CALCAENEA OF DOMESTIC DOGS

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ABSTRACT

The calcanea of domestic dogs are described and compared to those of the wolf and coyote.

INTRODUCTION

Domestic dogs (*Canis domesticus*) have been tamed and fed by man while being kept as a pet. Most crosses have been with the timber wolf *(Canis lupus)* with many breeds known to have been formed by such crosses. Crosses have also been made with the coyote *(Canis latrans)* although no known domestic breed has resulted from such crosses. Natural wild crosses have been called "coy-dogs".

MATERIALS AND METHODS

Calcanea of various breeds of dogs were studied. The specimens were borrowed from the Peabody Museum (PM), American Museum (AM), National Museum (NM) and the Philadelphia Academy of Science (PAS). All measurements listed in Tables 1 and 2 were taken with Helios dial calipers.

WILD ANCESTORS

Calcanea of canine ancestors have been discussed by Stains (1975). The closest relatives of the domestic dog are the wolf and the coyote. Domestic dogs of wolf origin were probably the huskies, samoyes, chows, pomeranians, elkhounds, collies, alsatian, corgis, schipperkes, terriers, greyhounds, setters, spaniels, pointers, retrivers, mastiffs, bulldogs and true hounds (Fiennes and Fiennes, 1968).

DOMESTIC BREEDS

The largest breeds examined were the Great Dane and St. Bernard. The cuboid surface is wider than long in the Great Dane and longer than wide in the Scotch Deerhound. The anterior articular surface is divided into two parts and usually the upper part is longer than the lower part. There is a third surface between the cuboid and the lower part of the anterior articular surface, thus the cuboid surface appears continuous with the anterior articular surface. Measurements of calcanea are presented in Table 1 and indices in Table 2.

Following are 50 breeds of dogs whose calcanea are briefly described.

GREAT DANE. (PM 1362). The Great Dane has a calcaneum with a rounded and small anterior articular surface with the greatest length of the upper part of 5.0mm and the lower 2.8mm. The upper 2.1mm of the medical articular surface is curved over slightly at a 150° angle. The cuboid surface is heart-shaped and wider than long. The trochlear process is bulbous with a slight slope at the

lower end and ending in the upper one-half of the lower part of the posterior articular surface. The widest part of the trochlear process is half-way between the end of the bone and the lower end of the medial articular surface; being closer to the anterior articular surface.

ST. BERNARD (PM #2569, PAS #4989). The St. Bernard is the largest breed examined. The widest area of the posterior articular surface is even with or slightly below the end of the medial articular surface. The cuboid surface is longer than wide. The trochlear process is bulbous, sloping at the lower end of the cuboid surface and ending at the upper end, ½-way up the lower end of the posterior articular surface.

SCOTCH DEERHOUND (NM 238168). The anterior articular surface is in two parts, the greatest length of the upper part is 8.4mm and the lower 6.6mm. The cuboid surface is longer than wide. The trochlear process is bulbous, the widest part being the lower end of the medial articular surface and the upper end of the anterior articular surface to which it is slightly closer. Calcanea of the Scotch Deerhound are similar to the St. Bernard but lacks the second (upper) enlargement of the trochlear process.

RUSSIAN WOLFHOUND (AM 139940); NM 269321, 291144). The calcaneum is slender and elongate. The anterior articular surface is small and composed of two parts: 5.1mm upper and 2.6mm lower which is rolled; not obvious in some. The upper 3.5mm of the medical articular surface is slightly curved at a 150° angle.

GERMAN SHEPHERD (AM 165623). The anterior articular surface is in two parts forming a nearly smooth curve, the upper part 7.1mm long and the lower 5.0mm long. Both the cuboid and anterior articular surfaces are distinct and separate. The trochlear process is slight with the widest point near the center of the anterior articular surface.

FOXHOUND (PM 2681). The anterior articular surface is in two parts: Upper 7.2mm with 1.7mm curved over at a 135° angle and lower part 5.1mm. There is a third surface between the cuboid and the lower part of the anterior articular surface. The trochlear process is small with the widest part even with or slightly below the upper edge of the anterior articular surface.

MASTIFF (NM 22249). The anterior articular surface is in two parts but tends to be rounded and quite small, upper part 3.8mm and lower 4.2mm; medial articular surface with the upper 2.6mm curved at a 145° angle. The cuboid surface is spade-shaped with the width across the exterior part of the surface of 13.6mm. The trochlear process is slight with the widest part even with or slightly above the upper edge of the anterior articular surface. The body is enlarged giving the bone a massive appearance.

BLOODHOUND (PM 1942). The anterior articular surface with two parts: the upper 6.5mm long and the lower 4.0mm long. The upper 3.2mm of the medial articular surface is curved over at a 125° angle. The medial articular surface is distinct and sets well above on the sustentaculum. The trochlear process is distinct but small and widest at a point near the center of the anterior articular surface.

NEWFOUNDLAND (AM 147899, NM 21992). The anterior articular surface is in two parts: upper 7.1mm, lower 4.7mm and curves into the cuboid surface. Medial articular surface is curved over proximally at 130° angle. There is a smooth area between the cuboid and the lower part of the anterior articular

surface. Trochlear process small and widest near the upper part of the anterior articular surface.

SALUKI (AM 120450). The anterior articular surface is 7.1mm for the upper part and 6.8mm for the lower. The medial articular surface has a well-developed 3.8mm turned area on the proximal edge. The cuboid surface is continuous with the anterior articular surface. The trochlear process is widest at a point even with the proximal end of the anterior articular surface.

OTTERHOUND (NM 283103). The anterior articular surface is 6.3mm for the upper and 5.4mm for the lower part which slopes abruptly into the cuboid. The medial articular surface has a slight curve of 1.6mm at a 140° angle. The cuboid surface has an obvious dip between the cuboid and the anterior articular surface.

GREYHOUND (NM 22308, 22690, 261035). The trochlear process is widest near the upper edge of the anterior articular surface. The anterior articular surface is 6.1mm in greatest length of the upper surface and 4.3 mm for the lower which is rather indistinct and insignificant as a rounded knob. The medial articular surface has a slight turning of one corner in some. The cuboid surface is either separate or continuous with the anterior articular surface.

SCOTCH COLLIE (NM 241137, AM 14044). The anterior articular surface is in two parts: 5.5mm long for upper and 4.9mm for lower which tends to be continuous with the cuboid surface. The medial articular surface has the upper 2mm curved over a 130° angle.

LABRADOR HUSKY (NM 2600). The anterior articular surface is 5.3mm for the length of the upper surface and 14.1mm for the lower. The medial articular surface is continuous with the anterior articular surface with a dip present. The trochlear process is obvious, the widest between the anterior and medial articular surfaces but nearer the anterior articular surface.

GORDON SETTER (NM 2566). The anterior articular surface is slightly rounded and prominent, upper part 10.0mm, lower 6.7mm. The medial articular surface with a distinct separation between the cuboid surface and the lower part of the anterior articular surface. The troclear process is bulbous, being widest level with the proximal edge of the anterior articular surface.

POINTER (NM 2616). Anterior articular surface a small knob with 3.4mm upper and 3.6mm lower. Medial articular surface not turned. The trochlear process is bulbous and widest between the anterior and medial articular surfaces.

ARKANSAS COONHOUND (NM 2431). The anterior articular surface is 5.3mm long for the upper part and 6.0mm for the lower which is also wider. The medial articular surface with the upper 2.9mm curved over at a 120° angle. The trochlear process is small, being widest at a level between the anterior and medial articular surfaces.

BLUE MERLE COLLIE (AM 145123). The anterior articular surface has a length of 4.1mm for the upper half and 3.4mm for the knoblike lower half. The trochlear process is more obvious than in most dogs, the widest part being between the medial and anterior articular surfaces.

BOXER (AM 150052). The anterior articular surface is 5.3mm for the upper part and 4.3 for the lower which is not prominent. The medial articular surface has 2.5mm of the tip rolled. The cuboid surface is continuous with the anterior

articular surface with a dip present. The trochlear process is widest between the anterior and medial articular surfaces.

GIANT SCHNAUSER (NM 2564). The anterior articular surface is 5.1mm for the upper part and 3.5mm for the lower with a small knob. Medial articular surface with 2.8mm of the upper part slightly turned. The cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is low with the widest point within the anterior articular surface.

CLIMBER SPANIEL (NM 2664). The anterior articular surface of 5.9mm for the upper part and 4.2mm for the lower. Medial articular surface with a gradual rolling of the upper edge. The cuboid surface is continuous with the anterior articular surface with a prominent dip between. The trochlear process is slight with the widest part between the center and upper edge of the anterior articular surface.

DALMATIAN (NM 130219). Anterior articular surface of two parts: length of upper 5.5mm and lower 5.0mm which curves into the cuboid surface. Medial articular surface with 1.5mm of the upper edge curving over at a 133° angle. The cuboid surface is not so distinct as in the calcaneum of the Newfoundland. The trochlear process is prominent and widest near or slightly proximal to the proximal edge of the anterior articular surface.

BASSET (NM 2611). The anterior articular surface has a 4.6mm upper part and a 3.6mm lower which forms a rolled knob. The medial articular surface with a tip of 2.1mm rolled. The cuboid surface is in two parts which was not noticed in any other dog. One part is the true cuboid 9.3mm long and 7.9mm wide; the other part is 3.5mm long and is continuous with the anterior articular surface; if the space between these two surfaces is included, the length is 13.3mm. The trochlear process is widest even with the upper edge of the anterior articular surface.

IRISH SETTER (NM 20979, 21997). The anterior articular surface is 4.4mm for the upper part and 2.4mm for the lower which is rolled and difficult to distinguish. The medial articular surface has a turn of about 130° angle at about half the width. The trochlear process is widest at the center of the anterior articular surface or between the anterior and medial articular surfaces.

AFGHAN SPANIEL (NM 22252, AM 100231). The medial articular surface has a slight turning of the edge. The cuboid surface is continuous with the anterior articular surface with little or no dip. The trochlear process is widest below the center of the anterior articular surface.

MEXICAN PIT BULL (NM 1452). The upper part of the anterior articular surface is 3.7mm and the lower 3.0mm and poorly developed; the medial articular surface has 2.4mm of the shallow surface turned; the cuboid surface is continuous with the anterior articular surface with a prominent dip. The trochlear process is widest between the anterior and medial articular surfaces.

SAMOYEDE (NM 1897). The anterior articular surface is 5.1mm for the upper segment and 4.5mm for the lower. The upper 0.9mm of the medial articular surface is turned. The cuboid surface is separate from the anterior articular surface. The trochlear process is widest within the anterior articular surface.

BEDDINGTON TERRIER (AM 99635). The anterior articular surface has a 4.1mm upper part and a 3.6mm lower part which is rather small. The medial articular surface has one corner slightly rolled. The cuboid surface is continuous

with the anterior articular surface with a slight dip. The trochlear process is rather distinct as in the Irish terrier, the widest part being between the anterior and medial articular surfaces.

IRISH TERRIER (AM 90154, 90155). Anterior articular surface with upper part 5.35mm and lower 4.75mm; medial articular surface with 1.35mm rolled. Cuboid surface continuous with the anterior articular surface with an obvious dip. The trochlear process is more prominent than in most dog calcanea and widest near the upper edge of the anterior articular surface with a slightly less widening at the cuboid surface.

KERRY BLUE TERRIER (NM 2421). The calcaneum is extremely rugose which affects the accuracy of width measurements. The anterior articular surface is 4.2mm in greatest length for the upper part and 3.4mm for the lower which is rather small. The medial articular surface has an obvious dip. The trochlear process is completely covered by a rugose abscess.

BLACK CHOW (NM 2347). The anterior articular surface has an upper length of 5.1mm and a lower of 4.1mm, the lower being much wider than the upper. The medial articular surface with a turning of 1.5mm. The cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is widest between the anterior and medial articular surfaces but nearer the anterior surface.

WHIPPET (AM 35156). The anterior articular surface is 3.6mm long for the upper part and 1.9mm for the lower (small and rolled). The medial articular surface has an additional 2mm turned over the edge. The cuboid surface is continuous with the anterior articular surface. The trochlear process is widest at a point near the center of the anterior articular surface.

SPITZ (NM 187976, 187977). The anterior articular surface is 4.35mm for the upper part and 3.8mm for the lower with the lower much broader than the upper; medial articular surface has little obvious turning; cuboid surface continuous with the anterior articular surface which contains an obvious dip; trochlear process is indistinct with the widest point within the anterior articular surface.

MEXICAN HAIRLESS CHIHUAHUA (NM 270260). The anterior articular surface has measurements of 3.0mm for the length of the upper part and 2.7mm for the lower which is a small knob; medial articular surface with the upper 1.5mm rolled; cuboid surface continuous with the anterior articular surface with a prominent dip. The trochlear process is not obvious, but widest at the cuboid level.

ITALIAN GREYHOUND (NM 35140). The anterior articular surface has a greatest length of the upper of 2.4mm and for the lower part 2.3mm. The medial articular surface with the upper 2mm folded. The cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is widest between the anterior and medial articular surfaces.

BULL TERRIER (AM 70118, NM 29115). The anterior articular surface is 3.9mm in greatest length of the upper part and 3.2mm for the lower. The cuboid surface is continuous with the anterior articular surface with a prominent dip. The trochlear process is widest between the anterior and medial articular surfaces.

WIRE-HAIRED FOX TERRIER (AM 90162, 99603). The anterior articular surface has a greatest length of the upper part of 4.2mm and for the lower part, 2.7mm; medial articular surface has no turning; cuboid surface continuous with the anterior articular surface with a distinct dip. The trochlear process is distinct, being widest between the anterior and medial articular surfaces.

SCOTCH TERRIER (AM 90212, 100216). The anterior articular surface is 2.2mm in length of both the upper and lower sections; the medial articular surface may be rolled slightly with 1.5mm; the cuboid surface is continuous with the anterior articular surface with a prominent dip; the trochlear process is distinct and low near the center of the anterior articular surface or between the anterior and medial articular surfaces.

SKYE TERRIER (NM 21993). The anterior articular surface is extremely small with the upper 3.1mm in length and the lower 1.1mm. The medial articular surface with a slight rolling of 1.3mm. The cuboid surface is continuous with the anterior articular surface with a prominent dip. The trochlear process is widest at a point within the anterior articular surface.

LHASE TERRIER (AM 143519). The anterior articular surface is 4.6mm for the upper part and 5.3mm for the lower. The medial articular surface with 1.6mm of the upper part rolled. The cuboid surface is continuous with the anterior articular surface with a prominent dip. The trochlear process is distinct and widest near the center of the anterior articular surface.

MEXICAN HAIRED DOG (NM 270172). The anterior articular surface is 2.4mm for the upper part and 1.6mm for the lower; the medial articular surface with the upper 1.9mm rolled. The cuboid surface is continuous with the anterior articular surface with a prominent dip. The trochlear process is widest within the anterior articular surface.

ENGLISH TOY SPANIEL (NM 2576). The anterior articular surface is 3.3mm for the upper part and 3.1mm for the lower which forms a rolled curve; medial articular surface with a slight turning of 2.1mm; the cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is widest near the mid point of the anterior articular surface.

PEKINESE (AM 35171, 90188, 100188). The anterior articular surface is 3.6mm for the upper and 3.7mm for the lower with a tendency for an additional surface to the left of the upper surface; a medial articular surface with little or no rolling; the cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is widest within the anterior articular surface or between the anterior and medial articular surface.

POMERANIAN (NM 61588). The anterior articular surface is 2.1mm for the upper part and 2.3mm for the lower. The medial articular surface with 1.4mm slightly rolled. The cuboid surface continues with the anterior articular surface with a prominent dip. The trochlear process is widest near the upper edge of the anterior articular surface.

MEXICAN CHIHUAHUA (NM 258307). The anterior articular surface has a greatest length of the upper part of 2.2mm and for the lower part 2.3mm. The medial articular surface with the upper 1.2mm folded. The cuboid surface continuous with the anterior articular surface with a slight dip. The trochlear process is widest between the anterior and medial articular surfaces.

MALTESE (NM 61587). The anterior articular surface is 2.0mm for the upper part and 1.7mm for the lower which is very small. The medial articular surface with 1.5mm rolled. The cuboid surface is continuous with the anterior articular surface with a slight dip. The trochlear process is widest near the upper end of the anterior articular surface.

CHIHUAHUA (NM 35387, 42897, 90210, 90231, 99658, 100132). The medial articular surface with the upper part folded in most specimens; anterior articular surface 2.4mm upper and 2.15mm lower; cuboid surface continuous with the anterior articular surface with a slight dip; wider near the anterior articular than below. The trochlear process is usually even with the upper edge of the anterior articular surface.

SUMMARY

Wild canids have shorter (17-66mm) calcanea than domestic dogs (17-73mm), lower dorso-ventral height (wild 7 to 28mm; domestic 11 and 32mm), a narrower least width of body (2 to 12mm in wild canids; 3 to 15mm in domesticated dogs); a narrower width (7 to 29mm in wild; 7 to 33 in domesticated). A collie-coyote cross is closer to the calcaneum of the Blue Merle Collie than the Scotch Collie. A pointer-coyote cross is closer in size of calcaneum with the posterior and medial articular surfaces narrower but similar; the coyote calcaneum is much smaller. Wild killed coyotes of unknown but suspected crosses ranged between 44.7 and 51.6mm in total length, 13.3 to 21.0 in dorso-ventral height, 61. to 8.0mm in least width of body, and 16.4 to 20.5mm in width.

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Figure 1. Stains "Calcanea of Domestic Dogs"

Row One. St. Bernard, Great Dane, Russian Wolfhound, Scotch Deerhound, Mastiff, Foxhound, German Shepherd, Bloodhound, Newfoundland, Scotch Collie, Saluki.

Row Two. Dalmatian, Pointer, Afghan Spaniel, Labrador Husky, Arkansas Coonhound, Boxer, Giant Schnauser, Blue Merle Collie, Irish Setter, Greyhound, Climber Spaniel, Gordon Setter, Otterhound, Basset, Mexican Pit Bull, Bulldog.

Row Three. Samoyede, Black Chow, Beddington Terrier, Kerry Blue Terrier, Whippet, Irish Terrier, Spitz, Mexican Hairless Chihuahua, Scotch Terrier, Bull Terrier, Wire-haired Terrier, Italian Greyhound, Skye Terrier, Lhase Terrier, Mexican Haired Dog, English Toy Terrier, Pekinese, Mexican Chihuahua, Pomeranian, Chihuahua, Maltese.

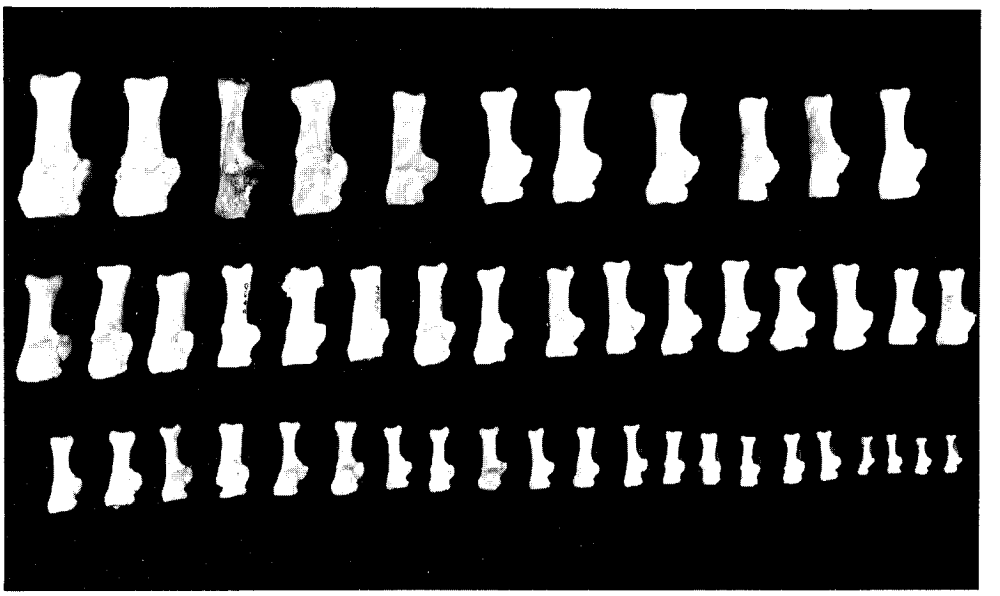

Table I. Measurements of Calcanea of Domestic Dogs and Ancestral Canids.

Breed	Total Length (TL)	Greatest Length (GL)	Width (W)	Greatest Width (GW)	Dorso-Ventral Height D-VH	Least Width Body LWB
Great Dane	69.7	72.4	30.4	41.0	31.1	14.2
St. Bernard	67.9	72.5	30.5	37.2	32.4	19.7
Scotch Deerhound	66.3	67.6	27.2	37.2	29.7	11.3
Russian Wolfhound	64.3	65.3	23.7	41.1	25.6	9.7
TIMBER WOLF	57.9	66.0	23.7	29.0	24.0	9.2
German Shepherd	57.8	59.9	23.4	30.0	24.5	11.0
Foxhound	57.4	59.9	25.5	31.8	24.9	10.4
Mastiff	57.2	58.5	25.0	31.6	25.1	12.8
Bloodhound	56.0	58.7	26.0	32.8	26.0	10.5
Newfoundland	54.9	56.9	23.9	30.8	22.8	10.1
Saluki	54.8	56.1	22.4	30.6	24.5	8.9
Otterhound	53.6	55.3	23.7	31.3	24.5	10.6
Greyhound	51.8	53.7	21.0	26.8	22.6	7.7
Scotch Collie	51.4	52.9	20.7	21.9	22.5	9.9
Labrador Husky	51.1	52.8	20.5	26.5	21.3	8.8
Gordon Setter	50.6	52.0	20.3	26.6	21.1	9.8
Pointer	50.4	52.0	21.9	27.4	21.2	9.9
Eskimo Dog	50.0	51.2	20.1	26.2	21.5	7.8
Arkansas Coonhound	49.6	51.5	21.4	28.1	21.3	10.3
Blue Merle Collie	47.9	49.9	11.6	24.7	20.5	7.2
Boxer	46.8	48.9	20.5	26.5	22.6	10.8
Giant Schnauser	45.5	48.2	20.2	25.7	20.0	8.0
Climber Spaniel	45.3	46.4	20.6	25.9	20.3	7.9
Dalmatian	42.5	43.9	19.5	25.2	19.0	9.2

Basset	42.3	43.9	21.7	25.8	24.5	8.3
COYOTE	40.4	45.4	16.0	22.4	15.9	5.9
Irish Setter	40.9	41.7	17.6	22.3	17.8	7.4
Afghan Spaniel	38.9	39.9	16.3	21.6	16.8	7.3
Mexican Pit Bull	38.8	40.0	16.8	21.9	17.2	7.1
Samoyede	37.7	38.8	15.0	21.1	16.9	6.8
Bull Dog	37.5	38.6	16.1	21.15	16.7	9.2
Beddington Terrier	37.3	38.4	15.2	20.2	15.7	5.7
Irish Terrier	37.1	37.8	15.9	20.8	16.8	6.8
Kerry Blue Terrier	36.9	37.3	16.9	19.9	16.4	6.9
Black Chow	36.7	38.2	17.2	21.5	17.7	7.0
Whippit	36.0	31.4	16.0	20.7	17.0	5.5
Spitz	32.3	33.3	13.6	17.5	13.9	5.9
Mexican Hairless Chihuahua	31.7	32.6	10.8	17.3	11.6	3.3
Italian Greyhound	30.3	31.4	11.6	16.9	13.0	4.1
Bull Terrier	30.0	31.3	13.3	16.7	20.8	5.9
Wire-haired Terrier	29.8	30.7	12.8	16.3	13.4	5.3
Scotch Terrier	29.6	30.3	14.6	18.1	12.3	6.0
Skye Terrier	26.2	27.4	10.7	14.8	11.7	4.8
Lhase Terrier	25.4	25.7	11.5	14.9	12.6	4.1
Mexican Haired Dog	25.2	25.4	10.8	14.4	11.6	3.3
English Toy Spaniel	24.5	25.4	10.8	14.4	10.6	4.0
Pekinese	24.3	26.85	10.7	13.9	11.0	4.4
Pomeranian	19.7	19.8	7.6	10.0	7.8	2.9
Mexican Chihuahua	19.4	19.7	7.6	10.5	9.2	2.6
Maltese	18.9	19.2	8.7	10.6	8.8	2.3
Chihuahua	17.2	18.3	7.4	9.5	8.2	2.15

Table II. Indices (Ratios) and Surfaces of Calcanea of Domestic Dogs and Ancestral Canids

Breed	W/TL	D-VH/TL	LWB/D-VH	Medial Articular Surface		Cuboid Surface	
				Greatest Width	Greatest Width	GL	GW
Great Dane	.436	.446	.456	12.3	7.8	14.1	15.3
Saint Bernard	.449	.453	.608	17.7	16.8	21.0	15.8
Scotch Deerhound	.410	.447	.378	17.7	16.8	18.0	11.4
Russian Wolfhound	.368	.398	.378	7.7	12.4	14.2	12.4
TIMBER WOLF	.409	.409	.383				
German Shepherd	.404	.423	.449	11.6	7.6		
Foxhound	.444	.434	.447	10.0	6.8	14.4	11.2
Mastiff	.437	.438	.549	11.5	7.6	17.2	13.6
Bloodhound	.464	.464	.404	13.3	7.7	16.8	15.0
Newfoundland	.434	.415	.443	10.4	6.0	15.5	11.4
Saluki	.423	.462	.363	11.1	6.4	15.5	13.5
Otterhound	.442	.457	.432	12.1	6.7	17.2	12.0
Greyhound	.406	.436	.341	9.5	6.3	12.5	10.1
Scotch Collie	.402	.438	.440	9.4	6.5	13.9	10.2
Labrador Husky	.401	.417	.413	8.4	6.1	14.7	11.9
Gordon Setter	.401	.417	.464	11.9	10.5	11.8	10.0
Pointer	.435	.421	.467	10.8	7.1	14.6	10.5
Eskimo Dog	.402	.430	.363				
Arkansas Coonhound	.432	.429	.484	9.9	6.7	13.7	11.0
Blue Merle Collie	.242	.428	.351	7.4	4.8	13.5	9.7
Boxer	.438	.482	.474	10.3	10.1	14.3	10.4
Giant Schnauser	.444	.439	.400	9.5	6.7	13.8	10.0
Climer Spaniel	.219	.448	.389	14.4	6.4	12.9	9.2
Dalmatian	.458	.447	.484	9.5	5.2	13.5	10.9

Basset	.513	.579	.338	10.0	5.2	13.3	7.9
COYOTE	.391	.388	.373	11.5	6.6	14.0	11.0
Irish Setter	.430	.435	.416	8.5	5.5	11.3	7.7
Afghan Spaniel	.420	.431	.436	8.5	5.3	11.1	8.3
Mexican Pit Bull	.433	.443	.242	8.8	5.6	11.0	9.9
Samoyede	.418	.462	.402	8.0	4.7	9.9	8.8
Bull Dog	.451	.445	.550	8.8	5.3	11.7	8.85
Beddington Terrier	.410	.420	.363	8.0	4.7	10.8	8.8
Irish Terrier	.428	.454	.405	8.6	5.2	10.6	8.85
Kerry Blue Terrier	.457	.444	.237	8.0	4.0		
Black Chow	.468	.482	.411	8.3	5.5	10.3	8.6
Whippet	.444	.472	.323	7.2	4.8	10.8	9.1
Spitz	.421	.430	.424	6.5	4.75	9.8	8.35
Mexican Hairless Chihuahua	.341	.366	.284	6.6	3.8	8.9	7.9
Italian Greyhound	.382	.429	.315	6.1	3.8	8.8	5.5
Bull Terrier	.443	.693	.284	5.4	3.4	9.3	7.7
Wire-haired Terrier	.428	.448	.393	6.25	3.4	9.4	6.7
Scotch Terrier	.474	.482	.415	5.8	4.1	7.7	6.8
Skye Terrier	.408	.446	.410	5.7	3.7	7.8	5.3
Lhase Terrier	.452	.496	.325	5.7	3.7	7.8	5.3
Mexican Haired Dog	.428	.460	.284	5.6	3.6	8.3	5.5
English Toy Spaniel	.440	.432	.377	5.9	3.6	8.1	5.7
Pekinese	.440	.452	.400	5.9	3.7	7.3	5.3
Pomeranian	.385	.395	.372	5.1	2.6	5.8	5.4
Mexican Chihuahua	.392	.474	.283	4.8	3.1	5.6	4.9
Maltese	.460	.469	.263	3.8	2.5	6.0	3.5
Chihuahua	.415	.479	.298	4.0	2.35	5.3	4.1