

The Anthropomorphology of Classical Skulls from Malta

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ABSTRACT

A series of human skulls dated by archaeological context to the Classical age are studied anthropomorphologically and compared to previous studies of Maltese skulls from several other historical periods. The cranial indices of the St. Agatha population was shown to have no statistical differences from indices of skulls pertaining to the Early Modern Period, but were significantly different from the Prehistoric skull indices. The Prehistoric skulls were shown to be generally dolichocephalic, while the Classical and post-Classical skulls were mesocephalic. There were however statistically significant differences between the facial indices of the Classical skulls when compared to the Early Modern skulls, with the Classical skulls showing narrow and slightly longer facial structure. Two skulls showing the congenital variation of persistence of the metopic suture are described and discussed.

KEYWORDS

anthropomorphology; skulls; classical period; melitensia

Introduction

The anthropology of cranial remains from Malta dated to the Prehistoric, Medieval and Modern periods has been repeatedly assessed and discussed (Zammit et al. 1912; Bradley 1912; Dudley Buxton 1922; Pace 1972; Pace & Ramaswamy 1990). A series of 23 skulls labelled Romano-Maltese of unknown provenance have been previously studied and measured (Dudley Buxton 1922). This present study deals with the anthropological assessment of a series of skulls dated by archaeological context to the Classical Age. The Classical period in Malta is generally accepted to include the Punic-Byzantine period when the political influence of the Islands fell under the respective dominion of Phoenicia, Carthage, Rome and Byzantium. It lasted from about the ninth century BC until 870 AD when the Islands fell under Arab rule heralding the beginning of the Medieval period.

Material and Methods

The study is based on the series of 23 skulls held in the St. Agatha museum and catacombs (Plate 6). The

skulls were collected from the catacombs and tombs in the vicinity of the St. Agatha Church. These tombs have been dated by their archaeological context to the period encompassing the late Punic to the Early Palaeochristian age (circa 200 BC to 200 AD), thus pertaining to the Classical period. Maltese skull specimens from other sites in Malta, and dated archaeologically to the Classical Age, now kept in Cambridge (Plate 2) and the Gozo Museum (Plates 1&3), were also studied and measured. These former two skulls were obtained from Ghajn Tuffieha [c.1865] (Camb.1) (Plate 2) and Bingemma [1932] (Camb.2). Other Maltese skulls in the Cambridge collection do not have particulars as to provenance and were not considered in this review. The measurements published by L.H. Dudley Buxton pertaining to a series of ancient skulls (Dudley Buxton 1922), most of which were excavated by Sir T. Zammit, and held in 1920 in the Museum of Valletta and the Rabat Roman Villa Museum, have also been reviewed.

Standard cranial measurements were made using a craniometer and tape measure. Skulls showing interesting anatomical features were photographed. Since sexing of skeletal material was considered to be generally based on arbitrary grounds, it was

decided to treat the specimens as a whole, non-sexed population. The data was transcribed onto a specifically drawn Access database, and all calculations and statistical analysis performed using Excel and MedCalc statistical package. Statistical analysis of the cranial indices of these Classical skulls were compared, where possible, with other previously published cranial indices measurements of Prehistoric (Zammit et al. 1912), Early Modern (Dudley Buxton 1922) and Recent (Dudley Buxton 1922) skulls using the student t test.

Results

The mean + sd cranial measurements of the 23 skulls kept at St. Agatha Museum and Catacombs are tabulated in Table 1 together with the measurements of other Classical skulls from alternate archaeological sites. While there appears to be some discrepancy in the mean values of the two major populations studied, these differences were probably not significant, though statistical analysis could not be performed since Dudley Buxton failed to give the standard deviations of his mean values. The mean

Cranial Index in the St. Agatha group was computed as 78.08, while the value reported by Dudley Buxton was 76.33. Both mean measurement place the skulls in the Mesocephalic group.

There appeared to be significant differences between the Cranial Index ($p=0.0008$), the Height/Breadth Index ($p=0.0391$), and the Palatal Index ($p=0.0028$) of the St. Agatha Classical skull collection and the Hypogeum Prehistoric skulls. There were no statistically significant differences when the Height/Length Index ($p=0.1293$), Upper Facial Index ($p=0.3588$), the Nasal Index ($p=0.1214$), the Orbital Index ($p=0.1798$), and the Gnathic Index ($p=0.8889$) were considered (Table 2). There were no significant differences between the Classical skulls and the Early Modern - Recent skull measurements when the Cranial Index ($p=0.228$) and the Nasal Index ($p=0.928$) were considered, but significant differences were noted when the Height/Length Index ($p<0.0001$), and the Upper Facial Index ($p=0.0008$) were considered. The Orbital Index of the Classical skulls showed statistical differences when compared to the Early Modern, but not to

CRANIAL MEASUREMENTS	St.Agatha collection (n = 23) mean + sd	Romano-Maltese after Dudley Buxton (n = 23) mean	Camb 1	Camb 2
glabella-occipital	179.79 + 8.50 (n = 21)	183.74 (n = 22)	187	181
baso-bregmatic	132.87 + 5.72 (n = 15)	134.08 (n = 19)	143	127
auricular length	114.94 + 8.98 (n = 17)	-	123	112
baso-prosthion	96.07 + 4.41 (n = 14)	-	121	92
baso-nasion	101.8 + 5.57 (n = 15)	99.18 (n = 20)	109	104
cranial breadth	140.24 + 8.12 (n = 21)	139.59 (n = 23)	145	135
frontal breadth	118.68 + 6.36 (n = 19)	96.67 (n = 23)	116	110
bizygomatic breadth	124.94 + 9.94 (n = 18)	131.50 (n = 6)	130	128
nasal breadth	23.83 + 2.04 (n = 18)	24.21 (n = 21)	25	24
nasal height	50.94 + 2.44 (n = 18)	50.00 (n = 22)	50	55
orbital breadth	37.83 + 2.56 (n = 18)	39.17 (n = 20)	38	40
orbital height	32.58 + 2.92 (n = 18)	32.97 (n = 19)	32	33
naso-prosthion	68.78 + 3.57 (n = 18)	65.30 (n = 20)	64	-
nasio-gnathion	117.5 + 3.14 (n = 10)	-	120	-
palatal breadth	39.91 + 2.71 (n = 17)	36.42 (n = 19)	-	-
palatal length	49.68 + 2.82 (n = 17)	48.88 (n = 22)	-	-
skull circumference	517.3 + 22.26 (n = 20)	-	540	510
parietal thickness	4.95 + 1.24 (n = 10)	-	4	-
Cephalic Index	78.08 + 4.56 (n = 21)	76.33 (n = 21)	77.54	74.59
Height-Breadth Index	86.66 + 12.64 (n = 15)	~ 96.05	98.62	94.07
Height-Length Index	82.75 + 10.93 (n = 15)	72.25 (n = 16)	76.47	70.17
Total Facial Index	93.77 + 6.31 (n = 10)	-	92.31	-
Upper Facial Index	54.80 + 4.23 (n = 17)	48.44 (n = 9)	49.23	-
Nasal Index	46.85 + 4.10 (n = 18)	48.57 (n = 21)	50	43.64
Orbital Index	86.33 + 7.6 (n = 18)	83.67 (n = 15)	84.21	82.50
Palatal Index	80.64 + 7.73 (n = 17)	~ 74.51	101.67	-
Gnathic Index	94.46 + 4.28 (n = 14)	-	111.0	84.46

Table 1: Measurements of Classical Skulls Collections

Prehistoric or Recent skulls ($p=0.0004$) (Table 2). The Cranial Index of the Classical (CI = 78.08), Early Modern (CI = 77.09) and Recent (CI = 79.1) skulls defined the skull shape as Mesocephalic, while the CI of the Prehistoric (CI = 71.88) skulls defined these as Dolichocephalic.

Two skulls [SA004 and SA008] from the St. Agatha Museum collection merit special mention. These

skulls belong to two adult individuals, probably male and female. The skulls are characterised by the persistence of the metopic suture. The measurement characteristics of these two skulls are given in Table 3. Another skull showed exostosis of the left temporal ridge (SA/J), while two skulls showed a relatively porous medulla (SA/T003; SA/T008).

Other skull fragment remains of note, though not

CRANIAL MEASUREMENTS	Prehistoric	Classical	Medieval	Early Modern	Recent
Cranial Capacity Dudley-Braxton formula	1391.1	1385.4	1238.4	1389.4	1378.1
Cepahlic Index C vs P: $p=0.0008$ sig C vs EM: $p=0.2280$ ns C vs R: $p=0.3444$ ns	71.88 + 3.62 (10)	78.08 + 4.5 (21)	80.42	77.09 + 3.63 (463)	79.1 + 3.67 (41)
Height-Breadth Index C vs P: $p=0.0391$ sig C vs EM: not assessed C vs R: not assessed	103.49 + 1.88 (3)	86.66 + 12.64 (15)	90.04	~97.54	~94.39
Height-Length Index C vs P: $p=0.1293$ ns C vs EM: $p<0.0001$ sig C vs R: $p=0.0001$ sig	72.40 + 1.17 (3)	82.75 + 10.93 (15)	72.40	75.17 + 3.52 (461)	74.55 + 3.36 (40)
Total Facial Index C vs P: not assessed C vs EM: not assessed C vs R: not assessed	92.0 (1)	93.77 + 6.31 (10)	-	-	-
Upper Facial Index C vs P: $p=0.3588$ ns C vs EM: $p=0.0008$ sig C vs R: $p=0.0007$ sig	52.79 + 4.11 (5)	54.8 + 4.23 (17)	56.15	51.83 + 3.45 (247)	50.92 + 3.43 (38)
Nasal Index C vs P: $p=0.1214$ ns C vs EM: $p=0.9280$ ns C vs R: $p=0.2554$ ns	49.95 + 4.02 (6)	46.85 + 4.1 (18)	49.02	46.94 + 4.14 (448)	45.62 + 3.67 (42)
Orbital Index C vs P: $p=0.1798$ ns C vs EM: $p=0.0004$ sig C vs R: $p=0.2713$ ns	81.75 + 8.27 (8)	86.33 + 7.6 (18)	90.26	81.10 + 6.04 (462)	83.89 + 7.52 (31)
Palatal Index C vs P: $p=0.0028$ sig C vs EM: not assessed C vs R: not assessed	69.24 + 8.46 (8)	80.64 + 7.73 (17)	83.52	~ 73.32	~ 73.35 (30)
Gnathic Index C vs P: $p=0.8889$ ns C vs EM: not assessed C vs R: not assessed	94.7 + 4.53 (3)	94.46 + 4.28 (14)	-	-	-

Table 2: Comparative Index Measurements of Maltese Skulls

included in the measurements, are those belonging to an abortus with a frontal breadth approximating 5.3 cm making this equivalent to a 28 week gestation abortus (Plate 4).

CRANIAL MEASUREMENTS	SA004 female	SA008 male
glabella-occipital	169	177
baso-bregmatic	-	122
auricular length	105	113
baso-prostion	-	95
baso-nasion	-	96
cranial breadth	131	158
frontal breadth	117	128
bizygomatic breadth	124	144
nasal breadth	22	24
nasal height	54	50
orbital breadth	35	37
orbital height	31	31
naso-prostion	70	70
nasio-gnathion	-	119
palatal breadth	39	44
palatal length	47	52
skull circumference	500	520
parietal thickness	6	6
Cepahlic Index	77.5	89.3
Height-Breadth Index	-	77.2
Height-Length Index	-	68.9
Total Facial Index	-	82.6
Upper Facial Index	56.5	48.6
Nasal Index	40.7	48
Orbital Index	88.6	83.8
Palatal Index	83	84.6
Gnathic Index	-	99

Table 3: Individual Skull Measurements

Conclusions

The Maltese Islands during their history have seen several waves of recolonisation, sometimes preceded by a nearly total abandonment of the islands. The Classical Maltese inhabitants were probably the descendants of the Bronze Age colonisers who populated the islands after the end of the Temple Period (circa 2500 BC). The archaeological evidence suggests that environmental stresses forced the Temple Period inhabitants to abandon the islands and these were only re-populated after several centuries. The Bronze Age inhabitants continued populating the islands into the Classical Period with cultural and presumably biological influences from the Punic and Roman sphere of dominance. It has been suggested that the Maltese Islands were again practically abandoned during the Early Medieval Period, to be

again recolonised in the Late Medieval Period. These population movements and influxes would be expected to influence the skeletal characteristics of the various Maltese populations throughout the various historical periods.

The skulls from the various historical periods have been here shown to constitute separate morphological populations, though the statistical test results must be tempered by the scarcity of material available. The Classical skulls from St. Agatha's Catacombs have been shown to have important statistically significant differences from the Prehistoric skulls excavated from the Hal Saflieni Hypogeum ossarium in the Cranial, Height-Breadth and Palatal Indices. These indices did not show any statistical significant differences when the Classical skulls were compared to the Early Modern and Recent measurements. These same observations were noted by L.H. Dudley Buxton when comparing his Romano-Maltese skull collection of undefined provenance with the Hal Saflieni, Early Modern, and Recent skull collections (Dudley Buxton 1922). Dudley Buxton remarks that the cranial breadth has remained consistent from the Classical period onwards, while the Hal Saflieni skulls were noted to be extremely narrow. The glabello-occipital length was similar in the post-Classical skulls, but larger in the Hal Saflieni group (Plate 5). The estimated Cranial and Height-Breadth Indices based on these measurements suggest that there has been a gradual rounding of the cranium since the period represented by the Hal Saflieni skulls. The Palatal Index appears to have increased in the post-Classical skulls when compared to the Hal Saflieni skulls as a result of increasing breadth, the length having remained approximately steady. The mean Palatal breadth in the St. Agatha Classical skulls was slightly greater than the value given by Dudley Buxton for the Romano-Maltese skulls (Dudley Buxton 1922). The differences in the Cranial Index and Palatal Index noted in this study and that of Dudley Buxton suggests that the Prehistoric skulls (Plate 5) with their marked dolichocephaly and low palatal index were in fact a completely different population morphologically, while the Classical and post-Classical populations were overall similar in gross cranial morphology.

Significant differences have been noted between the St. Agatha Classical Period skulls and the Early Modern and Recent skulls in regards to indices which reflect cranial height. Another statistically significant difference was noted for the Upper Facial Index and the Cranial Height-Length ratio. Both these indices are significantly greater than the mean values obtained for the Early Modern Skulls, and the

Recent skulls. This observation is in contrast to that of Dudley Buxton who observed the reverse and noted that the Romano-Maltese skulls had a lower Upper Facial Index than skulls from earlier or later periods (Dudley Buxton 1922). The Upper Facial differences between the St. Agatha Classical Skull repertoire and the post-Classical periods skulls were dependent on a narrower bizygomatic breadth measurement in the former, while the naso-prosthion measurement was approximately equal in all the three groups. The Height-Length Index differences noted were dependent on a markedly lower baso-bregmatic height in the presence of relatively equal glabella-occipital length in the Classical skulls when compared to the post-Classical skulls. These differences suggest that the facial structure of the St. Agatha population was overall narrow and longer in contrast to later populations. The narrow facial structure of the St. Agatha population also accounts for the larger Orbital Index noted in this group. No statistical significance was noted between these indices in the St. Agatha skull repertoire and the Hal Saflieni group, even though the mean values were actually different being lower in the Prehistoric group of skulls. The lack of statistical significance can be explained by the fact that the number of observations relating to these indices for the Prehistoric group were below five readings.

The frontal bone is ossified in fibrous tissue from two primary centres which appear in the eight week of intrauterine life. From each of these centres ossification extends upwards to form the corresponding half of the bone. At birth the bone consists of two halves separated by the frontal or metopic suture, but union begins in the second year, and the suture is usually completely obliterated by the eight year. In a percentage of persons which shows some racial variation, the two halves of the frontal bone remain separate, and the metopic suture persists (Warwick & Williams 1973). In view of the relative infrequency of this condition, it is likely that the two individuals from St. Agatha catacombs showing this anatomical variation were related genetically.

The presence of skeletal remains pertaining to a late abortus estimated at 28 weeks of gestation (Plate 4) is not surprising in view of the fact that small loculi graves can be found hewn on the side walls both at St. Agatha's Catacombs and at St. Paul's Catacombs. These graves are horizontal recesses with their long axis in the direction of the catacomb gallery. These were probably made to measure, and cut whilst the prepared body was lying close by. After the corpse was laid in its recess, the front was sealed by a stone slab let in a groove in the rock, and cemented all

round with mortar. A very simple inscription was sometimes cut upon the slab or scratched in the wet mortar. Some of these graves are of very small dimension allowing only the burial of late abortions or stillbirths. Of a total of 409 interments at St. Agatha's Catacombs, no less than 104 (25.4%) belong to infants, a figure reflecting the high infant mortality rate (Camilleri 1984; Savona-Ventura 1997).

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Plate 1: Classical - Skeleton found under Roman amphora in Comino, Gozo Museum (Photo: A. Mifsud)

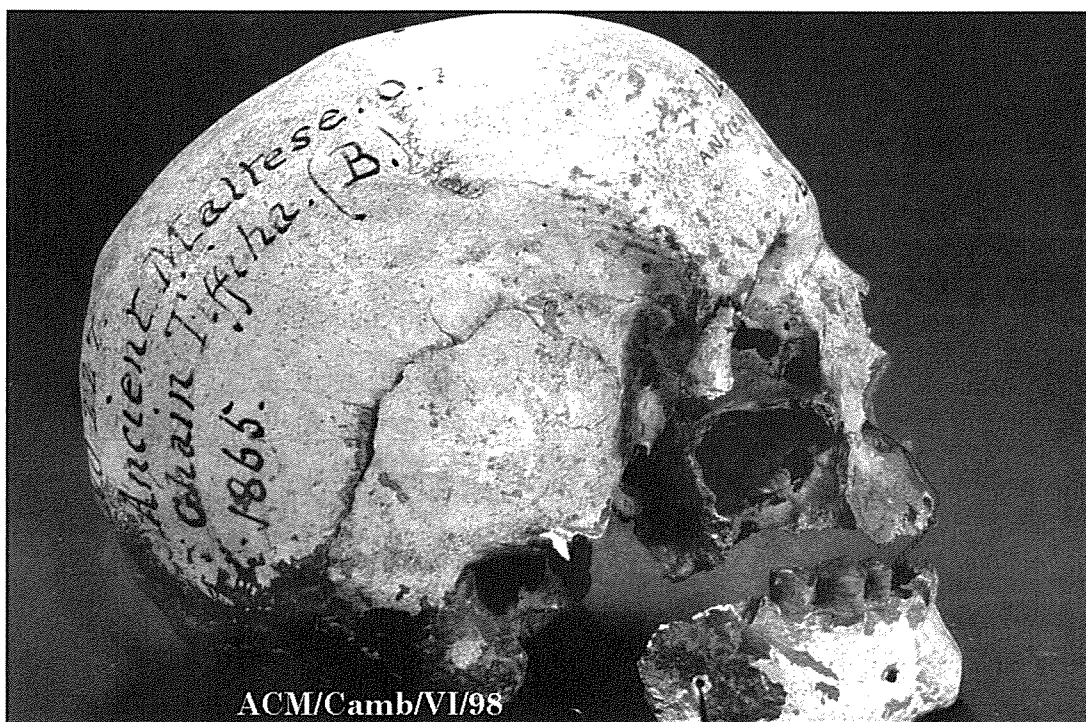


Plate 2: Classical - Skull discovered in a rock tomb at Ghajn Tuffieha in 1865
by Captain Schwann, Cambridge (Photo: A. Mifsud)



Plate 3: Classical - Skulls found in Punic Tomb in Gozo, Gozo Museum (Photo: A. Mifsud)

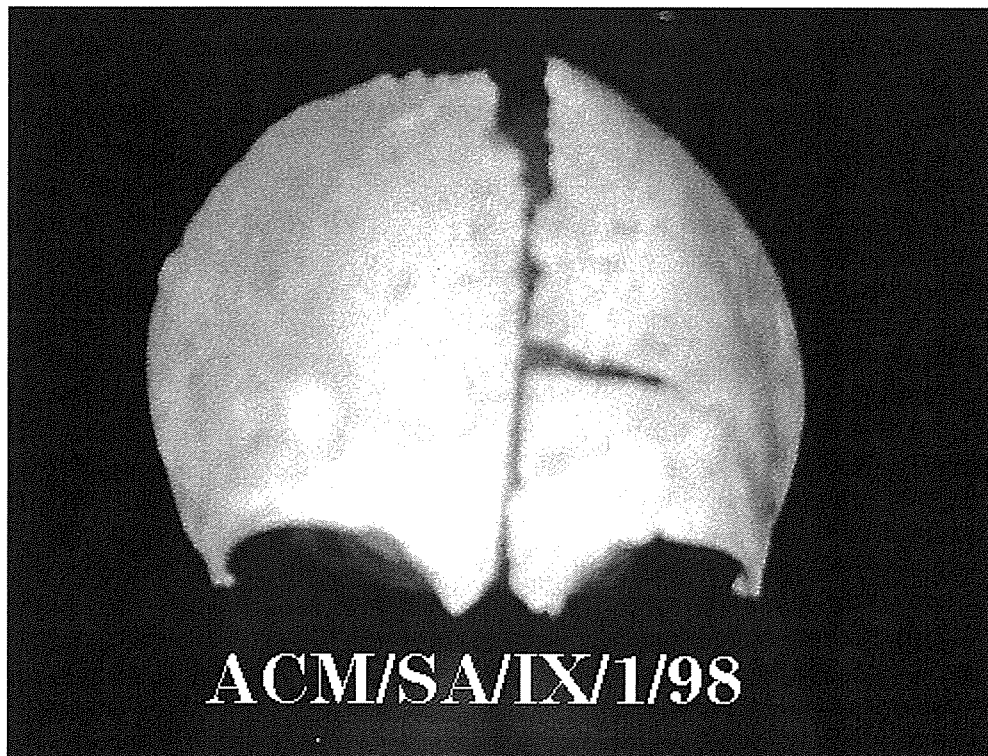


Plate 4: Classical - Skull of Foetus (28 weeks) , St. Agatha Museum (Photo: A. Mifsud)

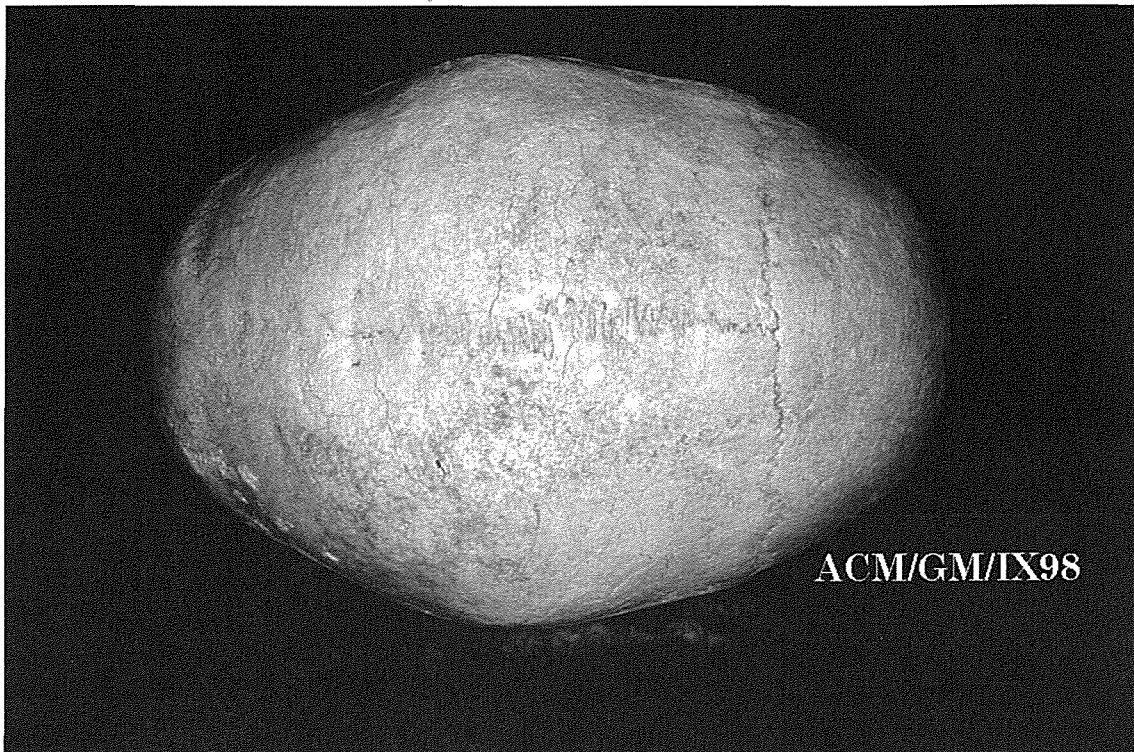


Plate 5: Prehistoric - Dolichocephalic skull, Gozo Museum (Photo: A. Mifsud)

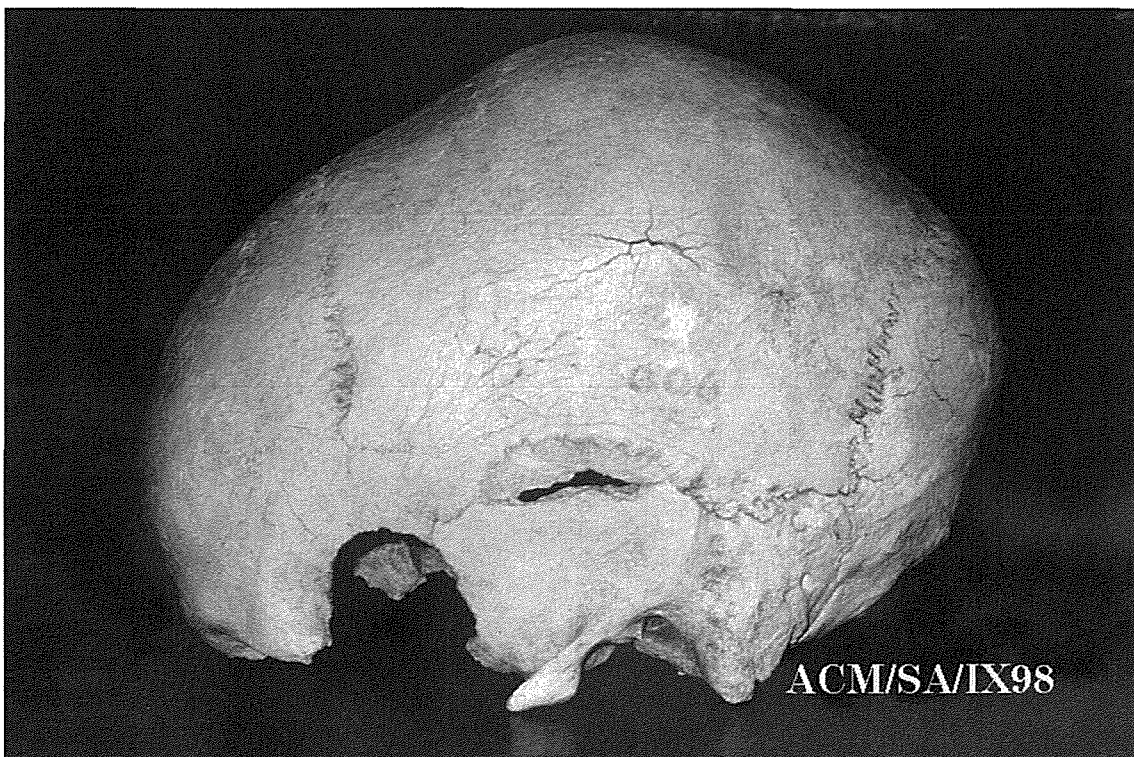


Plate 6: Classical - Early Roman Skull , St. Agatha Museum (Photo: A. Mifsud)