

**Pavlinovo Coding System for Identifiable Elements**  
(adapted from Pupičina system, Dr. Preston Miracle, Dept. of Archaeology, University of Cambridge)

PTM 3/87  
PTM 3/91  
PTM 1/96  
BKH 7/2010

<b>Field 1</b>	019	antler palm	
<u>Bone Identification number (Context)</u>	020	n/a	
	021	n/a	
<b>Field 2</b>	022	horn core	
<u>X coordinates</u> (in cm taken from SW corner of grid square)	023	antler unidentified	
	024	hyoid	
<b>Field 3</b>		use same code for all vertebra	
<u>Y coordinates</u> (in cm taken from SW corner of grid square)	.01	complete except for spinous process	
	.02	centrum and neural area (one or more processes not present)	
<b>Field 4</b>	.03	neural arch only	
<u>Area in excavation grid</u> (2m x 2m area)	.04	centrum only	
	.05	centrum epiphysis indeterminate	
<b>Field 5</b>	.06	centrum epiphysis anterior	
<u>Depth</u> (from surface)	.07	centrum epiphysis posterior	
	.08	odontoid process	
<b>Field 6</b>	.09	spinous process	
<u>Depth</u> (from datum)	.10	transverse process	
	.11	process indeterminate	
<b>Field 7</b>	.12	articular facet (zygapophysis)	
<u>Concentration/UL</u> designation	.13	sagittal split (indicate side in "symmetry")	
<b>Field 8</b>	.14	transverse split (indicate anterior/posterior in portion present)	
<u>Element Identification</u>			
999		indeterminate	
001		calvaria (brain case)	
002		occipital condyle	
003		occipital	
.1		paramastoid process	
004		sphenoid	
005		pterygoid	
006		vomer	
007		palatine	
008		interparietal	
009		parietal	
010		frontal	
011		petrous	
012		temporal	
013		zygomatic	
014		lacrimal	
015		nasal	
016		antler base	
017		antler beam	
018		antler tine	
	025	general vertebra	
	026	atlas	
	027	axis	
	028	cervical vertebra	
	029	thoracic vertebra	
	030	lumbar vertebra	
	031	sacrum	
	.1	sacral centrum	
	.2	sacral wing (lateral mass), indicate side in "symmetry"	
	.3	sacral body (neural area)	
	.4	sacral apex	
	.5	sacral fragment indeterminate	
	032	caudal vertebra	

- 033 rib
  - .1 head (fused) or epiphysis
  - .2 neck
  - .3 head and neck
  - .4 head, neck, tubercle
  - .5 tubercle
  - .6 tubercle and neck
  - .7 shaft fragment
  - .8 sternal end
- 034 costal cartilage
- 035 sternum
  - .1 manubrium
  - .2 sternal body
  - .3 sternal body segment
  - .4 xiphoid process
- 036 scapula
  - .1 glenoid fossa only
  - .2 glenoid fossa and blade portion
  - .3 blade portion
  - .4 spine fragment
  - .5 neck
  - .6 acromion process
  - .7 coracoid process
  - .8 epiphysis of scapula
- 037 clavicle
- 038 humerus
  - .1 humerus proximal epiphysis
  - .2 humerus proximal shaft
  - .3 humerus proximal end (epiph+shaft)
  - .4 humerus shaft fragment
  - .5 humerus shaft with nutrient foramen
  - .6 humerus distal end (epiph+shaft)
  - .7 humerus distal shaft
  - .8 humerus distal epiphysis
- 039 radius
  - .1 radius proximal epiphysis
  - .2 radius proximal shaft
  - .3 radius proximal end (epiph+shaft)
  - .4 radius shaft fragment
  - .5 radius shaft with nutrient foramen
  - .6 radius distal end (epiph+shaft)
  - .7 radius distal shaft
  - .8 radius distal epiphysis

if radius and ulna are fused together, code them separately and indicate in "articulation" that they are fused and weighed together

- 040 ulna (fused and separate ulna)
    - .1 ulna proximal epiphysis
    - .2 ulna proximal shaft
    - .3 ulna proximal end (epiph+shaft)
    - .4 ulna shaft fragment
    - .5 ulna shaft with nutrient foramen
    - .6 ulna distal end (epiph+shaft)
    - .7 ulna distal shaft
    - .8 ulna distal epiphysis
  - 041 carpal
  - 042 radial carpal (scaphoid)
  - 043 intermediate carpal (lunate)
  - 044 ulnar carpal (unciform)
  - 045 accessory carpal (pisiform)
  - 046 first carpal
  - 047 second carpal
  - 048 third carpal
  - 049 fourth carpal
  - 050 radial+intermediate carpal
  - 051 second+third carpal
- use same code for all metacarpals
- .1 metacarpal proximal epiphysis
  - .2 metacarpal proximal shaft
  - .3 metacarpal proximal end (epiph+shaft)
  - .4 metacarpal shaft fragment
  - .5 metacarpal shaft with nutrient foramen
  - .6 metacarpal distal end (epiph+shaft)
  - .7 metacarpal distal shaft
  - .8 metacarpal distal epiphysis
- 052 metacarpal 1
  - 053 metacarpal 2
  - 054 metacarpal 3
  - 055 metacarpal 4
  - 056 metacarpal 5
  - 057 metacarpal 3+4
  - 058 indeterminate metacarpal
  - 059 anterior proximal sesamoid
  - 060 anterior distal sesamoid
  - 061 anterior sesamoid
- use same code for portion for all phalanges
- .1 phalanx proximal epiphysis
  - .2 phalanx proximal shaft
  - .3 phalanx proximal end (epiph+shaft)
  - .4 phalanx shaft fragment
  - .5 phalanx shaft with nutrient foramen
  - .6 phalanx distal end (epiph+shaft)
  - .7 phalanx distal shaft
  - .8 phalanx distal epiphysis (no shaft present)

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062	anterior phalanx 1	.7	femur distal shaft
063	anterior phalanx 2	.8	femur distal epiphysis (only condyles present)
064	anterior phalanx 3		
065	anterior phalanx	076	patella
066	innominate [ilium+ischium+pubis]	077	tibia
067	ilium+ischium	.1	tibia proximal epiphysis
068	ilium+pubis	.2	tibia proximal shaft
069	ischium+pubis		tibial crest is anterior, medial+lateral
070	ilium	.3	tibia proximal end (epiph+shaft)
.1	acetabular end of ilium	.4	tibia shaft fragment
.2		.5	tibia shaft with nutrient foramen
.3	ilium acetabulum+shaft	.6	tibia distal end (epiph+shaft)
.4	ilium shaft fragment	.7	tibia distal shaft
.5	ilium shaft with nutrient foramen	.8	tibia distal epiphysis
.6	ilium shaft+iliac-sacral articulation (wing)		
.7	iliac-sacral articulation (wing)	078	fibula
.8	iliac crest	.1	fibula proximal epiphysis
		.2	fibula proximal shaft
071	ischium	.3	fibula proximal end (epiph+shaft)
.1	ischial acetabulum portion	.4	fibula shaft fragment
.2		.5	fibula shaft with nutrient foramen
.3	ischium acetabulum+shaft	.6	fibula distal end (epiph+shaft)
.4	ischium shaft fragment	.7	fibula distal shaft
.5	ischium shaft with nutrient foramen	.8	fibula distal epiphysis
.6	ischium shaft+ischial tuberosity		
.7	ischial tuberosity	079	lateral malleolus
.8		080	astragalus
		081	calcaneus
072	pubis	.1	calcaneus articulation with lateral malleolus+cuboid
.1	pubic acetabulum portion	.2	calcaneus articulation with astragalus
.2		.3	calcaneus articulation with astragalus, lateral malleolus and cuboid
.3	pubic acetabulum+shaft	.4	calcaneus shaft fragment
.4	pubic shaft fragment	.5	calcaneus shaft with nutrient foramen
.5	pubic shaft with nutrient foramen	.6	calcaneus distal end (epiph+shaft)
.6	pubic shaft+ventral articulation	.7	calcaneus distal shaft
.7	ventral articulation of pubis	.8	calcaneus distal epiphysis
.8			
073	acetabulum		
074	baculum	082	tarsal
075	femur	083	central tarsal (navicular)
		084	first tarsal
for proximal femur, code "medial" if head of femur,		085	second tarsal
code "lateral" if greater trochanter, code		086	third tarsal
"medial+lateral" if both		087	fourth tarsal (cuboid)
.1 femur proximal epiphysis		088	central+fourth tarsal
.2 femur proximal shaft		089	first+second tarsal
code lesser trochanter as posterior-medial		090	second+third tarsal
code third trochanter as posterior-lateral			
.3 femur proximal end (epiph+shaft)		use same code for all metatarsals	
.4 femur shaft fragment		.1	metatarsal proximal epiphysis
.5 femur shaft with nutrient foramen		.2	metatarsal proximal shaft
.6 femur distal end (epiph+shaft)		.3	metatarsal proximal end (epiph+shaft)

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.4	metatarsal shaft fragment	.5	phalanx shaft with nutrient foramen
.5	metatarsal shaft with nutrient foramen	.6	phalanx distal end (epiph+shaft)
.6	metatarsal distal end (epiph+shaft)	.7	phalanx distal shaft
.7	metatarsal distal shaft	.8	phalanx distal epiphysis (no shaft present)
.8	metatarsal distal epiphysis		
091	metatarsal 1	110	phalanx 1
092	metatarsal 2	111	phalanx 2
093	metatarsal 3	112	phalanx 3
094	metatarsal 4	113	phalanx
095	metatarsal 5	114	loose tooth upper
096	metatarsal 3+4	115	loose tooth lower
097	indeterminate metatarsal	116	loose tooth
		117	long bone fragment
		118	spongy bone
	use same code for portion for all phalanges	119	
.1	phalanx proximal epiphysis	120	premaxilla
.2	phalanx proximal shaft	121	premaxilla with teeth
.3	phalanx proximal end (epiph+shaft)	122	maxilla
.4	phalanx shaft fragment	123	maxilla with teeth
.5	phalanx shaft with nutrient foramen	124	premaxilla+maxilla
.6	phalanx distal end (epiph+shaft)	125	premaxilla+maxilla with teeth
.7	phalanx distal shaft		
.8	phalanx distal epiphysis (no shaft present)	130	mandibular symphysis
098	accessory phalanx 1	131	mandibular symphysis w/teeth
099	accessory phalanx 2	132	mandibular symphysis+diastema
100	accessory phalanx 3	133	mandibular symphysis+diastema w/incisors
101	posterior phalanx 1	134	alveolar
102	posterior phalanx 2	.1	diastema
103	posterior phalanx 3	.2	diastema with mental foramen
104	posterior phalanx	135	alveolar w/teeth
		136	alveolar+diastema
		137	alveolar+diastema w/teeth
	use same code for all metapodials	138	mandibular base
.1	metapodial proximal epiphysis	.1	mandibular heel
.2	metapodial proximal shaft	.2	base+heel
.3	metapodial proximal end (epiph+shaft)	139	base+diastema
.4	metapodial shaft fragment	140	alveolar+base
.5	metapodial shaft with nutrient foramen	141	alveolar+base w/teeth
.6	metapodial distal end (epiph+shaft)	142	alveolar+diastema+base
.7	metapodial distal shaft	143	alveolar+diastema+base w/teeth
.8	metapodial distal epiphysis	144	alveolar+diastema+base+symp
105	accessory metapodial	145	alveolar+diastema+base+symp w/cheek teeth
106	indeterminate metapodial	146	alveolar+ascending
107	proximal sesamoid	.1	ascending+heel
108	distal sesamoid	.2	ascending
109	sesamoid	.3	ascending+heel+alveolar
		147	alveolar+ascending w/teeth
		.1	alveolar+ascending+heel w/teeth
	use same code for portion for all phalanges	148	articular process
.1	phalanx proximal epiphysis	149	coronoid
.2	phalanx proximal shaft	150	articular+coronoid
.3	phalanx proximal end (epiph+shaft)	.1	articular+coronoid+heel
.4	phalanx shaft fragment	151	articular+ascending

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152 articular+ascending+coronoid  
 .1 articular+ascending+coronoid+heel  
 153 ascending+coronoid  
 154 complete mandible  
 155 complete mandible w/teeth  
 156 articular+ascending+coronoid+alveolar+base  
 157 articular+ascending+coronoid+alveolar+base  
 w/teeth  
  
 199 deciduous canine  
 200 permanent canine  
 201 upper I1  
 202 upper I2  
 203 upper I3  
 204 upper C  
 205 upper PM1  
 206 upper PM2  
 207 upper PM3  
 208 upper PM4  
 209 upper M1  
 210 upper M2  
 211 upper M3  
 212 upper M4  
 213 upper dI1  
 214 upper dI2  
 215 upper dI3  
 216 upper dC  
 217 upper dPM1  
 218 upper dPM2  
 219 upper dPM3  
 220 upper dPM4  
 221 lower I1  
 222 lower I2  
 223 lower I3  
 224 lower C  
 225 lower PM1  
 226 lower PM2  
 227 lower PM3  
 228 lower PM4  
 229 lower M1  
 230 lower M2  
 231 lower M3  
 232 lower M4  
 233 lower dI1  
 234 lower dI2  
 235 lower dI3  
 236 lower dC  
 237 lower dPM1  
 238 lower dPM2  
 239 lower dPM3  
 240 lower dPM4  
 241 Upper P3-P4  
 242 Upper M1-M2

243 Upper P3-M2  
 244 Upper M2-M3  
 245 Upper M1-M3  
 246 Upper incisiform  
 247 Upper dp3-dp4  
 251 Lower P3-P4  
 252 Lower M1-M2  
 253 Lower P3-M2  
 254 Lower M2-M3  
 255 Lower M1-M3  
 256 Lower incisiform  
 257 Lower dp3-dp4  
  
 300 bird  
 500 fish  
 999 indeterminate

**Field 9**

Species (col. 12-14)

001 smaller than rabbit  
 002 rabbit-small carnivore  
 003 small ungulate (caprid, small cervid)  
 004 medium ungulate (red deer, pig, reindeer, ass)  
 005 large ungulate (elk, giant deer, horse, bovid,  
 etc.)  
 006 n/a  
 007 *Capra hircus*  
 008 *Ovis aries*  
 009 *Ovis/Capra*  
 010 *Rupricapra rupricapra* (Chamois)  
 011 *Capra Ibex\_* (Ibex)  
 012 *Chamois/Ibex*  
 013 *Capreolus capreolus\_* (roe deer)  
 014 *Dama dama* (fallow deer)  
 015 *Dama/Cervus*  
 016 Cervid  
 017 *Cervus elaphus* (red deer)  
 018 *Rangifer tarandus\_* (reindeer)  
 019 *Alces alces* (European elk)  
 020 *Megaceros giganteus* (giant deer)  
 021 large cervid (elk, giant deer)  
 022 *Sus scrofa* (wild boar)  
 023 *Sus scrofa domesticus* (domestic pig)  
 024 *Bison priscus* (steppe bison)  
 025 *Bos primigenius* (auroch)  
 026 *Bos/Bison*  
 027 *Bos taurus*  
 028 *Dicerorhinos mercki*  
 029 *Coleodonta antiquatiss*  
 030 *Equus caballus*  
 031 *Equus hydruntinus*(wild half-ass)  
 032 *Equus\_sp.*  
 033 Rhino sp.

034 *Dicerorhinus hemitoechus*  
 035 small-medium sized carnivore  
 036 n/a  
 037 large carnivore  
 038 *Canis lupus* (wolf)  
 039 *Canis familiaris* (dog)  
 040 *Canis aureus* (jackal)  
 041 *Cuon alpinus* (dhole)  
 042 *Vulpes vulpes* (red fox)  
 043 *Alopex lagopus* (arctic fox)  
 044 *Canis* sp.  
 045 fox  
 046 canid  
 047 n/a  
 048 *Ursus arctos* (brown bear)  
 049 *Ursus spelaeus* (cave bear)  
 050 *Ursus* sp.  
 051 n/a  
 052 *Crocota crocuta* (spotted hyena)  
 053 n/a  
 054 *Felis silvestris* (wild cat)  
 055 *Felis lynx* (lynx)  
 056 n/a  
 057 *Panthera pardus* (leopard)  
 058 *Panthera leo* (cave lion)  
 059 *Martes* sp.  
 060 *Martes martes* (pine marten)  
 061 *Martes foina* (beech marten)  
 062 *Gulo gulo* (wolverine)  
 063 *Mustela erminea* (stoat)  
 064 *Mustela nivalis* (weasel)  
 065 *Mustela lutreola* (European mink)  
 066 *Mustela putorius* (European pole-cat)  
 067 *Meles meles* (badger)  
 068 *Lutra lutra* (otter)  
 069  
 070 *Lepus europaeus* (brown hare)  
 071 *Lepus timidus* (arctic hare)  
 072 *Lepus* sp.  
 073 *Erinaceus europaeus* (hedgehog)  
 074 n/a  
 075 n/a  
 076 n/a  
 077 n/a  
 078 n/a  
 079 n/a  
 080 *Marmota marmota*  
 081 *Castor fiber*  
 082 *Cricetus cricetus*  
 083 n/a  
 084 n/a  
 085 n/a  
 086 n/a

200 Rodent  
 300 Bird  
 400 Reptile  
 500 Fish  
 999 indeterminate

**Field 10**

Bone Break Type

1 stepped or columnar  
 2 sawtoothed or splintered  
 3 punctured  
 4 transverse, irregular  
 5 oblique, irregular  
 6 transverse, regular  
 7 oblique, irregular  
 8 spiral, irregular  
 9 spiral, regular  
 10 irregular break  
 11 longitudinal split  
 12 grooved  
 13 cut

**Field 11**

Recent break

1 recent break, length reduced  
 2 recent break, length not affected  
 9 no recent breaks

**Field 12**

Greatest Length in mm

**Field 13**

Weight in grams

**Field 14**

Articulation

1 n/a  
 2 articulated see succeeding  
 3 fused with preceding  
 4 articulated with preceding, weighed together  
 5 articulated with preceding, weighed separately  
 6 probably articulated  
 7 possibly articulated  
 9 indeterminate/not articulated

**Field 15**

Side

1 left  
 2 right  
 3 right medial/left lateral

- 4 left medial/right lateral
- 5 medial
- 6 both right and left
- 9 indeterminate

**Field 16**

Completeness (relative to complete bone)  
expressed to closest of following percents

- 10
- 25
- 50
- 75
- 90
- 100

**Field 17**

Portion present (anterior/posterior) (col. 27)

- 1 anterior portion present
- 2 central portion present
- 3 posterior portion present
- 4 complete anterior-posterior
- 9 indeterminate

**Field 18**

Portion present (medial/lateral) (col. 28)

- 1 medial portion present
- 2 central portion present
- 3 lateral portion present
- 4 complete medial-lateral
- 9 indeterminate

**Field 19**

Age Criteria

- 01 Epiphysis fused
- 02 Epiphysis fusing (epiphyseal line)
- 03 Epiphysis unfused
- 04 proximal fused/distal fused (for vertebra, proximal = anterior, distal = posterior)
- 05 proximal fused/distal fusing
- 06 proximal fused/distal unfused
- 07 proximal fusing/distal fused
- 08 proximal fusing/distal fusing
- 09 proximal fusing/distal unfused
- 10 proximal unfused/distal fused
- 11 proximal unfused/distal fusing
- 12 proximal unfused/distal unfused
- 13-14 n/a
- 15 cranial sutures fused
- 16 cranial sutures unfused
- 17-19 n/a
- 20 tooth bud (root unformed)
- 21 n/a
- 22 erupting tooth

- 23 n/a
- 24 open tooth root
- 25-30 n/a
- 31 slight or no wear on tooth
- 32 moderate wear on tooth
- 33 marked wear on tooth
- 34 very heavy wear (worn to root)
- 35 resorption of alveolus
- 36 deciduous tooth
- 37 permanent tooth
- 38 dental arcade with both deciduous and permanent teeth
- 39 n/a
- 40 bone texture and/or size
- 41-49 n/a
- 50 measurement
- 51-54 n/a
- 55 antler/horn development
- 56-59 n/a
- 60 arthritic lipping
- 61-98 n/a
- 99 indeterminate

**Field 20**

Relative Age

- 1-2 n/a
- 3 fetal/infant
- 4 n/a
- 5 subadult
- 6 adult
- 8 old adult
- 9 indeterminate

**Field 21**

Sex criteria

- 1 antler or antler pedicle present/absent
- 2 os penis (baculum)
- 3 os clitoris
- 4 metatarsal spur (calcar) (some male birds)
- 5 bone measurement
- 6 tooth measurement
- 7 qualitative morphology
- 8 medullary bone (females of some bird species)
- 9 non-applicable or indeterminate

**Field 22**

Sex

- 1 male
- 2 female
- 9 indeterminate

**Field 23**

Minimum Number of Elements

1	MNE	75
9	not MNE	90
		100

**TAPHONOMY**

**Field 24**

Weathering

0	absent
1	slight
2	marked
9	indeterminate

**Field 25**

Weathering type

0	absent
1	fine line fractures
2	spalling (flaking in planes)
3	root etching
4	chemical etching
5	abrasion (impact of wind and/or waterborne particles)
6	pitting
7	fine line fractures and spalling
8	water wear
9	other form (list in comments)
10	eroded

**Field 26**

Breakage pattern

0	unbroken
1	angular fracture (dry bone)
2	spiral fracture (green bone)
3	angular and spiral fractures
9	indeterminate

**Field 27**

Burning

0	unburnt
1	completely calcined (white/gray)
2	partly calcined
3	carbonized (black)
4	partly carbonized
5	burnt (reddish)
6	burnt (shiny)/partly burnt
7	possibly burnt

**Field 28**

Percentage Burned

10
25
50

**Field 29**

Split

0	not split
2	split longitudinally into medial/lateral parts
3	split longitudinally into anterior/posterior parts
4	split transversely
5	quartered longitudinally
6	split transversely and longitudinally

**Field 30**

Cut Marks

0	absent
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Numbering following Binford 1981.

**Field 31**

Comments