

# ANTHROPOLOGICAL ANALYSIS OF MUMMIFIED BURIALS FROM SAQQARA

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The main aim of the study was to describe the range of biological variation in cranio-facial and dental morphological traits of human skeletal remains from Ptolemaic

mummified burials at Saqqara. The results of the study have provided a valuable source of information on the biological history of Man in Egypt.<sup>1)</sup>

## SUBJECTS AND METHODS OF INVESTIGATION

The object of this study are the mummified burials excavated in 1998 and 1999 on the west side of the pyramid of Netjerykhet at Saqqara. Burials from the 1998 season were studied in storage, those from the 1999 season were investigated in the field. Most of the burials were of a secondary nature, devoid of any inscriptions or offerings. Precise dating was difficult, but the finds were well anchored in the Ptolemaic period. Except for one case (burial no. 67), all the burials were single. A total of 40 burials was investigated anthropologically.

The first step in the process was a general examination of each mummy to ascertain its condition. Considerable differences were noted regarding the state of preservation of bodies and skeletal remains. It has

been suggested that the condition of the mummy is dependent on how well the mummification preparations were carried out and the extent to which the burials have suffered at the hands of tomb robbers. The examination was followed by a general autopsy. The mummies were unwrapped, the manner of wrapping and the use of resin in embalming practices were noted and described. In the final step of the analysis, the bones were examined with the use of updated methodology.<sup>2)</sup>

All the dead were characterized by sex and age at death, lifelike stature and appearance, and health status. Standard methods of descriptive statistics were used, but the size of the sample does not warrant conclusions of a more general nature.

<sup>1)</sup> B. Brier, *Egyptian Mummies. Unraveling Secrets of an Ancient Art* (New York 1994); S. D'Auria, P. Lacovra, C.H. Roehrig, *Mummies and Magic: the Funerary Arts of Ancient Egypt* (Boston 1994); J. Goyon, *Rituels funéraires de l'ancienne Egypte* (Paris 1972); A. Lucas, *Ancient Egyptian Materials and Industries* (London 1972); G. Mokhtar, H. Riad, S. Iskander, *Mummification in Ancient Egypt* (Cairo 1973); A.J. Spencer, *Death in Ancient Egypt* (1982); J.H. Taylor, *Unwrapping a Mummy: the Life, Death and Embalming of Horemekenesi* (1996). Cf. also J.E. Harris, K.R. Weeks, *X-raying Pharaohs* (New York 1973).

<sup>2)</sup> J. E. Buikstra, D.H. Ubelaker, Standards 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* (1994); D. J. Ortner, W. J. Putschar, *Identification of Pathological Conditions in Human Skeletal Remains* (Washington & London 1997).

## METHODS OF MUMMIFICATION

A study of the material revealed two major methods of embalming. One, as seen in burial no. 75, consists of pouring a hot liquid resin liberally over the body in many stages. As a result, most of the wrappings have been converted into a hard, solid mass, which often cannot be removed otherwise than with a hammer. However, it was apparent that the anterior abdominal wall had been cut out and removed. Inside the abdominal and thoracic cavities there were visceral packages dipped in hot resin and wrapped in bandages. The packages contained the liver, lungs and intestines. The resin or bitumen-like substance has tinged the bones black or dark brown and has covered both the packages and the floors of the thorax, abdomen and pelvis. The brain was extracted from the head through the nostrils and the head was filled with resin or a bitumen-like substance.

The second method of mummification, as observed in burial no. 80, consists of dipping bandages in hot resin and using them to wrap the body of the deceased. About 10-12 layers of linen wrappings of varying quality were noted, some second-hand, some completely new. The outer lay-

ers were generally larger sheets or strips of a fine weave. The big bandages (about 10 cm in width) were usually cut into sections, increasing the total length of the bandages. For example, the head was wrapped in a 6-m long linen bandage. The head and neck, as well as arms and legs, and even individual fingers and toes were wrapped separately. It was found that spaces between the neck and head, the arms and legs and the body were filled with linen wads. This enabled the body of the deceased to be shaped appropriately. The viscera were removed, then packed back into the abdomen cavity. The brain was either extracted from the head through the nostrils or left in the skull and turned into powder. Only in some cases the empty skull was filled with resin. The color of the bones has remained light and both the bones and the several linen wrapping layers are easily accessible for analysis.

These two methods of mummification were the most common in our sample, but variations have been noted, making each body an individual case. Especially as the bodies are frequently quite severely damaged as a result of the tomb robbers' activity.

## DEMOGRAPHIC ANALYSIS

There were some problems in reconstructing the age and sex structure in our sample. The sex ratio estimated at 1.6 males to 1 female seems to follow from sample-size bias rather than the actual demographic situation. Individual data on sex and age of

the dead is presented in *Table 1*. Obviously, the representation of children, adult males and females is insufficient for the application of a life table. Indeed, the conclusions are hardly satisfying in view of the small sample size.

## WEST SAQQARA

## EGYPT

Number	Burial number	Sex	Age (in years)
1	34	Male	30-35
2	37	Male	25-30
3	42	Male	35-40
4	44	Male	20-25
5	45	Male	40-45
6	46	Child	2-3
7	47	Female	50-55
8	49	Child	4-6
9	50	Female	20-30
10	51	Male	40-45
11	53	Child	8-9
12	54	Male	30-35
13	55	Male	35-40
14	58	Female	30-35
15	59	Female	40-45
16	61	Male	30-35
17	62	Male	50-55
18	65	Female	20-25
19	66	Child	8
20	67a	Female	30-35
21	67b	Male	45-50
22	70	Female	25-30
23	72	Male	45-50
24	73	Child	5-6
25	75	Male	25-30
26	76	Male	35-40
27	77	Child	7
28	79	Female	Adult
29	80	Female	45-50
30	82	Male	35-40
31	83	Female	45-50
32	84	Male	17-23
33	85	Child	7-8
34	86	Male	45-50
35	87	Male?	20-25
36	88	Female	20-25
37	89	Male	30-35
38	90	Female	40-45
39	94	Unknown	Adult
40	95	Female	20-25

*Table 1. Distribution of the dead  
according to sex and age at death*

## MORPHOLOGY OF THE BONES

Descriptive statistics of the main cranial measurements are presented in *Table 2*. The dead may be described generally as individuals with medium-sized heads, rather nar-

row faces for the males and medium-sized for the females. Males were 172 cm tall on average, whereas the average stature of females was calculated at 162 cm.

Trait	Males				Females			
	N	X	Min	Max	N	X	Min	Max
Maximum Cranial Length g-op	15	184.2	176	199	8	177.7	173	185
Maximum Cranial Width eu-eu	15	140.8	135	146	8	136.7	131	143
Minimum Frontal Width ft-ft	15	96.0	84	104	8	94.0	89	98
Bizugomatic Width zy-zy	11	126.7	123	133	6	121.0	116	124
Bigonial Width go-go	8	94.1	81	103	6	87.3	84	93
Morphological Face Height n-gn	9	116.5	103	122	6	103.8	93	110
Upper Face Height n-pr	10	70.7	64	74	6	62.3	58	70
Eye Socket Height	9	35.0	32	42	5	33.0	31	35
Eye Socket Width	9	39.2	34	44	5	38.2	37	41

*Table 2. Arithmetic means and range of values of cranial measurements*

## PATHOLOGY OF THE BONES

It was possible to identify macroscopically some bone pathologies.<sup>3)</sup> In some cases of males and females aged over 40, there was evidence of degenerative arthritis of the lumbar vertebrae. This pathology of the spine was quite common in our sample as compared to other known pathological changes. In one case (skull no. 79) an interesting example of craniostenosis was noted.

In the majority of cases all the teeth were present in the dental arch. The pre-mortem loss of teeth was seldom observed. The greatest single problem in the dentition was attrition. A coarse diet led to wearing down of the teeth over a lifetime. The enamel and dentine were eroded away until the pulp was exposed. The living tissue inside the tooth died, and the empty root canals became a source of chronic infection and abscesses.

The second problem observed in our sample was periodontitis. This disease results in the loss of the bony support of the teeth and is often associated with plaque forming calculus or tartar deposits on the teeth. The ultimate result of periodontitis is extensive periodontal disease that results in tooth loss. Dental caries or cavities were far less frequent. If decay were present, it was most often of the pit and was of the fissure variety (top of the tooth) rather than interproximal (decay between the teeth).

There are two major environmental causes that may have resulted in the lack of extensive dental decay: The absence from the diet of refined carbohydrates, such as sugar, and the extreme attrition, which provides a more difficult environment for decay to begin.

## DISCUSSION

The variety of mummification methods observed in our sample is nothing unusual, as it is commonly known that the dead used to be treated individually. The treatment and the choice of wrapping methods depended on the social status of the deceased. The sample is hardly representative because of its limited size precluding any reconstruction of the social structure and reasonable conclusions.

The biological history of Man in Egypt indicates a remarkable stability as to cranial

morphology.<sup>4)</sup> According to results obtained in other studies,<sup>5)</sup> all Egyptian predynastic samples were attributed to the Nubian type. A major population change was admitted at the beginning of the Old Kingdom period. With the onset of the Dynastic period, the two regions, Nubia and Egypt, were separated and the population exchange was reduced. Consequently, morphological variability declined as well. Our data, although hardly sufficient in terms of numbers, seems to corroborate this statement.

<sup>3)</sup> After Ortner and Putschar, op.cit. Cf. A. Cockburn, E. Cockburn, Th.A. Reyman, *Mummies, Disease and Ancient Cultures* (Cambridge 1998).

<sup>4)</sup> C. Simon, R. Menk, Diachronic study of the internal structure of the population of the Nile Valley by means of multivariate analysis of morphometrical data, *Antropologia Contemporanea* 8,2 (1985), 95-104.

<sup>5)</sup> A.M. Batrawi, "The racial history of Egypt and Nubia", I & II, *JRAI*, 75 (1945-1946), 81-102, 76, 131-156; E. Strouhal, "Evidence of the early penetration of Negroes into prehistoric Egypt," *Journal of African History* 12,1 (1971), 1-9.

## FINAL REMARKS

A detailed analysis of the skeletal remains has provided the ground for a description of the average lifelike appearance of the dead as an individual with medium-sized head and fairly narrow face, degenerative

arthritis of the lumbar vertebrae, severely worn teeth and periodontitis of the dental alveoli. The stature of a male was approximated on average as 172 cm, that of a female as 162 cm.

