

### Appendix 1.a Cranial measurements

The following are cranial measurements taken from children and adults. Newborn babies and infants are excluded. Only those individuals with some measurements taken of the cranium are included in this appendix.

Measurements	Toutswe mogala						
	2	3	4	6	7	9	14
g-op	160.6	185	160.6	187	181	173	170
eu-eu	120		120.4		123	127	
zy-zy				111			
ba-b	110.8		110.9	151	130	125	136
ba-n	80.6		80.1	145	130		124
ba-pr	84.1		76.6	143	109.5		128.3
ecm-ecm	51	63.1	51.1	59.4			59.5
pr-alv		41.4	34.5	43			39.2
ALB	97.1			103.9		103.7	103.6
n-pr	52.5	57	43.3	56.6			50.3
ft-ft	86.5		82	93.5	81.9	90.3	91.1
fnt-fnt	90.6		90.9	102	94.2		
n-ns	36.6	39.8	31.6	42.3	32.7		37
al-al	20	24.4	22	24.5	18.8		18.43
d-ec	34.7	*37.5	32	38			
OBH	33.5	*34.4	33	35.5			38.5
ec-ec	84.2		78.6	91.3	84.5		
d-d	21.4	23.8	20.1	26.8			23.37
n-b	96.5	112.8	96.8	114.6	104.8		102.8
b-l	104.5	115.8	105.2	115.8	105.4	109.8	100.1
l-o	89	97.1	95	87.2	88.9	92.6	38.3
ba-o	38.3		34.8	42.9			28.9
FOB	30.6		23.5	31.6	23.5	30.7	
MDH			11.1	15.4	13.5	9.5	

\* Measurements taken from the right side

## Appendix 1.a Continued

Measurements	Toutswe Mogala continued				Bosutswe		
	16	17	20	25	3	4	5
g-op	180.2		166	182	190.1	182	189
eu-eu			116	127	130.4	129	133
zy-zy				129	140.1	112	139
ba-b			115	130	130.8	140	145
ba-n			80.6	104	100.5	99	143
ba-pr				98	100.8	91	146
ecm-ecm	55.9	55.9		57.1	67	59.7	67.8
pr-alv	45.1			50.4		46.1	56.2
ALB	102.7		85.7	120.5	122.4	103.8	119.6
n-pr	51.3	51.8		71	72.2	55.5	70.8
ft-ft				98.2	97.5	91	102.2
fnt-fnt				106.5		103	107.2
n-ns	42.8	37.5		55.1	53.1	40.3	50.6
al-al	22.8	22.4		24.5	23.8	21.8	29.2
d-ec	35	33.9*		42.5	41.2	34.7	36.7
OBH	33.3	39.3*		39.2	34	33.6	38.1
ec-ec	83			101.9	95.7	82.2	104
d-d	20			26.3	22.2	19.2	32.1
n-b			89.6	116.4	112.6	111	110
b-l		109.5	111	109.3	107.7	116	105
l-o		126.8	89.5	83.8	99.7	98	106
ba-o		94.9	35.4	36.8	43	37.2	39.7
FOB			21.5	30.7	31	28.1	31.4
MDH	23.8	16		24	33.4	25.4	30.2

\*Measurements taken from the right side

## Appendix 1.a Continued

Measurements	Bosutswe continued				Kgaswe B-55	
	6	11	12	13	2	16
g-op	191	169	181	184	180	185
eu-eu	123	128	125	127	120	120
zy-zy	114					
ba-b	148		148	141		138
ba-n	133		142	141		105
ba-pr	126		136	135		105
ecm-ecm	59.5		65.7	63.5	59.7	61
pr-alv	43.9		50.8	45.2		
ALB	106.8		122.7	109.7		113.5
n-pr	57		72.3	102.8	58.5	73.7
ft-ft	97.7		96.2	94.4	93.6	95.3
fimt-fimt	109.5		107.7	100.3	100.2	103.2
n-ns	43.2		52.1	53	58.9	48.4
al-al	23.6		23.1	24.7	27	25.8
d-ec	33.9		40.1	36	37.9	
OBH	33.5		40.1	33.7	29.6	
ec-ec	92		101.9	96.5	100.7	
d-d	22.9		29.6	28.1	26.9	
n-b	111.5		109.3	117.4	108.2	106.8
b-l	117		101.3	112.8	110.8	116.8
l-o	106		109.3	96.2	93.4	
ba-o	40			36.3		
FOB	27.5			26.4		
MDH	22.4		24.7	30.7	*26	*34

\* Measurements taken from the right side

## Appendix 1.b Mandibular measurements

Measurements	Toutswe										
	2	3	5	6	7	9	14	16	17	20	
C H	23.3	28	22.6	26.8	21.1	25.6	22.7	25.8	29.6	21.7	
BHMF	19.7	25.8*	17.4*	25.7	18	24.8	22.7	22.2	27	18.1	
BTMF	10.8	12.5*		12	10.2	12.2	12.5	12	12.1	8.78	
BD	69.1			73	70.1	75.4	84.4	77.8	79.4	66.7	
BB	89					96.3	103.3	97.6	93.2	82.7	
Min RB	26.5	30.7*	23.2*	33.7*	27.1	30.4	33.9	33.6	32.6	24.4	
Max RB	31.6	34.1*	30*	38.6*	31.8	37	39.5	40.6	34.8	34.5	
Max RH	31*	36*	27	41	34	37	41	30.9	39	32.5	
ML	61	69*	55	77	64	67	70		78	53	
MA°	133	133*	141	123	139	135	127	123	130	130	

## Appendix 1.b Continued

Measurements	Toutswe	Taukome			Bosutswe					
	continued	1	2	3	4	5	6	7	8	11
C H	36.1	34.3	33.5	33	27.3	34.4	27.7	19.4	23.3	26.8
BHMF	31.1	27.6	34.8	33.9	25.8	31.2	25.4	15.3	19.7	16.7
BTMF	10.3	12.6	11.9	10.3	11.9	13.2	10.9	8.6	8	12.8
BD	89.5	104.5	90.9	110.2	83.8		80.3	56.6		82.7
BB	121.9	124.5	118.8	122.1	97.1	122.8	108.2			106
Min RB	33.6	42.5	34	36.1	30.3	40.4	32.6	20.3		32.8
Max RB	44.7	53.6	48	44.7	38.5	46.8	38.2*		30.7	38.8
Max RH	58.5	62.	47	61*	43.5	60*	41*		38	39
ML	81	91	86	86.5*	66	91*	73.5*		61	71
MA°	120	109	131	136*	135	127*	127*		136	123.5

## Appendix 1.b Continued

Measurements	Bosutswe continued		Thatswane	Kgaswe B-55	
	12	13	3	2	16
CH	35.2	34.6	20.2	31.9	41.4
BHMF	29.3	29.6	17.4	29.8	37.2
BTMF	12.5	11	9.8	9.7	12.8
BD	105.4	91.8		79.7	81.7
BB	124.8	112.4		108.5	
Min RB	35.2	35.5	25.6*	36.2	32.2
Max RB	42.5	41.7	28.1*	43.3	42.1
Max RH	52	46.5	27.4	50.2	61
ML	79	86	60.1	80.3	82
MA°	126	121	136	119	121

CH- Chin height

BHMF- Body height at mental foramina

BTMF- Body thickness at mental foramina

BD- Bigonial diameter

BB- bicondylar breath

Min RB- Minimum ramus breath

Max RB- Maximum ramus breath

Max RH- Maximum ramus height

ML- mandibular lengths

MA°- Mandibular angle

\* Measurement from the right side

## Appendix 2 Postcranial measurements –clavicle and scapula

Burial	Max length midshaft (clavicle)	Sagittal diameter midshaft (clavicle)	Vertical diameter midshaft (clavicle)	Scapula height	Scapula breadth
<b>Toutswemogala</b>					
2	70.3	7.6	4.2	67.9	53.5
3	95.3*	8*	5.7*	95*	63.7*
6	110.1	8.2	8.4		
7	73.1	5.2	3.8		
9				78.5	58.6
13	92.4	6.06	5.2	84.4	60.8
14	95.4	7.7	5.5		61.7
15	90.3	8.6	5.1		
17	101.4*	9.4*	8.6*		
22				125.9	106.9
<b>Taukome</b>					
1	165	14.3	10.7		
2	154	11.9	8.4		105.3
<b>Thatswane</b>					
3	60.1	5.8	3.3		
4	100.2	7.5	5.7	100.2	68.9
<b>Mosu 3</b>					
1	120	8.7	6		
<b>Ngarwe B-55</b>					
1	200.7			14.7	13.5
2	294	50.1	37.7	19.9	14.7
5(1)	326.1	60	42.5	20.1	15.2
7(2)	320.1	50.7	40.8	20.7	15.6
15	220.1			13.5	11.5
16	314	57.5	42.1	20.6	16.4
24	330.5	50.9	44.2	23.7	18.1

## Appendix 2 continued, Humerus

Burial	Max length	Epicondylar breadth	Max diameter head	Max diameter midshaft	Min diameter midshaft
<b>Toutswemogala</b>					
2	*140.2	*20.8		*11.5	*9.3
3	*198	*40.3		*14.4	*12
5	*116.1	*25.7		*10.5	*9.5
6	220.9	40.2		14.4	11.9
7	*151	*30.6		*10.3	*8.3
8	161			10.8	9.2
9	163	32.1		13.3	10.8
13	194.8	*36.1		*13.4	*9.9
14	181	35.3		12.9	11.7
15	200.8	30.6		14	10.3
17	245	42.3		18.5	13.4
22	328	61	44.7	20.9	16.7
24	*147	*28.5		*11.7	*9.7
<b>Taukome</b>					
1	330	70	48.9	22.9	18.7
2	319	62	40.3	25.3	18.2
<b>Thatswane</b>					
3	110.2	20.6		10.5	8.8
4	*200.5	*40		*14	*10.6
<b>Mosu 3</b>					
1	276	49.5		16.6	14.6
<b>Kgaswe B-55</b>					
1	200.7			14.7	13.5
2	294	50.1	37.7	19.9	14.7
5(1)	320.1	60	42.8	20.1	15.2
7(2)	320.1	50.7	40.8	20.7	15.6
15	220.1			13.5	11.5
16	*314	*57.5	*42.1	*20.6	*16.4
24	330.8	50.9	44.2	23.3	18.1

## Appendix 2 continued- Radius and Ulna

Burial	Max length radius	Sagittal diameter midshaft radius	Transverse diameter midshaft radius	Max length ulna	Dorso-volar diameter ulna	Transverse diameter ulna	Physiological length ulna	Min circumference ulna
<b>Toutswemogala</b>								
2	111	5.7	7.7	124.9	9.5	8.8	108.5	18
3	157	7	10.7	175	14	10.4	153	27
5	91.2	5.3	6.6	104.6	9.5	7.5	92.9	
6	190.8	8.4	10.1	210.3	12.2	8.8	190.4	20.4
7	*119	*5.3	*7.3	134	10.6	9	121	21
8	120.2	5.5	7.1	126.5	10.6	9.6	111.5	
9	130.8	6.9	9.7	145.1	13.3	10.3	128	10
13	160	7.5	8.2	176	11.3	10	158	24
14	155	7.6	9.9	168	11.8	9.9	149	23
15	160.2	8.4	10.4	170.7	11.2	10.5	160.2	23
17	185	9.9	12.7	202	15.9	11.8	182	24
22	*267	*11.1	*14.9	*285	*15.1	*13.6	256	27
25	*263	*12	*15	*281	*15.7	*15	*255	
<b>Taukome</b>								
1	262	13	14.9	284	18.4	14.4	245	39
2				*295	*17.8	*15.6	*268	33
<b>Thatswane</b>								
4	160.2	7.5	8.6	180.2	13.3	14.3	160.7	27
5	260	11	15.9	277	19.4	14.8	243	36
<b>Mosu 3</b>								
1	209	9.7	11.4	235	14.7	12	205	
<b>Kgaswe B-55</b>								
1	180.2	10.6	8.8					
2	220	10.8	13					
5(1)				280.6	15.6	14.4	25.4	
6				162	11.5	11	149	
7(2)	250.6	11.8	15.1					
15	170.6	9.6	8.7	180.9	12.8	10.2	175	22
16	254	12.4	15	*266	*15.3	*15.8	*240	
24	*280.9	*12.6	*17	*310	*14.4	*18.5	*280	39



## Appendix 2 continued, Femur

Burial	Max len	Bicondy len	Epicondy len	Max diam head	A-P subtroch	Trans subtroch diam	A-P diame midsh	Trans diam midsh	Cirmfe midsh
<b>Toutswemogala</b>									
2	190.2	190.1	30.7		12.6	15.8	12.6	13.5	40.4
6	320		40.9		18.1	23.7	17.7	17.6	50.7
7	200	198	40.5		13.5	16.5	12.9	11.5	40
8	217	214	42.2		12.3	16.4	13.2	12.2	42
9	235	233	47.4		17.7	20.4	15.5	15.5	52
14	270	268	52.3		19.6	20.9	17.8	14.3	54
15	281	280			17.3	22.3	19	12.3	50.6
22	486	483	78	46.3	27	32	28.8	29.8	
25	485	479	81	44.5	26.2	36.1	28.3	28.7	
<b>Taukome</b>									
2	449			41.5	23.8	33.8	28.5	28.6	88
<b>Thatswane</b>									
4	281				19.3	22	16.7	16.6	50
5	485	480	72	41.3	23.9	29.3	27.5	23	80
<b>Mosu 3</b>									
1	390	388	62		21.1	26.2	21.1	22.1	
<b>Kgaswe B-55</b>									
2	415	406	69	38	21.8	27	23	25	76
5(1)	470	469	80	43.2	23.9	29.2	29.1	26.6	90.3
5(2)	495	493		45.7					
6	252				15.5	18.6	15.6	15.5	48.5
7(2)	481	478	70.9	44.8	20.8	28.4	30	24.9	80.7
16		480	74		23.7	28.7	27.6	24.5	
24	481	443	70.7	43.8	24	31.1	38.2	28.8	100
26	448			43.3	23.1	28.1	27.5	25.6	

## Appendix 2 continued, Innominate

Burial	Height	Max breadth	Pubis length	Inchinal length
<b>Toutswemogala</b>				
2			47.2	41.4
6		90.5	51.2	51.6
			44.4	50.5

## Appendix 2 continued, Tibia

Burial	Condylomalleola length	Max proximal epiphyseal breath	Max distal epiphyseal breath	Max diameter nutrient foramen	Tranverse diameter nutrient foramen	Circumference nutrient foramen
<b>Toutswemogala</b>						
2	160.5	30.5	20.2	16.2	14.8	49
3		50.9		22.8	16.3	65
6	70	40.6		22.3	17.2	60.5
7				15.6	13	45
8				15.2	12.2	46
9	192			18.6	17	58
13				19.5	16.3	58
14	228		30.9	20.9	16.7	58
15	*231	*40.6	*30	*20.8	*16.7	*60
17	287	35.8	27.8	22.8	80	
22	*411	*77	*51	*35.2	*22.6	*95
25	*411	*79	*49	*39.6	*21.9	
<b>Taukome</b>						
1			50.6	36.8	24.4	60
2			43.4	35.5	22.6	60
<b>Thatwane</b>						
4	240.2			21.6	16.3	84
5	396	73.5	49	31.9	21.7	75
<b>Mosu3</b>						
1	327	52	39	28.5	20.6	
<b>Kgaswe B-55</b>						
2	47		42	27	21.2	
5(1)	96	70.6	50.1	38.2	24.8	
24	20	70.3	50.1	39.6	26.7	

## Appendix 2 continued- Innomate

Burial	Height	Iliac breath	Pubis length	Ischium length
<b>Toutswemogala</b>				
2			47.2	41.4
6		90.6	51.2	61.6
8			44.4	50.5
9			48	47.8
<b>Taukome</b>				
1	214	163	81.9	89.6
2		147	88.9	75
<b>Mosu 3</b>				
1	*172	*120	*65.2	*73.6
<b>Kgaswe B-55</b>				
2	*181		72.5	75.6

*Bag 2 (TOR (S) second half level 2)*

Fragment of an adult os carpal as well as an infant femora, tibiae and right ulna. The remains were excavated by Lepionka (1977) and examined by De Villiers (1976). The bag also includes a fragmented animal tooth.

*Bag 3*

The remains comprise of a manubrium, partially complete radius, humerus, femur, tibiae, patella and calcaneus and bones of the hands and feet of a subadult (De Villiers 1976).

*Bag 4 (TOE E113 First half level 1)*

Fragment of an infant occipital bone, vertebrae, phalanges and ribs. The remains were excavated by Lepionka (1977) and examined by De Villiers (1976).

*Bag 5 (TOR 133 burial)*

Incomplete radius, complete left calcaneus, talus and other tarsal and metatarsal bones, phalanges of an immature individual.

### Appendix 3. Incomplete and commingled bones from Toutswemogala and Taukome

The following remains are too incomplete to yield much useful information. They have not been included in the demographic analysis. It is difficult to account for each package of these incomplete remains in terms of whether they were found as isolated remains or whether they were separated from the main bags during storage. Consequently, there is no information regarding their provenance and burial styles. Lepionka unearthed all of them. Reference is made to those described by De Villiers as isolated human remains (De Villiers 1976).

#### Toutswemogala incomplete skeletons

##### *Bag 1 (10R3 [10R01] burial sub level 1)*

The remains comprise of a nearly complete scapula, complete clavicles, and a fragment of a humerus, a radius and an incomplete femur. The bones appear to belong to one infant. They have been examined by De Villiers (1976) in the past.

##### *Bag 2 (10R135 second half level 2)*

Fragment of an adult molar, as well as an infant femora, tibiae and right ulna. The remains were excavated by Lepionka (1977) and examined by De Villiers (1976). The bag also includes a fragmented animal tooth.

##### *Bag 3*

The remains comprise of a manubrium, partially complete radius, humerus, femur, tibiae, patella and calcaneus and bones of the hands and feet of a subadult (De Villiers 1976).

##### *Bag 4 (10 R135 First half level 1) Burial Healer*

Fragment of an infant occipital bone, vertebrae, phalanges and ribs. The remains were excavated by Lepionka (1977) and examined by De Villiers (1976).

##### *Bag 5 (10R 135 burial)*

Incomplete radius, complete left calcaneus, talus and other tarsal and metatarsal bones, phalanges of an immature individual.

*Bag 6 (10R135 Burial 5)*

Two partially complete right scapulae, both from immature individuals but different in size and hence belonging to separate individuals. A permanent maxillary molar, a third molar and a mandibular incisor were also found. The remains were excavated by Lepionka (1976) but it is not clear whether they were sent to De Villiers for examination.

*Bag 7 (5 R135 first half burial level 4)*

The bag contains a fragment of the maxilla with two deciduous molars. The molars had been held in place by compacted soil. De Villiers (1976) had identified the fragment as that of a mandible.

*Bag 8 (ORO level 4)*

Fragments of an infant femur and vertebra are included in this bag. The remains have been examined by De Villiers (1976).

*Bag 9 (5 R135 first half level 3)*

There is a deciduous canine, fragments of the vertebrae and radius (De Villiers 1976). The vertebrae appear to be of an individual possibly older than the individual whose radius was included in this bag.

*Bag 10 (5 R135 first half level 2)*

The bag contains fragments of the vertebrae, ribs and axis. The remains are of an infant (De Villiers 1976).

*Bag 11 (10R3 [10R01] level 4) Pot burial Beaker*

Fragments of the left temporal bone and some vertebrae are put together in this bag. The remains are of infant.

*Bag 12*

The bag has no site label. It contains partially complete femora of possibly the same individual.

*Bag 13(10R135 Burial S)*

This bag contains bones isolated from the same bag as Burial 20. They comprise of a nearly complete vertebral column, a complete sacrum, a complete radius, a rib fragment, head of humerus, epicondyles of both femora, proximal ends of tibiae, complete calcanei and taluses as well as some phalanges. The remains are of an immature individual but who was older than Toutswe Mogala Burial 20.

*Bag 14 (10R135 Burial S)*

The bag contains a complete clavicle of an adult individual. The clavicle was placed in the same bag as Toutswe Mogala Burial 20 possibly as part of Lepionka's way mechanism to save space (Lepionka 1978).

*Bag 15*

The bag has no site record and it contains a partially complete right side of the cranium (temporal and frontal bones). The individual was immature as indicated by cranial sutures.

*Bag 16*

A permanent maxillary and medial incisor as well as some phalanges and metatarsal bones are included in this bag. They are of an immature individual. The site record label is missing.

*Bag 17(5R 155 first half burial bedrock)*

Some vertebral centra and a single phalanx are in this bag. The bones are of an immature individual.

*Bag 18*

The bag contains the following remains of a possible newborn or infant, neural arches, tibia, humerus and calcaneus. In addition there are fragments of the sacrum, neural arches and a radius of an immature individual but their size indicate that the individual was older than the one described before. A fragment of the sphenoid bone and

thoracic vertebrae of mature individual indicate the presence of a third individual in this bag. A permanent incisor is also present. There is no site label.

*Bag 19 (5R 135 second half level 2)*

The bag contains several fragments of possibly different individuals. There is an incomplete adult mandibular ramus, rib fragments, a nearly complete set of adult phalanges and an incomplete clay figurine. There is also a proximal end of a tibia and fragments of different skulls.

**Taukome incomplete remains**

*Bag 1*

A fragment of a right femur of an adult was found in a rodent burrow on the western end of unit 1 (Denbow 1979b).

*Bag 2*

In unit 5 level 6 (between 40 and 60 cm below surface), in the light brown silt soil, a cranial fragment was found (Denbow 1979b). The fragment came from the southeastern side of the unit and was in a rodent burrow. The skull is represented by articulated parietals and a frontal bone. The left orbit is complete and has no signs of pathology while the right orbit is missing.

*Bag 3*

Fragments of a parietal and a pelvic bone which had been dug out by rodents in unit 6, level 5, 60 - 75 cm below surface (Denbow 1979b).

#### Appendix 4 Recommendations to BNMMAG for scientific handling and storage of human tissue

The author proposes the following recommendations or guidelines for proper cataloguing, storing and handling of archaeological skeletons.

- ❖ That the archaeology laboratory personnel be given basic training in identifying, handling and storing human skeletal remains.
- ❖ That each skeleton be labeled with proper ink upon arrival at the institution. The process should also include the current collections but a trained anthropologist should be employed to help identify individual skeletons where possible from the boxes with more than one individual.
- ❖ That a section be established within the storerooms or laboratories for the sole purpose of storing human skeletal remains and their associated grave goods.
- ❖ That a cataloguing system for human remains be established with coded burial numbers. The codes should indicate the site from where the burial was found, the date (year) of excavation and the burial number.
- ❖ That once the catalogue is established on the basis of the current collections, the BNMMAG should control the numbering of new burials found at sites where previous excavations produced burials e.g., one burial was found at Bosutswe in 2001, which should be burial 1 for that site so that those found in 2002 should start at burial 2, or alternatively indicate the date of excavation
- ❖ Boxes of proper sizes should be used to store individual skeletons so that each individual is placed in one box. The boxes should be labeled properly indicating the burial number and site from where the burial was recovered.
- ❖ That the BNMMAG establish a body of rules for archaeologists submitting human skeletal remains for storage. The rules should emphasize that skeletons should be accompanied by field notes and photographs, indicating the date of excavation, the principal excavator and team members, provenance, burial style and any other essential information.