

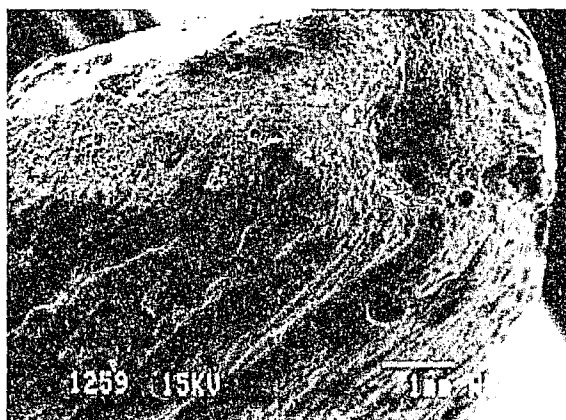
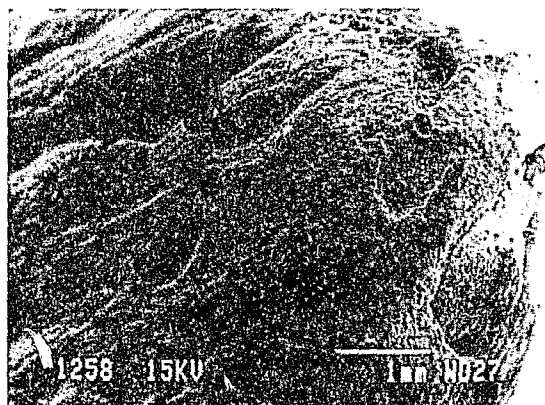


Figure 121. SEM images of SKX 21790.

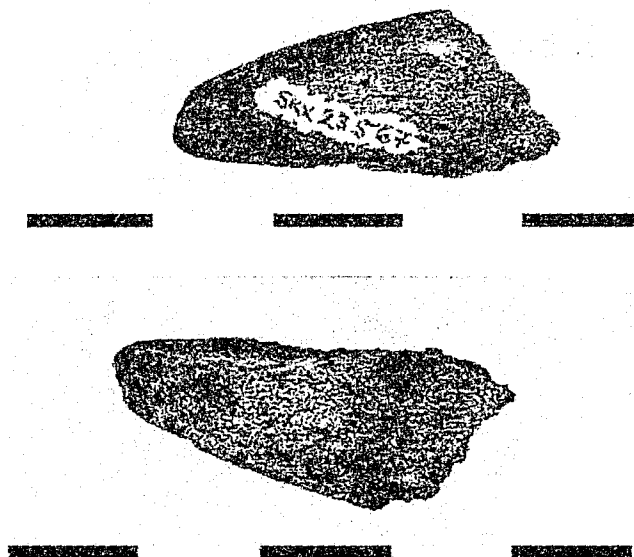


Figure 122. Swartkrans specimen SKX 23567. Anterior (top) and posterior views. Scale = 1 cm.

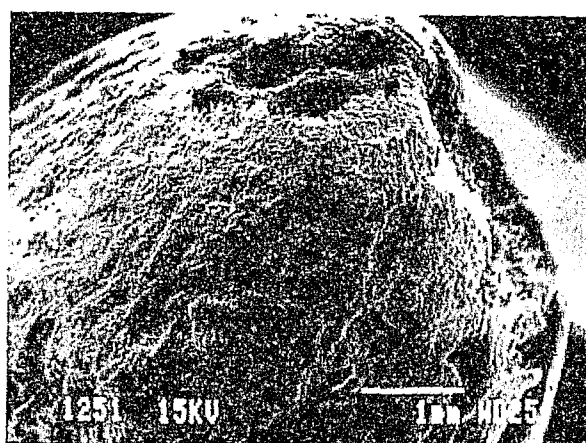
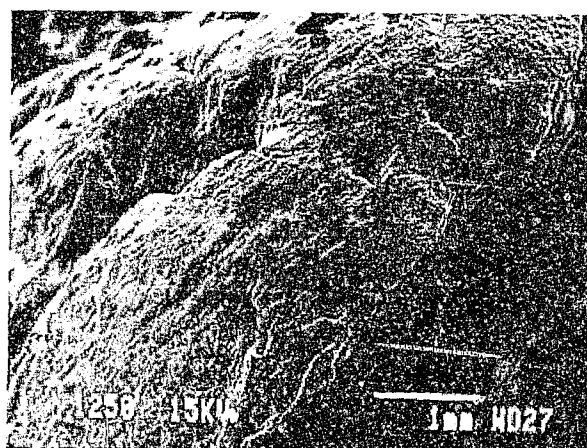


Figure 123. SEM images of SKX 23567.

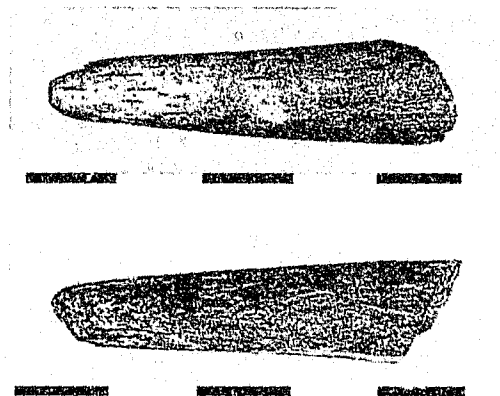


Figure 124. Swartkrans specimen SKX 26234. Anterior (top) and posterior views. Scale = 1 cm.

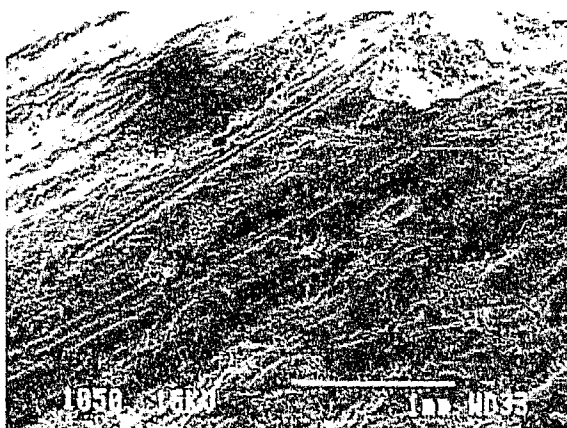
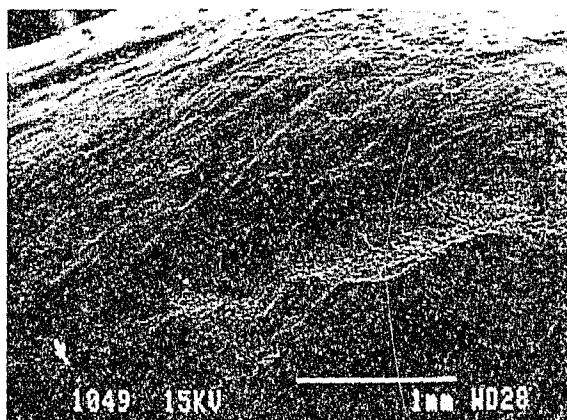


Figure 125. SEM images of SKX 26234.

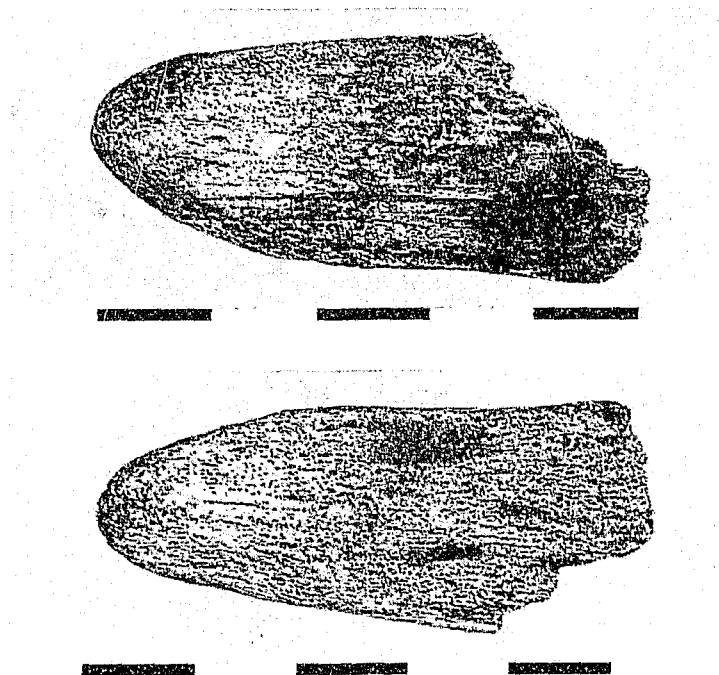


Figure 126. Swartkrans specimen SKX 28437. Anterior (top) and posterior views. Scale = 1 cm.

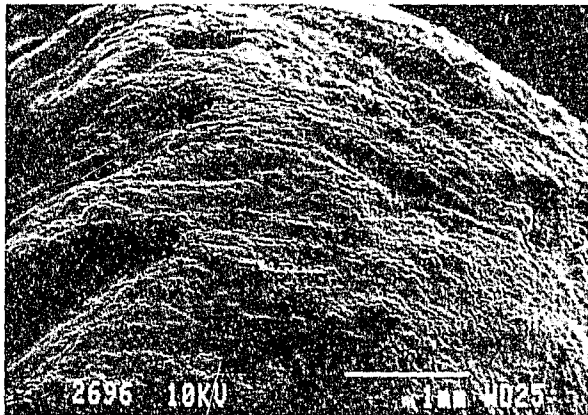
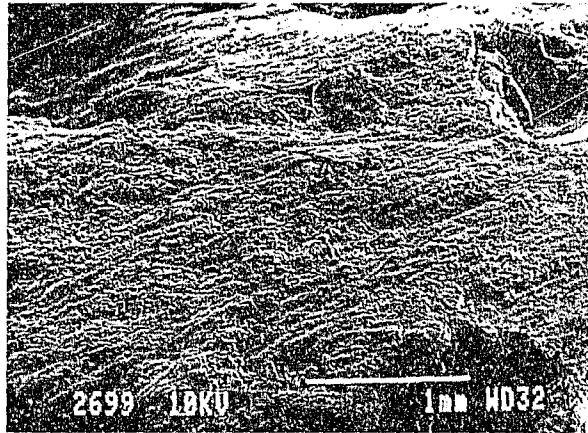


Figure 127. SEM images of SKX 28437.

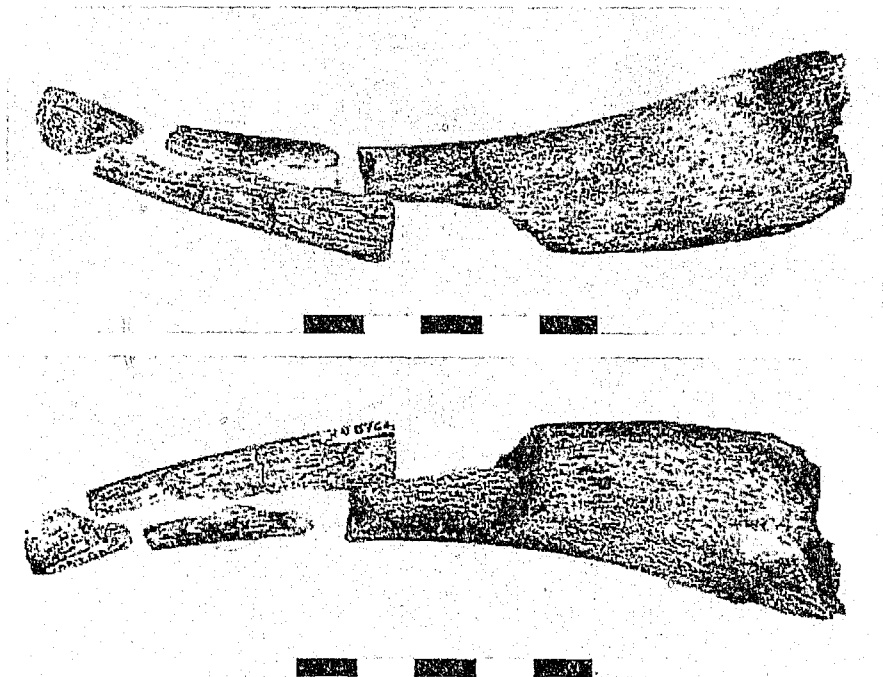


Figure 128. Swartkrans specimen SKX 28876B. Anterior (top) and posterior views.
Scale = 1 cm.

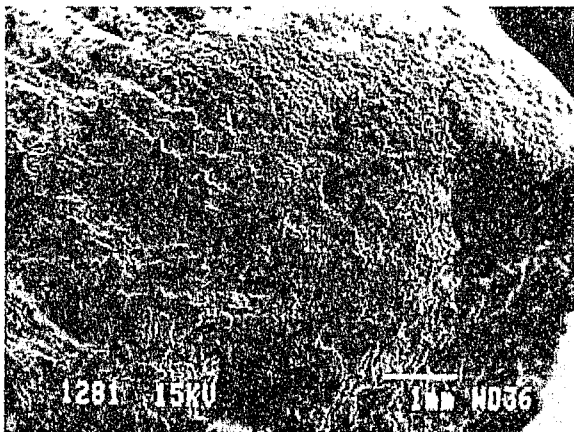
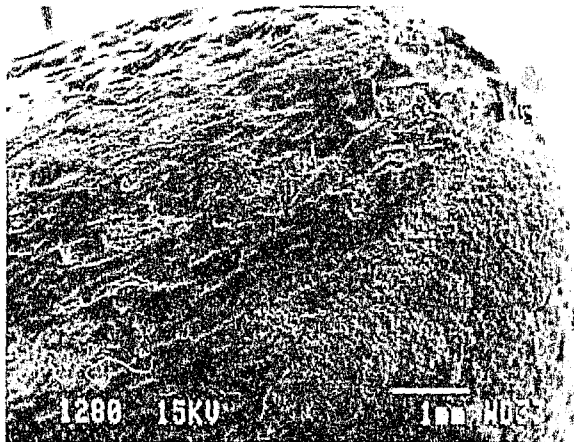
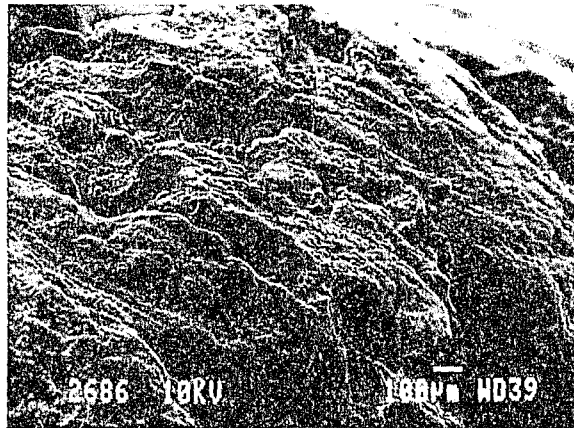


Figure 129. SEM images of SKX 28876B.

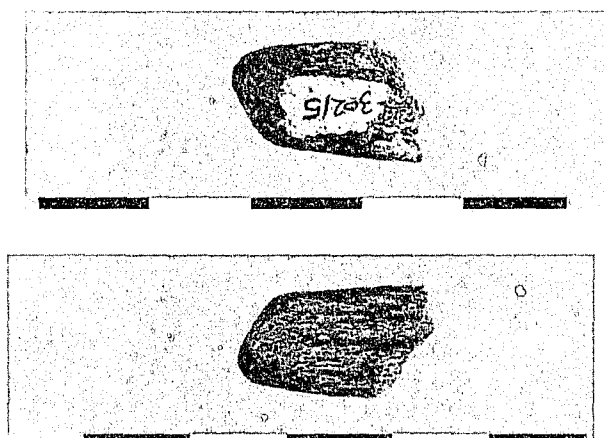


Figure 130. Swartkrans specimen SKX 30214/5. Anterior (top) and posterior views. Scale $\approx$ 1 cm.

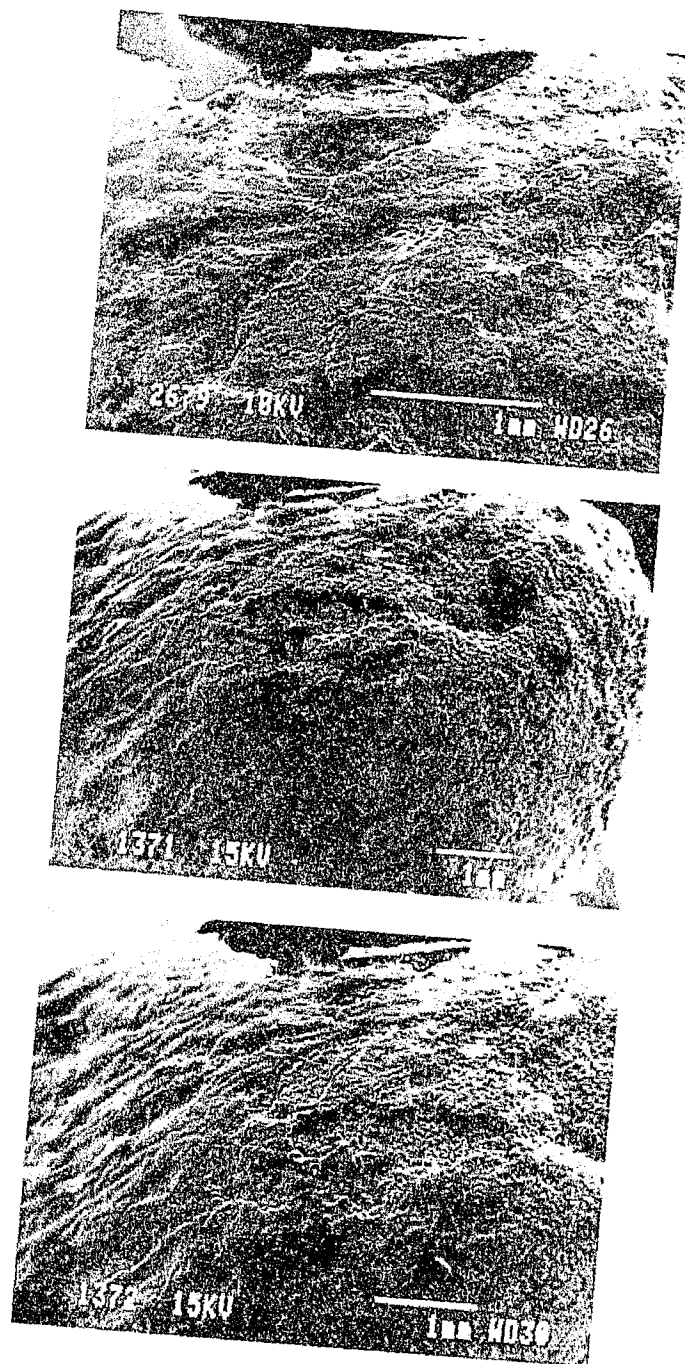


Figure 131. SEM images of SKX 30214/5.

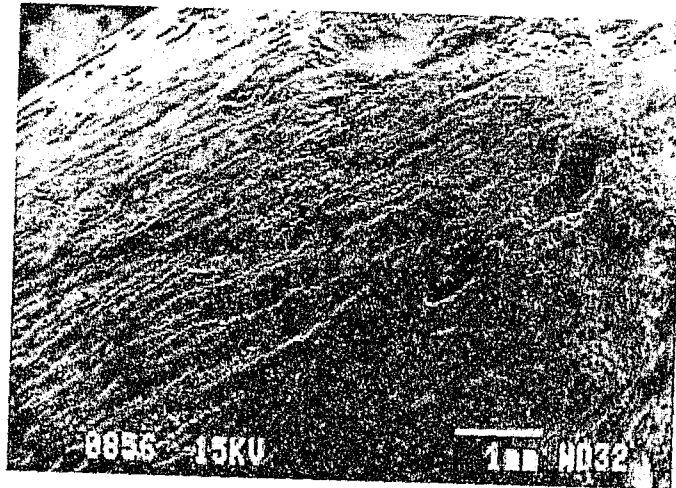
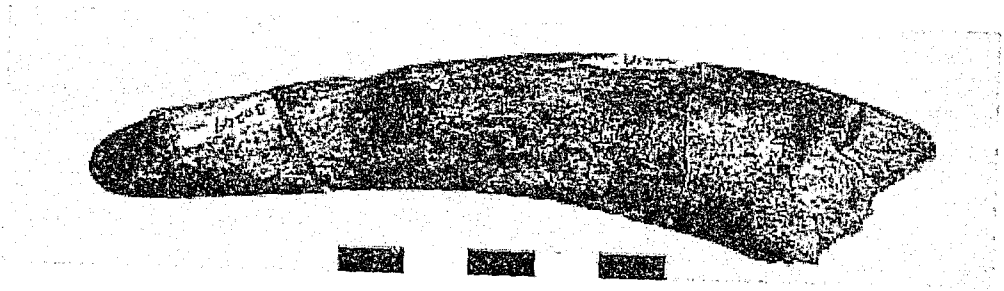


Figure 132. Swartkrans specimen SKX 30246/9. Anterior view (top; scale = 1 cm) and SEM image of wear pattern.

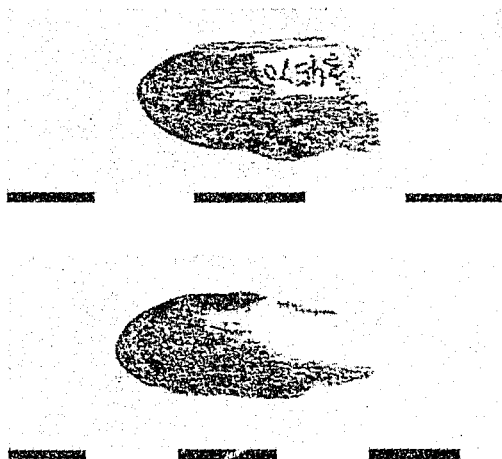


Figure 133. Swartkrans specimen SKX 34570. Anterior (top) and posterior views. Scale = 1 cm.

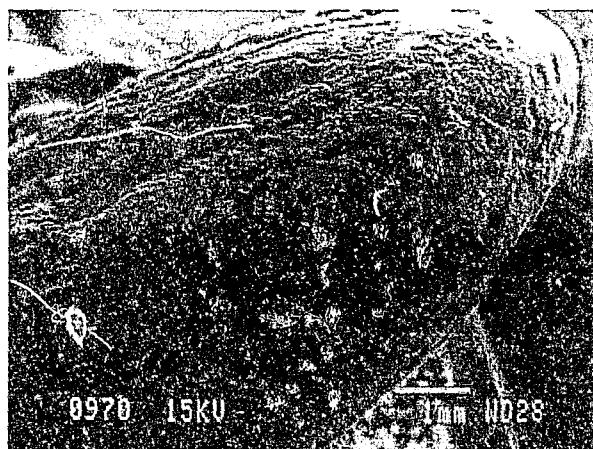


Figure 134. SEM image of SKX 34570.

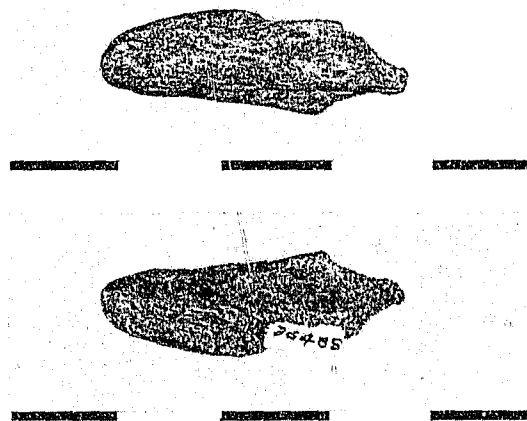


Figure 135. Swartkrans specimen SKX 36485. Anterior (top) and posterior views. Scale = 1 cm.

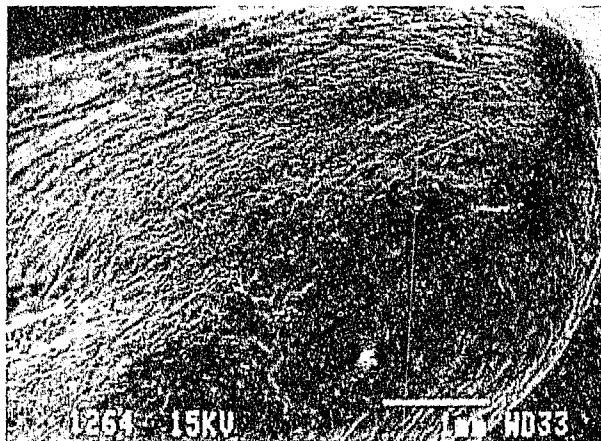
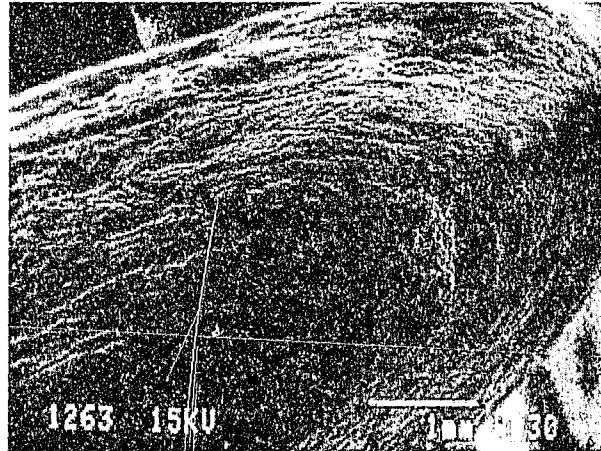


Figure 136. SEM images of SKX 36485.

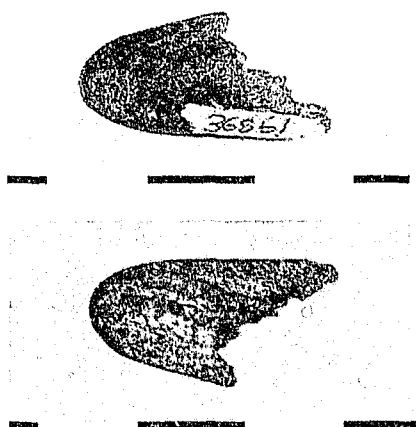


Figure 137. Swartkrans specimen SKX 36861. Anterior (top) and posterior views.
Scale = 1 cm.

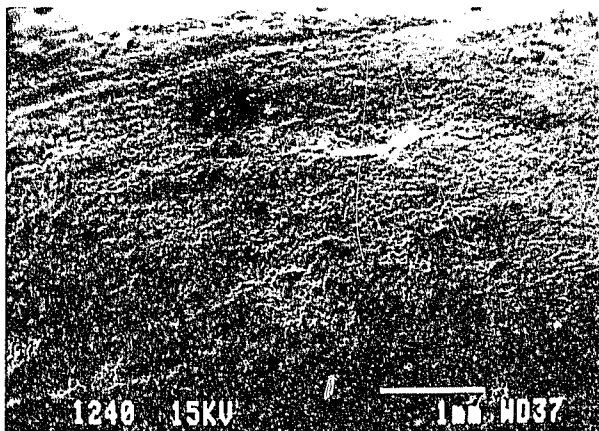
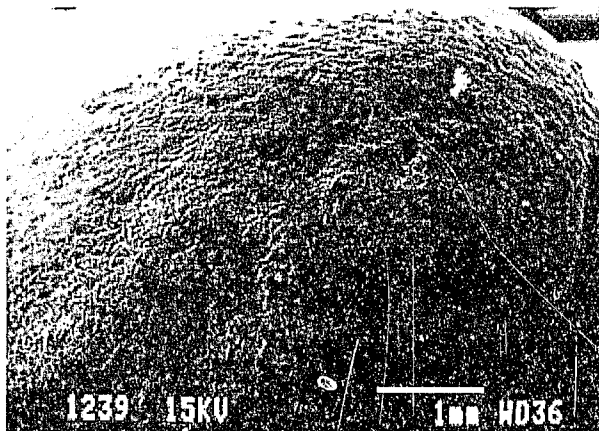


Figure 138. SEM images of tip of SKX 36861. Note absence of wear pattern.

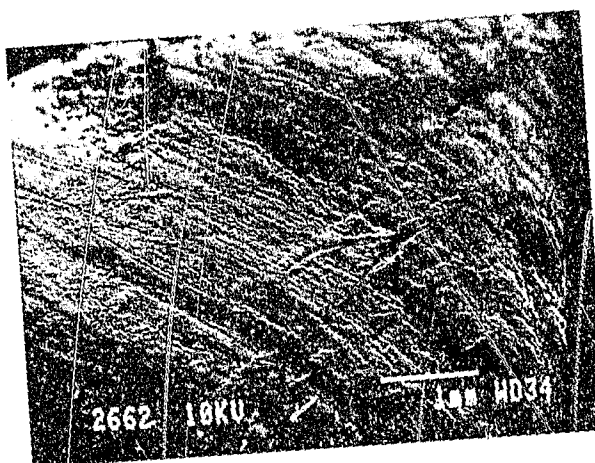
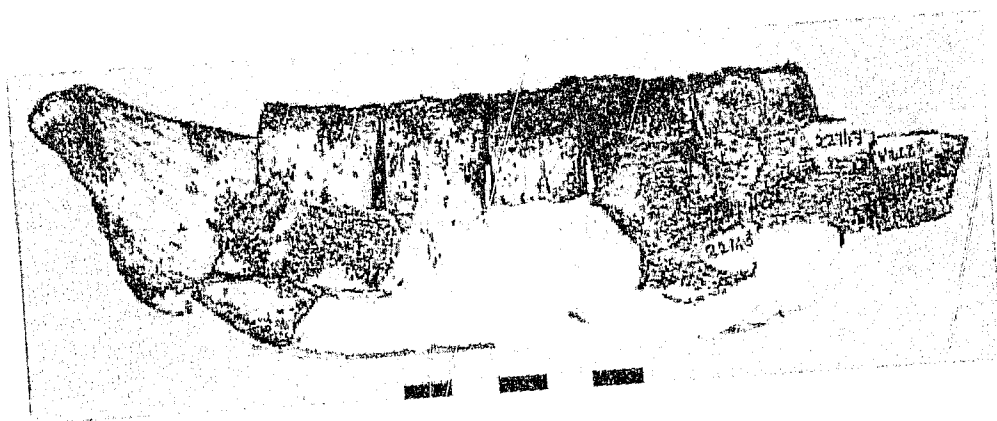


Figure 139. Swartkrans image SKX 29388. Anterior view (top; scale = 1 cm) and SEM image of wear pattern.

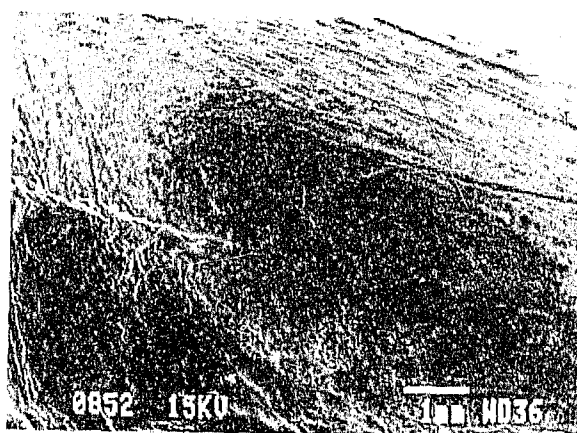
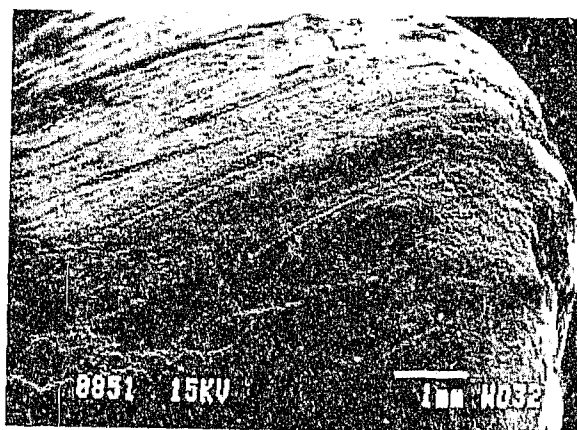


Figure 140. SEM images of SKX 29388.

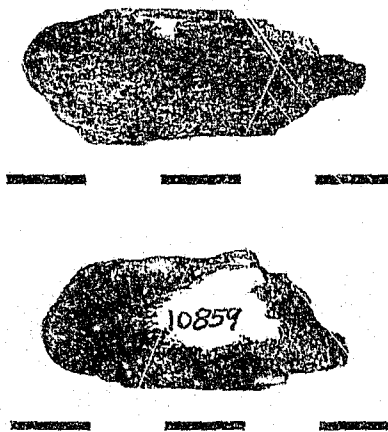


Figure 141. Swartkrans specimen SKX 10859. Anterior (top) and posterior views.
Scale = 1 cm.

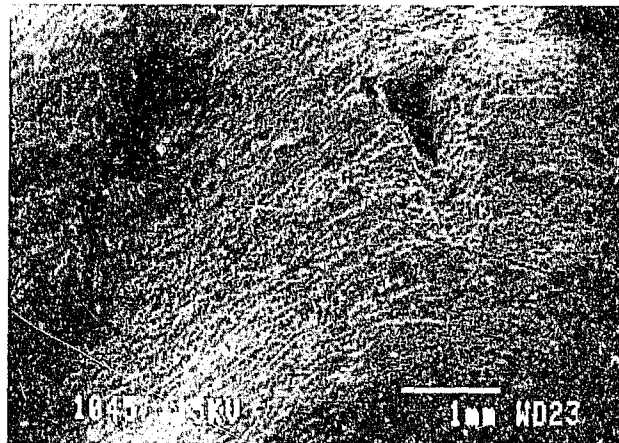


Figure 142. SEM image of SKX 10859.

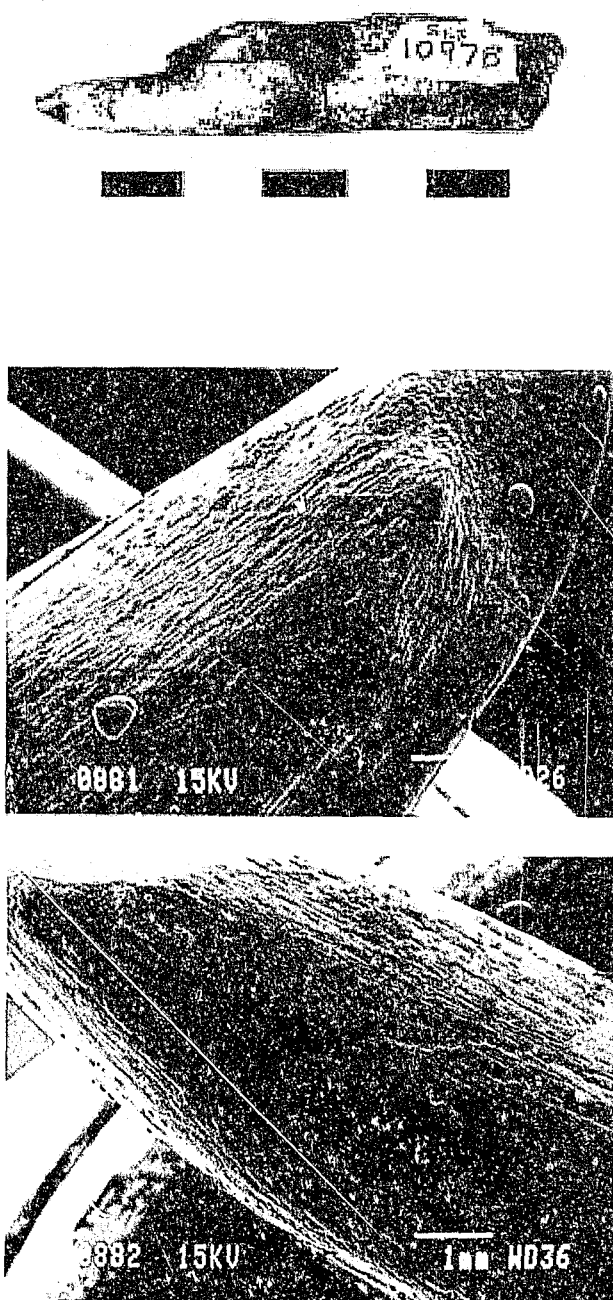


Figure 143. Swartkrans specimen SKX 10978. Anterior view (top; scale = 1 cm) and SEM images.

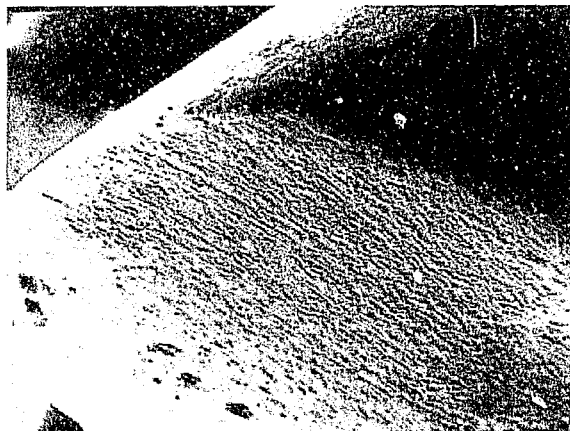
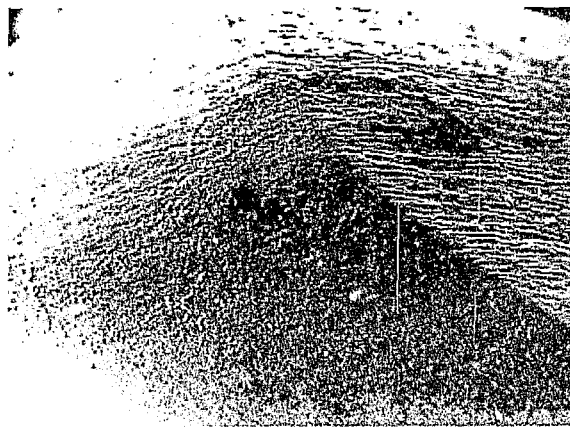
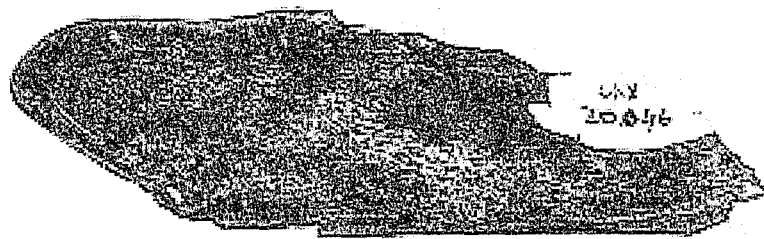


Figure 144. Swartkrans specimen SKX 20046. Anterior view (top; scale = 1 cm) and SEM images.

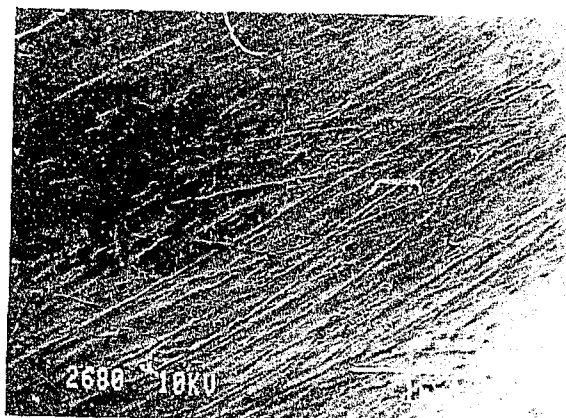
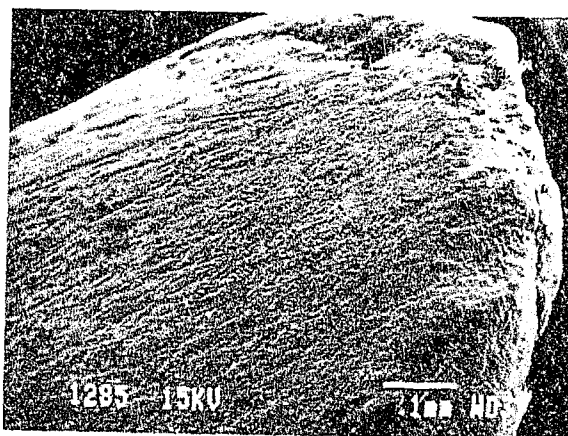
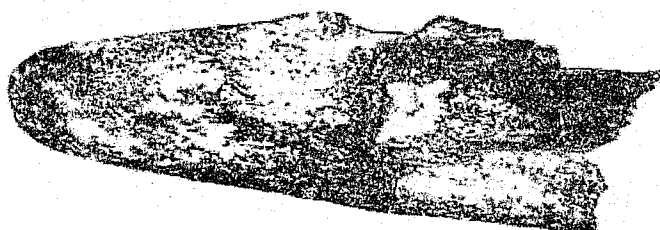


Figure 145. Swartkrans specimen SKX 20081. Anterior view (top; scale = 1 cm) and SEM images of wear pattern.

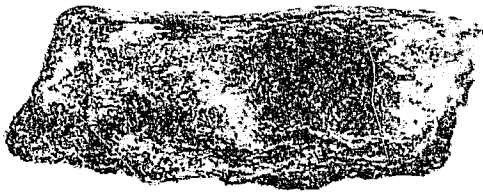


Figure 146. Swartkrans specimen SKX 21617. Anterior (top) and posterior views.
Scale = 1 cm.

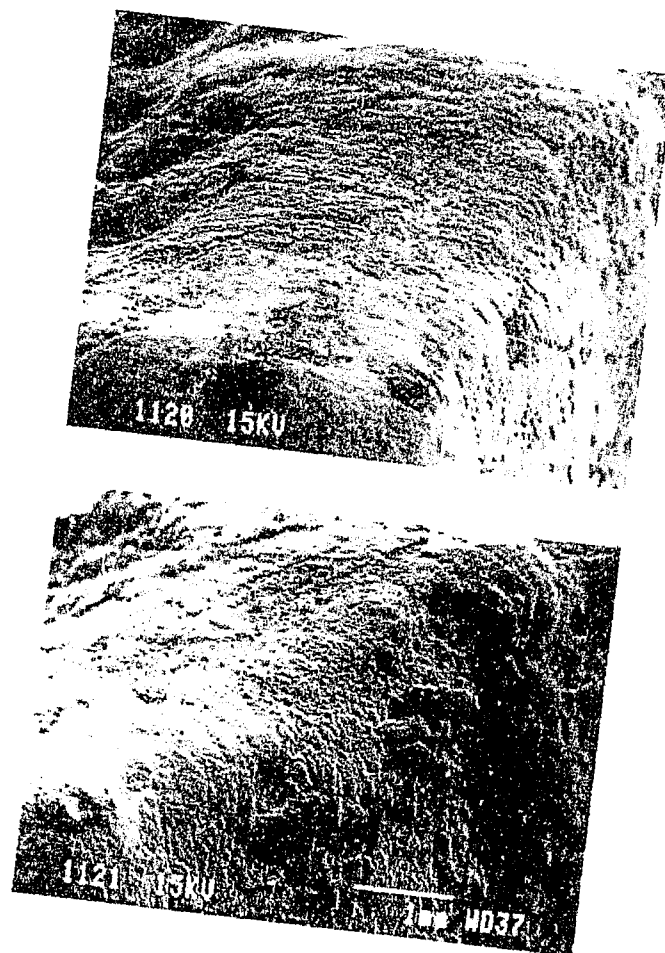


Figure 147. SEM images of SKX 21617.

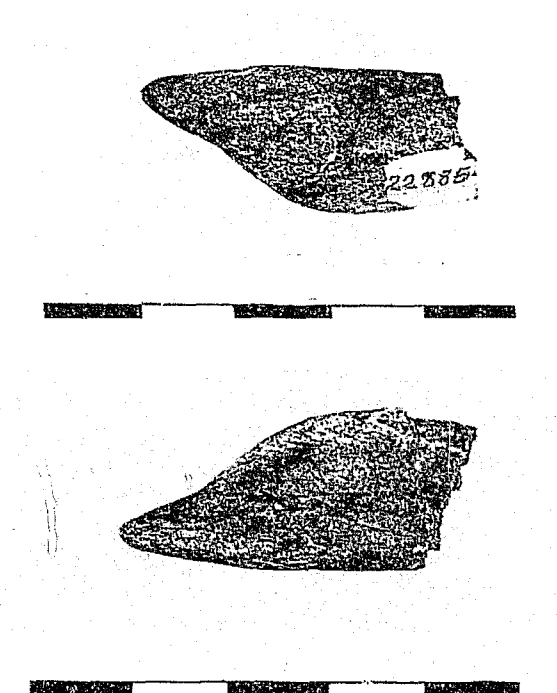


Figure 148. Swartkrans specimen SKX 22885. Anterior (top) and posterior views.
Scale = 1 cm.

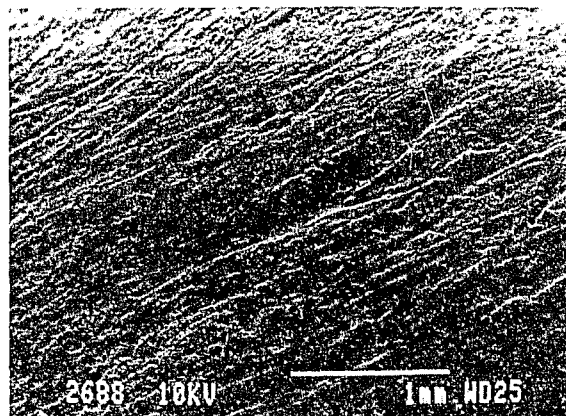
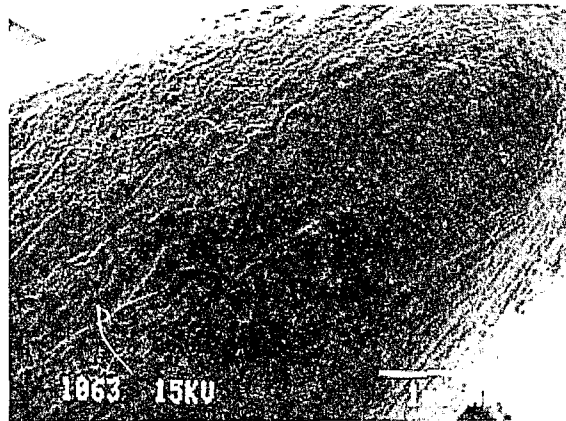


Figure 149. SEM images of SKX 22885.

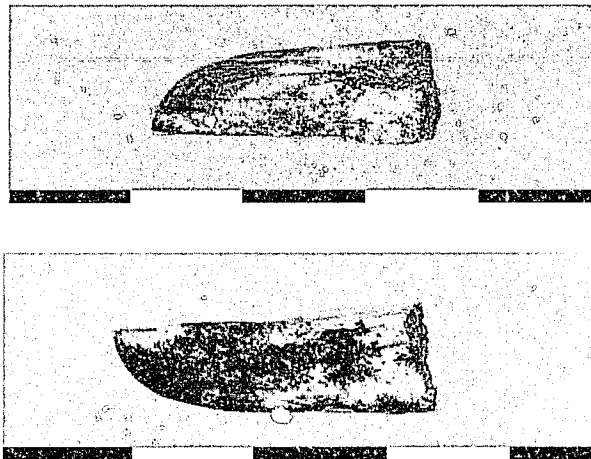


Figure 150. Swartkrans specimen SKX 22933a. Anterior (top) and posterior views. Scale = 1 cm.

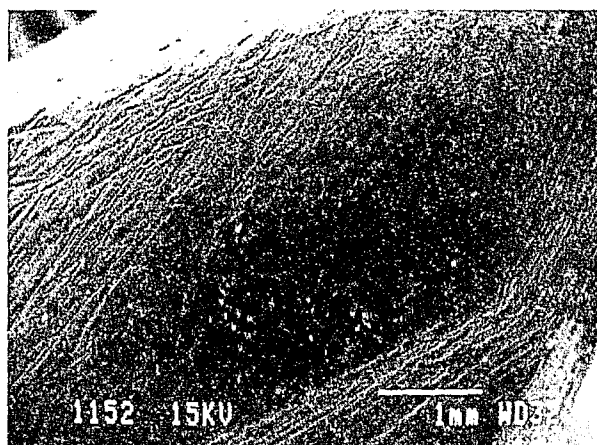


Figure 151. SEM image of SKX 22933a.

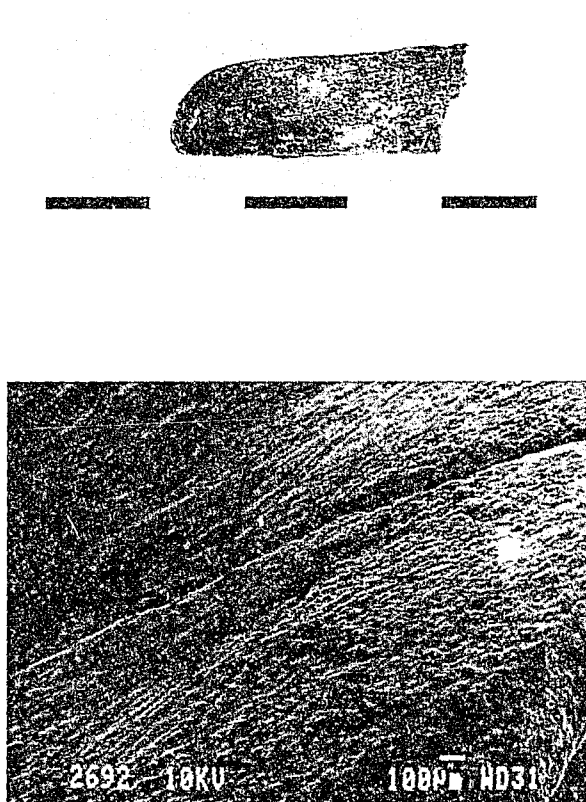


Figure 152. Swartkrans specimen SKX 25678. Anterior view (top) and SEM image of wear pattern. Scale = 1 cm.

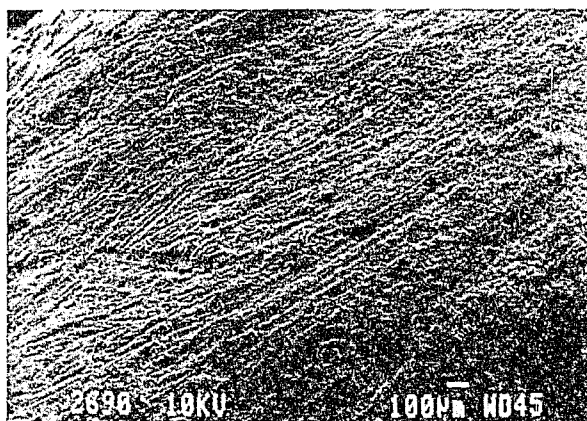
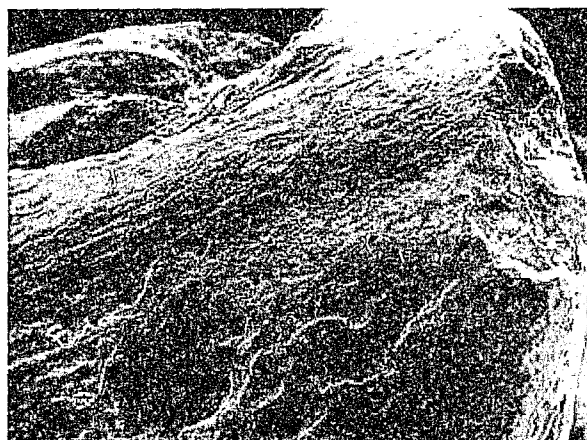


Figure 153. SEM images of SKX 25678.

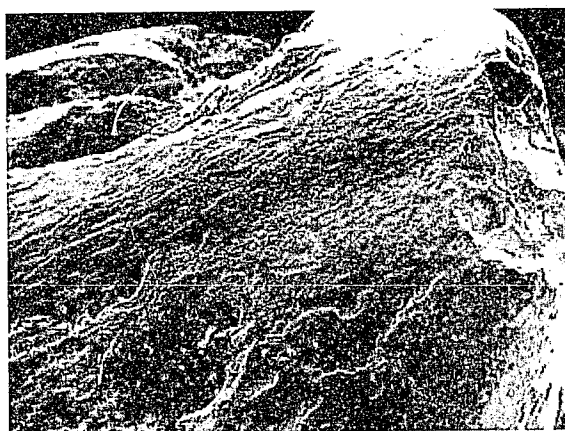
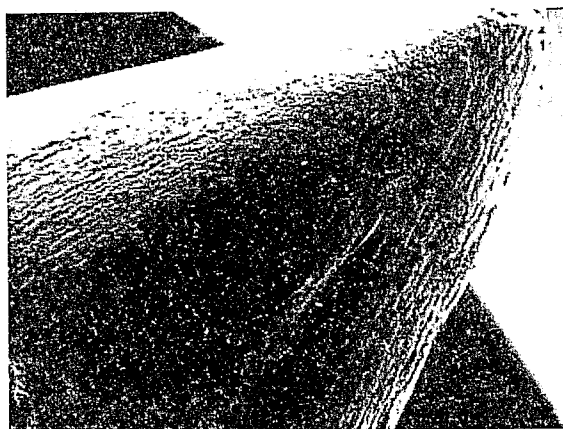
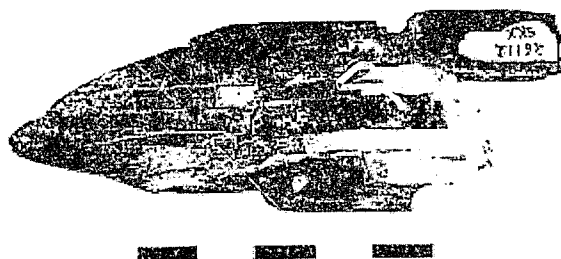


Figure 154. Swartkrans specimen SKX 26112. Anterior view (top; scale = 1 cm) and SEM images.

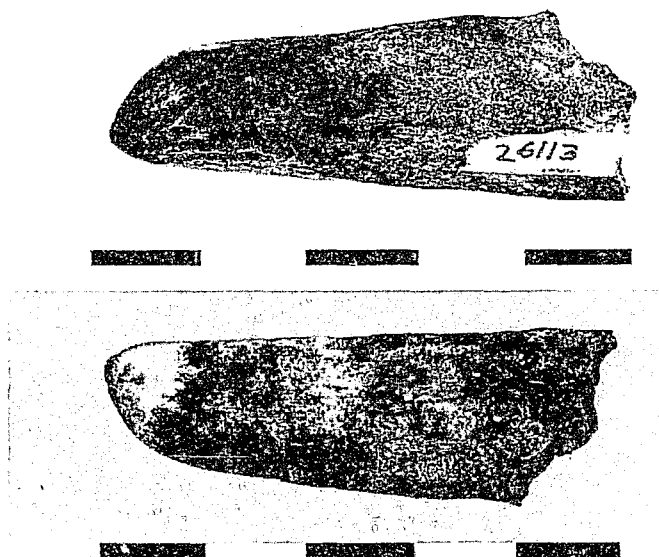


Figure 155. Swartkrans specimen SKX 26113. Anterior and posterior views.
Scale = 1 cm.

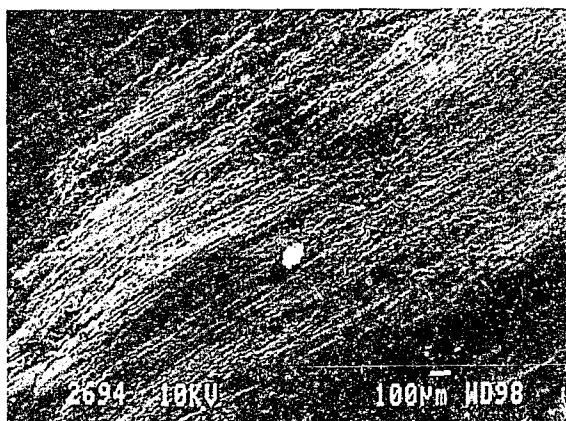
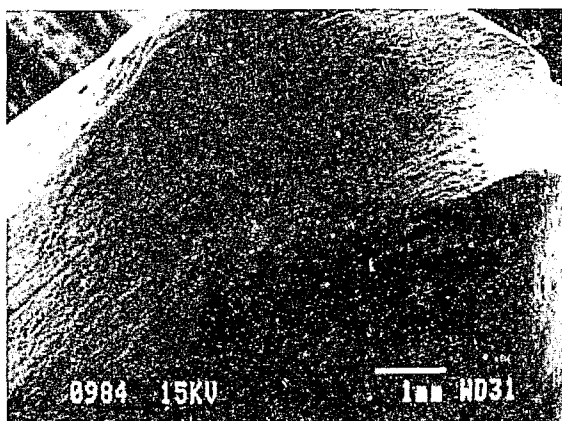


Figure 156. SEM images of SKX 26113.

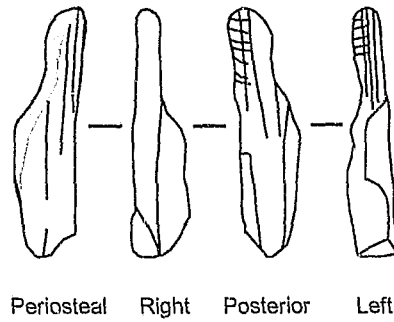
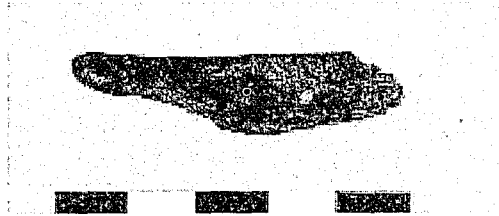


Figure 157. Swartkrans specimen SKX 26138. Anterior view (top; scale = 1 cm) and diagram showing striations.

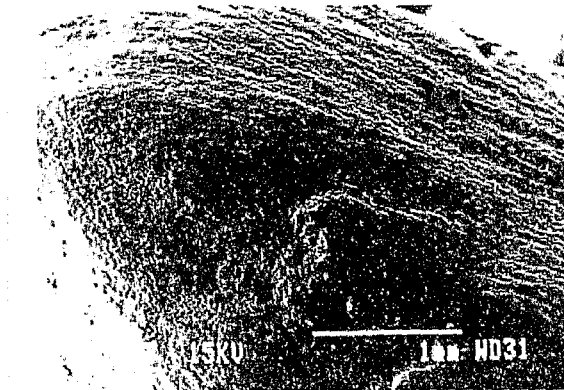
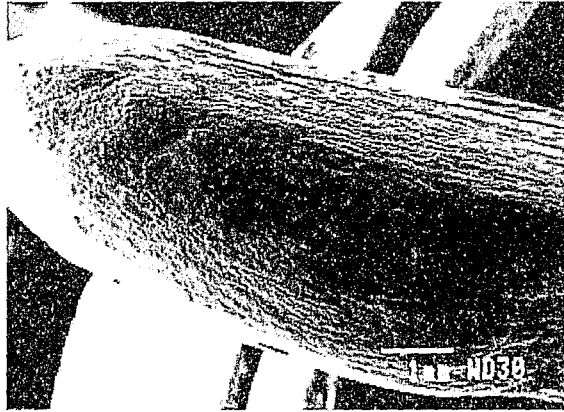


Figure 158. SEM Images of SKX 26138.

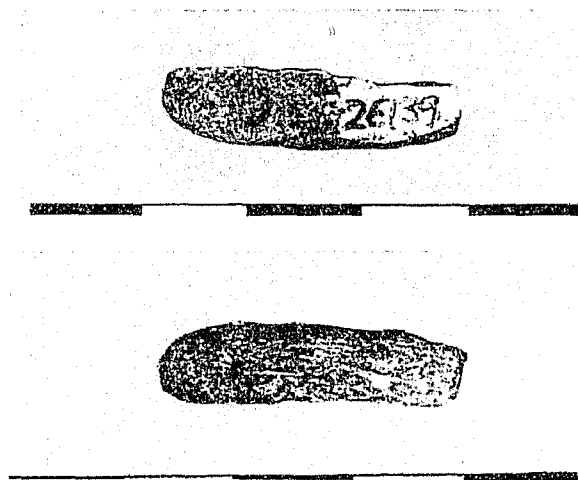


Figure 159. Swartkrans specimen SKX 26139. Anterior (top) and posterior views.
Scale = 1 cm.

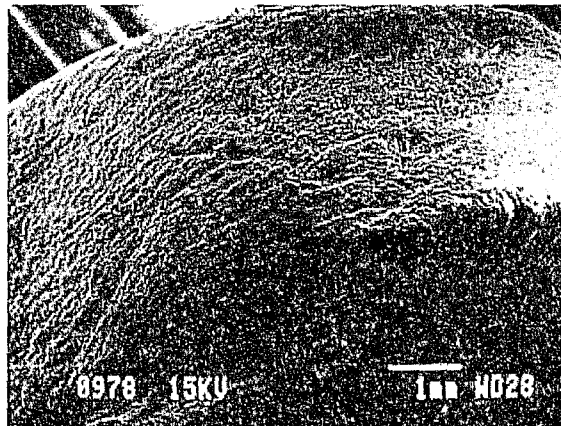
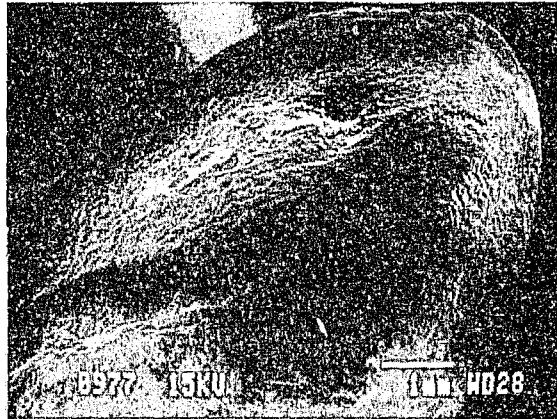


Figure 160. SEM images of SKX 26139.

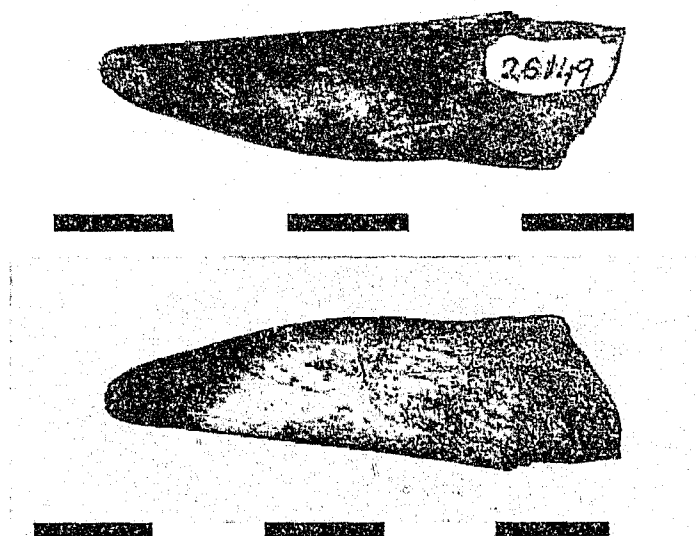


Figure 161. Swartkrans specimen SKX 26149. Anterior (top) and posterior views.
Scale = 1 cm.

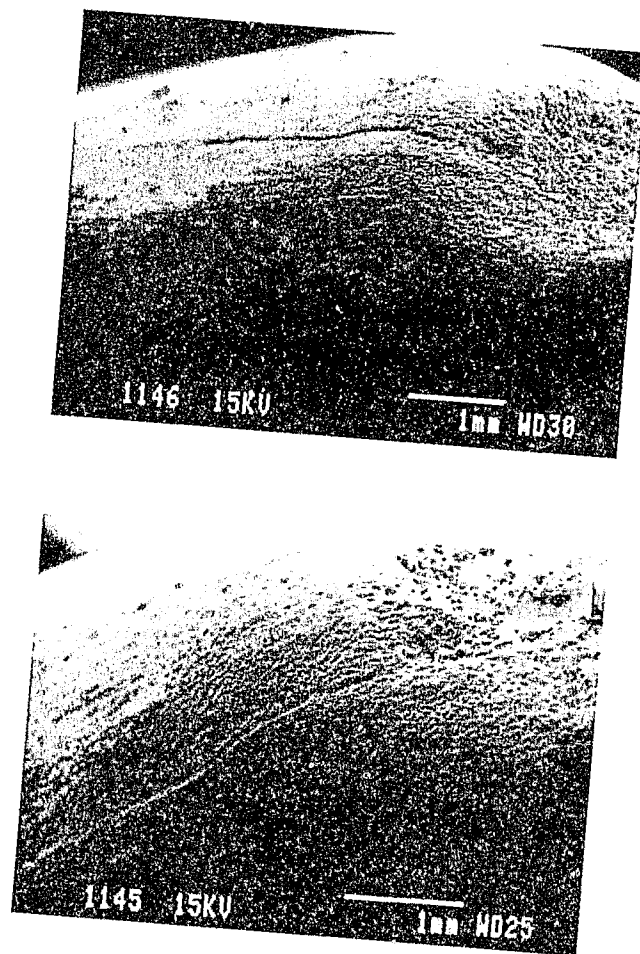


Figure 162. SEM images of SKX 26149.

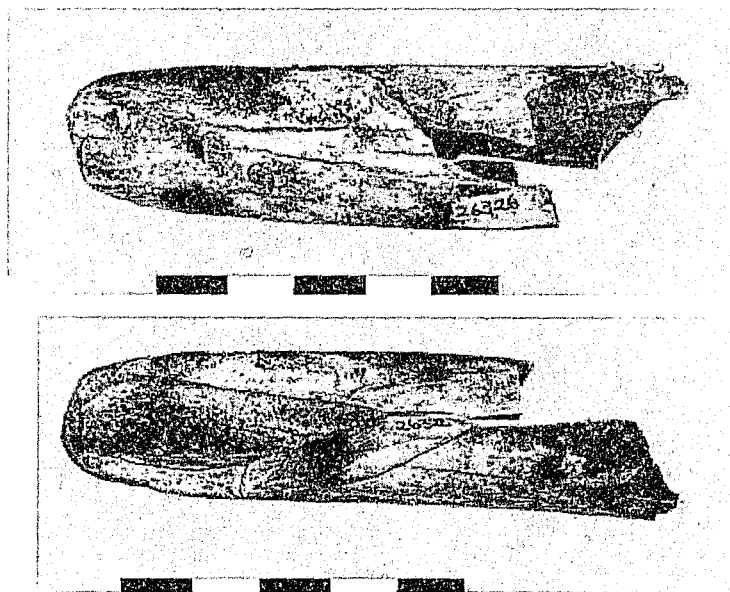


Figure 163. Swartkrans specimen SKX 26324. Anterior (top) and posterior views. Scale = 1 cm.

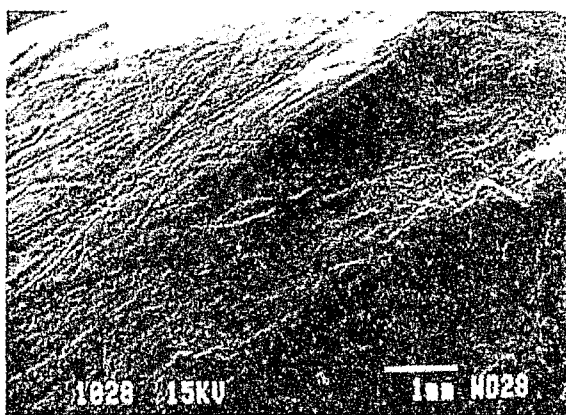
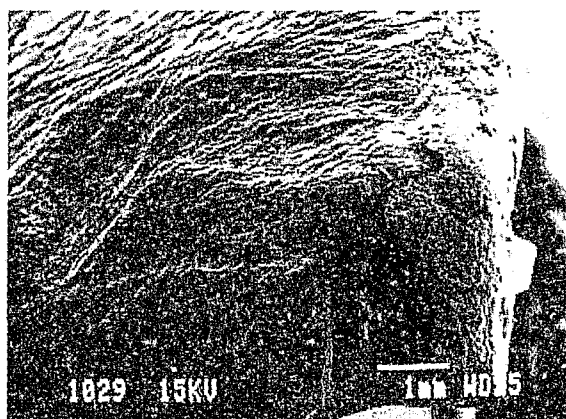


Figure 164. SEM images of SKX 26324.

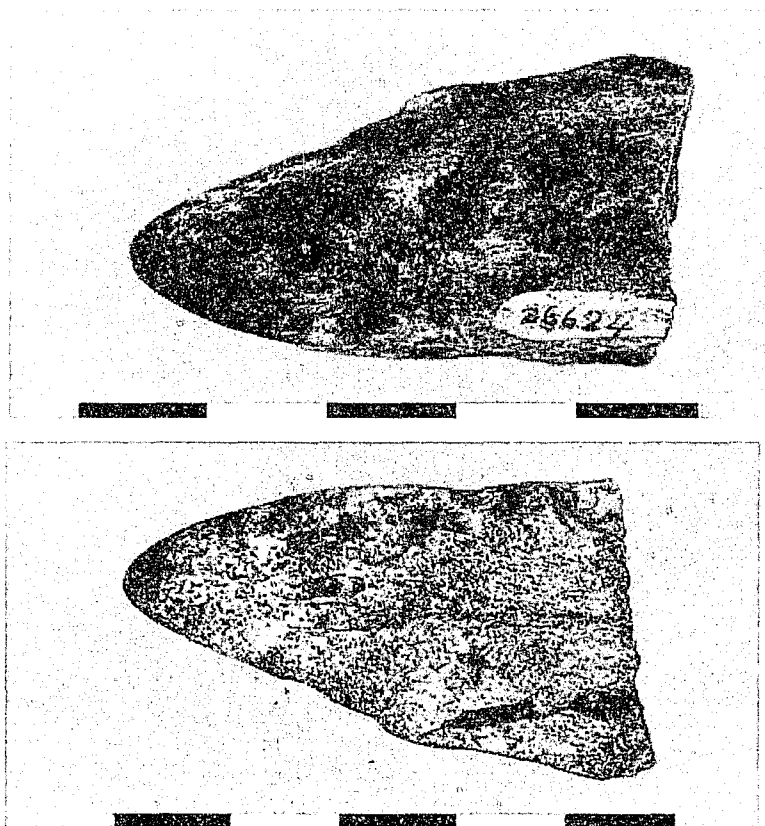


Figure 165. Swartkrans specimen SKX 26624. Anterior (top) and posterior views.
Scale = 1 cm.

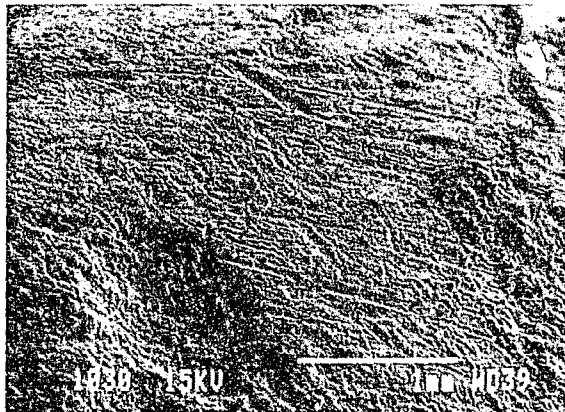


Figure 166. SEM images of SKX 26624.

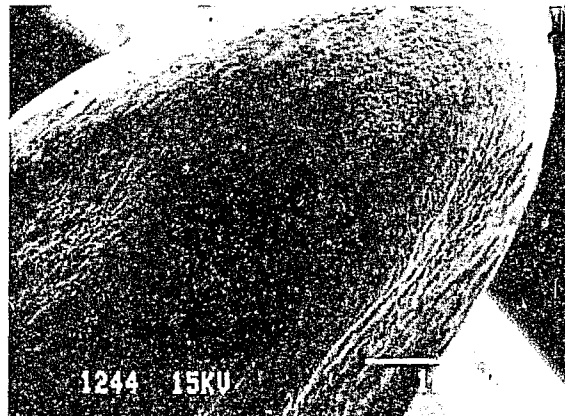
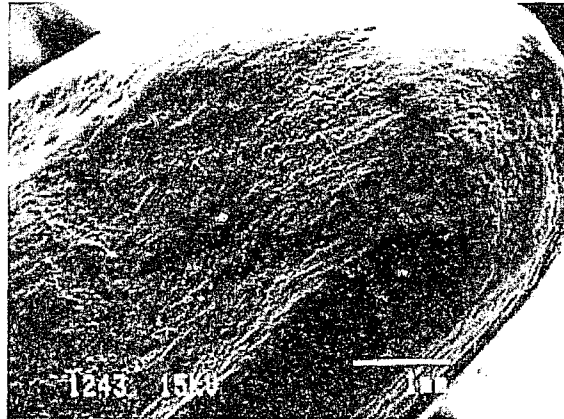


Figure 168. SEM images of SKX 28076.

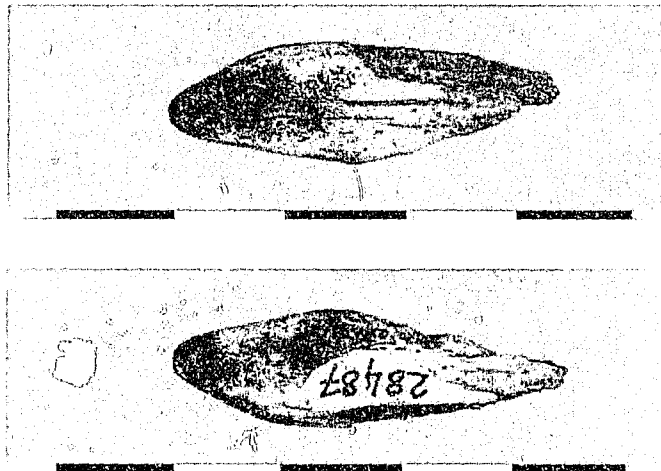


Figure 169. Swartkrans specimen SKX 28487. Anterior (top) and posterior views. Scale = 1 cm.

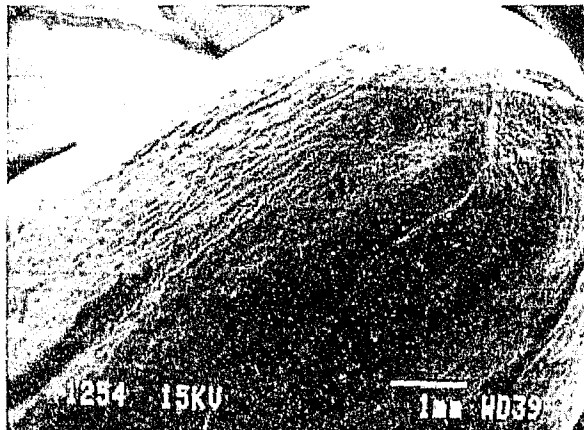
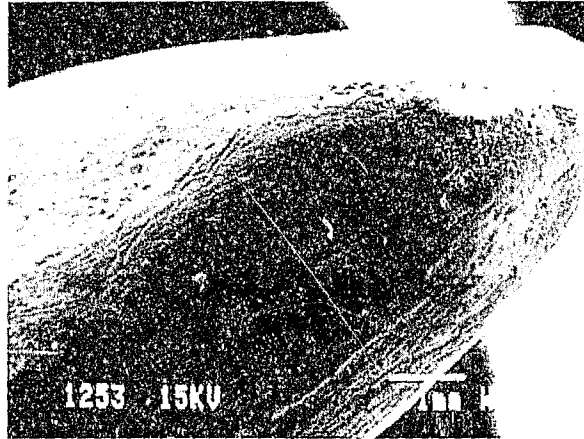


Figure 170. SEM images of SKX 28487.

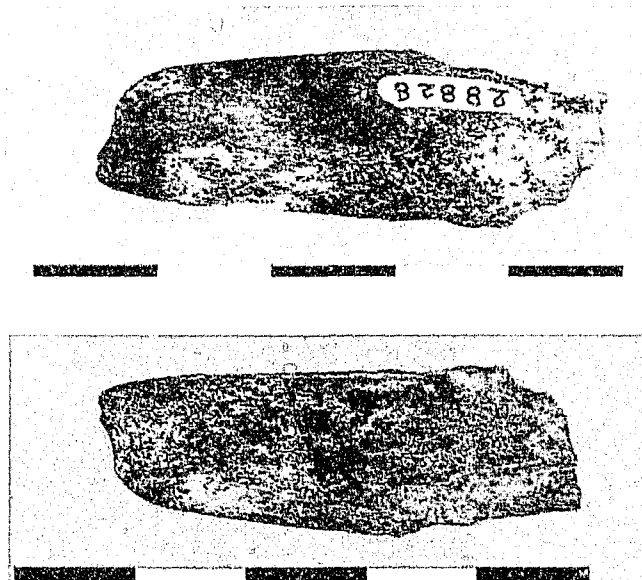


Figure 171. Swartkrans specimen SKX 28828. Anterior (top) and posterior views. Scale = 1 cm.

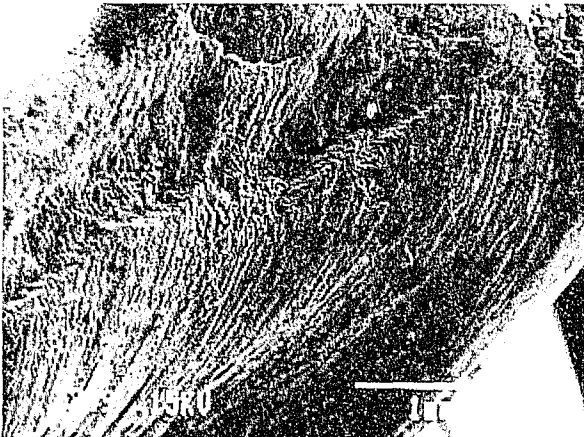
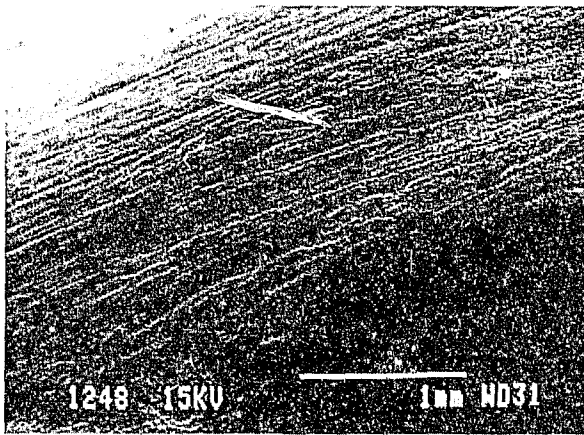
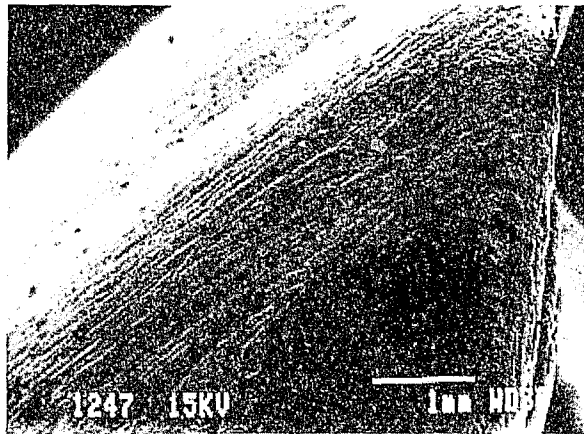


Figure 172. SEM images of SKX 28828.

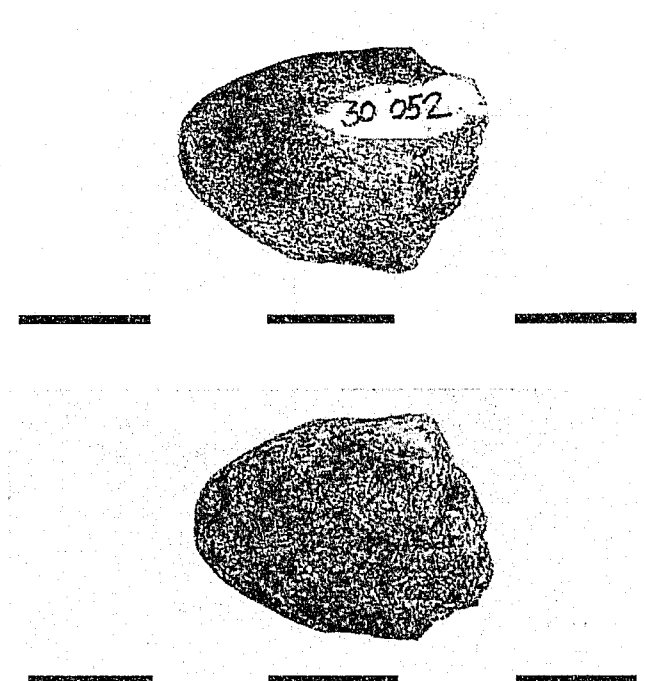


Figure 173. Swartkrans specimen SKX 30052. Anterior (top) and posterior views.
Scale = 1 cm.

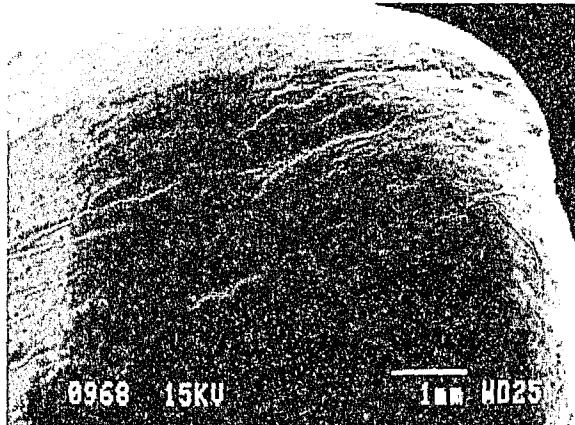
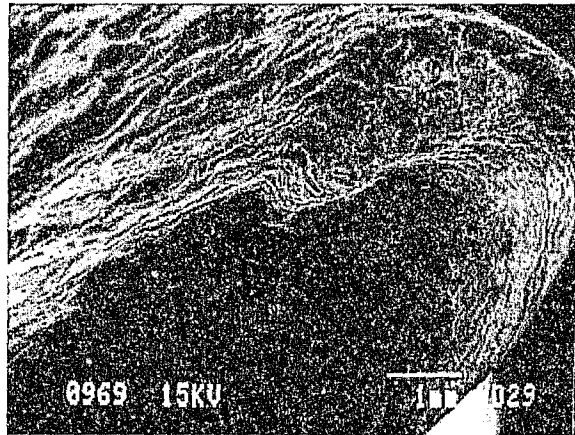


Figure 174. SEM images of SKX 30052.

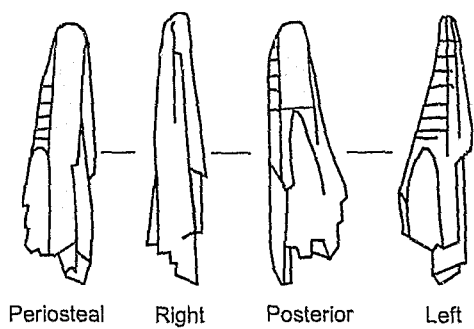
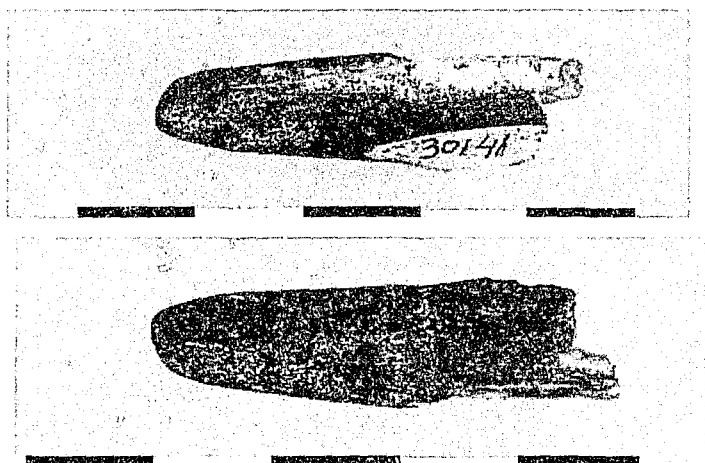


Figure 175. Swartkrans specimen SKX 30141. Anterior (top; scale = 1 cm) and posterior views. Diagram showing striations (below).

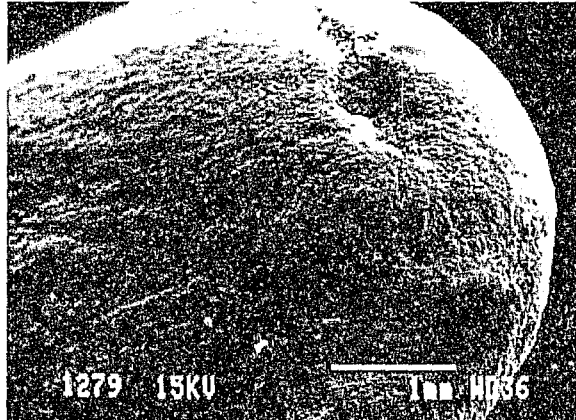
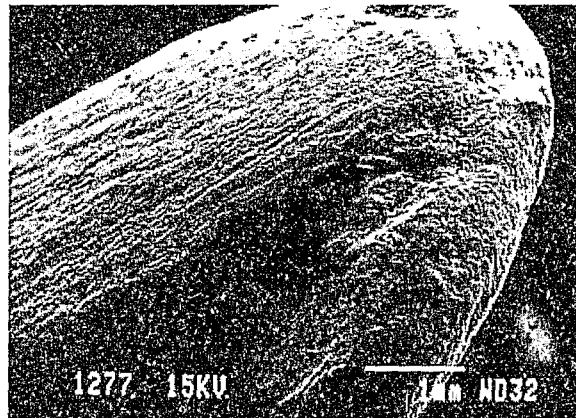


Figure 176. SEM images of SKX 30141.

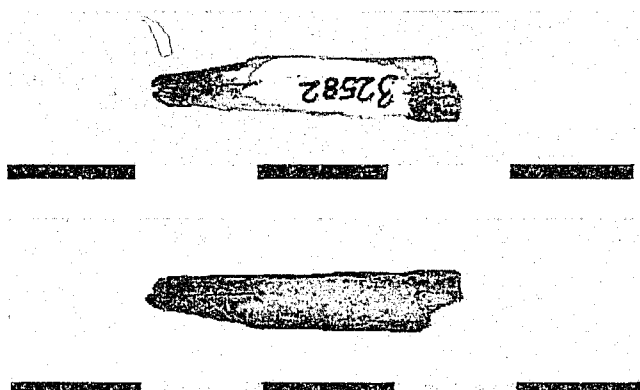


Figure 177. Swartkrans specimen SKX 32582. Anterior (top) and posterior views. Scale =1 cm.

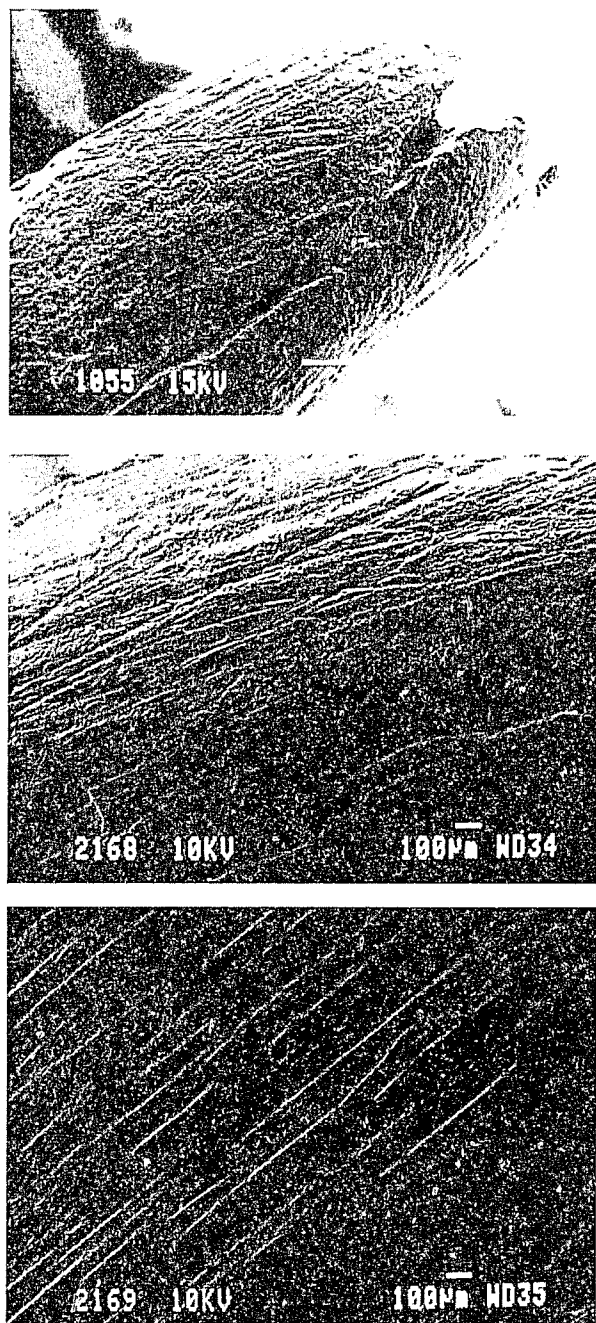


Figure 178. SEM images of SKX 32582.

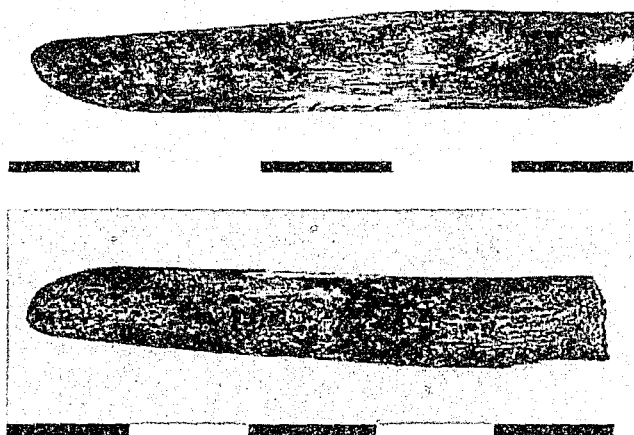


Figure 179. Swartkrans specimen SKX 32897. Anterior (top) and posterior views.
Scale = 1 cm.

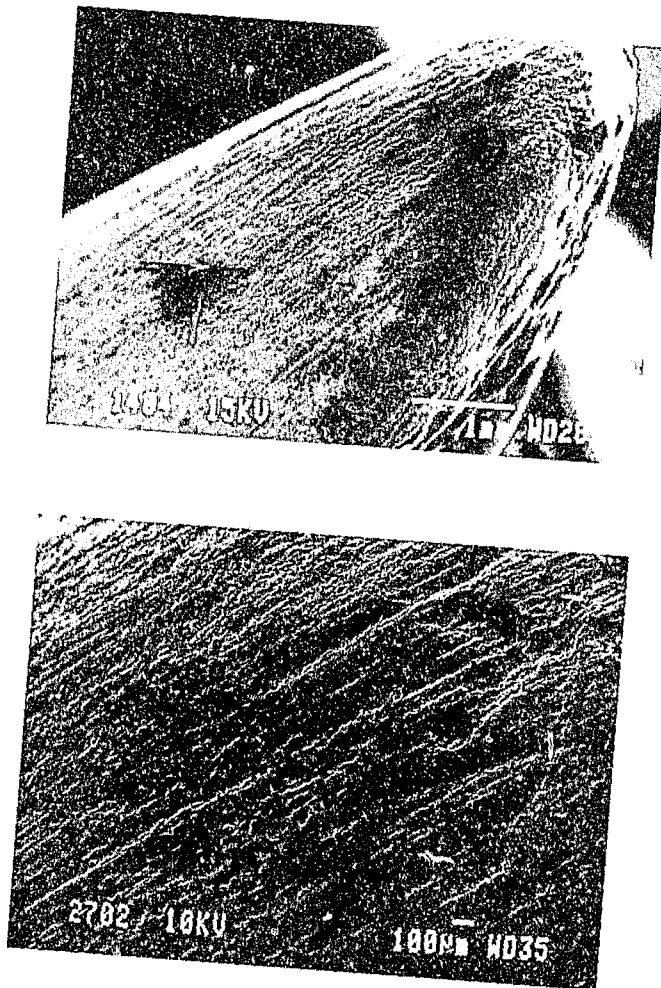


Figure 180. SEM images of SKX 32897.

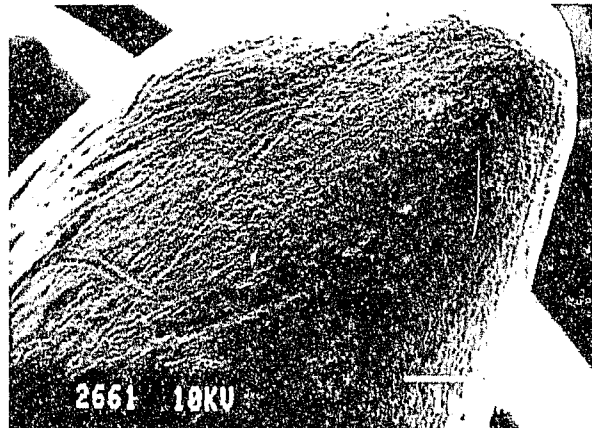
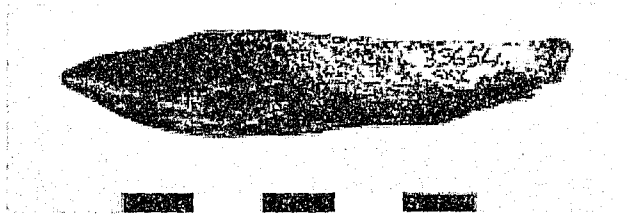


Figure 181. Swartkrans specimen SKX 33654. Anterior view (top; scale = 1cm) and SEM image of wear pattern.

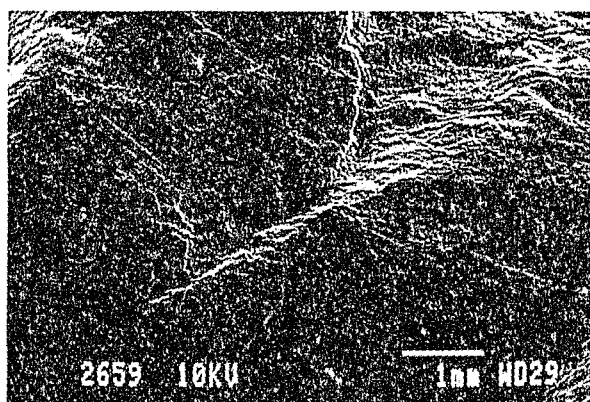
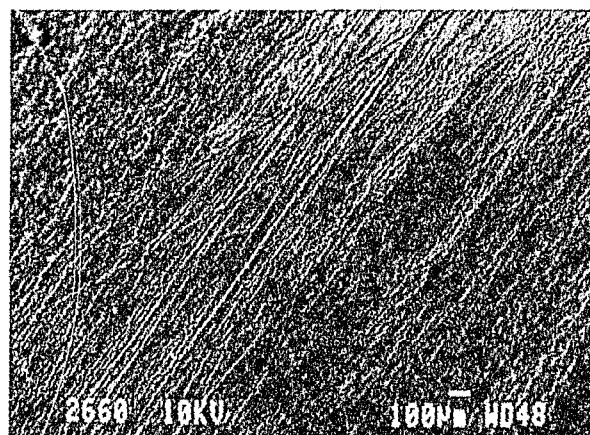


Figure 182. SEM images of SKX 33654.

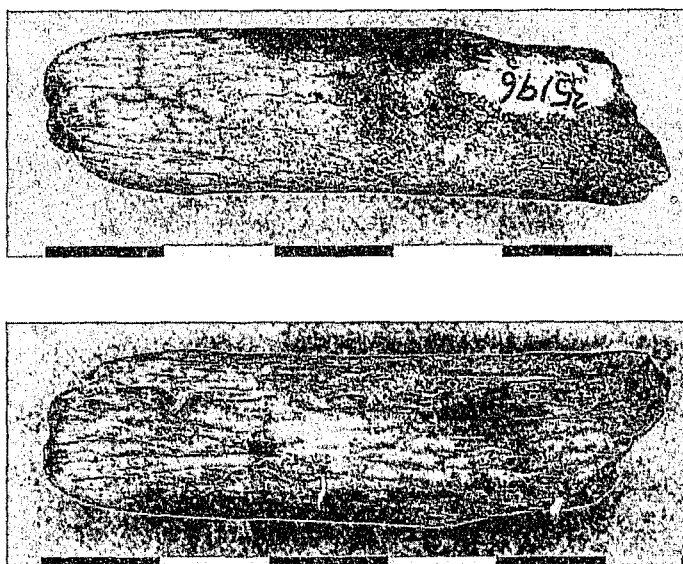


Figure 183. Swartkrans specimen SKX 35196. Anterior (top) and posterior views. Scale = 1 cm.

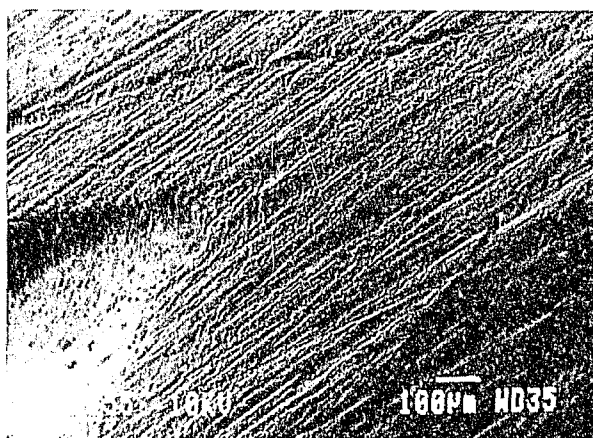
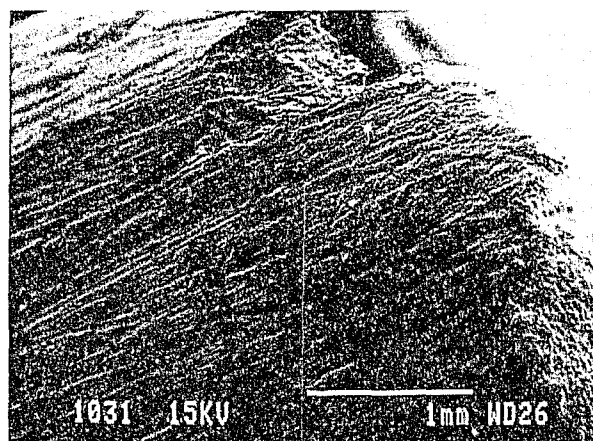


Figure 184. SEM images of SKX 35196.

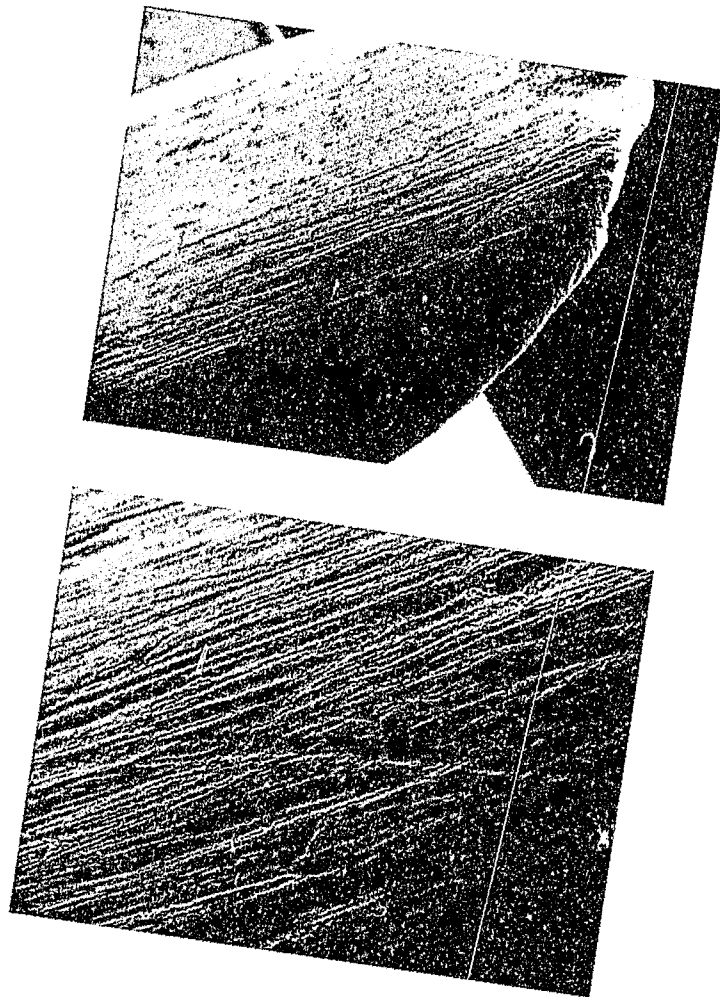


Figure 185. SEM Images of SKX 35196.

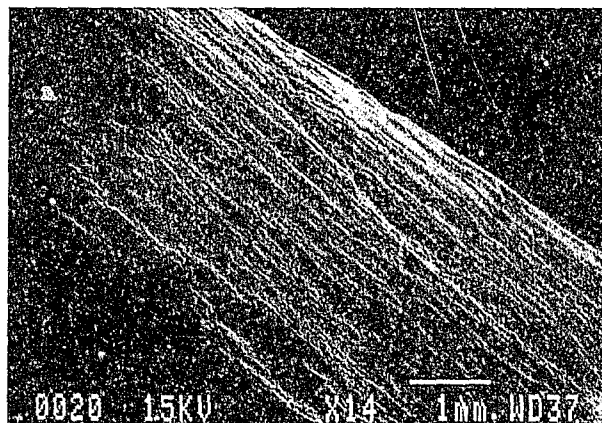
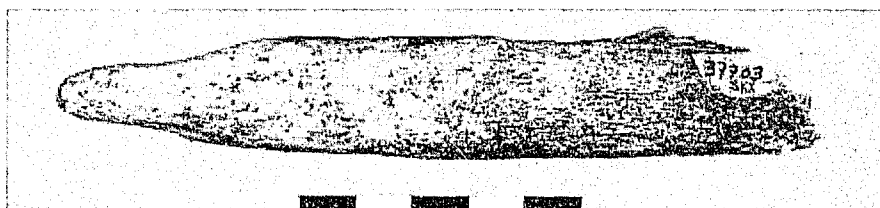


Figure 186. Swaiikrans specimen SKX 37703. Anterior view (top; scale = 1 cm) and SEM image of wear pattern.

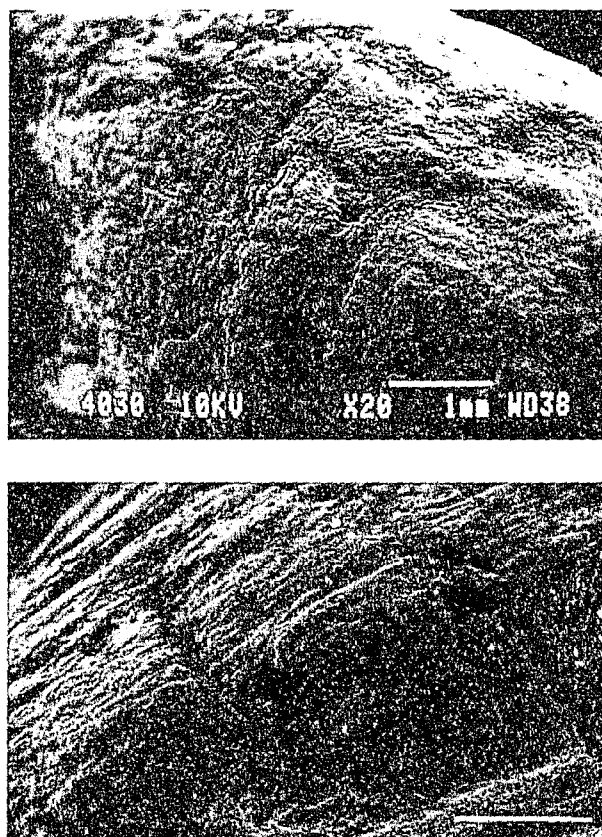


Figure 187. SEM images of SKX 37703.

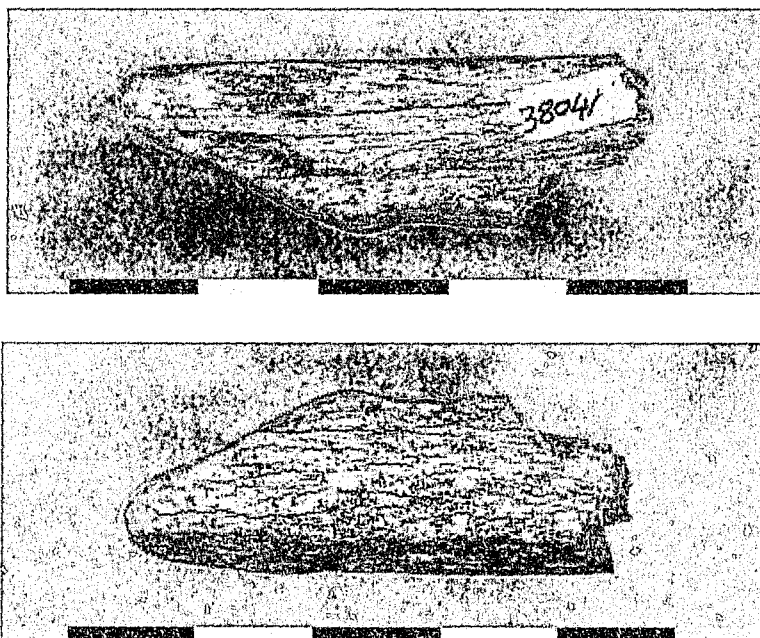


Figure 188. Swartskrans specimen SKX 38041. Anterior (top) and posterior views.
Scale = 1 cm.

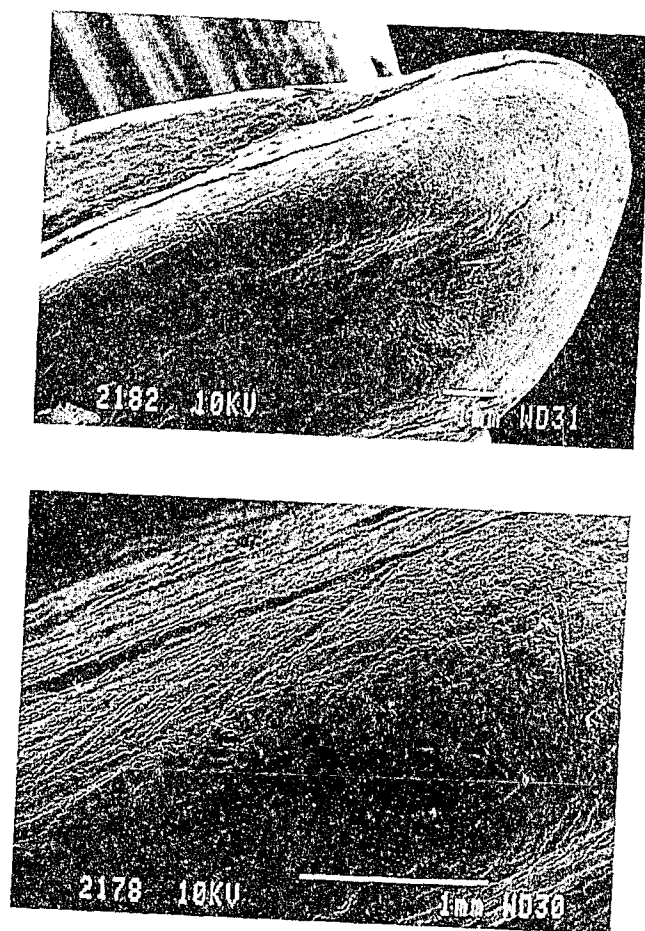


Figure 189. SEM images of SKX 38041.

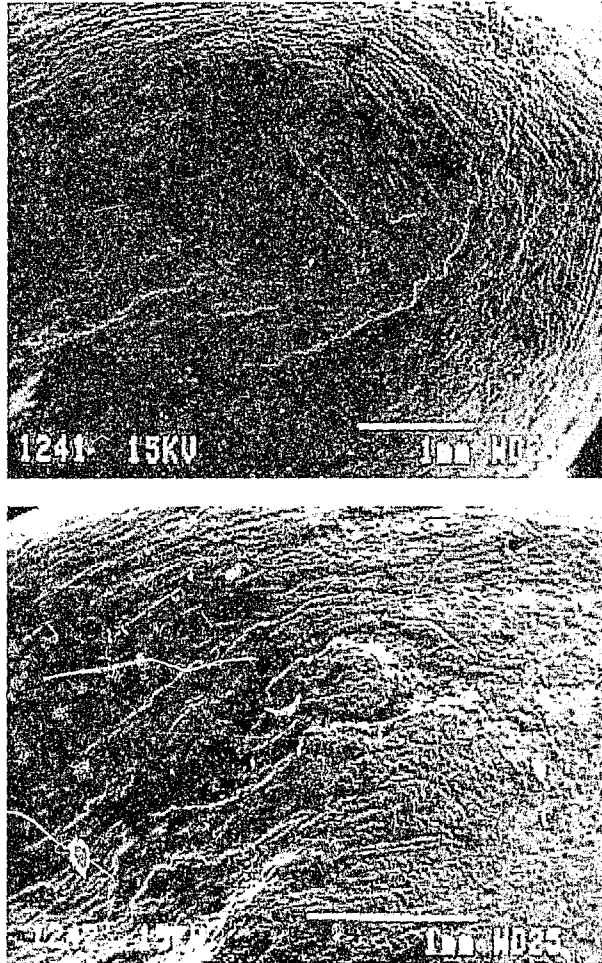


Figure 190. SEM images of SKX 38041.

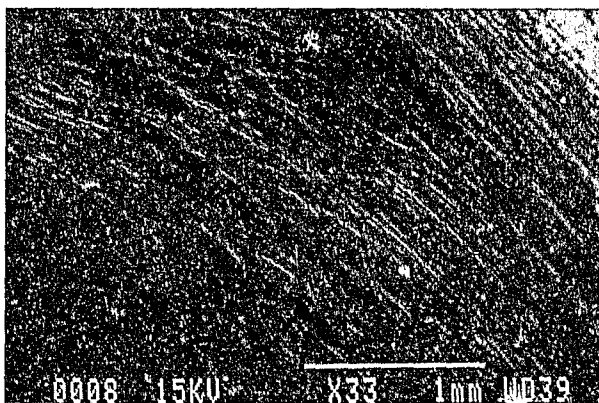
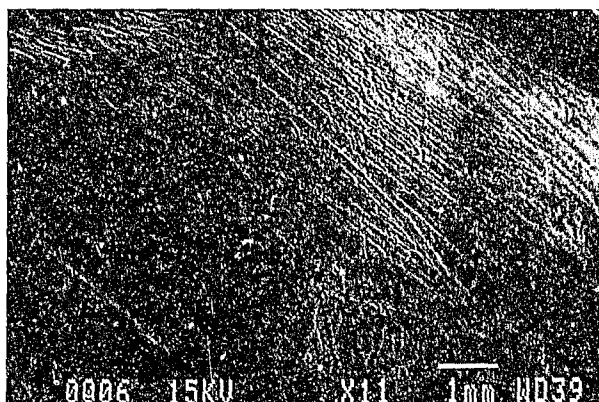
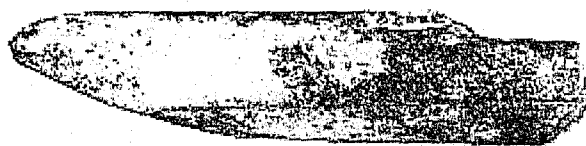


Figure 191. Swartkrans specimen SKX 38830. Anterior view (top; scale = 1 cm) and SEM images of wear pattern.

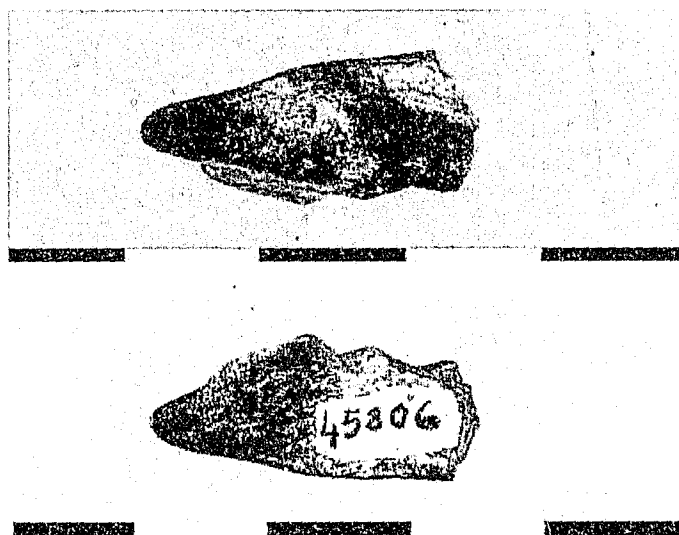


Figure 192. Swartkrans specimen SKX 45806. Anterior (top) and posterior views.
Scale = 1 cm.

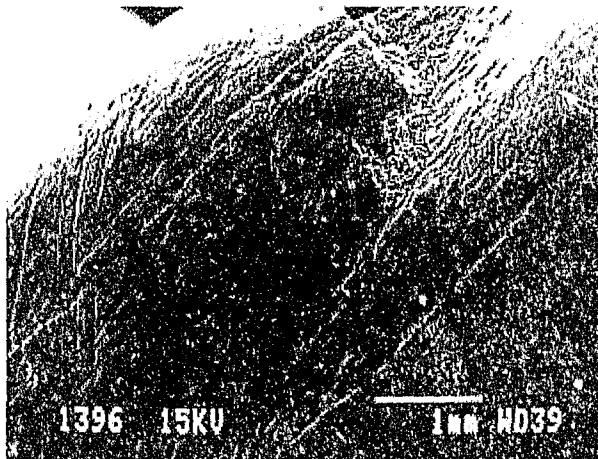
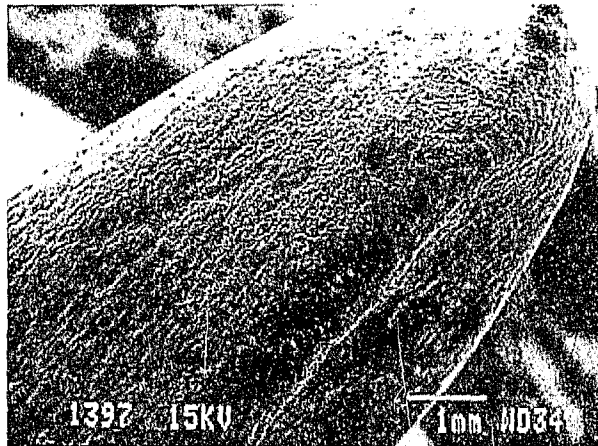


Figure 193. SEM images of SKX 45806.

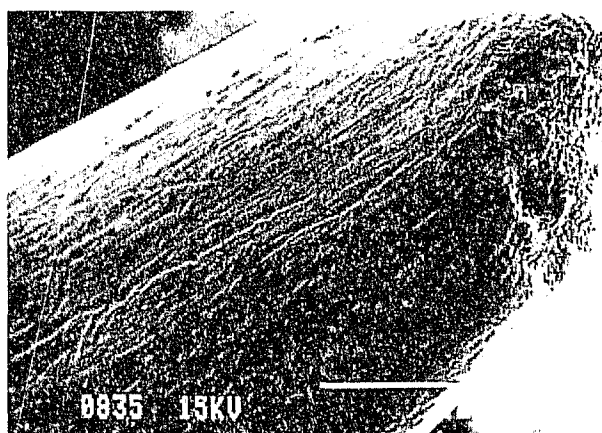
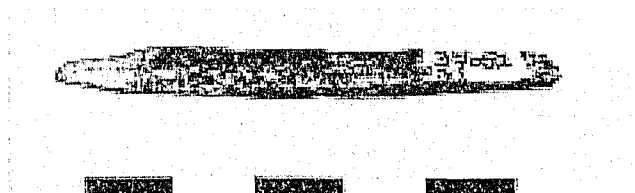


Figure 194. Swartkrans specimen SKX 37052. Anterior view (top; scale = 1 cm) and SEM image of wear pattern.

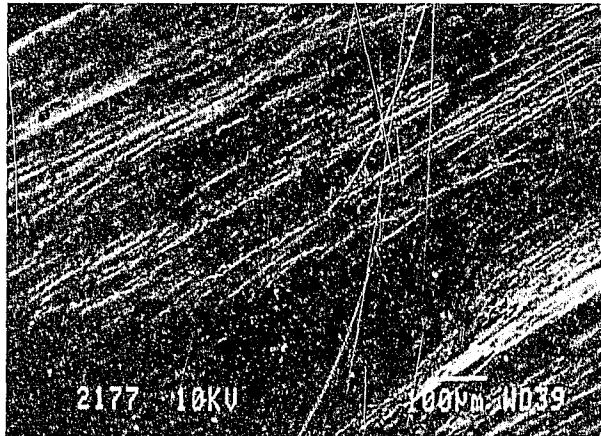
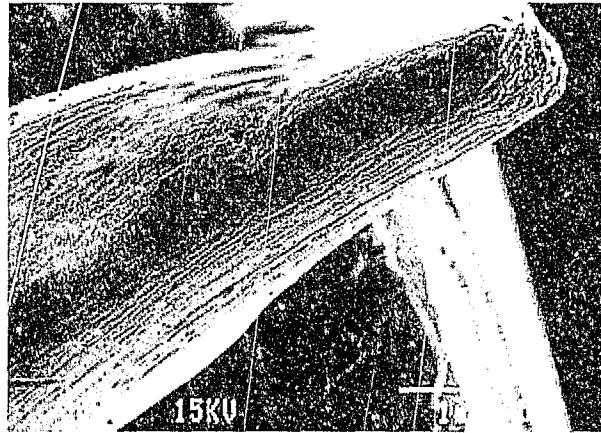


Figure 195. SEM images of SKX 37052.

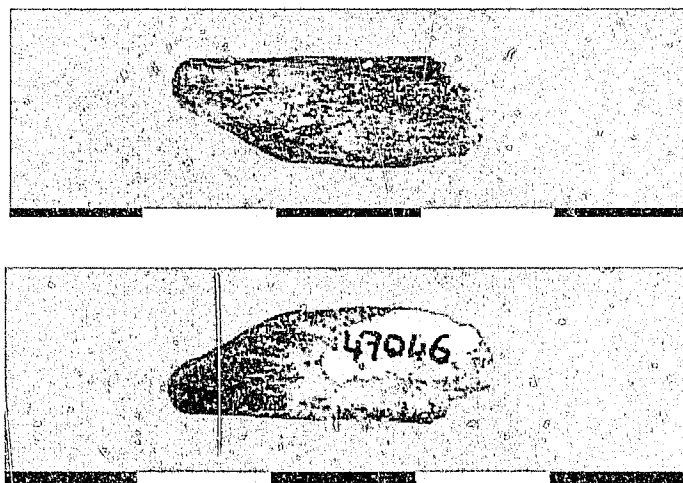


Figure 196. Swartkrans specimen SKX 47046. Anterior (top) and posterior views. Scale = 1 cm.

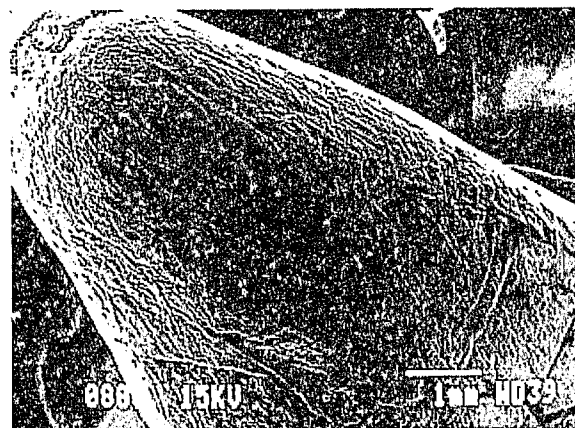
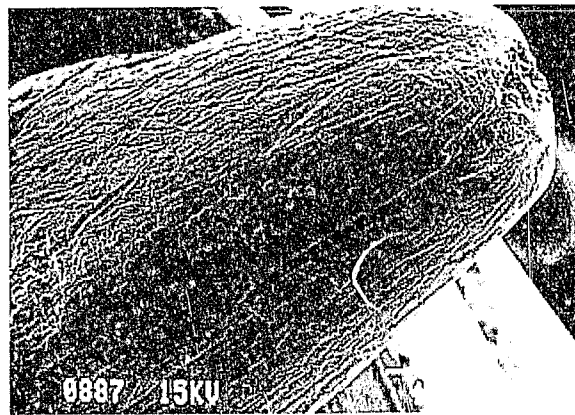
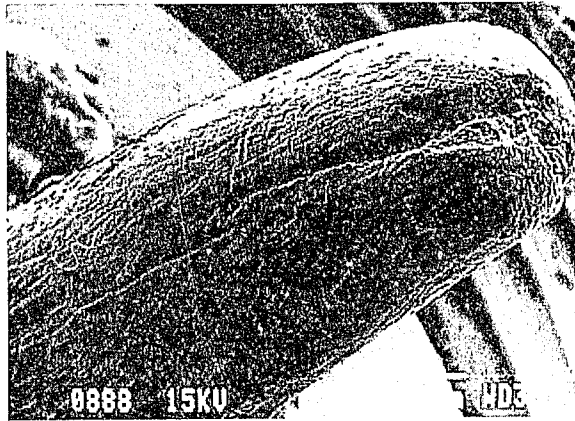


Figure 197. SEM images of SKX 47046.

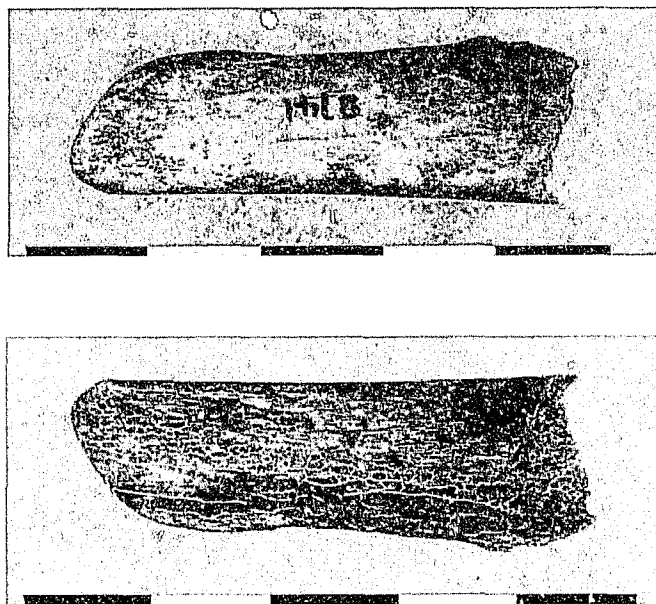


Figure 198. Swartkrans specimen SKX 8741. Anterior (top) and posterior views. Scale = 1 cm.

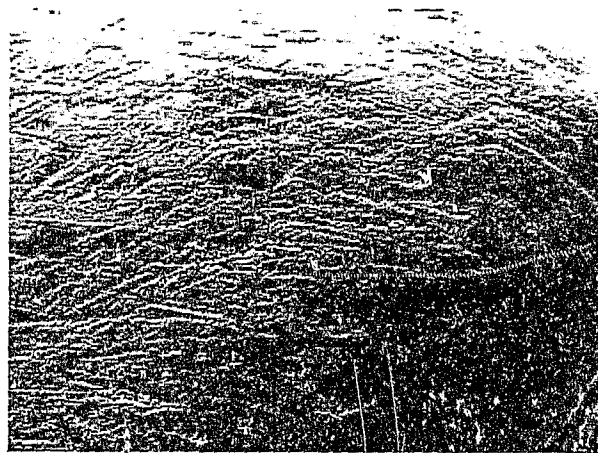


Figure 199. SEM images of SKX 8741.



Figure 200. Swartkrans specimen SKX 2787. Anterior (top) and posterior views.
Scale = 1 cm.

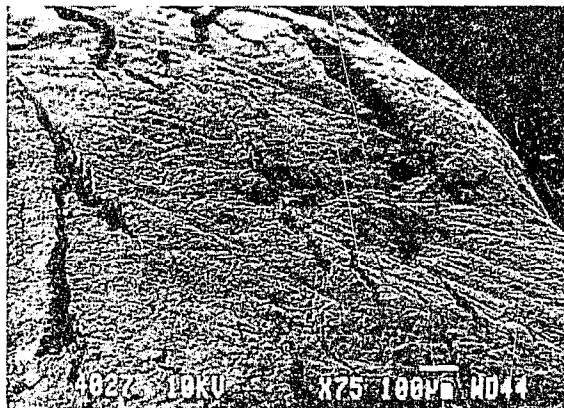
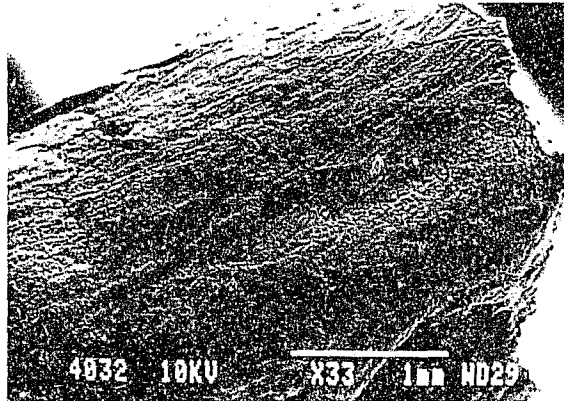


Figure 201. SEM images of SKX 2787.

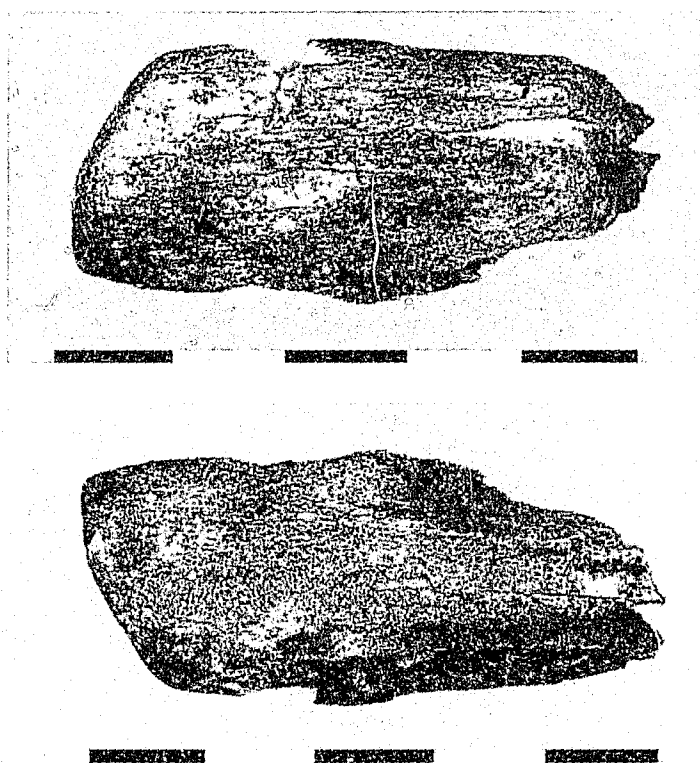


Figure 202. Swartkrans specimen SKX b. Anterior (top) and posterior views.
Scale = 1 cm.

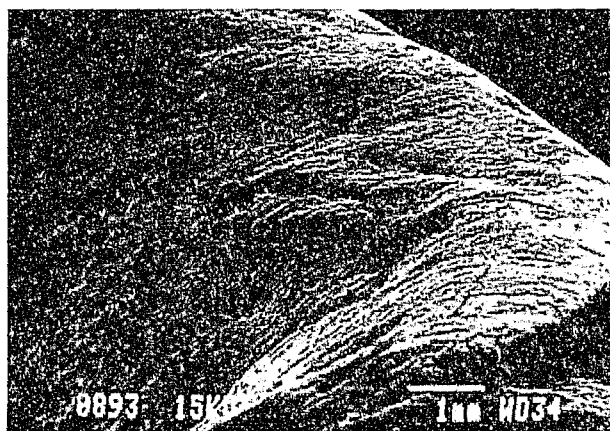
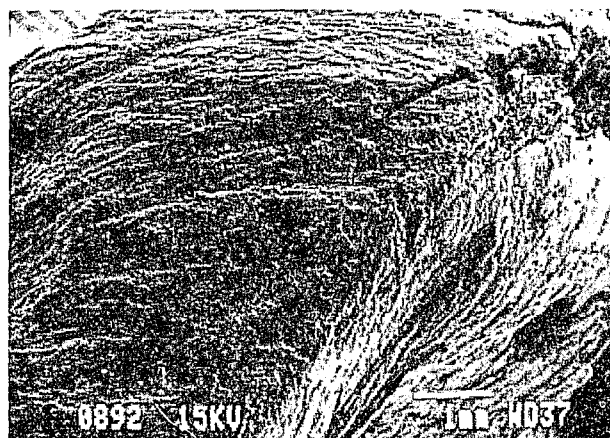


Figure 203. SEM images of SKX b.

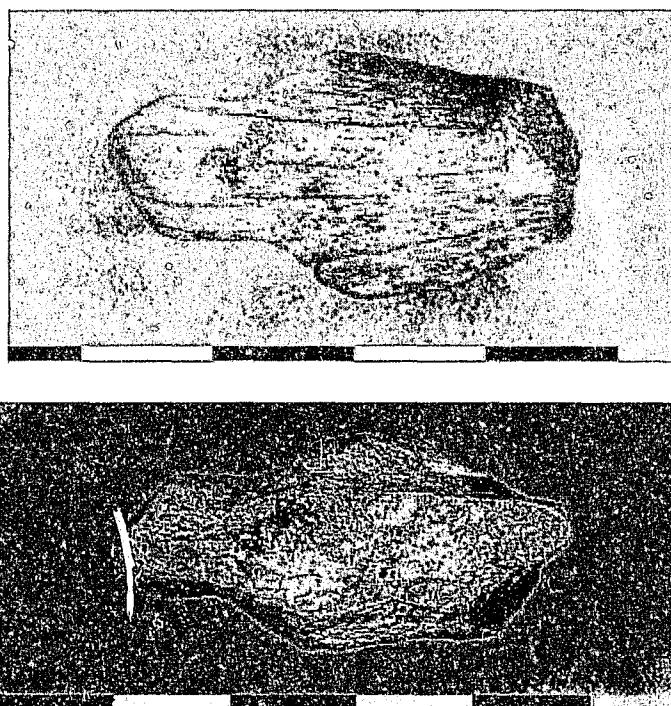


Figure 204. Swartkrans specimen SKX 39365. Anterior (top) and posterior views. Scale = 1 cm.

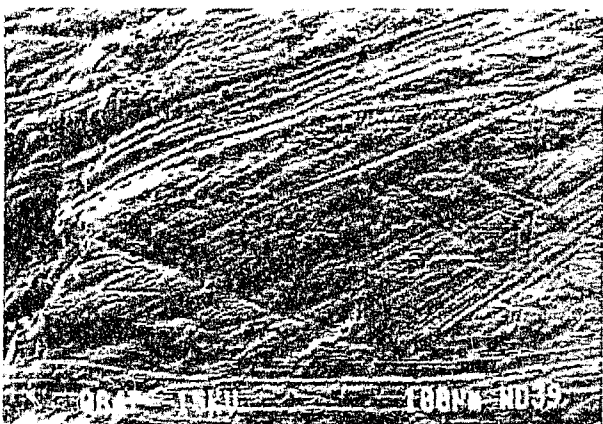
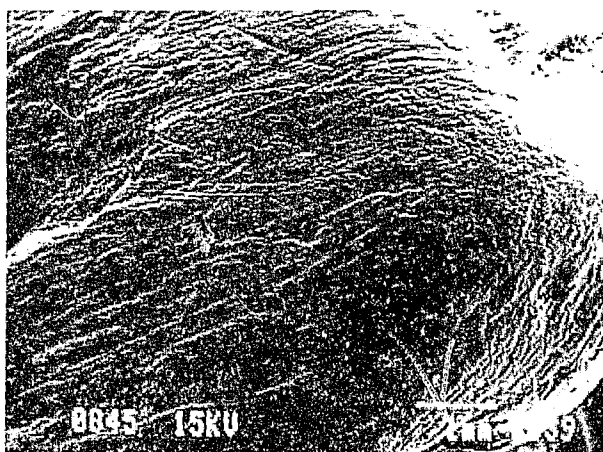
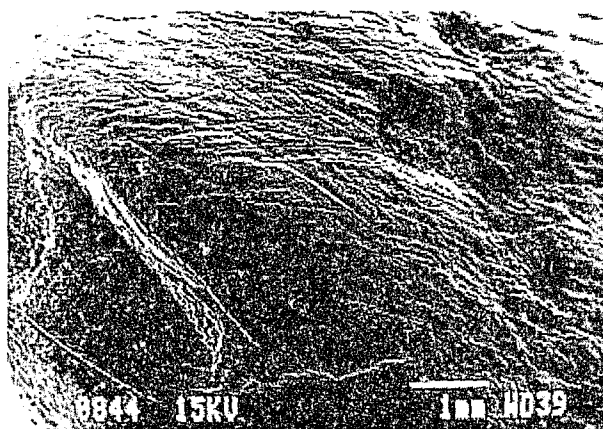


Figure 205. SEM images of SKX 39365.

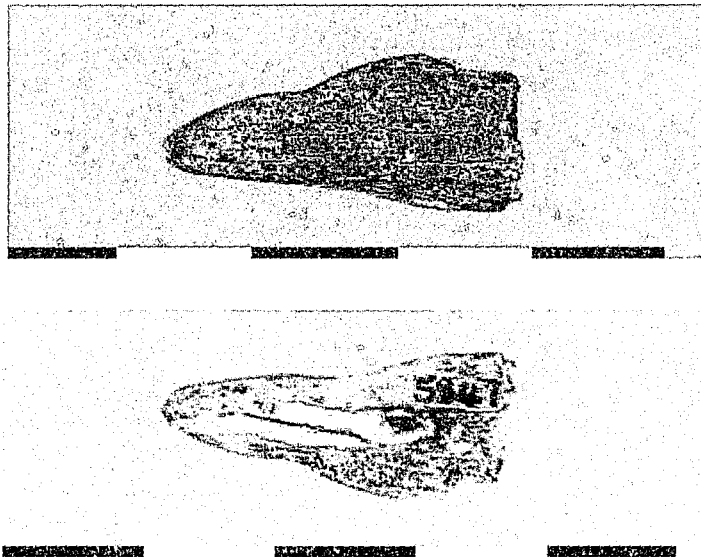


Figure 206. Swartkrans specimen SKX 5847. Anterior (top) and posterior views.
Scale = 1 cm.

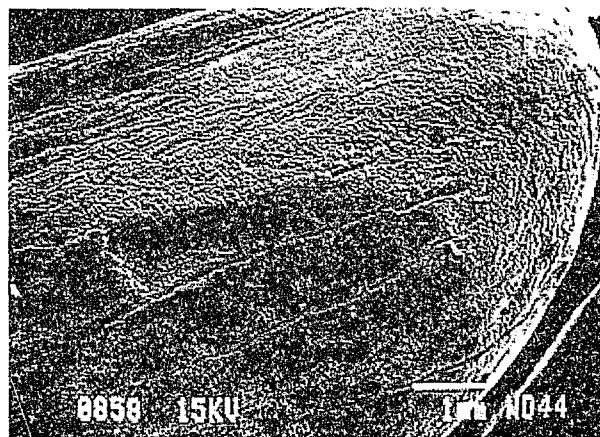


Figure 207. SEM images of SKX 5847.

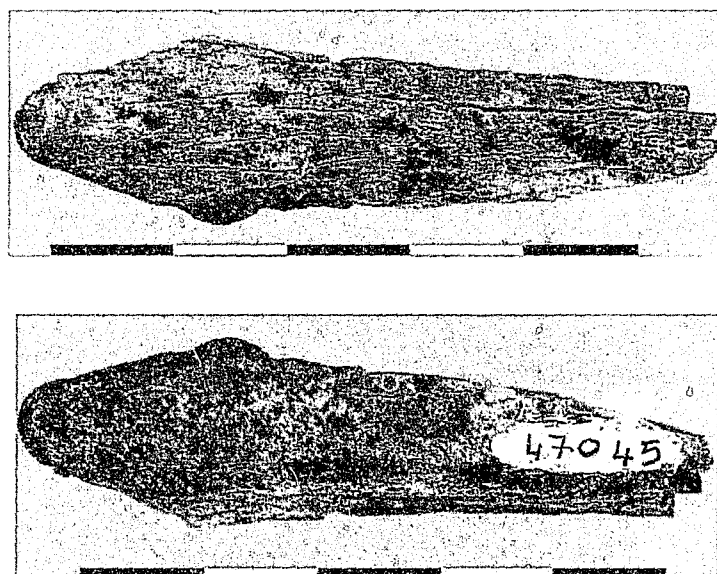


Figure 208. Swartkrans specimen SKX 47045. Anterior (top) and posterior views.
Scale = 1 cm.

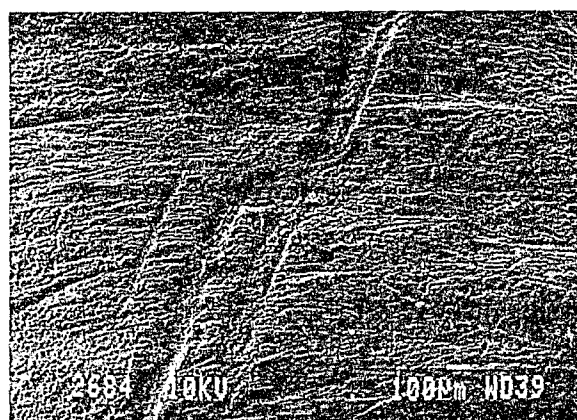
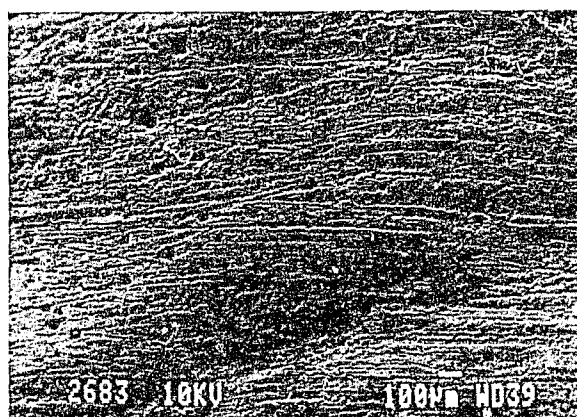
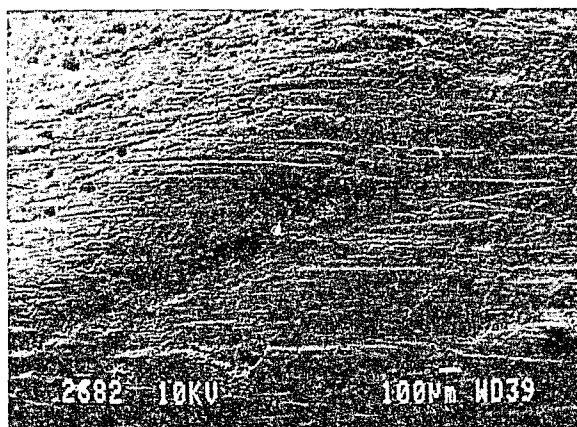


Figure 209. SEM images of SKX 47045.

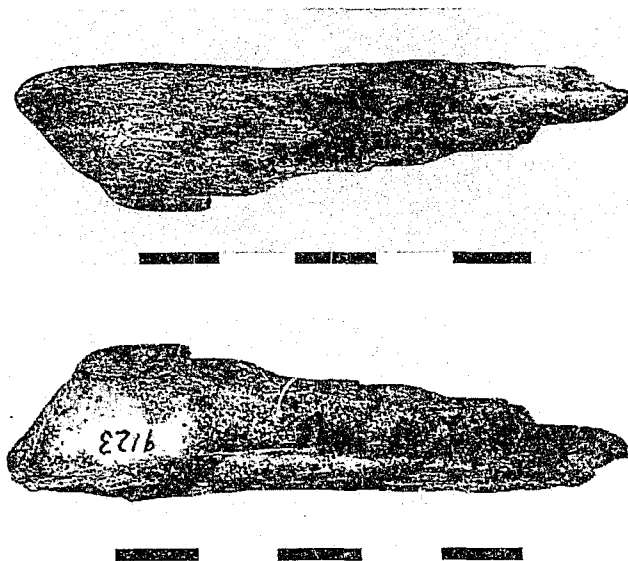


Figure 210. Swartkrans specimen SKX 9123. Anterior (top) and posterior views.
Scale = 1 cm.

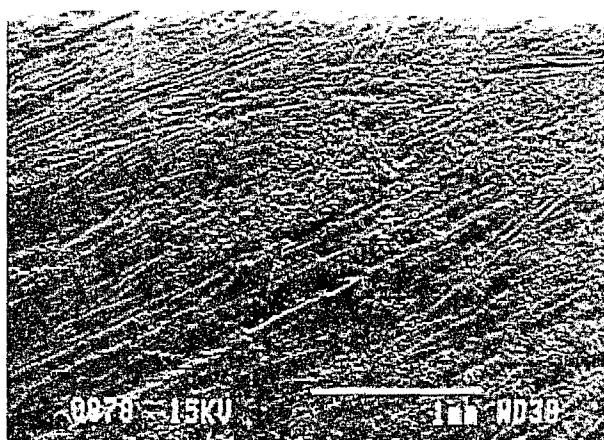
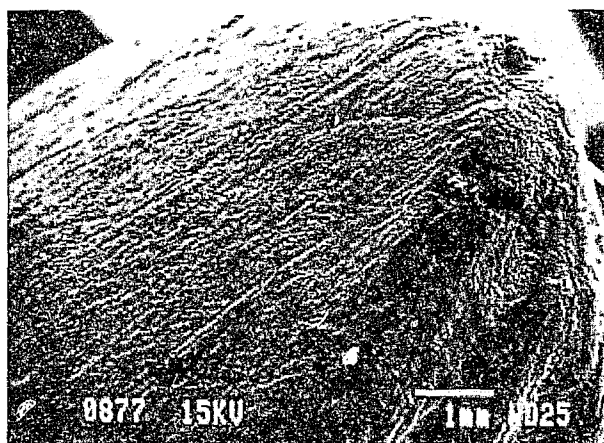


Figure 211. SEM images of SKX 9123.

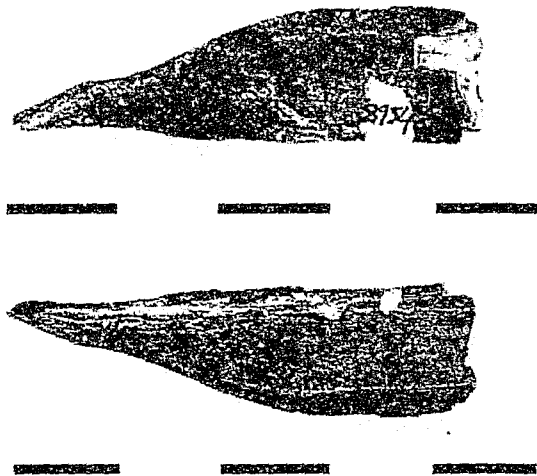


Figure 212. Swartkrans specimen SKX 8954. Anterior (top) and posterior views.
Scale = 1 cm.

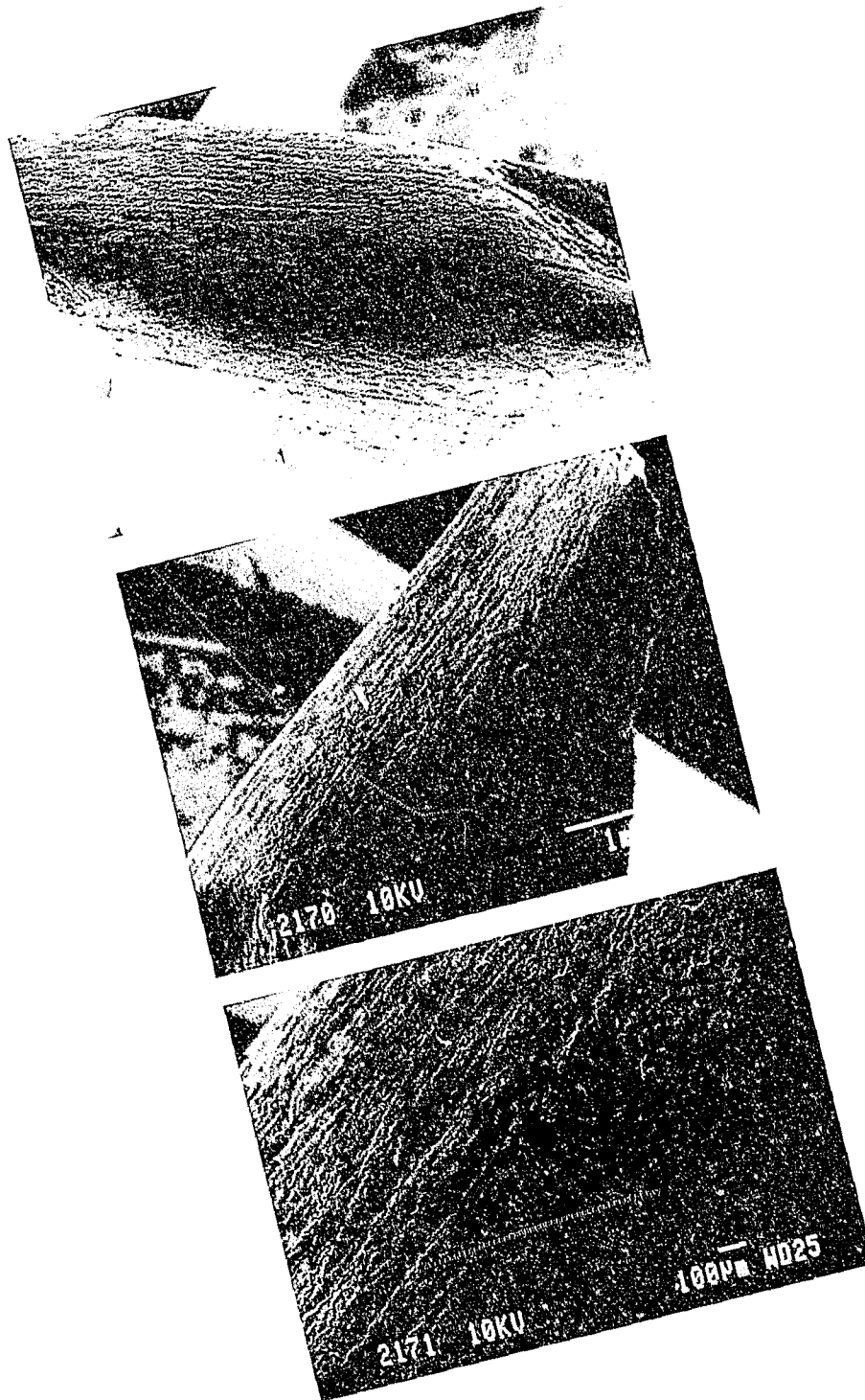


Figure 213. SEM images of SKX 8954.

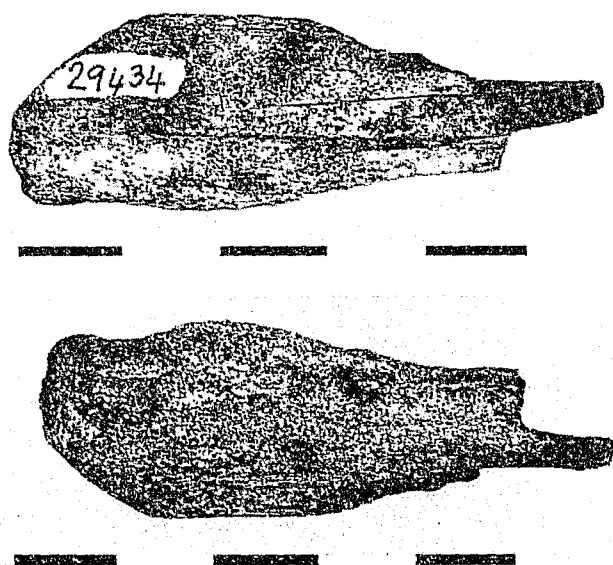


Figure 214. Swartkrans specimen SKX 29434. Anterior (top) and posterior views. Scale = 1 cm.

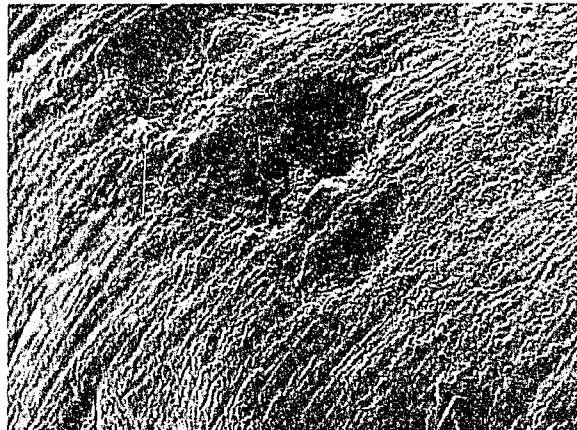
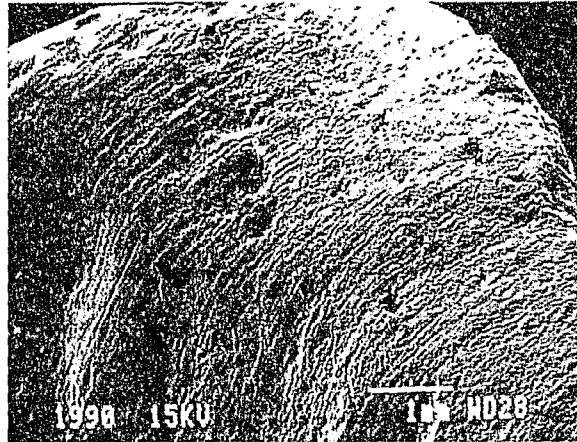


Figure 215. SEM images of SKX 29434.

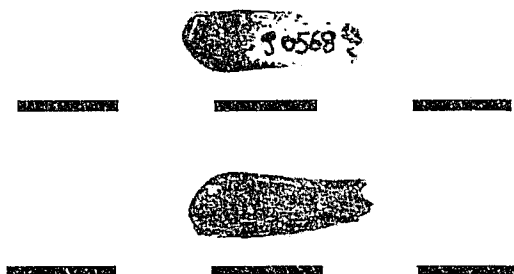


Figure 216. Swartkrans specimen SKX 30568. Anterior (top) and posterior views.
Scale = 1 cm.

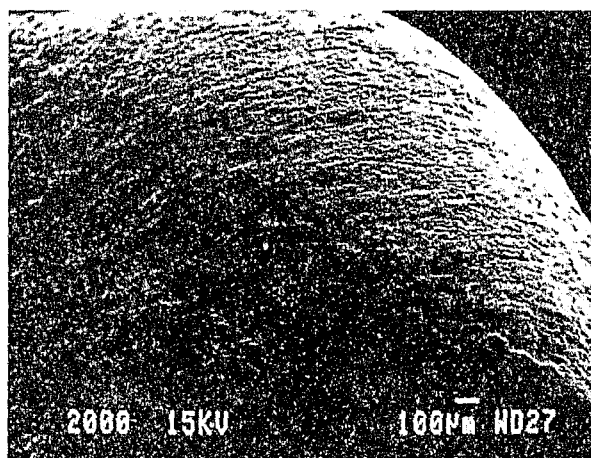
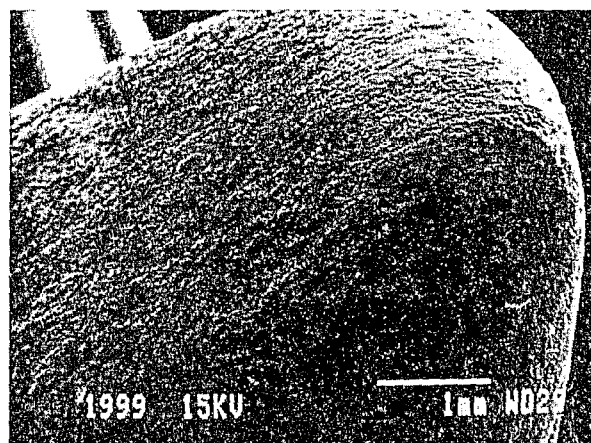


Figure 217. SEM images of SKX 30568.

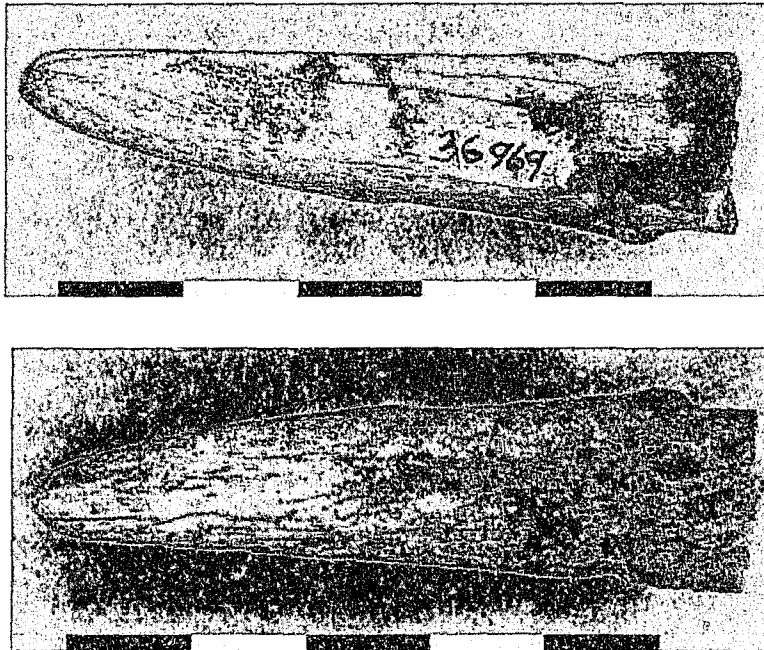


Figure 218. Swartkrans specimen SKX 36969. Anterior (top) and posterior views. Scale = 1 cm.

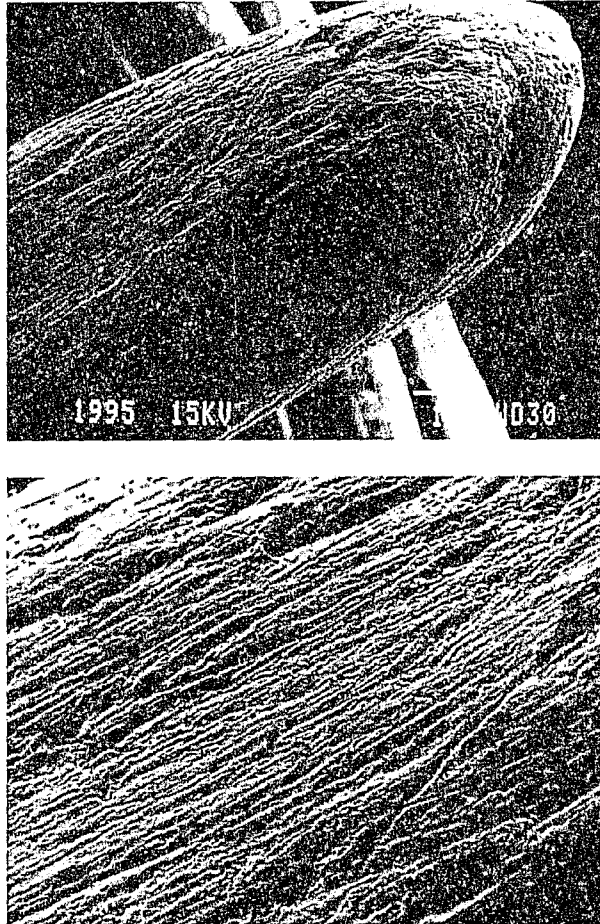


Figure 219. SEM images of SKX 36969.

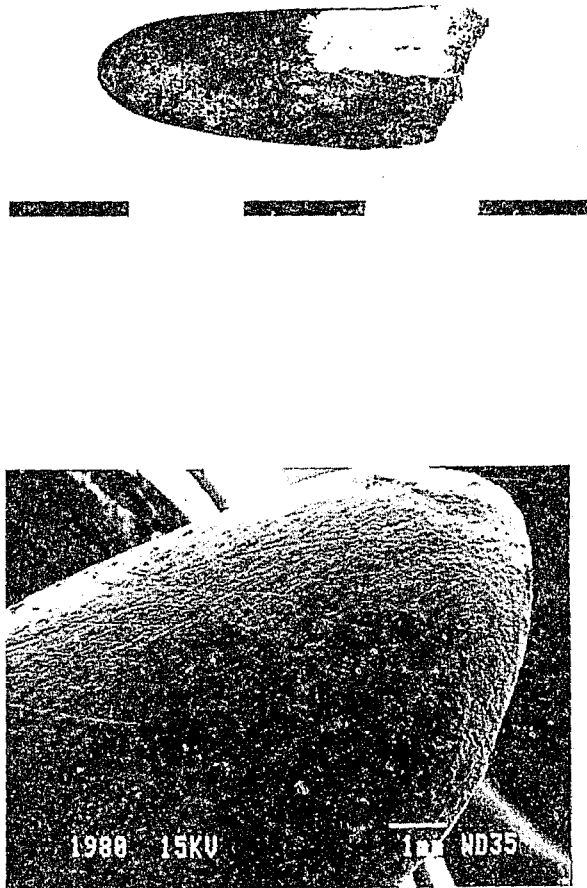


Figure 220. Swartkrans specimen SKX 19845. Anterior view (top; scale = 1 cm) and SEM image of wear pattern.

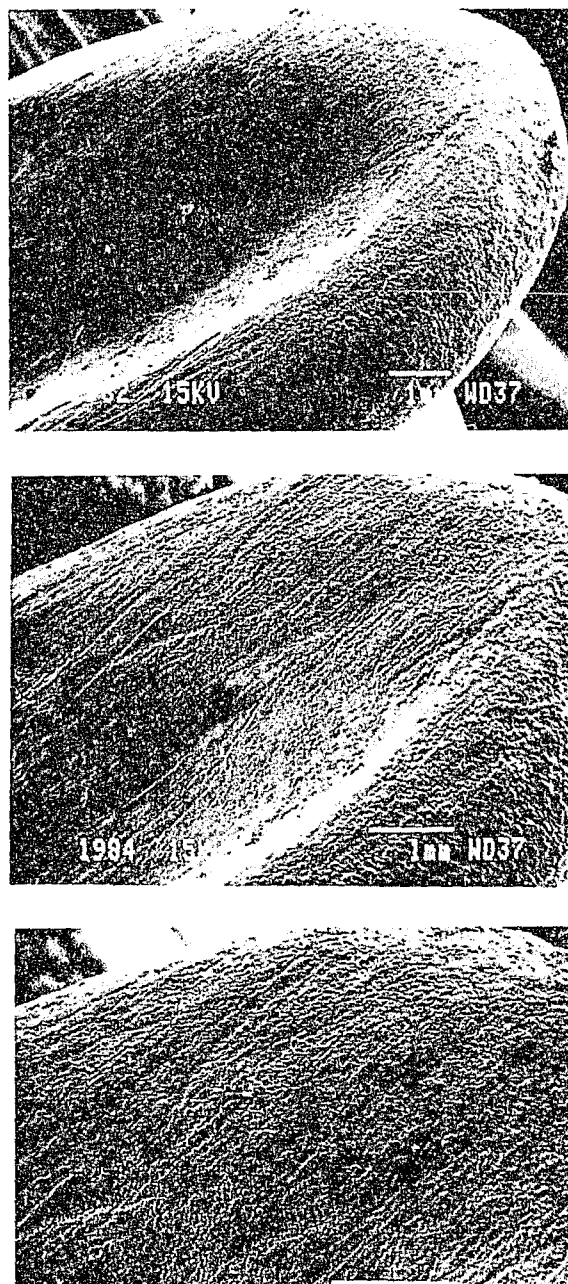


Figure 221. SEM images of SKX 19845.

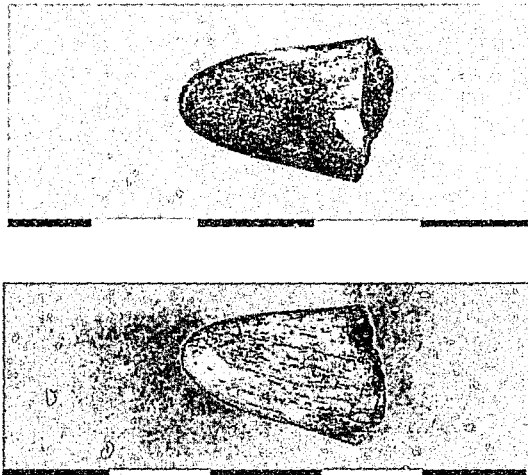


Figure 222. Swartkrans specimen SKX 34370. Anterior (top) and posterior views.
Scale = 1 cm.

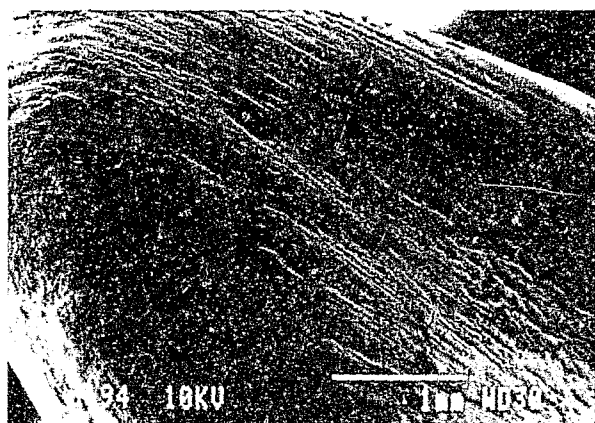


Figure 223. SEM image of SKX 34370.

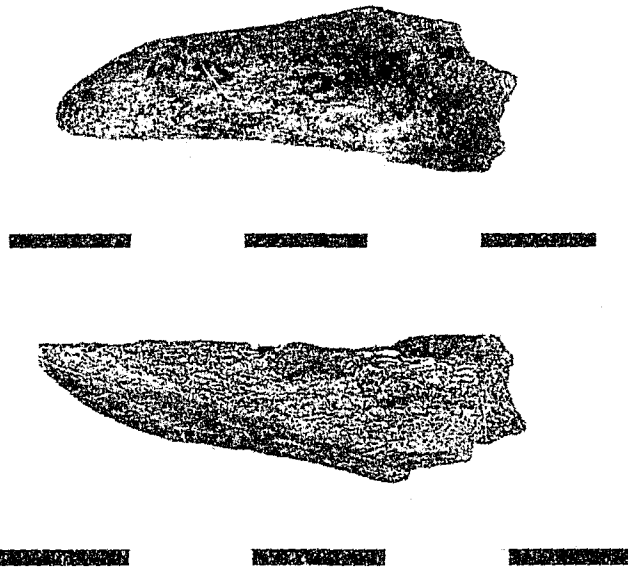


Figure 224. Swartkrans specimen SKX SEM. Anterior (top) and posterior views (scale = 1 cm).

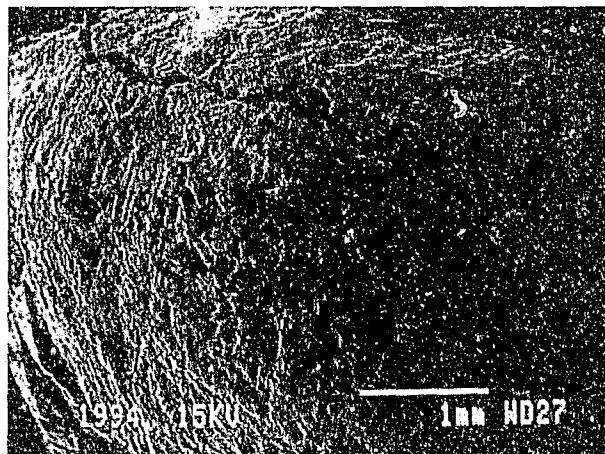


Figure 225. SEM image of SKX SEM.

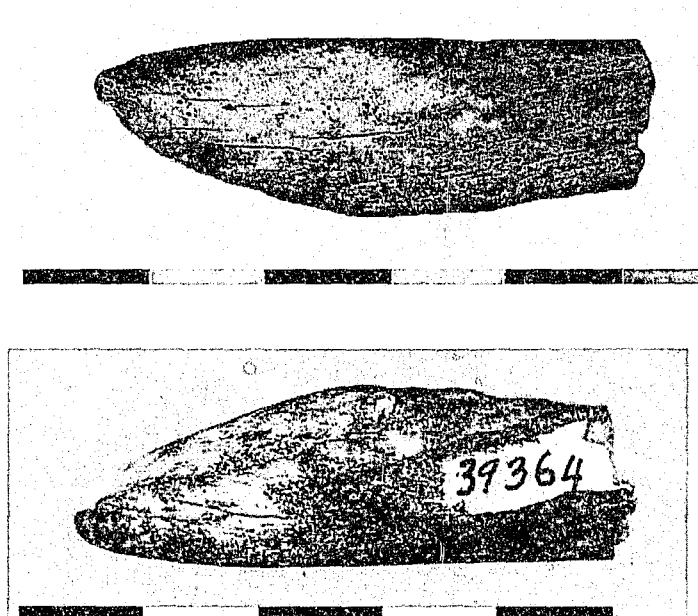


Figure 226. Swartkrans specimen SKX 39364. Anterior (top) posterior views.
Scale = 1 cm.

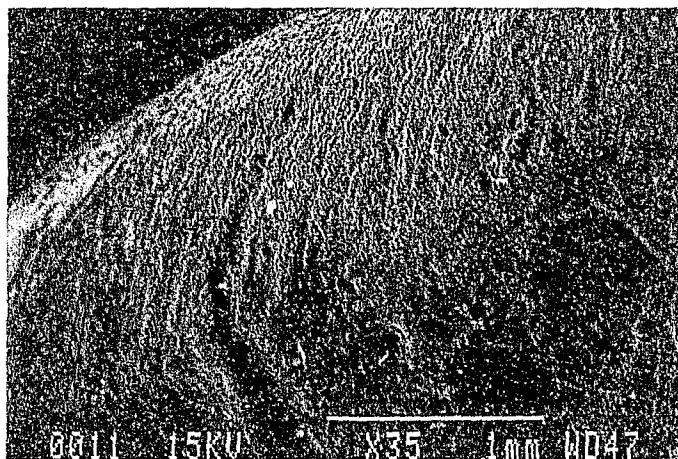


Figure 227. SEM image of SKX 39364.

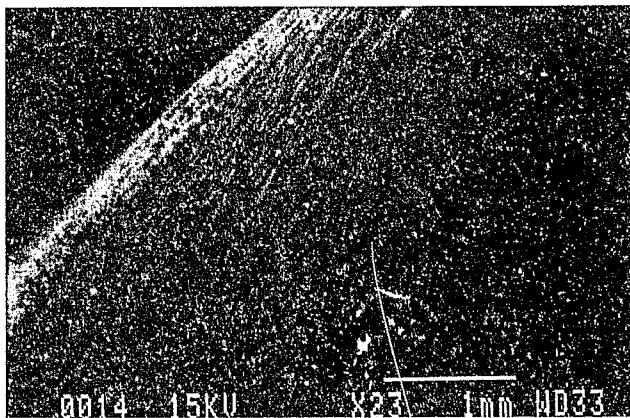
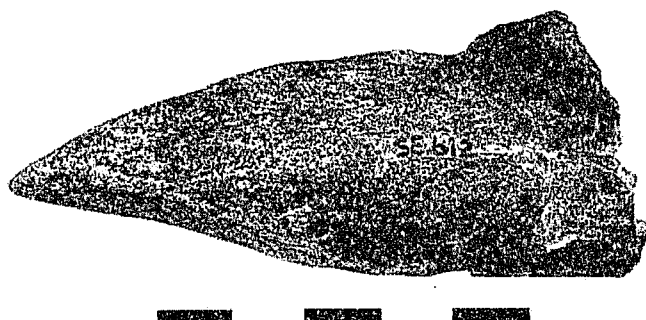


Figure 228. Sterkfontein specimen SE 612. Anterior view (top; scale = 1 cm) and SEM image.

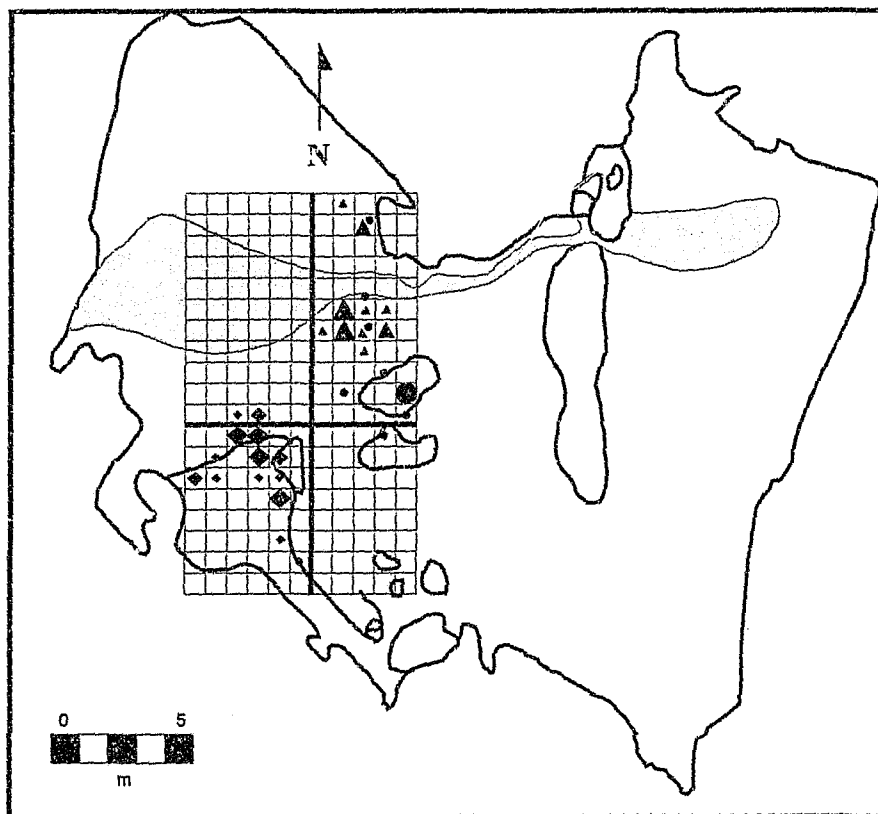


Figure 229. Site plan of Swartkrans (after Brain 1993) showing spatial distribution and density of bone tools. Scale = 1 cm.

Table 1. Context of purported bone tool specimens examined for this study.

Locality	Member	Age range (Reference)	Element	Catalogue number	Co-ordinates and quadrant	Depth (cm)
Swartkrans Cave site	1 Lower Bank	c.1.5 - 1.8 Mya (1; 2; 3)	Horn.	SKX 4228b	E5/N5 SW	560-570
			Horn.	SKX 7068	E5/N4 SW	470-480
			Horn.	SKX 5011	E3/N10 --	uncertain
			Flake	SKX 794	E2/N3 --	350-400
			Flake	SKX 1429	E4/N3 --	500-550
			Flake	SKX 3477/78	E4/N4 NE	510-520
			Flake	SKX 5003	E4/N5 NW	660-670
			Flake	SKX 5001	E3/N4 NW	610-620
			Flake	SKX 5005	E3/N5 SW	610-620
			Flake	SKX 5006	E3/N5 SE	640-650
			Flake	SKX 5008	E3/N5 SE	580-590
			Flake	SKX 5010a	E4/N9 --	1000
			Flake	SKX 5010b	E4/N9 --	1000
			Flake	SKX 7062	E5/N4 SW	460-470
			Flake	SKX 5000	E3/N5 SW	620-630
			Flake	SKX 5009	E3/N5 NE	750-760
			Flake	SKX 5012	E4/N9 --	1230
	2	c.1.0 - 1.5 Mya (1; 2)	Horn.	SKX 12383	E4/S6 SE	80-90
			Horn.	SKX 15536	E6/S1 --	150-200
			Horn.	SKX 17211	E4/S3 NE	160-170
			Flake	SKX 105	E5/S2 --	180-190
			Flake	SKX 1142	E6/N1 --	175-200
			Flake	SKX 3227	E4/N4 SE	460-470
			Flake	SKX 10158/9	E1/S7 SE	100-110
			Flake	SKX 16976	E4/N9 --	1200-1230
			Flake	SKX 352	E5/N2 --	250-275
			Flake	SKX 1141/3	E6/N1 --	175-200
	3	c.1.0 - 1.5 Mya (1; 2)	Flake	SKX 3287	E4/N4 NE	490-500
			Horn.	SKX 21790	W3/S1 SW	190-200
			Horn.	SKX 28876B	W3/S2 NE	280-290
			Horn.	SKX 30246/9	W3/S3 SE	320-330
			Horn.	SKX 23567	W2/S4 NW	200-210
			Horn.	SKX 26234	W2/S5 NE	270-280
			Horn.	SKX 28437	W3/S3 NE	280-290
			Horn.	SKX 30214/5	W3/S3 NE	300-310
			Horn.	SKX 34570	W4/S2 SE	370-380
			Horn.	SKX 36485	W5/S3 --	550-600
			Horn.	SKX 36861	W5/S2 --	600-650
			Mand.	SKX 29388	W3/S2 --	220-230
			Shaft	SKX 26324/8	W2/S5 SE	300-310
			Flake	SKX 10859	W6/S4 --	0-100
			Flake	SKX 10978	W6/S4 --	0-100
			Flake	SKX 20046	W2/S5 NE	200-210
			Flake	SKX 20081	W2/S5 SE	210-220
			Flake	SKX 21617	W2/S5 NW	220-230
			Flake	SKX 22885	W3/S1 SW	210-220
			Flake	SKX 22933a	W3/S2 SE	200-210
			Flake	SKX 25678	W2/S5 SW	240-250
			Flake	SKX 26112	W2/S3 SW	170-180
			Flake	SKX 26113	W2/S3 SW	170-180

Table 1. *continued*

Locality	Member	Age	Catalogue number	Co-ordinates and quadrant	Depth (cm)
			Flake	SKX 26138	W3/S2 NE 210-220
			Flake	SKX 26139	W3/S2 NE 210-220
			Flake	SKX 26149	W3/S2 NE 200-210
			Flake	SKX 26624	W2/S5 NE 280-290
			Flake	SKX 28076	W3/S4 NE 230-240
			Flake	SKX 28487	W3/S3 NE 290-300
			Flake	SKX 28828	W3/S3 NE 270-280
			Flake	SKX 30052	W3/S3 NW 320-330
			Flake	SKX 30141	W3/S3 NW 300-310
			Flake	SKX 32582	W4/S2 NE 230-240
			Flake	SKX 32897	W4/S2 SE 270-280
			Flake	SKX 33654	W3/S2 SW 420-430
			Flake	SKX 35196	W4/S2 – 470-550
			Flake	SKX 37703	W3/S3 – 550-600
			Flake	SKX 38041	W5/S4 – 660-700
			Flake	SKX 38830	W4/S1 – 70
			Flake	SKX 45806	W3/S2 SW 260-270
			Flake	SKX 37052	W3/S3 – 610-620
Sterkfontein	5	c.1.5 - 2.0 Mya	Flake	SE 612	Breccia
Cave site	(Middle Breccia/ Extension site)	(1; 4; 5)			

The data in this table are derived from Brain (1993).

The numbers in parentheses after 'Age range' refer to references. 1 = Vrba (1982); 2 = Watson (1993); 3 = Delson (1988); 4 = Vrba (1985); 5 = Kuman & Clarke (1999).

Horn. = horncore; Mand. = mandible.

Note that depths are in cm to conform with published data.

Table 2. Summary of comparative collections examined for this study.

Modifying agent		Locality
Biotic	Brown hyaena (<i>Hyaena brunnea</i>)	Botswana Den, G.N.P., Botswana
		Kannaguass Den, G.N.P., Botswana
		Kaspersdraai B Den, G.N.P., Botswana
		Kwang Den, G.N.P., Botswana
		Rooikop Den, G.N.P., Botswana
		Two dens, Central Namib Desert, Namibia
		Deelpan A, Free State, South Africa
		Uitkomst, Gauteng Province, S. A.
	Spotted hyaena (<i>Crocuta crocuta</i>)	Kaspersdraai Den, G.N.P., Botswana
		Satara, Kruger National Park, S. A.
		Urikaruus Den, G.N.P., Botswana
		Bacon Hole Cave, South Wales, U. K.*
	Mixed hyaena sp. and porc. <i>Hyaena</i> sp.	Wright's Den, G.N.P., Botswana
		Randall's
		Elandsfontein Bone Circle, C. P., S. A.*
Abiotic	Domestic dog (<i>Canis</i> sp.)	Ysterfontein,*
		Irene, Gauteng Province, South Africa
	Leopard (<i>Panthera pardus</i>)	Johannesburg, South Africa
		Portsmut, Namibia
		Hakos River, Namibia
		Kruger National Park, South Africa
	Cheetah (<i>Acinonyx jubatis</i>)	Quartzberg, Namibia
		Valencia, Namibia
		Umfolosi, Kwazulu-Natal, S. A.
	Porcupine (<i>Hystrix</i> sp.) Trampling activity	Valencia Ranch, Namibia
		Wepener, Free State, South Africa
		Elandsfontein Main, C. P., S. A.*
		Homeb water hole, Namibia
		Spring action
		Florisbad, Free State, South Africa*
		Vlakkraal, Free State, South Africa*
		Flood plain context
		Erkroon A, Free State, South Africa*
	Fluvial abrasion	Cornelia, Free State, South Africa*
		River gravel context
		Erkroon B, Free State, South Africa*
	Wind erosion	Duinefontein 2 (Melkbos), C. P., S. A.*
		Oyster Bay, C. P. South Africa*

An asterisk indicates a fossil assemblage.

G.N.P. = Gemsbok National Parks.

S. A. = South Africa.

C. P. = Cape Province.

U. K. = United Kingdom.

porc. = porcupine

Table 2. *Continued.*

<i>n</i>
27
54
13
56
17
7023
220
234
15
12
69
199
8
70
196
150
7
4
184
318
174
212
239
108
291
105
1116
93
216
42
301
974
263
152
139

Table 3. Summary of comparative collections by source.

	Institution	Reference
Brown hyaena, Botswana	Transvaal Museum, Pretoria	1
Brown hyaena, Kannaguass	Transvaal Museum, Pretoria	1
Brown hyaena, Kaspersdraai B	Transvaal Museum, Pretoria	1
Brown hyaena, Kwang	Transvaal Museum, Pretoria	1
Brown hyaena, Rooikop	Transvaal Museum, Pretoria	1
Brown hyaena, Namibia	Transvaal Museum, Pretoria	2; 3
Brown hyaena, Deelpan A	Q.R.D., National Museum, Bloemfontein	4
Brown hyaena, Uitkomst	Transvaal Museum, Pretoria	5
Spotted hyaena, Kaspersdraai	Transvaal Museum, Pretoria	1
Spotted hyaena, Satara	Transvaal Museum, Pretoria	5
Spotted hyaena, Urikaruus	Transvaal Museum, Pretoria	1
Spotted hyaena, Bacon Hole	Natural History Museum, London	6; 7
Mixed hyaena sp. and porcupine	Transvaal Museum, Pretoria	1
Hyaena sp., miscellaneous	Transvaal Museum, Pretoria	
Hyaena sp., Elandsfontein B.C.	South African Museum, Cape Town	8
Hyaena sp., Ysterfontein	South African Museum, Cape Town	
Dog, Irene	Transvaal Museum, Pretoria	
Dog, Johannesburg	University of the Witwatersrand M.S.	
Leopard, Portsmut	Transvaal Museum, Pretoria	5
Leopard, Hakos River	Transvaal Museum, Pretoria	5
Leopard, Kruger National Park	Transvaal Museum, Pretoria	5
Leopard, Quartzberg	Transvaal Museum, Pretoria	5
Leopard, Valencia	Transvaal Museum, Pretoria	5
Cheetah, Umfolosi	Transvaal Museum, Pretoria	5
Cheetah, Valencia	Transvaal Museum, Pretoria	5
Porcupine, Wepener	Transvaal Museum, Pretoria	
Trampling, Elandsfontein Main	South African Museum, Cape Town	8; 9
Trampling, Homeb water hole	Transvaal Museum, Pretoria	5
Spring, Florisbad	Q.R.D., National Museum, Bloemfontein	10; 11
Spring, Vlakkraal	Q.R.D., National Museum, Bloemfontein	12
Flood plain, Erfkroon A	Q.R.D., National Museum, Bloemfontein	
Fluvial, Cornelia	Q.R.D., National Museum, Bloemfontein	13
River gravel, Erfkroon B	Q.R.D., National Museum, Bloemfontein	
Wind, Duinefontein 2	South African Museum, Cape Town	14; 15
Wind, Oyster Bay	Q.R.D., National Museum, Bloemfontein	

Q.R.D. = Quaternary Research Department.

B.C. = Bone Circle.

M.S. = Medical School.

1 = Mills & Mills (1977); 2 = Skinner & van Aarde (1991);

3 = Skinner *et al.* (1997); 4 = Scott & Klein (1981); 5 = Brain (1981);

6 = Cook (1986); 7 = Sutcliffe *et al.* (1987); 8 = Klein & Cruz-Urbe (1991);

9 = Klein (1978); 10 = Kuman & Clarke (1986); 11 = Brink (1987);

12 = Wells *et al.* (1942); 13 = Butzer (1974); 14 = Hendey (1968); 15 = Klein (1976).

A blank signifies no reference.

Table 4. Weathering stages in large (after Behrensmeyer 1978) and small mammals (after Andrews 1990). Additions to large mammal descriptions from Johnson (1985) in parentheses. (Table after Lyman 1994).

Weath. stage	LARGE MAMMALS		SMALL MAMMALS	
	Description	Range in years since death	Description	Range in years since death
0	greasy, no cracking or flaking, perhaps with skin or ligament/soft tissue attached (marrow edible, bone still moist).	0 to 1	no modification	0 to 2
1	cracking parallel to fibre structure (longitudinal); articular surfaces perhaps with mosaic cracking of covering tissue and bone (split lines begin to form, low moisture, marrow sours and is inedible).	0 to 3	slight splitting of bone parallel to fibre structure; chipping of teeth and splitting of dentine.	1 to 5
2	flaking of outer surface (exfoliation), cracks are present, crack edge is angular (marrow decays, split lines well developed).	2 to 6	more extensive splitting but little flaking; chipping and splitting of teeth leading to loss of parts of crown.	3 to 5+
3	rough homogeneously altered compact bone resulting in fibrous texture; weathering penetrates 1-1.5 mm maximum; crack edges are rounded.	4 to 15	deep splitting and some loss of deep segments or "flakes" between splits; extensive splitting of teeth	4 to 5+
4	coarsely fibrous and rough surface; splinters of bone loose on surface, with weathering penetrating inner cavities; open cracks.	6 to 15		
5	bone falling apart <i>in situ</i> , large splinters present, bone material very fragile.	6 to 15		

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