

FORM AND FUNCTION 1: THE BASIC DOG.

During the 1990s, Dr Helen Hewson-Fruend [www.acdb.au.com/biography.html] wrote a series of articles on form and function in the dog. They were first published in *Pedigree Pal Digest* and later reprinted in the *Canine Journal*. Helen's analysis of form and function has stood the test of time. Little has changed except that much more is known about canine domestication now, 2019, than was known in the 1990s. These advances in knowledge do not affect Helen's analyses. Neither form nor function have changed. Here is the first of Helen's articles; others to follow.

FORM AND FUNCTION: PART 1, THE BASIC DOG

H. J. Hewson-Fruend

"The domestic dog, no matter what his looks may make him, is under the skin nothing more or less than a tractable wolf — or, to look at it from another angle, the wolf is nothing more nor less than a wild dog."

Edwin H. Colbert

Since the dog is a domesticated wolf, its primitive form and function is close to that of the wolf. An appreciation of this fact is essential to understanding the modern domestic dog. The latter is represented in 300-400 breeds and myriads of mongrels, each of which is a variation of the ancestral wolf. The ancestral wolf, based on archaeological and fossil evidence, size and distribution, is the Palaeolithic short-faced wolf. It is the **wild-type**. The term "wild-type" has been coined by geneticists to define the normal genotype of a natural population in the wild.

The domestication process resulted in some definable changes from the wild wolf to the domesticated dog. These changes were induced both environmentally and genetically, as behaviour patterns and selection pressures changed. The resultant domesticated dog (c. 12,000 years ago) is the **primitive type**. Olsen (1985) defines the observable changes from wolf to dog as follows:

"Among the first observable changes in the skulls, jaws, and dentitions of these tamed canines are: the foreshortening of the muzzle, or rostrum; the crowding of the tooth rows, and the comparative overall reduction in the size of the teeth. As domestication occurred, the mandibles deepened midway along the horizontal ramus, with a more convex inferior margin than that found in similar-sized wild wolves."

It is difficult (outside of a Museum and a study of archaeology) to come to grips with precisely what the primitive domestic dog looked like. However, it is reasonable to conclude that it was a wolflike dog and modern wolflike dogs most closely resemble it.

In spite of this difficulty it is desirable to derive an hypothetical exemplar which I will call the **basic dog**. In order to define the basic dog it is necessary (for convenience) to determine a modern conformation most closely resembling the primitive domestic dog. L. and R. Coppinger (1982) have addressed the issue in terms of form and function. Their "heeler" type is as follows:

"The cattle-driving dogs ... (with) pricked ears and long, pointed noses ... They are ... closest in appearance to the wild type."

J. Clutton-Brock (1981) addresses the issue in terms of wild/semi-domesticated dogs. She states:

"In their morphology dingoes are closely related to the Indian pariah and New Guinea dogs. They are most interesting relics of the dogs that must have been widespread throughout western and eastern Asia during the prehistoric period."

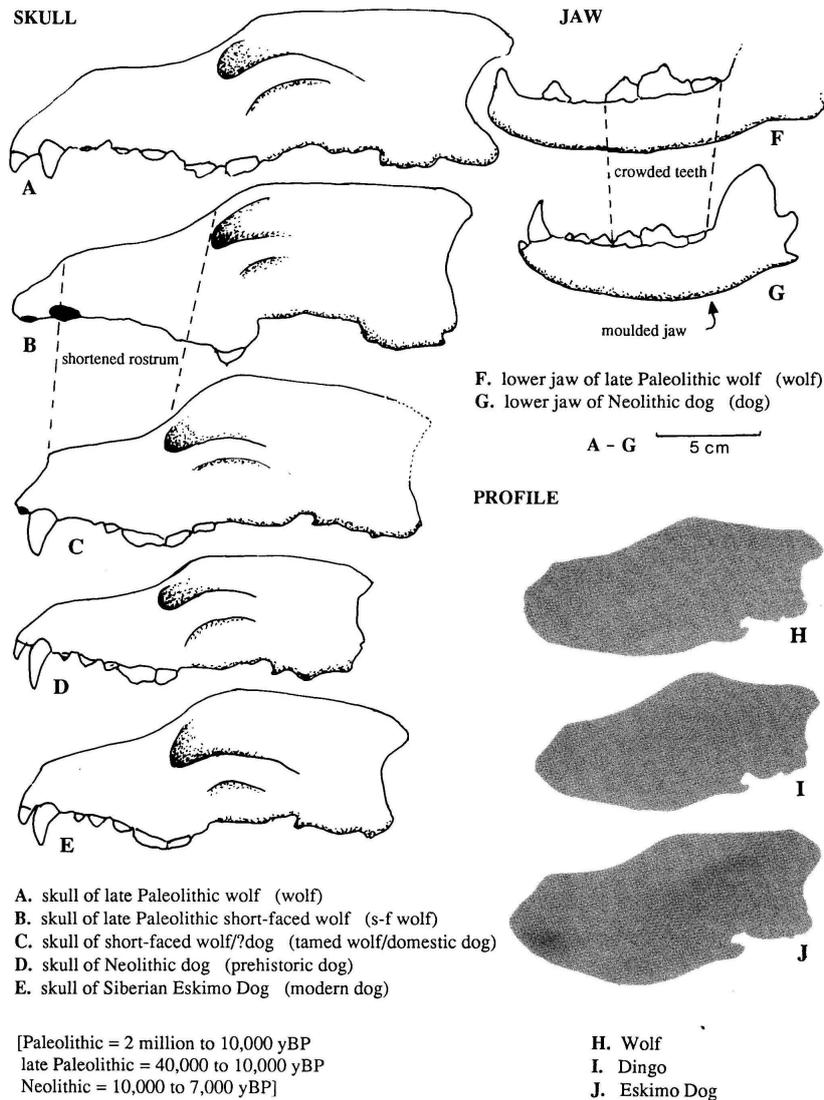
*We can define the hypothetical basic dog:
a prick eared dog
3:2 skull:muzzle ratio
9:10 height:length ratio
trotting structure
males 18 to 24 inches (46 to 61 cm) tall
double/flat coat
scimitar tail
free of exaggerations*

S. J. Olsen (1985) takes a palaeontological (fossil) approach:

"I feel confident ... that the short-faced wolves from the Fairbanks area appear to be the forerunners of the later, domesticated Eskimo dogs."

Thus we can define the hypothetical basic dog as a prick eared dog with a 3:2 skull:muzzle ratio; 9:10 height:length ratio; trotting structure; males in the range of 18 to 24 inches (46 to 61 cm) tall; double/flat coat; scimitar tail; free of exaggerations.

In doing that, we have a structural, functional and genetic basis — a norm — from which to interpret form and function. In effect we can assess form and function in comparison with the **basic dog**. We can assess it as degrees of variation through to exaggeration or in terms of specific mutations.



Progression of changes in skull shape from wolf to dog during domestication

References

Clutton-Brock, J. Domesticated Animals from Early Times. Heinemann & British Museum (Natural History), London.
 Coppinger, L. & R. (1982). Livestock-guarding dogs that wear sheep's clothing. *Smithsonian* April 1982 64-73.
 Olsen, S. J. (1985). Origins of the Domestic Dog. University of Arizona Press, Tucson.

Further reading

Fiennes, R. & A. (1968). The Natural History of the Dog Weidenfeld and Nicholson, London. McLoughlin, J. C. (1983). The Canine Clan. Viking Press, New York.