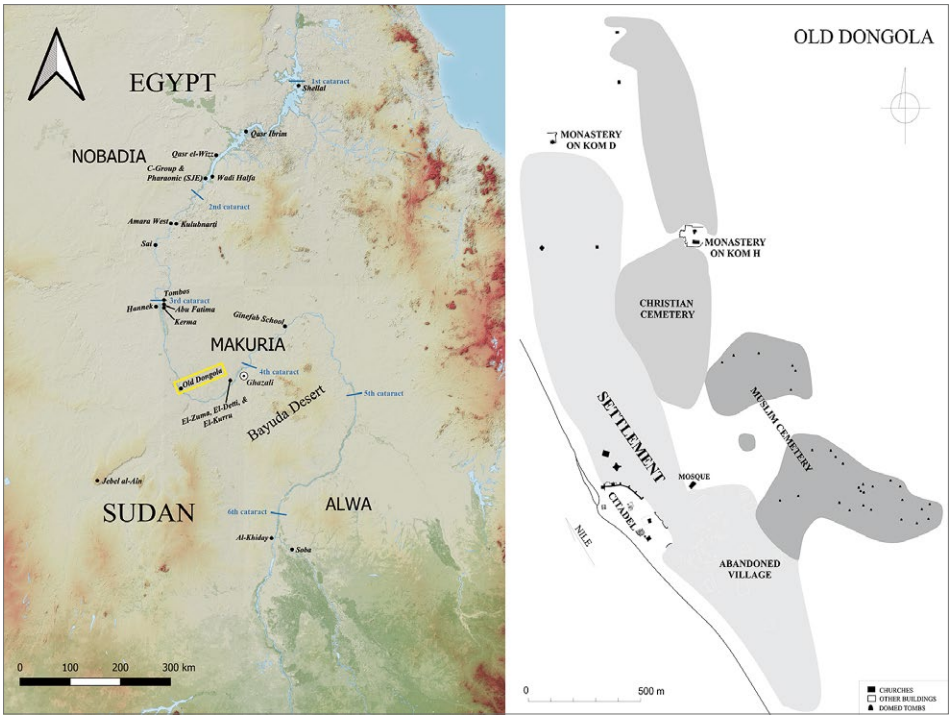

Fig. 1. Old Dongola —marked in yellow— and the monastery on Kom H (After Obłuski 2021: Figs 1, 2; edited by R. Stark)

THE MONASTERY ON KOM H AT OLD DONGOLA

The monastery on Kom H [*Fig. 2*] is part of a mound of approximately 1.2 ha (around 100 m × 120 m), located about 1.5 km northeast of the citadel at the northern edge of the Tungul agglomeration (Jakobielski 2001: 22; Obłuski 2019: 40). An unfired mud-brick perimeter wall with several towers enclosed the monastery. The architectural complex included two churches, a monastic courtyard, and service buildings such as a kitchen, dormitory, storerooms, and the *kellion* or hermitage/sanctuary of St. Anna. Two annexes located west of the perimeter wall —the Southwest Annex and Northwest Annex— were also associated with the monastery (Obłuski 2019: 40–46). The dedication of the Kom H monastery remains uncertain, with two proposed affiliations: the "Monastery of the Holy Trinity" (Jakobielski 2008) and the "Monastery of St. Anthony the Great" (Godlewski 2013b: 78–91). The monastery appears to have functioned from approximately the 6th/7th century to the 13th or early 14th century CE (Jakobielski 2001: 22; 2008: 283; Godlewski 2018: 16, 25, 30; Dzierzbicka and Danys 2021: 441). Excavation and documentation of the Kom H monastery have been ongoing since 1989 (Jakobielski 2001: 24). In terms of absolute chronology, Dzierzbicka and Danys (2021) recently examined stratified contexts from Courtyard A, a service area in the southwest part of the monastery, which was used between approximately the 11th and 14th centuries CE, primarily for the delivery of supplies, food processing, and storage (Dzierzbicka and Deptuła 2018). The study presented by Dzierzbicka and Danys (2021) provides seven AMS radiocarbon dates [*Table 1*] from wood and charcoal in this area, ranging from 962–1041 cal CE with a probability of 91.9% (Poz-100060) to 1181–1273 cal CE with a probability of 94.2% (Poz-99963). These dates provided a foundational anchor for refining the ceramic chronology of the site and the broader region. Radiocarbon dating of a charcoal fragment associated with the burning of incense in front of the west wall of the superstructure of tomb 12 in the TNWH cemetery (Kom H) yielded a result of 930±60 BP (GD-11194; 995–1225 cal CE with 95.4% probability),[1] with the upper limit serving as a *terminus ante quem* for the construction of a northern commemorative complex above the twin

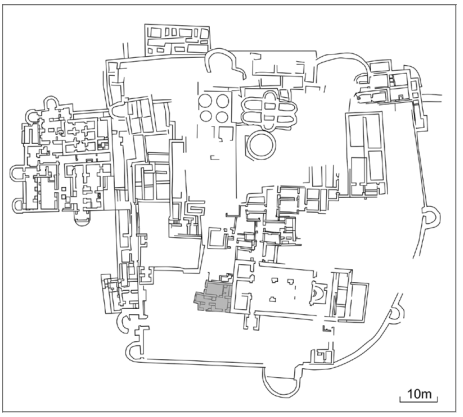

Fig. 2. Plan of the Monastery on Kom H with the sanctuary of Anna area highlighted in gray (Drawing D. Dzierzbicka)

1 Calibrated for this study using OxCal v4.4.4 (2021) by Bronk Ramsey; r:5, with atmospheric data from Reimer et al. (2020).

crypts (Crypts 2 and 3) in the Northwest Annex of the monastery (Żurawski 1996: 133; 1999: 242).

Beyond the radiocarbon dates mentioned above, dating of medieval contexts from Old Dongola and surrounding sites has so far been relatively limited. A few isolated samples have been published by Godlewski (2015a: 19), Godlewski, Danys, and Osypińska (2015: 84), and Stark (2021: 217, 223; 2022: Table 3). With the most recent research now underway, a significantly expanded dataset of radiocarbon dates is expected to become available for later contexts at Old Dongola.

Table 1. Radiocarbon dates from the monastery on Kom H and the Christian Cemetery at Old Dongola

Sample ID	Context	^{14}C BP	^{14}C calibrated cal CE	Material dated	Lab ID	Source
Anna	Sanctuary of Anna	785±30 BP	1218–1280 (95.4%)	Collagen (femur)	Poz-159914	This study
ODB20 (#42)	Old Dongola Christian Cemetery	1275±30 BP	665–822 (95.4%)	Collagen (femur)	Poz-126743	Stark (2022)
ODB21 (#76)	Old Dongola Christian Cemetery	1370±30 BP	605–772 (95.4%)	Collagen (rib)	Poz-137838	Stark (2022)
ODB22 (#82)	Old Dongola Christian Cemetery	1455±30 BP	568–650 (95.4%)	Collagen (rib)	Poz-137840	Stark (2022)
ODB24 (#85)	Old Dongola Christian Cemetery	1455±30 BP	568–650 (95.4%)	Collagen (rib)	Poz-137841	Stark (2022)
N/A	Grave No. 12 (TNWH Cemetery)	930±60	1016–1225 (94%)	Charcoal	GD–11194	Żurawski (1996)
Dongola.H.1	Courtyard A on Kom H	1030±30 BP	962–1041 (91.9%)	Wood	Poz-100060	Dzierzbicka and Danys (2021)
Dongola.H.2	Courtyard A on Kom H	830±30 BP	1161–1264 (95.4%)	Wood	Poz-100061	Dzierzbicka and Danys (2021)
Dongola.H.3	Courtyard A on Kom H	825±35 BP	1156–1272 (95.4%)	Charcoal	Poz-99964	Dzierzbicka and Danys (2021)
Dongola.H.4	Courtyard A on Kom H	840±30 BP	1154–1264 (95.4%)	Charcoal	Poz-99967	Dzierzbicka and Danys (2021)
Dongola.H.5	Courtyard A on Kom H	965±35 BP	1015–1160 (95.4%)	Charcoal	Poz-99968	Dzierzbicka and Danys (2021)
Dongola.H.6	Courtyard A on Kom H	805±30 BP	1181–1273 (94.2%)	Charcoal	Poz-99963	Dzierzbicka and Danys (2021)
Dongola.H.7	Courtyard A on Kom H	880±35 BP	1039–1224 (95.4%)	Charcoal	Poz-100009	Dzierzbicka and Danys (2021)

THE SANCTUARY OF ANNA ON KOM H AT OLD DONGOLA

The sanctuary was first documented and partially excavated by Stefan Jakobielski and colleagues between 1990 and 1993 (Jakobielski 1993: 107–108; 2001: 23; Jakobielski, Pluskota, and Żurawski 1993; Żurawski 1999), with subsequent excavations carried out by Włodzimierz Godlewski from 2010 onward (Godlewski 2014a: 275–280; 2015b). During the first phase of excavation, an architectural analysis of the construction sequence suggested that it was added to the west wall of the monastery church on Kom H in the 10th century CE (Jakobielski 1993: 106).

Building H.B.2, located immediately west of the main church of the monastery on Kom H, has been identified as the *kellion* (hermitage) or sanctuary of a male Saint Anna [*Fig. 3*], the first Nubian saint known by name (Godlewski 2013b: 83; Łajtar 2014: 293; 2017: 103). The name Anna is believed to derive from the local Nubian onomastic stock, as it is also attested for males in several Old Nubian documents

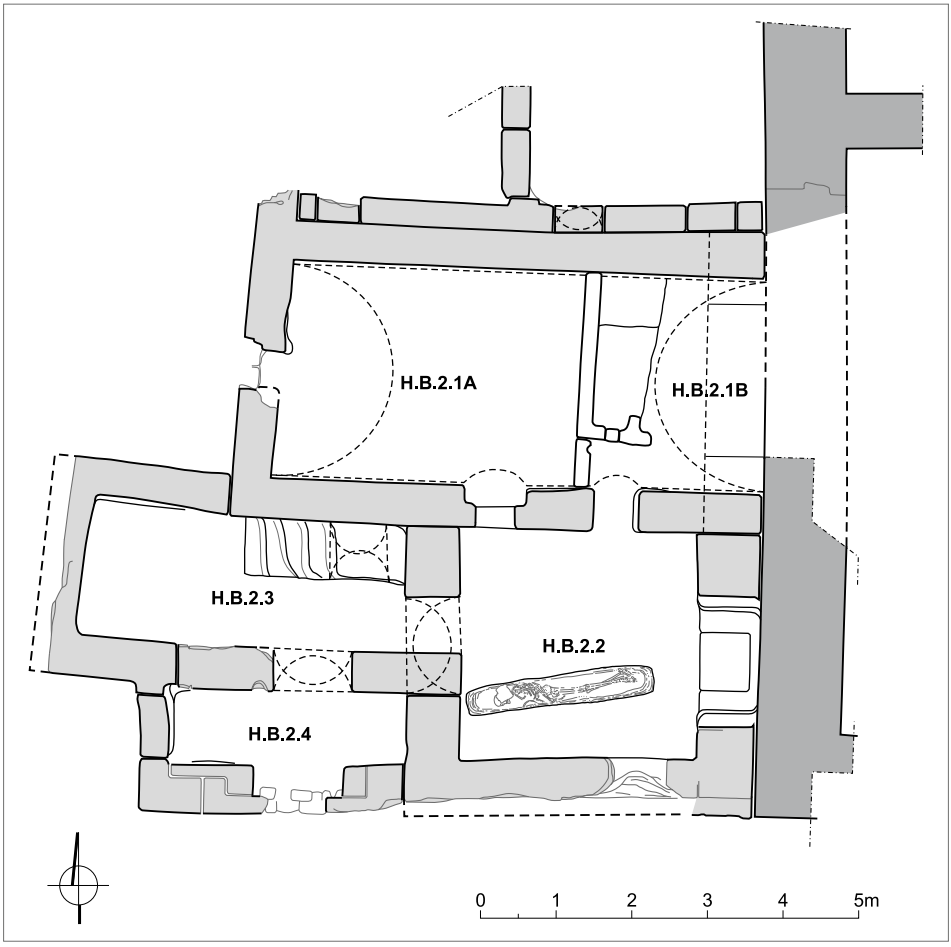

Fig. 3. Plan of the sanctuary of Anna (PCMA UW | plan J. Dobrowolski; updated by S. Maślak)

from Qasr Ibrim and in an inscription from the church of Sonqi Tino (Łajtar 2014: 293; 2017: 103). The sanctuary of St. Anna consists of a small complex of five rooms. The original hermitage comprised two rooms (H.B.2.1 and H.B.2.2) abutting the west wall of the main church. The northern room (H.B.2.1) was divided into western and eastern sections by a screen wall. The western section (H.B.2.1A), measuring 2.88 m × 3.18 m, was probably used for the resident hermit's daily activities. Several figural paintings adorn its north wall, including depictions of Christ, angels, and saints (Martens-Czarnecka 2001). These were added later, when the hermitage was transformed into a sanctuary. A passage at the eastern end of this room connected it to the adjacent eastern room, which measured 2.88 m × 2.32 m and contained a mastaba, suggesting it functioned as a bedroom (H.B.2.1B). Room H.B.2.2, located south of H.B.2.1 and adjacent to the church, likely served as a place for the hermit to receive visitors without compromising the privacy of his cell.

The last two rooms of the complex (H.B.2.3 and H.B.2.4) were added during a later phase, associated with the transformation of Anna's *kellion* into a sanctuary. The northern room (H.B.2.3) was provided with an ambo. Modifications also extended to the hermit's meeting room, which was furnished with an altar. These additions clearly indicate that the first room functioned as the naos of a church, where the congregation gathered during Mass and was addressed by a priest standing on the ambo. The former meeting room (H.B.2.2) was transformed into a *hierateion* (Obłuski 2019: 42), i.e. a sanctuary within the church accessible only to those who had received the sacrament of priesthood (Obłuski 2016: 482).

Inscriptions suggest that the sanctuary phase of the complex dates to the 11th century CE. A visitor's graffito on the north wall of Room H.B.2.2 provides a date of 791 in the Era of the Martyrs (approximately 1074/1075 CE) (Jakobielski 1993: 107; Godlewski 2013a: 672–673; Łajtar 2014: 286). Although Jakobielski, Pluskota, and Żurawski (1993: 307) recorded two additional dated graffiti in the original report, only the above date survived subsequent critical re-evaluation by Adam Łajtar (2014). Re-examination of these graffiti *in situ* was no longer possible due to the disintegration of the plaster bearing the inscriptions. Palaeographic evidence in the form of the Nubian majuscule further supports the date of 1074/1075 CE provided by the graffito as the probable *terminus ante quem* for the building's transformation into a sanctuary (Łajtar 2014: 286; Godlewski 2014a; Obłuski 2019: 42). The first phase of the building must predate this graffito. However, as it abuts the monastery church, it was certainly constructed sometime after the church itself, which was in use from around the 7th to the early 14th century CE (Gazda 2008: 359; Łajtar 2018: 37; Godlewski 2018: 30).

Three graffiti invoking "O, Saint Anna!" in Old Nubian confirm the association of this sanctuary space with St. Anna. Another Graeco-Nubian graffito on the west wall of Room H.B.2.2 indicates that the feast of Anna was celebrated on 10 Tybi (5 January in regular years and 6 January in leap years), supporting the identification of Anna as a local saint (Godlewski 2013a; Łajtar 2014: 290, 292). Godlewski (2014a: 280) suggests that the veneration of

Anna as a saint probably developed during the episcopate of Archbishop Georgios (approximately 1063–1113 CE), perhaps with his encouragement. However, no firm evidence confirms a direct connection between Georgios and Anna.

It has been suggested that Anna was most likely not a monk of the Dongola monastery. This conclusion is based on the absence of the usual terms of monastic affiliation —"*apa*", a title not exclusively monastic but commonly used among monks, or "*abba*"— in connection with the inscriptions naming Anna. Moreover, the sanctuary walls feature depictions of Saints Menas, Philotheos, and Theodore Stratelates killing a serpent — figures who were also not monks (Godlewski 2013b: 83; 2014a: 280). On the other hand, Łajtar (2017: 103–104) argues that Anna was a monk because "his dwelling was in a monastery", and this is the most plausible explanation.

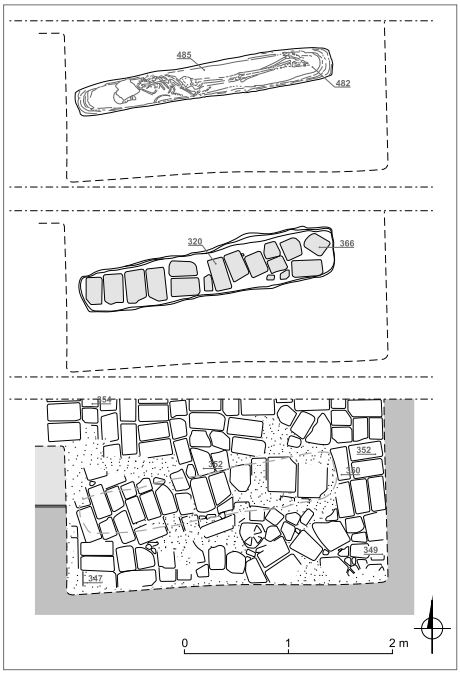

Fig. 4. Burial of Anna (Drawing J. Dobrowolski and B. Żurawski; digitized by M. Momot after Żurawski 1999: Fig. 45). Note: numbers indicate relative level in centimeters; the level marked as 320 follows the original but is evidently incorrect and should read 370

While much remains unknown about Anna's life, it is clear from the numerous inscriptions in Greek and Old Nubian that Anna's sanctuary received many visitors, further suggesting the veneration of Anna within Tungul society (Godlewski 2013b: 83). Jakobielski, Pluskota, and Żurawski (1993: 307) report 60 graffiti, numbered T.1 to T.60. Building on this work through a detailed on-site study, Łajtar (2014: 286) identified 71 inscriptions, excluding graffiti without lettering. Among the individuals who left epigraphic evidence of their visit(s) to Anna's sanctuary was the archimandrite Gourrōnga (Łajtar 2014: 289–290), who is probably the same person who left a graffito in the upper church at Banganarti, which functioned as a pilgrimage site not far from Tungul (Żurawski 2012; 2014). Other inscriptions indicate that the sanctuary was also visited by an *archistylites*,[2] *abba* Kyri, and at least six members of the

2 Łajtar and Pluskota (2001: 348–349) propose that the term archistylites was possibly a monastic title used for individuals responsible for the spiritual life of monks in a given monastery (see also Obłuski 2019: 291). This title has, to date, been attested only at Old Dongola, where the names of at least two individuals who held it are known — namely, Archbishop Georgios in the 11th/12th century CE and an individual named Lazaros. Another inscription attesting the title is known, though without an associated name, and was found on a window grille recovered during the excavation of the Northwest Annex on Kom H (Jakobielski 2003: 213–214, Fig. 2; Łajtar 2014: 289).

clergy who served in the Great Church of Iesu. Additional graffiti attest to the visits of a priest of the Great (Church of the) Trinity and another person who may have been a priest in a church of Raphael (Godlewski 2014a: 280; Łajtar 2014: 288–290).

THE BURIAL OF ANNA?

The pit-grave burial later associated with Anna was discovered in 1990 in a room initially designated as Room S1 (H.B.2.2), which was proposed to be a kind of chapel (Jakobielski 1993: 107–108, Fig. 5) within the "South Unit (SU)" at Site S (Jakobielski 1993: 106–108; Jakobielski, Pluskota, and Żurawski 1993: 326, Fig. 17). This grave was first documented by Bogdan Żurawski (Jakobielski, Pluskota, and Żurawski 1993: Fig. 9; Żurawski 1995: 349–352; 1999: 244–247, Fig. 45). According to Żurawski (1999: 246), after the initial identification in 1990, the burial of the "colourful belt man" was excavated and documented in 1991.[3] At that time, the burial site was recorded, but the skeletal remains were not exhumed; instead, they were reburied after the burial environment had been documented. The specific use of belts as part of monastic and/or ecclesiastical dress remains unclear at present and requires further investigation beyond the scope of this paper.[4] Anna's burial was located beneath a re-paved floor, some of the tiles of which appear to have been hastily acquired materials rather than standard paving tiles. Approximately 20 cm below this re-paved floor, a layer of mud bricks was discovered within the burial shaft [*Fig. 4*] (Żurawski 1999: 244, Figs 44–45), apparently serving as a burial cover — an arrangement also attested in other Christian tombs at Old Dongola (Żurawski 1995: Fig. 10; Stark 2022).

During initial assessment by Żurawski, it was noted that the individual in the grave was buried on an east–west axis, with the head at the west end, lying on the right side in an extended position, with the hands crossed over the pelvis and two mud bricks placed over the face, ostensibly to protect the head. Although not elaborated upon in the text, Żurawski (1999: Fig. 45) depicts the lower legs of this individual as crossed at the mid-shaft of the tibia. Apart from the right-sided

3 This burial was possibly first exposed and documented during the 1991/1992 archaeological season, at some point between 17 December 1991 and 13 February 1992. Although initially identified in 1990, further documentation may have occurred in the subsequent 1991 season, as: "…during the following field season [i.e., in 1991] it [i.e., the woolen belt] gained its iconographic Sitz im Leben" (Żurawski 1999: 245). Whether the burial was identified in 1990 and documented in 1991, or both identified and documented in situ in 1990, the fact that Żurawski drew the skeletal remains suggests that the proposed later exposure date —reported as 1993 by Godlewski (2014a: 278) or 1992 by Mahler (2015: 340)— may be erroneous (see also Jakobielski 1993: 107).

4 In terms of monastic attire in Nubia, there is a lack of clarity regarding what monks specifically wore and whether all monks wore the same clothing elements. Most evidence of Nubian monastic/ecclesiastic dress to date derives from wall paintings and, to a lesser extent, from textual and textile analyses (see Innemée 1992; 2016; Czaja 2018; Martens-Czarnecka 2001; 2011; Obłuski 2019: 204–206). With regard to the use of woolen belts at Tungul (Old Dongola), Żurawski (1995: 350) notes: "The monk, apparently a resident of the Monastery was portrayed wearing a colorful belt similar in appearance to the belt found in 1990 (Fig. 28)".

burial position, the overall posture is consistent with medieval Makurian Christian burial traditions (Adams 1998: 25). Recovered textile fragments suggest that the individual was buried with a shroud, together with a colorful knitted woolen belt identified in the loin area.[5] A painted depiction of a figure[6] wearing a similar belt was later identified in Room 1b, adjacent to the commemorative chapel built over twin crypts (Godlewski, Mahler, and Czaja-Szewczak 2012: Fig. 1) within the Northwest Annex of the monastery. Żurawski (1999: 245) notes that this may either represent the individual buried in the sanctuary of Anna or, more likely, reflect a common element of monastic dress at that time.

During the 2012 field season, the skeletal remains associated with Anna were re-excavated (Mahler 2015) from the "South Chamber", which Godlewski (2014a) identifies in the text as H.B.2.1, although Fig. 9 in the same article labels this room as H.B.2.2. The burial was again found in the southeast room of the sanctuary, having been reburied beneath the baked-brick floor within a pit approximately 0.40 m wide, 2.40 m long, and 1.34 m deep, cut through the southern part of the room. During the various excavations, no obvious gravestone was found; however, irregular traces of lime mortar were identified on the paving stones in the area of the burial pit cut, raising the possibility that a gravestone may once have been present, though this remains uncertain (Godlewski 2014a: 279).

In 2012, the human skeletal remains within the grave were subjected to biological anthropological analysis on site at Old Dongola by Robert Mahler (2015), who identified the buried individual as a 50–60-year-old male. A second assessment of age and sex estimation, conducted by Robert Stark on site at Old Dongola in 2022, was consistent with Mahler's original findings. Sex and age estimates in both assessments were based on macromorphological features of the pelvis and skull, following standard methods outlined in Lovejoy et al. (1985), Meindl and Lovejoy (1985; 1989), Buikstra and Ubelaker (1994), White (2000), and Nikita (2017). Morphological features used to estimate sex included the mastoid process, nuchal crest, supraorbital margin, glabella, and mental eminence, as well as the greater sciatic notch, ischiopubic ramus, ventral arc, preauricular sulcus, and subpubic concavity. Age-at-death was estimated based on the morphology of the auricular surface and pubic symphysis, in conjunction with cranial suture closure.

At the time of assessment, Mahler (2015: 341) noted that the degree of post-depositional alteration observed in the recovered skeletal remains may indicate that the skeleton had been removed, or at least disturbed *in situ*, during the ini-

5 It is unclear whether the textile used for this "belt" was confirmed as wool through textile analysis or if its material was inferred based on texture and appearance. It is also uncertain —given the state of textile preservation at the time of excavation— whether this "belt" (a questionable term, as most monastic belts were likely made of leather) was found around a burial shroud or directly encircling the waist of the individual.

6 Although Żurawski (1999: 245–246) identifies this figure as a monk, later interpretation of the wall paintings from Room 1b did not support this association (Martens-Czarnecka 2011: 56).

tial excavation and documentation of the burial in 1990. In addition, none of the textiles identified with the burial in 1990 (e.g. the colored woolen belt) were present when the burial was re-assessed in 2012, suggesting that such items may have been removed during the initial identification. Following the 2012 anthropological analysis, the skeletal remains of the proposed Anna were reburied in the original grave.

During the winter field season of 2022, the skeletal remains were once again exhumed from the sanctuary in order to collect samples for radiocarbon dating and chemical analyses. Following sample collection, the remains were packaged and securely stored in Crypt 2 on Kom H.

METHODS

COLLAGEN EXTRACTION

Collagen extraction from a femur bone sample for the purpose of accelerator mass spectrometry (AMS) radiocarbon (^{14}C) dating was carried out by Dr. Rafał Fetner at the Faculty of Archaeology, University of Warsaw. A wire brush was used to clean the surface of the bone sample, which was then weighed, and collagen was extracted according to the modified protocols of Longin (1971). The sample was demineralized using 0.3 mol HCl, rinsed three times with ultrapure water, and then heated in dilute HCl (pH 3) at 70°C for 48 hours. It was subsequently filtered using an Ezee-filter™ separator (Elkay, UK) before being lyophilized for 48 hours. The resulting collagen sample was weighed, and the percentage of preservation was assessed.

AMS RADIOCARBON DATING

For AMS radiocarbon dating, sample combustion in vacuum-sealed quartz tubes was used to generate CO_2 using CuO and Ag wool at 900°C for over 10 hours. Prior to reduction with hydrogen (H_2) using 2 mg of Fe powder as a catalyst, the resulting CO_2 and water vapor were dried in a vacuum line. The carbon–iron mixture was then pressed into an aluminum holder. ^{14}C background (coal) and Ox-II standards used in the sample run were prepared in the same way (Czernik and Goslar 2001).

AMS ^{14}C measurements were performed at the Adam Mickiewicz University (AMU) in Poznań using a Compact Carbon AMS (National Electrostatics Corporation, USA) to assess ^{14}C content in the analyzed sample (Goslar, Czernik, and Goslar 2004). Measurements were made by comparing the intensities of the ^{14}C, ^{13}C, and ^{12}C ion beams measured for each sample and for standards (i.e. modern standards of oxalic acid II and a ^{14}C-free carbon "background" standard). In each AMS run, 30–33 samples of unknown age were analyzed, alternating with 3–4 modern standard samples and 1–2 background (coal) samples.

Conventional ^{14}C ages were calculated following Stuiver and Polach (1977), using the $^{13}C/^{12}C$ ratio measured by AMS simultaneously with the $^{14}C/^{12}C$ ratio, with correction for isotopic fractionation. The greater of either uncertainty due to counting statistics or the standard deviation of the partial $^{14}C/^{12}C$ results was used to calculate the total uncertainty of

the ^{14}C age. Uncertainties in $^{14}C/^{12}C$ measurements of standard samples were also considered; the 1-σ uncertainty reported for the conventional ^{14}C age represents the best estimate of total measurement uncertainty.

Calibration of the ^{14}C age and plotting were performed using OxCal ver. 4.4.4 (2021) by Bronk Ramsey (2009), referencing the most recent atmospheric calibration curve: IntCal20 (Reimer et al. 2020).

RESULTS

The extracted femoral collagen constituted 11.0% of the dry tissue sample weight. The analyzed bone collagen produced a radiocarbon date of 785±30 BP (Poz-159914). When calibrated, this corresponds to a time period with a 95.4% probability of falling between 1218 and 1280 cal CE [*Fig. 5*].

DISCUSSION

The results of the AMS do not agree with the previously proposed timeframe for the life of the individual believed to be the eponymous Anna. The previously proposed chronology was inferred from the structural development of the sanctuary and from textual and epigraphic evidence. Using the 95.4% AMS radiocarbon date range of 1218–1280 CE and Mahler's (2015) estimate of approximately 50–60 years at death, an approximate birth window of 1158–1230 CE can be deduced for St. Anna. Taking into account bone-collagen turnover —approximately 20 years for the femur (Hedges et al. 2007: 815)— the proposed dating bracket would fall between roughly 1178–1250 CE, implying that the individual was unlikely to have been born before 1178 CE or to have died after 1300 CE.[7] Given the inherent uncertainties in AMS dating, variation in collagen turnover rates (Parfitt 2002; 2004; Hedges et al. 2007; Matsubayashi and Tayasu 2019), and increasingly wide age estimates for indi-

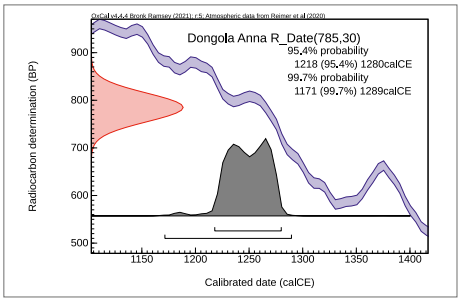

Fig. 5. 14C calibration plot for sample Poz-159914

7 These underlying calculations aim to broaden the bracket to the maximum extent allowed by the data. Taking 50–60 years as the estimated age-at-death, as determined using macroscopic methods, the first calculation of 1158–1230 CE reflects the maximum range provided by 1218–60=1158 CE and 1280–50=1230 CE. Taking a proposed collagen turnover rate of 20 years into account, the window of assessment is conservatively adjusted by 20 years such that the assessment of approximately 1178–1250 CE reflects 1218–(60–20)=1178 CE and 1280–(50–20)=1250 CE. If the numbers used are correct, the individual under study was likely born no earlier than 1178 CE and likely died no later than 1300 CE (i.e., 1280+20=1300 CE).

viduals over 50 (Nikita 2017), this proposed date range remains approximate. Nevertheless, even with these caveats in mind, the radiocarbon date for the individual buried in H.B.2.2 does not align with the epigraphic *terminus ante quem* previously proposed for the sanctuary.

The radiocarbon date also calls into question previous assumptions regarding the veneration of the individual buried in the sanctuary. The derived date of 1075 CE has been used to suggest the 11th century CE as the *terminus ante quem* for the origin of the sanctuary of Anna. Based on this, Godlewski (2014a: 280) proposed that the cult of Anna likely developed during the episcopate of Archbishop Georgios at Dongola (approximately 1063–1113 CE), and may even have been initiated under his influence, although no direct evidence supports this hypothesis. However, the new radiocarbon date challenges this interpretation due to the chronological gap between Georgios's lifetime and that of the individual buried in the sanctuary. If the estimated date of birth for the individual from H.B.2.2 — identified as Anna— is taken as 1178 CE (based on bone collagen turnover), this would place his birth 65 years after Georgios's death in 1113 CE, as recorded on his epitaph. Even if bone collagen turnover is disregarded and a date of birth around 1158 CE is used, this still falls 45 years after Georgios's death. Moreover, when the full 99.7% calibrated confidence interval is considered, the individual's birth would fall somewhere between 1131 and 1259 CE — a date range that remains inconsistent with Georgios's lifetime.

Taken together, these observations render any direct association between the individual identified and Archbishop Georgios untenable in light of the current ^{14}C evidence. However, prosopographic data indicate that the commemorative church remained in use until at least the first half of the 14th century (Łajtar 2017: 94), which is consistent with the timeframe indicated by the radiocarbon results. As such, either the epigraphic evidence suggesting an earlier date for the sanctuary's establishment must be reconsidered, or the individual buried in Room H.B.2.2 is not, in fact, Anna. While there remains a remote possibility that the AMS radiocarbon date is inaccurate, there is no indication in the available analytical evidence of contamination or error in the sample, making this an unlikely explanation.

CONCLUSION

While the life and lived experiences of Anna remain obscure, the floruit of the individual buried beneath the sanctuary floor is now somewhat clearer thanks to the AMS radiocarbon dating of bone collagen. Except in rare instances of direct epigraphic attestation and aDNA confirmation of biological relationships, it is seldom possible to establish the precise, independent identities of individuals recovered from bioarcheological contexts. Accordingly, this was not the aim of the research presented here. As the proposed first Nubian saint known by name, Anna would almost certainly have exerted a significant influence on the religious life of Tungul's inhabitants — likely extending to nearby pilgrim-

age sites such as Banganarti, and perhaps more broadly across Makurian/Nubian society. However, despite the inability to definitively identify the individual buried in the sanctuary, the assumed connection between this person and St. Anna —as well as the presumed contemporaneity of the sanctuary with his life— can now be questioned in light of the new radiocarbon dating results. Such evidence calls for additional radiocarbon dating of Kom H contexts, alongside a re-evaluation and further integration of the existing textual and archaeological data. Such efforts may help situate the new evidence within a broader interpretive framework, including alternative readings of the site that may previously have been overlooked. It is also hoped that future isotopic analyses of diet and mobility will offer further insight into the life of the individual believed to have been St. Anna.

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References

Adams, W.Y. (1998). Towards a comparative study of Christian Nubian burial practices. *Archéologie du Nil Moyen*, 8, 13–41

Bronk Ramsey, C. (2009). Bayesian analysis of radiocarbon dates. *Radiocarbon*, 51(1), 337–360

Buikstra, J.E. and Ubelaker, D.H. (eds). (1994). *Stan dards for data collection from human skeletal remains: Proceedings of a seminar at the Field Museum of Natural History, organized by Jonathan Haas* (=*Arkansas Archeological Survey Research Series* 44). Fayetteville, AR: Arkansas Archeological Survey

Czaja, B. (2018). The "golden textile" from a burial in the Monastery on Kom H in Dongola: Conservation and restoration. In W. Godlewski, D. Dzierzbicka, and A. Łajtar (eds), *Dongola 2015–2016: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 5) (pp. 67–74). Warsaw: University of Warsaw Press

Czernik, J. and Goslar, T. (2001). Preparation of graphite targets in the Gliwice Radiocarbon Laboratory for AMS 14C dating. *Radiocarbon*, 43(2A), 283–291

Dzierzbicka, D. and Danys, K. (2021). Radiocarbon dates from the Monastery on Kom H in Old Dongola (Sudan) and the chronology of medieval Nubian pottery. *Radiocarbon*, 63(2), 439–459

Dzierzbicka, D. and Deptuła, A. (2018). Courtyard A at the Monastery on Kom H in Dongola. Fieldwork in 2014–2016. In W. Godlewski, D. Dzierzbicka, and A. Łajtar (eds), *Dongola 2015–2016: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 5) (pp. 79–100). Warsaw: University of Warsaw Press

Gazda, D. (2008). The Monastery Church on Kom H in Old Dongola after two seasons of excavations in 2006. *Polish Archaeology in the Mediterranean*, 18, 349–360

Godlewski, W. (2013a). Archbishop Georgios of Dongola: Socio-political change in the kingdom of Makuria in the second half of the 11th century. *Polish Archaeology in the Mediterranean*, 22, 663–677

Godlewski, W. (2013b). *Dongola: Ancient Tungul. Archaeological guide* (=*PCMA Archaeological* Guides 1). Warsaw: PCMA UW

Godlewski, W. (2014a). Dongola 2010–2011. *Polish Archaeology in the Mediterranean*, 23/1, 265–284

Godlewski, W. (2014b). The kingdom of Makuria. In J.R. Anderson and D.A. Welsby (eds), *The Fourth Cataract and beyond: Proceedings of the 12th International Conference for Nubian Studies* (=*British Museum Publications on Egypt and Sudan* 1) (pp. 155–169). Leuven: Peeters

Godlewski, W. (2015a). The architecture of the Central Hall. In W. Godlewski and D. Dzierzbicka (eds), *Dongola 2012–2014: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 3) (pp. 15–24). Warsaw: PCMA UW

Godlewski, W. (2015b). Dongola: Seasons in 2012–2013. *Polish Archaeology in the Mediterranean*, 24/1, 325–339

Godlewski, W. (2018). The Monastery Church. In W. Godlewski, D. Dzierzbicka, and A. Łajtar (eds), *Dongola 2015–2016: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 5) (pp. 15–30). Warsaw: University of Warsaw Press

Godlewski, W., Danys, K., and Osypińska, M. (2015). Palatial Building SWN.B.I and earlier relics of Buildings SWN.B.IV and SWN.B.X. In W. Godlewski and D. Dzierzbicka (eds), *Dongola 2012–2014: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 3) (pp. 65–84). Warsaw: PCMA UW

Godlewski, W., Mahler, R., and Czaja-Szewczak, B. (2012). Crypts 1 and 2 in the Northwest Annex of the Monastery on Kom H in Dongola: Report on the exploration in 2009. *Polish Archaeology in the Mediterranean*, 21, 338–360

Godlewski, W. and Medeksza, S. (1987). The so-called Mosque Building in Old Dongola (Sudan): A structural analysis. *Archéologie du Nil Moyen*, 2, 185–205

Goslar, T., Czernik, J., and Goslar, E. (2004). Low-energy 14C AMS in Poznań Radiocarbon Laboratory, Poland. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 223–224, 5–11

Hedges, R.E.M., Clement, J.G., Thomas, C.D.L., and O'Connell, T.C. (2007). Collagen turnover in the adult femoral mid-shaft: Modeled from anthropogenic radiocarbon tracer measurements. *American Journal of Physical Anthropology*, 133(2), 808–816

Innemée, K.C. (1992). *Ecclesiastical dress in the medieval Near East* (=*Studies in Textile and Costume History* 1). Leiden: E.J. Brill

Innemée, K.C. (2016). Monks and bishops in Old Dongola, and what their costumes can tell us. In A. Łajtar, A. Obłuski, and I. Zych (eds), *Aegyptus et Nubia christiana: The Włodzimierz Godlewski jubilee volume on the occasion of his 70th birthday* (pp. 411–434). Warsaw: PCMA UW

Jakobielski, S. (1993). Old Dongola, 1991–1992. *Polish Archaeology in the Mediterranean*, 4, 98–110

Jakobielski, S. (2001). 35 years of Polish excavations at Old Dongola: A fact file. In S. Jakobielski and P.O. Scholz (eds), *Dongola-Studien: 35 Jahre polnischer Forschungen im Zentrum des makuritischen Reiches* (=*Bibliotheca Nubica et Aethiopica* 7) (pp. 1–48). Warsaw: ZAŚ PAN

Jakobielski, S. (2003). Old Dongola: Fieldwork in 2002. *Polish Archaeology in the Mediterranean*, 14, 211–229

Jakobielski, S. (2008). The Holy Trinity Monastery in Old Dongola. In W. Godlewski and A. Łajtar (eds), *Between the Cataracts: Proceedings of the 11th Conference for Nubian studies, Warsaw University, 27 August – 2 September 2006*, I. *Main papers* (=*PAM Supplement Series* 2.1) (pp. 283–302). Warsaw: Warsaw University Press

Jakobielski, S., Pluskota, K., and Żurawski, B. (1993). Polish excavations at Old Dongola, twenty-fifth season 1991/92. *Kush*, 16, 288–333

Jakobielski, S. and Scholz, P.O. (eds). (2001). *Dongola-Studien: 35 Jahre polnischer Forschungen im Zentrum des makuritischen Reiches* (=*Bibliotheca Nubica et Aethiopica* 7). Warsaw: ZAŚ PAN

Łajtar, A. (2013). On the name of the capital of the Nubian kingdom of Makuria. *Przegląd Humanistyczny*, 57(2), 127–134

Łajtar, A. (2014). Dongola 2010: Epigraphic report. *Polish Archaeology in the Mediterranean*, 23/1, 285–295

Łajtar, A. (2017). Anna, the first Nubian saint known to us? *Bulletin de la Société d'archéologie copte*, 56, 91–110

Łajtar, A. (2018). The Constantinopolitan Creed in an inscription from the Monastery Church on Kom H in Dongola. In W. Godlewski, D. Dzierzbicka, and A. Łajtar (eds), *Dongola 2015–2016: Fieldwork, conservation and site management* (=*PCMA Excavation Series* 5) (pp. 37–46). Warsaw: University of Warsaw Press

Łajtar, A. (2020). Literacy in Christian Nubia: Perspectives from the Polish mission in Dongola. *Sudan & Nubia*, 24, 5–23

Łajtar, A. and Pluskota, K. (2001). Inscribed vessels from the Monastery of the Holy Trinity at Old Dongola. In S. Jakobielski and P.O. Scholz (eds), *Dongola-Studien: 35 Jahre polnischer Forschungen im Zentrum des makuritischen Reiches* (=*Bibliotheca Nubica et Aethiopica* 7) (pp. 335–355). Warsaw: ZAŚ PAN

Longin, R. (1971). New method of collagen extraction for radiocarbon dating. *Nature*, 230(5291), 241–242

Lovejoy, C.O., Meindl, R.S., Pryzbeck, T.R., and Mensforth, R.P. (1985). Chronological metamorphosis of the auricular surface of the ilium: A new method for the determination of adult skeletal age at death. *American Journal of Physical Anthropology*, 68(1), 15–28

Mahler, R. (2015). Skeletal remains from the Sanctuary of Anna in the Monastery on Kom H. Appendix to: W. Godlewski, Dongola. Seasons in 2012–2013. *Polish Archaeology in the Mediterranean*, 24/1, 340–343

Martens-Czarnecka, M. (2001). Wall paintings discovered in Old Dongola. In S. Jakobielski and P.O. Scholz (eds), *Dongola-Studien: 35 Jahre polnischer Forschungen im Zentrum des makuritischen Reiches* (=*Bibliotheca Nubica et Aethiopica* 7) (pp. 253–284). Warsaw: ZAŚ PAN

Martens-Czarnecka, M. (2011). *The wall paintings from the Monastery on Kom H in Dongola* (=*Nubia* 3; *Dongola* 3; *PAM Monograph Series* 3). Warsaw: Warsaw University Press

Matsubayashi, J. and Tayasu, I. (2019). Collagen turnover and isotopic records in cortical bone. *Journal of Archaeological Science*, 106, 37–44

Meindl, R.S. and Lovejoy, C.O. (1985). Ectocranial suture closure: A revised method for the determination of skeletal age at death based on the lateral-anterior sutures. *American Journal of Physical Anthropology*, 68(1), 57–66

Meindl, R.S. and Lovejoy, C.O. (1989). Age changes in the pelvis: Implications for paleodemography. In M.Y. Işcan (ed.), *Age markers in the human skeleton* (pp. 137–168). Springfield, IL: C.C. Thomas

Michałowski, K. (1966). Polish excavations at Old Dongola: First season, November–December 1964. *Kush*, 14, 289–299

Nikita, E. (2017). *Osteoarchaeology: A guide to the macroscopic study of human skeletal remains*. Amsterdam: Academic Press

Obłuski, A. (2016). Nobadian and Makurian church architecture: Qasr el-Wizz, a case study. In A. Łajtar, A. Obłuski, and I. Zych (eds), *Aegyptus et Nubia christiana: The Włodzimierz Godlewski jubilee volume on the occasion of his 70th birthday* (pp. 481–512). Warsaw: PCMA UW

Obłuski, A. (2019). *The monasteries and monks of Nubia* (=*Journal of Juristic Papyrology Supplement* 36). Warsaw: Raphael Taubenschlag Foundation

Obłuski, A. (2021). Introduction. In A. Obłuski and D. Dzierzbicka (eds), *Old Dongola: Development, heritage, archaeology. Fieldwork in 2018–2019. Vol. 1. Excavations* (=*Polish Publications in Mediterranean Archaeology* 1) (pp. 1–10). Leuven–Paris–Bristol, CT: Peeters

Obłuski, A. and Dzierzbicka, D. (eds). (2021). *Old Dongola: Development, heritage, archaeology. Fieldwork in 2018–2019. Vol. 1. Excavations* (=*Polish Publications in Mediterranean Archaeology* 1). Leuven–Paris–Bristol, CT: Peeters

Obłuski, A. and Dzierzbicka, D. (eds). (2022). *Old Dongola: Development, heritage, archaeology. Fieldwork in 2018–2019. Vol. 2. Material studies* (=*Polish Publications in Mediterranean Archaeology* 6). Leuven–Paris–Bristol, CT: Peeters

Obłuski, A., Godlewski, W., Kołątaj, W., Medeksza, S., and Calaforra-Rzepka, C. (2013). The Mosque Building in Dongola: Conservation and revitalization project. *Polish Archaeology in the Mediterranean*, 22, 248–272

Parfitt, A.M. (2002). Misconceptions (2): Turnover is always higher in cancellous than in cortical bone. *Bone*, 30(6), 807–809

Parfitt, A.M. (2004). What is the normal rate of bone remodeling? *Bone*, 35(1), 1–3

Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, R., Friedrich, M., Grootes, P., Guilderson, T., Hajdas, I., Heaton, T., Hogg, A., Hughen, K., Kromer, B., Manning, S., Muscheler, R., Palmer, J., Pearson, C., van der Plicht, J., Reimer, R., Richards, D., Scott, E., Southon, J., Turney, C., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A., and Talamo, S. (2020). The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon*, 62(4), 725–757

Stark, R.J. (2021). Archaeological fieldwork in Sector 1. Burial FN362 north of the citadel walls. In A. Obłuski and D. Dzierzbicka (eds), *Old Dongola: Development, heritage, archaeology. Fieldwork in 2018–2019. Vol. 1. Excavations* (=*Polish Publications in Mediterranean Archaeology* 1) (pp. 217–224). Leuven–Paris–Bristol, CT: Peeters

Stark, R.J. (2022). Old Dongola cemetery excavations—winter 2020 field season. *Sudan & Nubia*, 26, 66–81

Stuiver, M. and Polach, H.A. (1977). Discussion: Reporting of ^{14}C data. *Radiocarbon*, 19(3), 355–363

White, T.D. (2000). *Human osteology* (2nd ed.). San Diego, CA: Academic Press

Żurawski, B. (1995). Old Dongola 1984–1993. The Mortuary Complex. A preliminary report. *Études et Travaux*, 17, 327–364

Żurawski, B. (1996). Old Dongola: Cemeteries 1995. *Polish Archaeology in the Mediterranean*, 7, 121–135

Żurawski, B. (1999). The Monastery on Kom H in Old Dongola. The monks' graves. A preliminary report. *Nubica*, 4–5, 201–256

Żurawski, B. (2012). *St. Raphael Church I at Banganarti: Mid-sixth to mid-eleventh century. An introduction to the site and the epoch* (=*GAMAR Monograph Series* 2). Gdańsk: Gdańsk Archaeological Museum and Heritage Protection Fund

Żurawski, B. (2014). *Kings and pilgrims: St. Raphael Church II at Banganarti, mid-eleventh to mid-eighteenth century* (=*Nubia* 5). Warsaw: Neriton; IKŚiO PAN