APPENDIX

ANTHROPOLOGICAL RESEARCH IN THE FOURTH CATARACT REGION, 2006

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The program of the PCMA Fourth Cataract expedition, directed by Marek Chłodnicki (Archaeological Museum in Poznań) and Bogdan T. Żurawski (Research Center for Mediterranean Archaeology PAS) in January-March 2006 included examination of human skeletal remains excavated in the course of the season. The material originated from Post-Meroitic tumuli fields in the area of Es-Sadda, Hagar el-Beida and Shemkhiya, and a Christian burial ground near Shemkhiya [*Fig. 1*]. Altogether, 65 individuals were examined (23 skeletons from Es-Sadda, 36 from Hagar el-Beida and six from Shemkhiya). With the exception of two skeletons from the Christian cemetery (SH9), all of the remains came from tumulus burials.

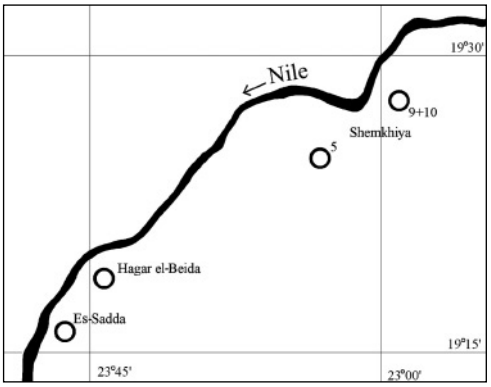

Fig. 1. Schematic localization of sites under exploration in 2006

The condition of most of the skeletons was good or very good. Some material, especially the postcranial one, had either been crushed by the weight of overlying fill or had suffered from partial biochemical destruction. The bones were subjected to morphological examination and measurements, especially craniological (craniometry and cranioscopy) [*Tables 1-6*]. Beside a case of double trepanation of the skull [*Fig. 2*], evidence of trauma or pathology has been observed, particularly of the mastication organs, and will be the object of a separate study. The state of the dentition overall can be evaluated as average, although variable by individual; cases of enamel hypoplasia and caries were rare. Cribria orbitalis were also seldom seen. Frequent alveolar abscesses, occasionally extensive, and changes due to periodontitis, as well as cases of mandibular head hypoplasia [*Fig. 3*], are an indication of numerous pathologies of the dental apparatus.

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Table 1. Es-Sadda – craniometry

No.	sex	Measurement values														
		g-op	eu-eu	b-ba	au-au	ft-ft	zy-zy	zm-zm	n-ns	n-pr	n-gn	mf-ek	h. orbit.	apt-apt	go-go	kdl-kdl
T1	f	184	128	127	112	93	125*	96	42	68	111	39	32.5	28.5	84	112
T2	m	185	136	126	123	131	99	99	51	70	115	36	29	28	91	120
T3	f	180	138	123	120	91	129	97	49	63	116	40	33	27	93	116
T4	m	185	135	136	124	97	140	102	49	69	115	42	32.5	29(32)	98	126
T5	m	189	140	136	113	91	130	93	49	69	116	38	36	26	90	117
T6	m	197	127	134	124	97	136	100	50	74	117*	40	32	26.5	-	117
T11	m?	194	136	143	119	95	134	94	49	70	116	39	33	25.5	96	117
T13	f	184	128	135	107	93	114	89	44	67	112	35	30.5	23	82	102
T15	m	194	131	132	119	130	99	98	47	68	119	40	29.5	27.5	99	115
T18	m?	191	137	130*	115	104	-	-	-	-	-	-	-	-	85	114
T28	f	173	126	124	105	87	119	93	47	66	112	38	32	26	86	105
T33	f	162	119	123	104	94	111	87	41	62	102	34	28	23	79	102
T47	f	187	127	135	103	122**	92	88	44*	57*	95*	36*	33*	23	92	112
T48	f	191	138*	145*	110*	-	123*	89	46*	62*	108*	38	33*	23.5	96	120
T61	m?	190	129	135	113	96	127	100	50	66	117	39	31.5	28	88	110
T62	m	180	126	126	112	87	122	93	46	65	110	38	30	26	97	106
T69	m	179	136	132	124	96	136	94	46	65	105	3705	32	27	98	112
T76	f?	187	123	115	138	122	94	104	50	72	124	39	38	24.5	94	108*
T77	m	183	135	132	124	99	134	97	52	75	121	40	35	23	97	124
T79	f	174	135	124	121	89	128	99	48	68	113	41	38	28	84	113
T81	m	196	134	128	120	95	129	100	48	63	112*	40	32	27.5	89	108
T82	f?	178	134	129	116	93	123	95	48	63*	105*	38	34.5	28	86	113

**) in excess of standard measurement error*

Table 2. Es-Sadda – cranial indices

No.	Sex	Indices										
		Cl	LH	BH	fr.p.	K	V	mf	n	o	m_2	m_3
T1	f	70.0	69.0	99.2	72.7	54.4*	70.8	88.8*	67.9	83.3	156.0	145.0
T2	m	73.5	68.1	92.6	72.8	53.4	70.7	87.8	54.9	80.6	160.5	149.0
T3	f	76.7	68.3	89.1	65.9	48.8	64.9	89.9	55.1	82.5	159.0	147.0
T4	m	73.0	73.5	100.7	71.9	49.3	67.6	82.1	59.2 (65.3)	77.4	160.0	152.0
T5	m	74.1	72.0	97.1	65.0	53/1	74.2	89.2	53.1	94.7	164.5	155.0
T6	m?	64.5	68.0	105.5	76.4	54.4	74.0	86.0	53.0	80.0	162.0	152.7
T11	m?	70.1	73.7	105.1	69/9	52.2	74.5	86.6	52.0	84.6	165.0	157.7
T13	f	69.6	73.4	105.5	72.7	58.8	75.3	98.2	52.3	87.1	156.0	149.0
T18	m?	71.7	68.1*	94.9*	75.9	-	-	-	-	-	164.0	152.7*
T28	f	72.8	71.7	98.4	69.0	55.5	71.0	94.1	55.3	84.2	149.5	141.0
T33	f	73.5	75.9	103.4	79.0	55.9	71.3	91.9	56.1	82.4	140.5	134.7
T47	f	67.9	72.2	106.3	62.3	46.7**	62.0*	77.9**	91.7**	52.3*	157.0	149.7
T48	f	72.3*	75.9*	105.1*	-	50.4**	69.7*	87.8**	51.1*	86.8*	164.5*	158.0**
T61	m?	67.9	71.1	104.7	74.5	52.0	66.0	92.1	56.0	88.8	159.5	151.3
T62	m	70.0	70.0	100.0	69.0	53.3	70.0	90.2	56.5	78.9	153.0	144.0
T69	m	76.0	73.7	97.1	70.6	47.8	69.1	77.2	58.7	85.3	157.5	149.0
T76	f?	65.5	77.5	117.9	84.6	59.0	76.6	101.6	49.0	97.4	155.0	151.7
T77	m	73.8	72.1	97.8	73.3	56.0	77.3	90.3	44.2	87.5	159.0	150.0
T79	f	77.6	71.3	91.9	69.5	53.1	68.7	88.3	58.3	92.7	154.5	144.3
T81	m	68.4	65.3	95.5	70.9	48.8	63.0	86.9*	57.3	80.0	165.0	152.7
T82	f?	75.3	72.5	96.3	69.4	51.2*	66.3*	85.4*	58.3	90.8	156.0	147.0

Indices: Cl. – Cranial Index; LH – Cranial Lenght-Height Index; BH – Cranial Breadth-Height Index; fr.p – Frontoparietal Index; K – Kollman's Upper Facial index ; V – Virhoff's Upper Facial Index; mf – Total Facial Index (morphological); n – Nasal Index; o – Orbital Index; m_2 – Vertical Skull Contour Module; m_3 – Cranial Module
**) calculated from data burdened with measurement error in excess of the standard*

Table 3. Hagar el-Beida – craniometry

No.	sex	measurement values														
		g-op	eu-eu	b-ba	au-au	ft-ft	zy-zy	zm-zm	n-ns	n-pr	n-gn	mf-ek	h.orbit.	apt-apt	go-go	kdl-kdl
HB1/T6	m	179	125	131*	113	96	117	92	50	73	120	41d	31.5d	24	87	106*
HB2/T1	m	186	116	138	117	89	135	102	51.5	70	121	45	33	29.5	99	118
HB2/T2	m	189	125	145	122	98	135	104	49	69	118	41	31	29.5	99	119
HB2/T4	m	172	129	134	122	93	134	87	48	69	115	41	34.5	26.5	93	115
HB2/T12	m	191	135	137	122	100	132	99	48	70	117	43.5	35.5	25	-	-
HB2/T14	m	200	134	128	117	130	99	99	52*	73	123	43	35	28	88	106
HB2/T24	m	180	139	135	116	94	128*	85	47	63	-	38.5	31	29	-	-
HB2/T25	m	183	125	126	106	85	116	91	44	59	101	35.5	30	25	83	105
HB2/T26	m	182	129	131	119	93	126*	98*	47	66	113	39	29	28	87	108
HB2/T28	m	182	140	142	116	87	126	92	51	67	110	40	31.5	23.5	85	108
HB2/T29	m	205	142	142	122	105	139	100	55*	73	123	42.5	34	28(32)	98	123
HB2/T31	m?	185	126	131	124	89	122	94	50	67	112	40.5	33	28	91	111
HB2/T52	m	189	130	136	115	94	130	105	52*	72	124	42	34.5	28	98	115
HB2/T53	f	181	124	126	107	89	116	89	49	56	-	39	36	23.5	-	-
HB2/T54	f	179	126	132	101	89	112	85	40.5	56	95	36	30	23.5	74	99
HB2/T56	f	174	122	133	108	93	115*	92	44	63	102	41	33.5	24	88	102
HB11/T7	m?	186	142**	125-130	130**	100	126*	89	58*	78*	113*	38*	39*	25	74	112

**) in excess of standard measurement error*

Table 4. Hagar el-Beida – cranial indices

No.	Sex	Indices										
		CI	LH	BH	fr.p.	K	V	mf	n	o	m_2	m_3
HB1/T6	m	69.8	73.2*	104.8*	76.8	62.4	79.3	102.6	48.0	76.9	152.0	145.0*
HB2/T1	m	62.1	74.2	119.0	76.7	51.9	68.6	89.6	57.3	73.3	151.0	146.7
HB2/T2	m	66.1	76.7	116.0	78.4	51.1	66.3	87.4	60.2	75.5	157.0	153.0
HB2/T4	m	75.0	77.9	103.9	72.1	51.5	79.3	85.8	55.2	84.1	150.5	145.0
HB2/T12	m	70.7	71.7	101.5	74.1	53.0	70.7	88.6	52.1	81.6	163.0	154.3
HB2/T14	m	67.0	64.0	95.5	73.9	56.2	73.7	94.6	53.8	81.4	167.0	154.0
HB4/T15	m	67.5	68.0	100.8	74.8	52.3	68.7	91.5	73.8	58.5	162.5	152.3
HB2/T24	m	72.2	75.0	97.1	67.6	49.2*	74.1	-	61.7	80.5	159.5	151.3
HB2/T25	m	68.3	68.9	100.8	68.0	50.9	64.8	87.1	56.8	84.5	154.0	144.7
HB2/T26	m	71.0	75.3	101.6	72.1	52.4*	67.3*	89.7*	59.6	74.4	155.5	147.3
HB2/T28	m	76.9	78.0	101.4	62.1	53.2	72.8	87.3	50.0	78.8	161.0	154.7
HB2/T29	m	69.3	69.3	100.0	73.9	52.8	73.0	88.5	50.9 (58.2)	80.0	173.5	163.0
HB2/T31	m?	68.1	70.8	103.0	70.6	54.9	71.3	91.8	56.0	81.5	155.5	147.3
HB2/T52	m	68.8	72.0	104.6	72.3	55.4	69.2	95.4	53.8	82.1	159.5	151.7
HB2/T53	f	68.5	69.6	101.6	71.8	48.3	62.9	-	48.0	92.3	152.5	143.7
HB2/T54	f	71.0	73.7	104.8	79.5	50.0	68.9	84.8	58.0	83.3	152.5	145.7
HB2/T56	f	70.1	76.4	109.0	76.2	54.8*	68.5	88.7*	54.5*	81.7	148.0	143.0
HB11/T7	m?	76.3**	69.9-67.2	88.0-91.5	70.4*	61.9**	87.6*	89.6**	43.1*	102.6**	164.0	151.0-152.7

Indices: Cl. – Cranial Index; LH – Cranial Lenght-Height Index; BH – Cranial Breadth-Height Index; fr.p – Frontoparietal Index; K – Kollman's Upper Facial index ; V – Virhoff's Upper Facial Index; mf – Total Facial Index (morphological); n – Nasal Index; o – Orbital Index; m_2 – Vertical Skull Contour Module; m_3 – Cranial Module
**) calculated from data burdened with measurement error in excess of the standard*

Table 5. Shemkhiya – craniometry

No.	Sex	Measurement values													
		g-op	eu-eu	b-ba	au-au	ft-ft	zy-zy	zm-zm	n-ns	n-pr	n-gn	mf-ek	h. orbit.	apt-apt	go-go	kdl-kdl
SH5/T6	f	173	127*	130*	105	93	112	94	53	72	113	39	32.5	27.5	81	107
SH5/T9	f	192	132*	137	105*	99	119	91	50	66	112	40d	33.5d	26	83	113
SH5/T12	f	200	128*	140*	108*	100	118*	95*	50	70	118*	38*	31*	26*	85	108*
SH9/G35	f	175	127	127	109	96	117	96*	48	65	107	38	29.5	28	82	100
SH10/T1	m	181	133	135	121	89	130	86	53	70	114	38	32.5	24.5	99	116

**) in excess of standard measurement error*

Table 6. Shemkhiya – cranial indices

No.	sex	indices										
		CI	LH	BH	fr.p.	K	V	mf	n	o	m_2	m_3
SH5/T6	f	73.4*	75.1**	102.3**	73.2*	64.3	76.6	100.9	51.9	83.3	150.0*	143.3**
SH5/T9	f	68.8*	71.4	103.8*	75.0*	55.5	72.5	94.1	52.0	83.8*	162.0*	153.7*
SH5/T12	f	64.0*	70.0*	109.4**	78.1*	59.3*	73.7	100.0**	52.0*	81.6**	164.0*	156.0**
SH9/G35	f	72.6	72.6	100.0	75.6	55.6	67.7*	91.5	58/3	77.6	151.0	143.0
SH10/T1	m	73.5	74.6	101.5	66.9	53.8	81.4	87.7	46.2	85.5	157.0	149.7

Indices: Cl. – Cranial Index; LH – Cranial Lenght-Height Index; BH – Cranial Breadth-Height Index; fr.p – Frontoparietal Index; K – Kollman's Upper Facial index ; V – Virhoff's Upper Facial Index; mf – Total Facial Index (morphological); n – Nasal Index; o – Orbital Index; m_2 – Vertical Skull Contour Module; m_3 – Cranial Module
**) calculated from data burdened with measurement error in excess of the standard*

The Es-Sadda cemetery, except for one doubtful child burial, is represented by 22 adult skeletons (12 men and 10 women), mainly of *maturus* or *adultus/maturus* age (although some could definitely be classified already as *senilis*!). Apart from two individuals representing undoubtedly the Black variety, the group was spread more or less equally between the White and a mix of Black and White varieties.

The skeletons examined from Hagar el-Beida (altogether 36), on each of the five sites explored in the region, include both juvenile and adult individuals, although not older than *adultus/maturus*, except for one case. Among the adults individuals there are 25 men and seven women.

The few individuals studied from the sites around Shemkhiya include three adult women from site SH5, one of the White variety. The rest are Black-White half-breeds, as well as one intervariety male skeleton from site SH10. The two skeletons from the Christian cemetery at SH9 are of a child aged 6-8 and of a woman representing the Black-White half-breed.

A closer comparative analysis of skeletons from the Post-Meroitic cemeteries in the Fourth cataract region requires further studies. It should help to verify theories concerning ethnogenetical processes taking place in the region.

Fig. 2. Skull with traces of healed double trepanation (Photo K. Piasecki)

Fig. 3. Pathological changes (hypoplasia) of the articular surface of a mandibular head (Photo K. Piasecki)