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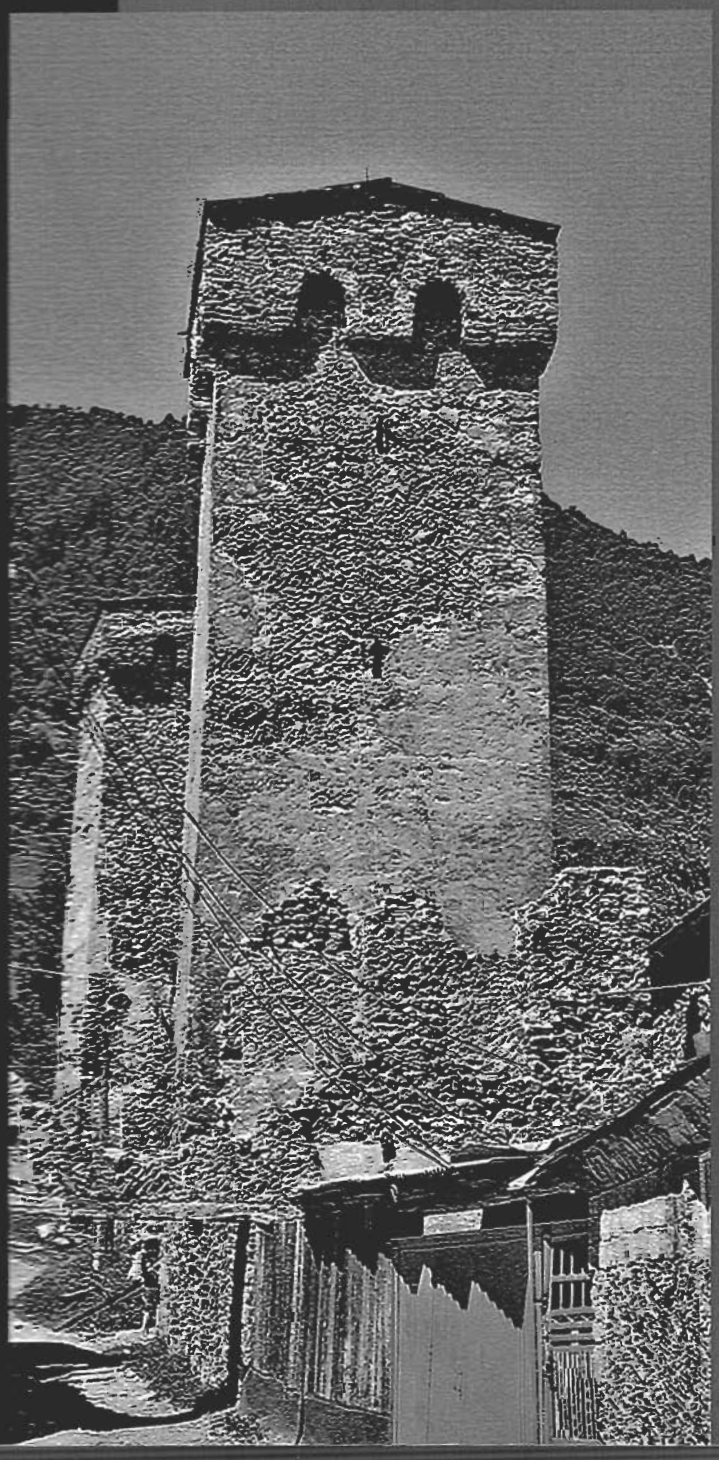

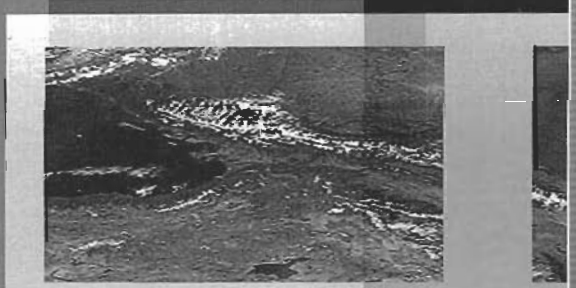

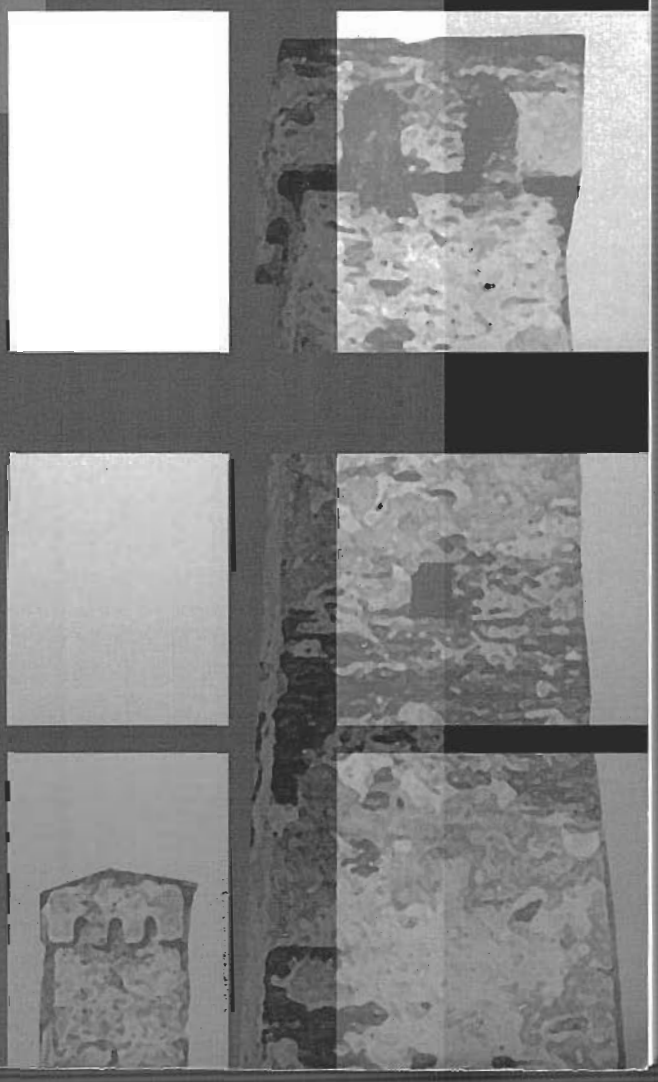

ივანე ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტი

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საქართველოს მეცნიერებათა ეროვნული აკადემია

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THE HUMAN REMAINS FROM DOGHLAURI CEMETERY (FIELD SEASON 2015)

Abstract
We present in this paper the archaeological data and the anthropological analysis of the graves found during the 2015 campaign at the site of Doghlauri-Aradetis Orgora (Georgia). The cemetery gave evidence of both Early and Late Bronze age burials in which the skeletal remains of 12 subjects have been brought to light. For them we diagnosed sex and age at death and we recorded anthropological measurements, indexes and traits of the skeleton together with skeletal and dental pathologies of this human sample.

Introduction

In this contribution we present the results of the analysis of the human skeletal remains recovered during a short salvage excavation carried out in June/July 2015 under the direction of Iulon Gagoshidze at the cemetery of Doghlauri near the site of Aradetis Orgora in the Shida Kartli province[1].

The cemetery

Located in the valley of the River Kura, on the western bank of the Western Prone, near the junction of the latter with the Eastern Prone and the Kura, Aradetis Orgora is one of the most important archeological sites of the Shida Kartli province. The archaeological area covers a surface of 40 ha at the southern edge of the gently sloping Dedoplis Mindori plain (**Fig. 1**). The ancient settlement develops on three different mounds: the Main (Western) Mound, also known as "Dedoplis Gora" ("the queen's hill"), and the Eastern and Northern mounds. It was inhabited from at least the 4th mill. BC to the Early Medieval period, the main occupation phases being the Late Bronze/Early Iron Age (when the settlement extended over all the three mounds), the Kura-Araxes and the Late Hellenistic/Early Roman periods (which are only attested on the Main Mound).[2]
The settlement's burial ground, which is known as "Doghlauri cemetery" from the name of the neighbouring village, was in use during both the Kura-Araxes and the Late Bronze/Early Iron Age, to which the majority of the graves can be attributed. With several hundred burials, it is one of the largest burial grounds in the region. It occupies a flat area on the second terrace of the Kura, at a height of 20 meters above the level of the river, located to the north-west of the settlement, between the Northern Mound and the route of the old Tbilisi-Batumi highway.
Doghlauri cemetery had been investigated, in the past, by different Georgian teams. Between 1979 and 1982, an expedition of the S. Janashia State Museum directed by I. Gagoshidze brought to light 11 EBA (Kura-Araxes), 56 LB/EAI graves and a LBA kurgan[3]. Since 2012, salvage excavations carried out there under the direction of I. Gagoshidze on the occasion of the construction of the Ruisi-Agara section of the new Tbilisi-Batumi Highway, whose route crosses the cemetery and heavily damages it, resulted in the discovery of 415 additional graves[4], which still await publication.
The construction, in spring 2015, of artificial terraces flanking the path of the new highway destroyed a few additional graves, and thus caused the necessity of a new salvage excavation. This was carried out between

[1] Members of the "Georgian-Italian Shida Kartli Archaeological Project" of Ca' Foscari University of Venice in collaboration with the Georgian National Museum, jointly directed by I. Gagoshdze and Elena Rova, took part to the excavation.
[2] For a general description of the site and a summary of the results of the excavation, see FURTWÄNGLER ET AL. 2008; GAGOSHIDZE, ROVA 2016.
[3] FURTWÄNGLER ET AL. 2008: 41. The Kura-Araxes graves are published in JALABADZE ET AL. 2012: 75-82.
[4] 153 graves were excavated in 2012 (see GAGOSHIDZE 2012 for a short preliminary report); for some information on the following seasons and for a preliminary plan of the excavated graves, see GELASHVILI 2014: 210 pl 1.

June 22th and July 13th by a team of the Georgian National Museum headed by I. Gagoshidze with the assistance of members and workmen of the joint "Georgian-Italian Shida Kartli Archeological project".
Work was carried out over an irregular area occupying a maximal total surface of 260 x 20 m. It involved: 1) documentation of what was left of some graves damaged by the construction of the highway terrace, which were still visible on the section of the excavated area and, 2) excavation of all the graves and related features visible in the delimited area after removing of the 30-40 cm thick humus layer. All the graves had been dug into the 1.5 m thick layer of yellowish clay overlying the 3-4 m thick layer of pebbles conglomerate which constitutes the river terrace; as a consequence, their pits were easily distinguishable, on the background of the yellowish clay, as areas filled with dark-coloured soil and stones.
Excavation resulted into the discovery of 33 different graves and related features. These included: three Early Bronze Age (Kura-Araxes) graves (Nos. 2, 3 and 5), 26 Late Bronze Age graves (Nos. 1, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 26, 28, 29, 30, 31, 32, 33), three of which (Nos. 19, 20, and 26) were apparently cenotaphs, and four stone-filled pits, occasionally containing a few pottery sherds (Nos. 22, 24, 25, 27).
Among the Kura-Araxes graves, especially interesting is No. 2, whose burial pit was surrounded by a wall of cobblestones, which contained the remains of three different individuals, one appearing as a primary burial and the scattered remains of at least other two, together with burial goods including two pottery vessels and some metal ornaments (**Fig. 2**). Graves belonging to the Late Bronze Age mostly consisted of individual pit graves covered with a small mound of stones. They were oriented in N-S direction, and the bodies were placed in crouched position on their right or left side, with the head pointing N and upper and lower limbs flexed. The original position of the head could be recorded, from the observation of cervical vertebrae, only for the subject last buried in Grave 2; Grave 12 hosted the remains of a subject buried in prone position and the possible presence of a head-rest in perishable material given the position of the skull and the mandible (**Fig. 3**). Burial goods include pottery vessels, metal weapons and ornaments and, notably, for the first time in Doghlauri cemetery, a diadem (Grave 15), the remains of a threshing board (Grave no. 18), a bronze dagger (Grave 23, adult male) and several bronze ornaments (Grave 33, a subadult subject).

Methodology of anthropological analysis

Sex diagnosis has followed morphological cranial and pelvis features listed by Ferembach et al. (1979) and Acsadi and Nemeskeri indexes (1970). Age determination has been diagnosed through the observation of cranial sutures, (MEINDL and LOVEJOY 1985), pubic symphysis (TODD 1920; BROOKS and SUCHEY 1990; UBELAKER 1978) and dental wear (MOLNAR 1971; BROTHWELL 1981) for adult subjects, epiphyseal union (BROTHWELL 1981; BUIKSTRA and UBELAKER 1994; CAMPILLO and SUBIRÀ 2004) and developmental and stage maturation of each bone (SCHEUER and BLACK 2000) for sub-adult subjects. We focused in closer detail on the observation of the final stages of skeletal maturation, as the complete fusion of acromion, iliac crest and ischium (around 18 years of age), fusion of the sternal end of the clavicle (25-30 years), of the sacral vertebrae and long bones' latest epiphyses (BYERS 2002; COX 2000) and on dental developmental and eruption stages of the third molar tooth (ALQAHTANI et al. 2010). Metrical and morphometrical traits of cranial and postcranial bones have been recorded following Martin–Saller (1956-1959) and classified according to Hug for single cranial measurements (1940). Morphological and discontinuous traits have recorded following several Authors (FINNEGAN and FAUST 1974; BROTHWELL 1981; HAUSER and DE STEFANO 1989; MANN and MURPHY 1990; MARTIN-SALLER 1956-1959; OLIVIER 1960; MALLEGNI 1978). Markers of occupational stress have been analysed and interpreted following MALLEGNI 1978; BROTHWELL 1981; KENNEDY 1989; BORGOGNINI TARLI and PACCIANI 1993; CAPASSO et al. 1999; LORA and BERTOLDI 2009.

Sex and age of the sample

The human osteological remains recovered in 2015 sum up to 12 subjects from 10 different graves and belong to 5 males, 5 females and two sub-adults (14-16 years of age). The general state of preservation of the bones and teeth is not very good, with weathering and root damage to the spongy parts, such epiphyses of long bones and vertebrae and erosion of teeth enamel, that resulted in an under-evaluation

of skeletal stress markers and pathologies such enamel hypoplasia, Schmorl's nodes, periostitis and spondiloarthrosis. Only in one case we could reconstruct the neurocranium of a subject, thus cranial measurements and long bones' measurements for stature estimation in adults and for age estimation in juveniles are missing. Sex determination has been difficult because of the total absence of ischio-pubic areas of the pelvic region and age estimation had to rely in most of cases only on teeth wear analysis.
The composition of the sample is presented in Table 1.

Cranial measurements, indexes and traits
Cranial measurements could be recorded only for the male subject of Grave 12 (MS 1, maximum length: 178 mm-short; MS 8, maximum breadth: 129 mm-very narrow; MS 9, minimum frontal breadth: 90 mm-very narrow). The only cranial index obtained (MS 8/1, horizontal cranial index) for Grave 12 gave a value of dolichocrany. Among discontinuous traits of the skull, sagittal and lambdoid ossicles were recorded in Grave 12 (**Fig. 4**), the presence of metopic suture in Grave 7 and the presence of supra-orbitary foramina in Grave 12 and 17.

Table 1. The human sample from field campaign 2015.

Tomb	Sex	Age
2	F	35-45
2 sp	F	old adult
2 sp	M	young adult
7	F	35-45
10	M	adult
12	M	25-30
13	F?	45+
15	F?	15-16
17	M	35-45
18	F	25-35
23	M	Adult
33	M?	14-15

Post-cranial measurements, indexes and traits:
The values of post-cranial indexes showed rounded-section diaphyses of upper limbs, with a marked prevalence of eurybrachy in the humeri (6 cases, 4 right and 2 left) and only three cases of platybrachy on the right side of three male subjects. Olenic indexes of the ulnae fell in most of the cases into the euroleny class (3 cases) with only one occurrence of platoleny. Lower limbs record weak or absent femoral pilasters (rounded section at mid-diaphysis) in all the cases observed and a marked flattening of the upper third of the femur in antero-posterior sense: all the femurs were platymeric and hyperplatymeric for the meric index; while tibiae were non-flattened at the nutrient foramen (eurycnemy and mesocnemy).
Among the traits and markers of occupational stress we recorded a case of vastus notch of the patella (Grave 17), due to the frequent assumption of a squatted position, and a case of third trocanter of the femur (Grave 23). An heavy engagement of the upper and lower limbs and of the scapular girdle is testified by the muscular insertions of the arm and the forearm, such as pronator and brachialis muscles; particularly evident are those of pectoralis major and deltoid on the clavicles and along the linea aspra and solea on femurs and tibiae.

Dental pathologies
The sample was affected by a number of oral pathologies and a general poor dental health status becoming more evident in older subjects and appearing as:

-caries: Grave 2 (upper left premolar), sparse teeth from Grave 2 (practically almost all molars were affected and one canine), Grave 17 (lower left second molar), Grave 18 (lower right first molar)-**Fig. 5**;
-calculus: Graves 2, 13, 17, 18;
-enamel hypoplasia: Graves 12 and 33;
-ante-mortem loss of teeth: Grave 2 (lower first molars), 17 (lower left third molar), 18 (right lower second molar and second premolar);
-abscesses: Grave 2 (lower left second premolar), 17 (upper right second molar), 18 (lower right first molar);
-heavy degree of anterior wear, that could be connected to extra-alimentary use of teeth in Graves 2 and 17;
-parodontosis: Graves 2 (slight), 13, 17, 18;
-TMJ arthrosis: Graves 13, 17, 18;
Teeth samples were taken in order to perform paleonutritional analyses by stable isotopes and a more accurate assessment of age through the R. Cameriere's radiographic method applied on canines.

Skeletal pathologies
The most common pathologies observed on the sample, despite its high degree of fragmentation and bad preservation status were *cribra orbitalia* on the orbital roof of the frontal bone, recorded in almost all the subjects with this skeletal area still intact. It was most probably due to iron deficiency anaemia and probable heavy parasitic infestation in its most severe appearance, and has been observed in Graves 2, 7, 12, 17, 18-**Fig. 6**. Periostitis of the tibiae was recorded in Graves 2 and 17, osteoartrhosis of the main joints in Graves 2, 7, 17, 18, 23 (degenerative pathologies such as spondiloarthrosis and Schmorl's nodes of the spine could not be properly evaluated, due to the lackness or fragmentation of vertebral surfaces and processes) and ischiatic osteitis (probably due to the habit of sitting and hard and low surfaces) in Graves 10, 12 and 23.
Our taphonomical and anthropological analysis of Doghlauri cemetery allowed us to diagnose age and sex of 12 subjects recovered in 2015 field campaign. Adult and subadult age categories and both sexes are represented in the burial place. The Kura Araxes tomb 2 is the only one that appears to be lined with cobblestones and to have been used as a multiple burial, while the other are pit graves dug in the ground. The individuals were buried crouched on the left or right side with upper and lower limbs flexed. The most common pathologies recorded in the sample are teeth pathologies and *cribra orbitalia*, a heavy muscular engagement of the forearm and lower limbs is testified by the presence of evident muscle insertions, flattening of the lower limbs' diaphyses and markers of occupational stress.
The comparison with the larger human sample recovered from the same cemetery during previous campaigns and from other sites in the vicinity will hopefully shed more light on the lifestyle and health status of Bronze Age populations in this area.

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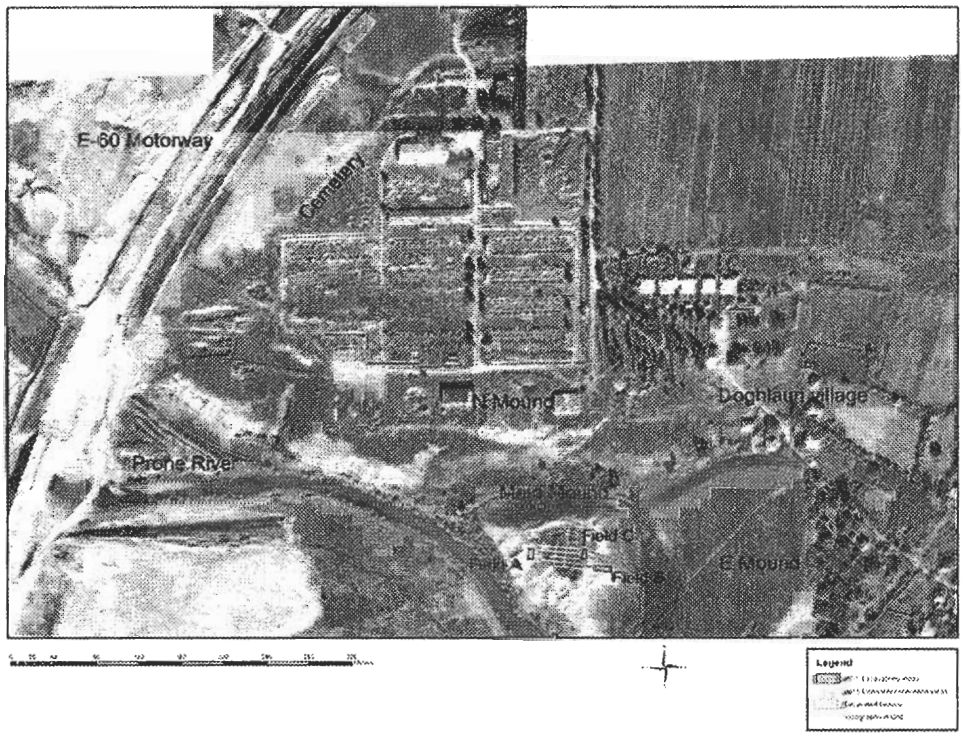
Fig. 1 Satellite view of the Aradetis Orgora archaeological site, with location of the Doghlauri cemetery, androute of the new highway (2015 excavated area marked in red) (modified from Google Earth).



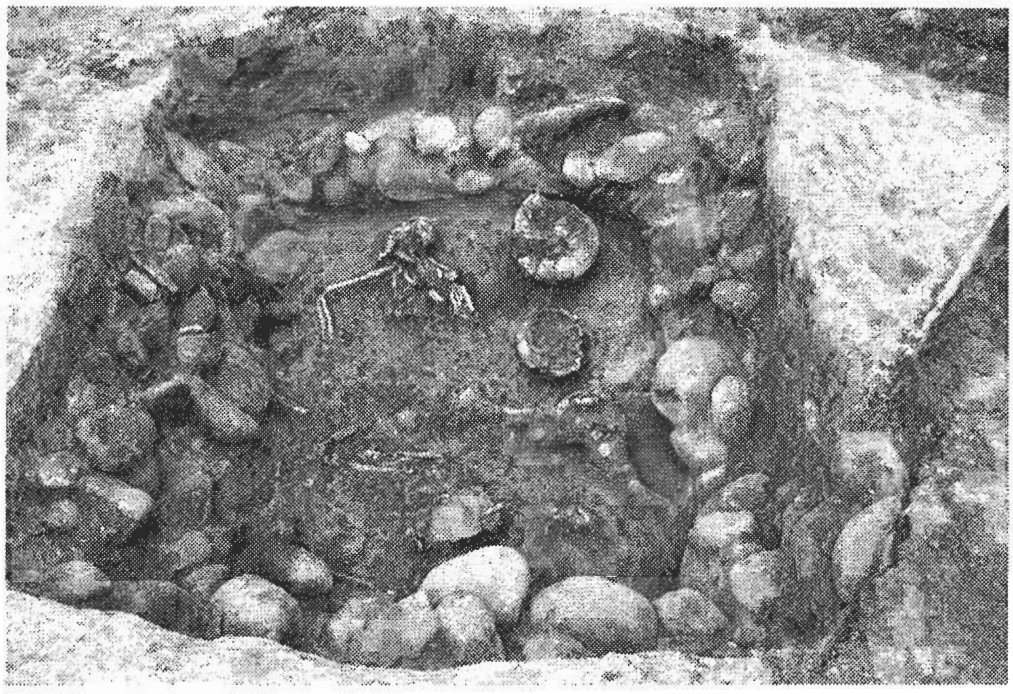


Fig. 2 Grave 2

Fig. 3 Grave 12

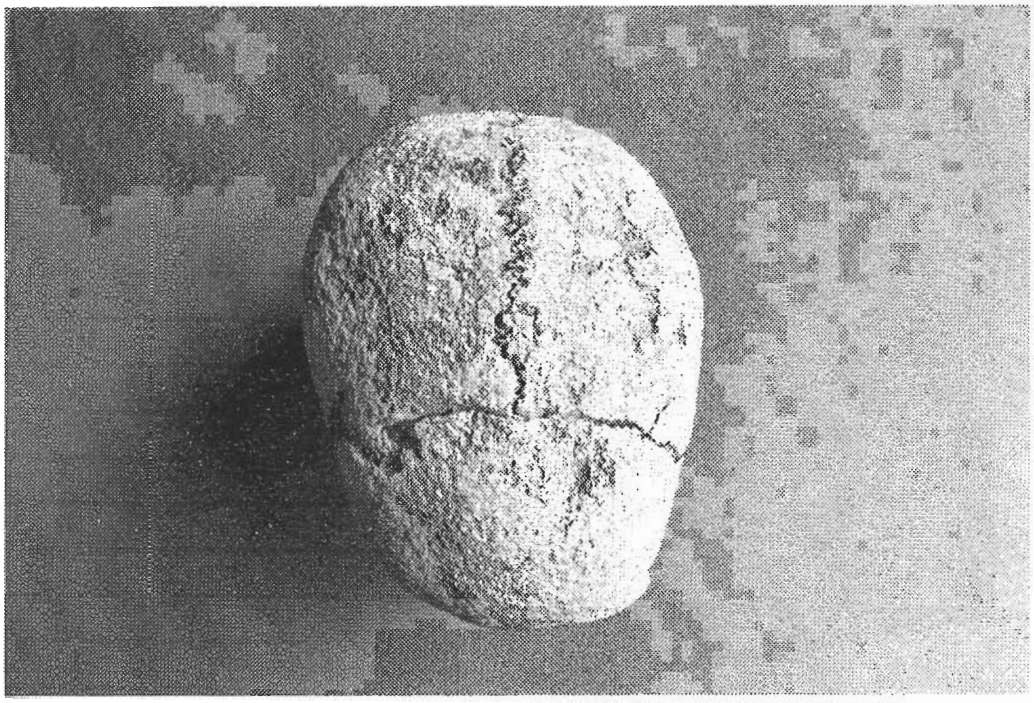


Fig 4 Accessory bones of the skull in Grave 12.

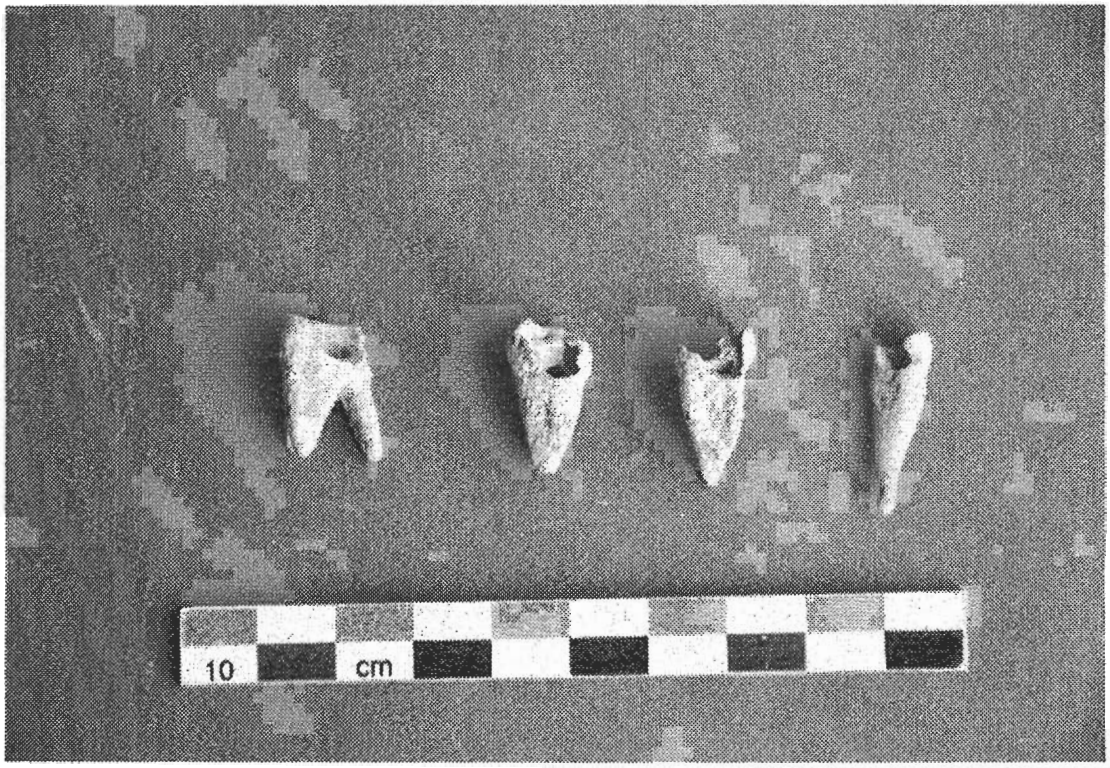


Fig. 5 Caries on teeth recovered

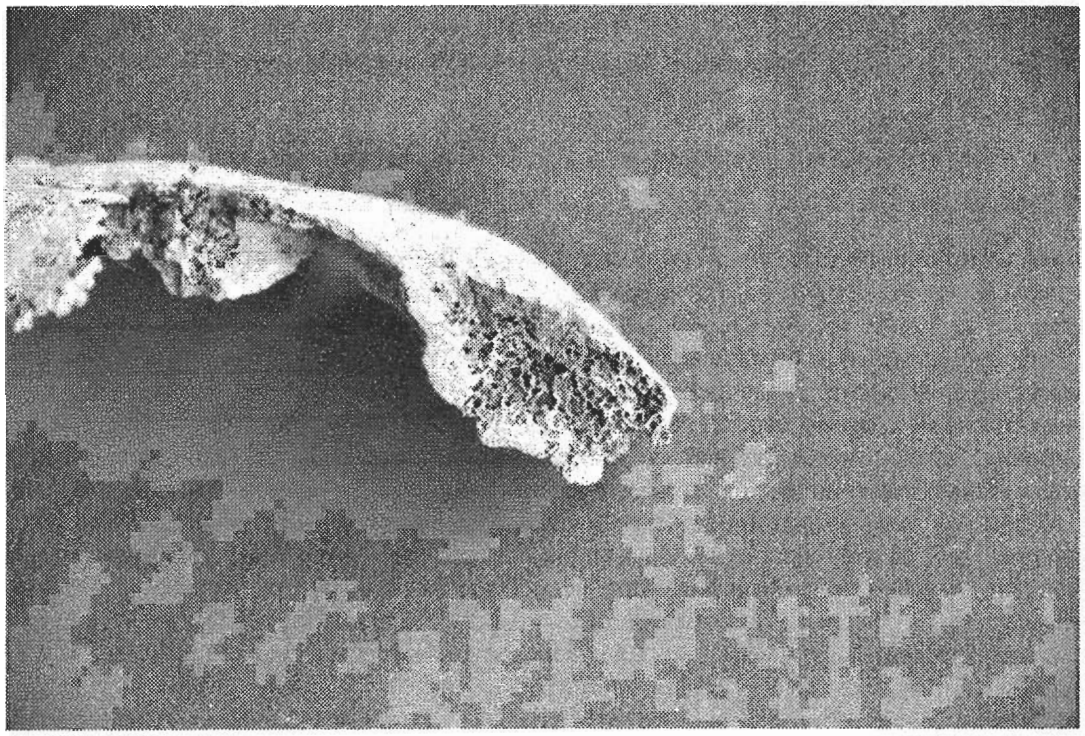


Fig. 6 Severe Cribra orbitalia in Grave 7.

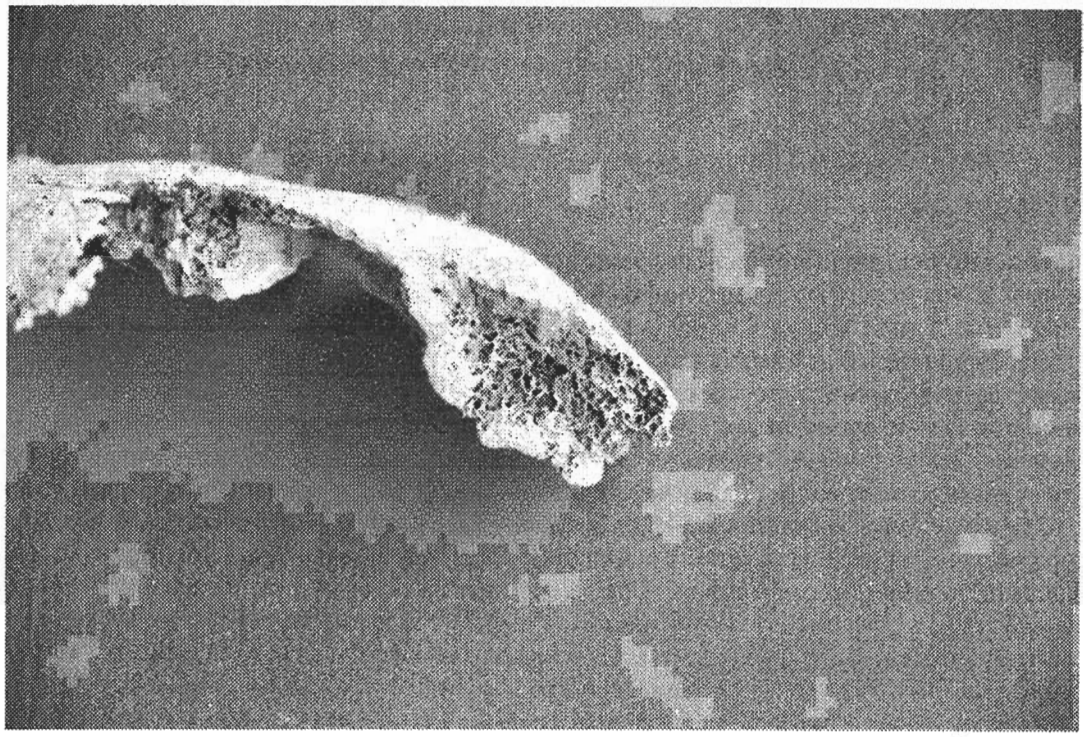


Fig. 6 Severe Cribra orbitalia in Grave 7.