ON THE HOMOGENEITY OF THE PYRAMID BUILDERS AS EVIDENCE OF THEIR ENDOGENOUS ORIGIN

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INTRODUCTION

The material which is the subject of this work entertains a special importance as there are disputes about the origin of the people of the Old Kindom and the development of their civilization. Elliot Smith and Douglas Derry emphasized in different occasions that the Dynastic period arose by immigation and population replacement. They also stated that « there was certainly a racial mixture in Lower Egypt at the time of the Pyramid Buiders (Smith and Jones, 1910; Smith and Derry, 1910; Smith, 1911 and Derry 1956). Smith and Derry were not the only workers who considered a homeland for the Ancient Egyptians and their civilization in every corner of the world except Egypt (Batrawi, 1946).

However there are neither anthropometric (Berry *et al*, 1967) nor good archeologic evidence to support an invasion of foreign peoples (Arkell and Ucko, 1965). Furthermore, the study of non-metric variation in Egyptian skulls showed that stability and homogeneity persisted from the Predynastic period right through the Old and Middle Kingdom (Berry and Berry, 1972).

MATERIAL AND METHODS

This series of skulls belongs to the region of Giza and to the period of the Old Kingdom IV-VI Dynasty (2686-2181 B-C.). It is a part of the material excavated between 1902 and 1946, by the Hearst Egyptian Expeditions in charge of Dr. Reisner. The examination took place in Reisner's storeroom at Giza where the human remains recovered by the Hearst Expeditions were stored. Selection of the skulls and ascertainment of their origin to be included in this study was achieved by crossmatching of the written code on the skulls with the original packing list*. Furthermore, the examined skulls were those which had no/or minimal soft tissue and were not affected by con-

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siderable deformation. Ffity - sex skulls were found to be either in a good condition or feasible for mending, that no or little damage affects the craniometric points needed in the examination.

Age estimation and sex determination, which were performed by anatomical appreciation, were carried out according to the criteria given by Martin and Saller (1957); Montagu, (1960); Olivier ((1960) and Brothwell (1963). All were adult skulls of which 27 were males and 29 females.

The principal system of measurement has been done in accordance with the Biometric Laboratory of London (Brothwell, 1963). All the measurements were taken to the nearest millimeter. Ten indices had been derived from the measurements.

RESULTS

Table (1) shows the means, the standard deviations of males and females and the results of testing the significance of the differences between the means of the two sexes by the t-test. It is evident that the males have consistently greater measurements (size character) than that of the females except the nasal breadth which is greater in the females, but the difference is insignificant. Regarding the indices, the only significant difference is that of the nasal index.

The significance of sex differences in the absolute and relative variations were tested by the F-test and the critical ratio (C.R.) (Mukherjee et al., 1955) respectively. The results are given in table (2), which shows that there is no significant difference between the two sexes neither in the absolute, nor in the relative variations i.e. the cranial characters of the males and females have the same variability.

Testing the homogeneity of the present sample was also carried out by comparing its absolute and relative variations with the corresponding variations of the long Egyptian E-series (Pearson and Davin, 1925). The results of the F-test and critical ratio are given in table (3), The table reveals that the absolute variations of the male skulls of the present series are significantly less than those of the E-series in two measurements but are more variable in five measurements and one index. The absolute variation of the female skulls of the present series are significantly more in four measurements and four indices. Regarding the relative variation, the comparison between the males of the two series reveals that the males of the present sample are significantly less variable than those of the E-series in two measurements, while the corresponding comparison between the females shows that, the females of the present sample are signifivantly more

in one measurement and one index.

DISCUSSION

Smith and Derry attributed the great development of the Egyptian civilization in the Old Kingdom, to an alien element. Their comments were the impetus for a thorough study of the available sample of crania from the Old Kingdom.

The present sample is not that large to allow the authors to draw general conclusions. Elliot Smith who worked in conjunction with the Hearst expedition in one excavation season in Giza had the opportunity to examine at first hand a series of skulls from the Old Kingdom which was adequate both in bulk and condition (Smith and Jones, 1910 and Smith and Derry, 1910). The comparison between Smith's figures and the corresponding figures of the present sample showed no significant difference (Shaaban, 1978). This indicates that they belong to one and the same population a finding which validates the description of the present sample as a representative of the whole Giza series from the Old Kingdom and accordingly this allows discussion of Smith and Derry's comments regarding the origin of the Pyramid builders.

The statistical treatment of the present sample showed that the absolute measurements were consistently greater in males than in females, and that sex differences were of the order which a homogeneous population exhibits (Stefenson, 1955). The standard deviation of the maximum cranial length and maximum cranial breadth are 4.80 and 3.35 respectively. The magnitude of these deviations indicates homogeneity of a single race (Pearson, 1903). Also the males and females exhibited the same order of variability; a result which is usually obtained when the two sexes in a population are of the same descent.

The E-series is a famous Egyptian series. It is a long homogeneous series of crania with low variability and it used as a reference material for any cranial series of Homo Sapiens (Pearson and Davin, 1925) The comparison between the absolute variability of the present series and that of the E-series revealed few differences. However, the comparison of their relative variation which has a more direct meaning than the absolute one (Heath *et al.* 1969) does not reveal any outstanding peculiarities which indicates that this sample represents a stable homogenous population.

With the above evidence of homogeneity of the IV-VI Dynasty series, the claim of racial mixture is refuted.

It is believed that the assumptions of the foreign origin of the Dynastic race, were not scientifically based. Smith (1910) stated in one occasion that «unfortunately nothing is known by direct observation of the

physical characters of the people of Lower Egypt before the time of the Pyramid Builders ». In addition Derry (1956) wrote «It is also very suggestive of the presence of a dominant race, perhaps relatively few in numbers but greatly exceeding the original inhabitants in intelligence; a race which brought into Egypt the knowledge of building in stone, of sculpture, painting, reliefs and above all writting; hence the enormous jump from the primitive Predynastic Egyptian to the advanced civilization of the Old Empire».

In fact there was no jump in the Egyptian civilization. Metals were discovered and used by the beginning of the Predynastic period which extended from 5000 to 3100 B.C.

Furthermore, the Egyptians used the Hieroglyphic and Hieratic scripts since the First Dynasty. These evidences show that there was a steady scientific and technical progress during these periods through a continuous evolution.

SUMMARY

Some foreign authors considered a homeland for the Dynastic Egyptians and their civilization in every corner of the world except Egypt. Others found that neither the anthropometric nor the archeologic evidence support invasion of foreign people. Still others showed the persistance of stability and homogeneity of the Egyptian population from the Predynastic period right through the Old and Middle Kingdom.

The present authors examined 56 crania from the region of Giza and from the period of the Old Kingdom (IV-VI Dynasty). These crania were excavated by the Hearst Expedition between 1902 1946.

The craniometric characters studied were fifteen measurements and ten derived indices. The results of the statistical treatment of the parameters showed the homogeneity of the population. The claim of racial mixture as the origin of the great development of the civilization of the Pyramid builders is refuted.

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Explanation of the abbreviations used in the tables.

L	Maxim. cranial length
B	Maxim. Cranial breadth
B'	Maxim. frontal breadth
H'	Basi-bregmatic height
LB	Basi-nasal length
G1	Basi-alveolar length
G'H	Upper facial height
GB	Bimaxillary breadth
J	Bizygomatic breadth
NH'	Nasal height
NB	Nasal breadth
$0'_1$	Orbital breadth
0_2	Orbital height
G'	Palatal length
G_2	Palatal breadth
100 B/L	Cranial index
100 H'/L	Height-length index
100 H'B	Height-breadth index
100 H'/(L.B)	Mean Height index
100 B'/B	Frontal index
100 G'H/J	Upper facial index
100 O_2/O'_1	Orbital index
100 NB/NH'	Nasal index
100 GL/LB	Prognathic index
100 G_2/G'_1	Palatine index

Table 1 : Male and Female means and standard deviations and the results of the t-test between the means.

Characters	MALES n	MALES M ± S	FEMALES n	FEMALES M ± S	t-test
L	27	184.96 ± 4.80	29	176.72 ± 5.20	S.
B	26	139.79 3.35	28	125.68 4.54	S.
B'	27	92.37 5.22	29	89.59 4.21	N.S.
H'	26	137.15 4.63	26	132.62 4.51	S.
LB	26	102.33 4.04	26	97.80 2.95	S.
GL	20	93.14 4.82	19.	92.08 5.10	N.S.
G'H	20	72.19 2.96	20	66.52 3.41	S.
GB	20	93,67 4.91	19	90.91 3.62	N.S.
J	20	127.98 3.63	19	120.28 4.28	S.
NH'	20	52.70 2.52	20	48.35 3.64	S.
NB	19	24.88 2.30	20	25.31 2.23	N.S.
$0'_1$	20	39.93 2.29	19	37.91 1.90	N.S.
$0'_2$	20	34.73 2.49	19	33.50 2.77	N.S.
G'_1	19	45.14 3.22	18	44.02 3.21	N.S.
G_2	19	37.55 3.41	19	36.31 3.75	N.S.
100 B/L	26	75.55 2.30	28	76.88 3.19	N.S.
100 H'/L	26	73.67 2.89	26	75.15 3.00	N.S.
100 H'/B	25	98.28 3.57	26	97.51 4.73	N.S.
100 H'/(L.B)	25	85.10 2.99	26	85.67 3.39	N.S.
100 B'/B	26	66.00 3.38	28	65.86 2.73	N.S.
100 G'H/J	20	57.32 2.18	19	55.03 3.10	N.S.
100 $0_2/0'_1$	20	87.02 5.00	19	88.38 5.88	N.S.
100 NB/NH'	19	47.31 5.20	20	52.63 6.66	S.
100 G_2/G'_1	18	83.25 8.29	17	82.14 7.10	N.S.
100 GL/LB	20	91.54 4.38	19	93.64 4.45	N.S.

N.S. = Non-Significant by t-test S. = Significant by t-test

Table 2 : The significance of the differences between male and female variabilities tested by the F-test and the critical ratio (C. R.)

Characters	F-test	C.R.
L	1.13 (N.S.)	0.44 (N.S.)
B	1.84 (N.S.)	1.70 (N.S.)
B'	1.54 (N.S.)	0.96 (N.S.)
H'	1.05 (N.S.)	0.03 (N.S.)
LB	1.88 (N.S.)	1.35 (N.S.)
GL	1.12 (N.S.)	0.30 (N.S.)
G'H	1.33 (N.S.)	0.99 (N.S.)
GB	1.84 (N.S.)	1.20 (N.S.)
J	1.39 (N.S.)	0.92 (N.S.)
NH'	2.09 (N.S.)	1.95 (N.S.)
NB	1.06 (N.S.)	0.21 (N.S.)
$0'_1$	1.45 (N.S.)	0.60 (N.S.)
$0'_2$	1.24 (N.S.)	0.65 (N.S.)
G'_1	1.01 (N.S.)	0.10 (N.S.)
G_2	1.22 (N.S.)	0.56 (N.S.)
100 B/L	1.92 (N.S.)	1.60 (N.S.)
100 H'/L	1.08 (N.S.)	0.09 (N.S.)
100 H'/B	1.76 (N.S.)	1.50 (N.S.)
100 H'/(L.B)	1.29 (N.S.)	0.61 (N.S.)
100 B'/B	1.53 (N.S.)	1.35 (N.S.)
100 G'H/J	2.02 (N.S.)	1.68 (N.S.)
100 $0_2/0'_1$	1.38 (N.S.)	0.64 (N.S.)
100 NB/NH'	1.64 (N.S.)	0.58 (N.S.)
100 G_2/G'_1	1.36 (N.S.)	0.59 (N.S.)
100 GL/LB	1.03 (N.S.)	0.03 (N.S.)

N.S. = Non-significant.

Table 3 : The significance of the differences between the E-series and the present sample variabilities tested by the F - test and C.R.

Characters	F-TEST		C.R.	
	Males	Females	Males	Females
L	1.37	1.26	1.40	0.72
B	1.94*	1.05	3.12**	0.02
B'	1.73*	1.28	1.78	0.94
H'	1.13	1.11	0.79	0.02
LB	1.08	1.37	0.09	1.47
GL	1.05	1.56	0.10	1.17
G'H	1.86*	1.16	2.73*	0.62
GB	1.16	1.37	0.41	1.17
J	1.51	1.01	1.46	0.10
NH'	1.27	2.08*	0.74	1.87
NB	1.69*	1.96*	1.31	1.31
$0'_1$	2.03*	1.46	1.85	1.28
0_2	1.76*	2.15*	1.42	1.98
G'_1	1.08	1.41	0.38	1.00
G_2	1.68*	2.20*	1.56	2.05*
100 B/L	0.77	1.55*	1.26	1.47
100 H'/L	1.01	1.15	0.26	0.16
100 H'/B	1.26	1.64*	1.00	1.45
100 $0_2/0'_1$	1.02	1.58*	0.23	1.09
100 NB/NH'	1.97*	3.12*	1.62	2.11*

* indicates that the difference is significant

** indicates that the difference is highly significant.