Canine Origins

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The wolf, the progenitor of the dog, is an extraordinarily effective predator. He is fleet of foot, of acute hearing and olfactory capability, strong and bold in the attack and works effectively in the cooperative social structure of the pack, attributes in many ways naturally well matched for an alliance with mankind. Although current scientific thinking is that the process of domestication was much more complex than primitive capturing, taming and thus directly domesticating wolves to create the dog, the end result is a remarkable working partnership. From the beginning man sought alliance with the dog as an effective protector in order to take advantage of these physical attributes of fleetness and power in his own struggle to survive and prosper. The keen canine olfactory capability, acute hearing and effective night vision are fundamental components of this protective functionality, for in order to repel a marauding predator, man or beast, it is necessary to detect his presence before harm can be done to livestock, property or members of the band, family or village.

Once agriculture commenced the crops would have tended to attract growing populations of varmints and pests, wild animals which at every opportunity would feed on the crops, in the field or stored after harvest, such as rats and deer. Newly domesticated animals, such as sheep, would have been enormously vulnerable to predation. The presence of primitive dogs would have alleviated much of this both by reducing the local population of prospective guest feeders, perhaps providing meat in the process, and by driving them away, permanently intimidating them. As carnivores, dogs or quasi-domesticated proto dogs would not have been inclined to disturb the crops or stored grain and, as proven by contemporary practice, could have been managed so as to fend off predators on the livestock while abstaining themselves.

The use of the dog in livestock husbandry and herding was an enormously important aspect of the contribution of the dog to the survival, advancement and prosperity of mankind. Although the use of contemporary herding dogs, particularly in the British Isles, often does not involve an important guardian role this is from the historical perspective a recent and unusual set of circumstances. In earlier and more primitive times, and over much of the world even today, herding and livestock guarding was and is as much defense against predators as containment, control and movement of the livestock itself. The common American or British perception of herding as being what Border Collies do on television or in the recently fashionable amateur herding trials reflects a very time and regional specific culture where control and manipulation of the sheep is the totality of the functionality. This situation has come about because of the eradication of the more significant predators in the British Isles several centuries ago.

Conventional wisdom, as espoused in popular literature and general canine books, is that man directly domesticated wolves to create the dog by capturing, taming and selectively breeding wolf pups. This process, which would have occurred over long periods of time, with false starts and failures along the way, and perhaps

in many places independently, would eventually have led to the breeding of animals living out entire lives in the company of man. The taming process would no doubt have been precarious with many becoming wild and aggressive as they matured and thus eventually being culled or returning to the wild. But from time to time some, the less aggressive and more tractable, and thus better adapted to life with man, would eventually have been bred while living with the band or within the village and the ongoing selection for the more tamable would gradually have increased the physical and psychological differences from the wolf population.

So prevalent is this viewpoint that it is widely assumed as established scientific fact. Yet the current literature belies this perception, that is, many current researchers increasingly believe that the dog is likely not directly descended from the grey wolf at all, but rather from an intermediate species or sub species, depending on the particular viewpoint being espoused. Thus while the wolf and the dog are very closely related, the emerging modern view is that there most likely was an intermediate non-domesticated breed or stage of development, which would have evolved and changed, thus distancing the first domesticated dogs from the wolf in terms of time and evolutionary state. Furthermore, if these views come to predominate under ongoing scientific scrutiny, increasingly likely, it will mean that man did not directly domesticate the wolf after all, but rather an existing wild or quasi-domesticated canid distinct from the wolf. This is of enormous importance, not only for the advancement of science, but because the existing mythology contributed to enormously misguided, ineffective and even damaging practices in canine breeding and especially training. The "alpha wolf" concept of dog training is dead, and being put to rest. We are the better for it.

Over the past thirty years science has made enormous strides in understanding the evolution of the human race, knowledge of fundamental practical importance in understanding the structure of modern society and the behavior of men, tribes and nations even today. New tools of science such as linguistic analysis and investigation of mitochondrial DNA sequence variation have resolved controversies and provided revolutionary insight. In coming to understand ourselves better our relationship with the domestic canine has been enhanced; these novel scientific methodologies have also been applied to the canine with equally significant and far reaching results.

There are practical consequences of this for dog breeders and trainers as well as historians. As an example, the concept of the alpha wolf has permeated the literature and gospel of dog training over the past thirty years, almost anything can be and has been justified and verified in terms of "just like the alpha wolf," perhaps most notably the once popularly promoted concept of the alpha roll. Yet L. David Mech, who popularized much of this in his famous 1970 book, has in the intervening years fundamentally revised his views and publicly urged his publisher to take the obsolete book out of print in favor of his subsequent work. (Mech, The Wolf: Ecology and Behavior of an Endangered Species, 1970) (Mech, Personal Web Site)

This enormous progress in the biological sciences in recent years offers the hope of better breeding, training, medical care and nutrition for our canine companions. Most of this is sound science supported by substantial DNA evidence, archeological discoveries and other scientific evaluation procedures which have come into use. But there is always an element of conjecture in the popular literature and care is needed to separate actual scientific reporting from amateur speculation, especially extreme speculation intended to popularize a person, a point of view or a commercial activity. All new knowledge and interpretation of existing knowledge needs to be applied with common sense and caution, for there can be danger in making simple minded interpretations and applying them blindly to training, breeding and discipline. We do not need to repeat the sort of nonsense propagated in canine circles based on the alpha wolf concept, which was always more hype than science.

In the 1750s the famous Swedish biologist and zoologist Carl Linnaeus organized a classification system for plants and animals, thus creating the field of taxonomy. In his system species with similar appearance were grouped into the genus, and the Latin word for the dog, Canis, became the genus Canidae in which he classified the wolf, fox, dog, jackals, coyotes and other similar creatures. The dog was viewed as a species, and a number of sub species were identified according to general physical appearance. It had long been known that dogs and wolves are very closely related, as they can interbreed and produce fertile offspring. By the 1990s modern molecular biology had demonstrated that the gray wolf (*Canis lupus*) is the common ancestor of domestic dog and many authorities therefore reclassified the dog as a subspecies of the wolf, that is, *Canis lupus familiaris.*

More recently some authorities, such as Coppinger, have nevertheless contended that for practical and evolutionary reasons the domestic dog is best thought of as a separate species. One consideration is that dogs can also produce viable offspring when bred to coyotes and jackals, which are themselves separate canine species. But more fundamentally they argue that although closely related the dog and wolf are separate species because they have developed marked differences in appearance, physiology, social mode and biological niche, and generally do not interbreed because of these differences.

All of this is important in our context because the concept of the dog as a subspecies of the grey wolf implies that the first dogs were directly tamed and thus large, aggressive pack oriented predators. There are, however, problems with this view because such animals would have been very difficult to deal with, and also because the dogs found with existent primitive peoples are much smaller, less aggressive and less pack oriented. Contemporary thinking has increasingly gravitated to the concept that the first domestic dogs were in fact very similar to these smaller, much less aggressive dogs, which implies that there is an intermediate evolutionary stage or species between the gray wolf and the first dogs. This has far reaching implications.

Although there is much speculation about the relationship between mankind and the progenitors of the domestic dog prior to the transition from hunter-gatherer to pastoral and agricultural life, solid archeological evidence is sparse. The popular and dramatic view of man the great hunter taming the wolf and teaming with him in the pursuit of big game has little direct evidence and serious practical ramifications.

Janice Koler-Matznick remarks:

> "At that time, humans had only clubs, axes, spears and knives. With these tools, stealth and ambush are used to secure large prey. Wolves are extremely difficult to condition to reliably inhibit inherent behavior. They instinctively chase large prey, and thus would hinder humans hunting cursorial (quick running) game, rather than assist. Wolves are also extremely food-possessive. If hungry tamed wolves did secure prey, humans would have to fight them for it. Dingoes provide a modern example of tamed wild canids as hunting aids. The Aborigines used dingoes to locate small prey that goes to ground or trees, but prevented dingoes from following when hunting kangaroos because the dingoes chased them off. If tamed wild canids are not useful aids, for hunting cursorial game and smaller canids are as proficient at locating smaller prey, there is no reason to keep large wolves in domestication." (Koler-Matznick, 2002)

Thus it would seem likely that prior to agriculture and pastoral life men and wolves may have interacted in various ways, perhaps with either scavenging from the other according to the luck of the hunt. Wolves living in proximity to human encampments or villages in order to scavenge may have inadvertently alerted in the

event of an intruder, just as the cry of the crow sometimes gives warning to the observant man walking in the forest. But a directly tamed wolf is clearly problematical as actively cooperating in the large game animal hunt or living in close relationship to the human band. The ancestral role of the dog in seeking out game and participating in the hunt for smaller game, driving them to ground or into the trees where they could be dispatched and harvested, is much better established by archeological evidence and observation of contemporary primitive practice than actual participation in the pursuit and slaying of large game animals.

Although villages or long-term encampments occurred sporadically in the hunter-gatherer era, in especially supportive locations, the advent of pastoral and agricultural living, very roughly about 12,000 years ago, was the point in time at which there begins to be substantial evidence of the human-canine relationship as we know it. The band of hunter-gatherers was always on the move, often making brief camps in the open, leaving little in the way of evidence of a primitive canine association or anything else; many things remain uncertain in our current state of knowledge.

Once planting and crop tending began mankind became tied to the soil and thus gave up the mobile way of life. Archaeological evidence is strong that the dog was present very early in this process. The immediate consequence of agricultural or village life was the creation and disposal of edible waste in the immediate area rather than spread across the countryside as the band moved in pursuit of game to hunt, carrion to scavenge or the abundance of nature to gather. All known primitive villages, those without a dogcatcher and eradication program, have quasi-tamed dogs belonging to no one in particular which live as scavengers, on the social margins, on the waste material. Even today large metropolitan areas, such as Moscow, sometimes have significant populations of indigenous canines with the same general physical attributes and quasi-domestic ecological niche.

In recent years Raymond Coppinger and others have theorized that as man gradually adapted to fixed agricultural life elements of the regional wolf population concurrently evolved into scavenging canines living on the periphery of human society and villages. Their view is that the discarded human waste in a fixed location attracted wolves as scavengers, and that gradually populations of these wolves became more and more dependent and as a consequence became less wild, smaller, with proportionately smaller heads and teeth, in other words, gradually became dogs or proto dogs. Modern DNA analysis is gradually producing significant evidence to support such speculation. (Coppinger & Coppinger, 2001)

In this view man did not domesticate the wolf at all, rather elements of the wolf population through scavenging on village waste gradually evolved into the dog, or an intermediate species, without any direct intervention, selection or even desire of men. Even to this day in many societies, particularly in the Middle East, dogs are regarded as unclean and much more of a nuisance than an asset, to be despised rather than used or loved.

Others, such as Koler-Matznick, take the point of view that the primitive agricultural village could not in general have supplied enough edible waste to support the evolution of a population of proto dogs. (Or, in her words by private communication: "The hunter-gatherer lifestyle did not produce enough refuse to nourish canids as large as the wolf. If the wolf was domesticated, this started long before there were permanent farming villages.")

Her view is that the available evidence most satisfactorily supports the concept of domestic dogs as descended from a species of medium-sized generalist canids, a truly wild species derived from but distinct from the wolf, that voluntarily adopted the pariah niche and remained commensal, that is living on human waste food

without providing substantial benefit in return, for an extensive period before some populations became truly domesticated.

The problem with this is that it is difficult to imagine an intermediate species not able to obtain sufficient food from the waste of the human population being able to compete with the wolf and other established predators. If this hypothetical independent, intermediate species did in fact exist, the question becomes how did it sustain itself, that is, what did it actually eat?

My view of this is that while the theories of Dr. Coppinger, Koler-Matznick and the many other contributors may seem to differ in significant ways this might well turn out to be primarily a matter of emphasis and the timing of the domestication process rather than irreconcilable fundamental differences. There is a solidifying consensus that there was an intermediate stage between the wolf and the domestication process, and the primary questions are about how long did the process take, where were these intermediate animals living, and how did they sustain themselves. Since there are no old world coyotes, and since we know of reasonably successful instances of taming new world coyote pups, perhaps the intermediate population was similar to the coyote, filled a similar ecological niche.

The general view of the scientific community is that the transition to agriculture was a response to growing populations, more and more people were competing for limited resources and gradually some began to plant and then increasingly tend crops. This was likely much more out of necessity than preference, for agricultural life was generally harder, disease more prevalent and diversity and quality of food in the village much less than for the hunter-gatherer band in pristine regions with abundant natural food. In this view it was the lessening of this abundance due to population increase that was the driving force behind the innovation of agriculture. It would seem that even primitive men preferred a life of hunting and fishing, sending the women and children out to gather the bounty of nature to the labor of planting, tending, gathering and processing grain. And perhaps the same diminishing supply of food put pressure on the wolf to adapt along with the human populations; the fact that the original domestic dogs were smaller with proportionately smaller teeth, skulls and brains may have been an adaptation to hard times, a restricted food supply.

The emergence of the dog as the despised scavenger on the edge of the human social structure will no doubt strike many as less heartwarming than the traditional notion of domestication by direct human intervention. The trouble is that people like and want to believe nice stories, that is, taking puppies home for the children to play with and having them grow up as dogs and living happily ever after is a lot more appealing than the dirty village dogs that are there primarily to live by consuming human waste. But the premise of an intermediate scavenger or pariah stage rather than direct wolf domestication is compelling in many ways and seems likely to emerge in time as the conventional wisdom.

Furthermore, contemporary efforts to tame wolves taken from the wild and wolf and dog crosses have tended to be difficult; such animals must be kept in elaborate pens or runs and cases of taking a wolf pup home and raising it in a normal pet situation, even with the most capable trainer, virtually do not exist. While wolf pups can to some extent be tamed, in general they are exceedingly difficult to train, that is, teach to reliably come, bring, stay or sit on command.

Thus while it had been common to accept the dog as the result of a simple process of man taming and domesticating the grey wolf, in the current scientific thinking the domestication process turns out to be much more complex, with a number of conundrums and apparent contradictions. For instance, the social structure of the canine, that is, the dynamics of the pack, and the in many ways similar structure of the hunter-gatherer bands are commonly put forth as the basis

of the human – canine alliance. Since the social structures are similar the migration of individuals from one to the other would seem to provide a sound basis for domestication.

A common counter example is that many of the larger wild cats are much more powerful than any canine, but their solitary social structure makes training and control in general problematic. Men may live with small domestic cats, but the cats retain their fundamental independence and do not generally work at the direction of or in cooperation with man, there are no herding or personal protection cats. If they catch a mouse or a rat, it is because they are hungry or interested in the sport of it, you cannot command a cat to go out and kill a mouse. Also, in domesticating a predator, one which is physically smaller tends to tip the scale in deciding who is ultimately boss in favor of the man.

The fact that men have trained cheetahs for hunting and large cats in circus acts are common would on the surface seem to contradict this. Also, it has been pointed out that you do not see wolves in circus acts because they are so much more difficult to train. [1]

Perhaps the key to this conundrum is to focus on the distinction between the concepts of tame and domesticated. As Ádám Miklósi comments:

> "Biologists prefer to study domestication in the context of evolution. For example, Price defines domestication as an 'evolutionary process by which a population of animals becomes adapted to man and to the captive environment by genetic changes.' Thus domestication is a Darwinian process including forms of selection that are present in natural populations." (Miklósi, 2007)

Dogs and sheep are domesticated, changed fundamentally in the process, while Indian elephants are tamed, taken from the wild and trained to work. The reason for taming rather than domesticating elephants seems to be that nature provides a reliable and cost effective source of supply, negating any potential advantages of actual domestication. Jared Diamond points out that only a very small number of wild animals are practical candidates for domestication, for a variety of reasons ranging from difficulty of reproduction in captivity to inherent difficulty in taming. (Diamond, 1999) He goes on to point out that none of the large African grazing animals such as the Zebra and various antelope species have ever been domesticated either for food or as draft or transportation animals in spite of repeated and determined efforts. No large animals other than the dog and llama, very limited in range and impact, were domesticated for either food or transport in the Americas or sub-Sahara Africa, a major factor in European world domination. (Diamond, 1999) The dog is unique in that it is the only large predator ever successfully domesticated.

Taming is distinct from domestication, a process of taking a wild animal – a wolf, bear or elephant - and by means of training, feeding and association modify the behavior so that it will respond to various commands and refrain from killing you the first time you turn your back. As we have seen, cheetahs, lions, tigers and bears can to some extent be tamed, that is, to perform in circus acts. The severe injuries in the Siegfried and Roy tiger act in Las Vegas a few years ago serve as a reminder that this is an extremely shallow and hazardous process. Yet the fact remains that the big cats are to some extent trained to a greater extent than has proven possible for the wolf.

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[1] Of course, it might well be that wolves are not common in circuses because their size and similarity in appearance to domestic dogs would limit the audience appeal. The existence of wolf acts in the nineteenth and early twentieth centuries, actually Borzois (Russian wolfhounds) and white German Shepherds were used, has been brought to my attention as a counter example.

How then, if the wolf is so difficult to tame and then train for useful work, did the dog become man's best friend? Cats are domesticated but carry on their original mode of existence, that is, hunt mice. Cats do not engage in cooperative activity – herding, joint hunting – because in nature they lead a solitary rather than a cooperative life. Cats are domesticated but do not take on new roles or work cooperatively with their owners, are famously independent even in domestication. Notice that all domestic cats are very small, small enough to insure that the man will always be physically dominant, win a physical confrontation. Dogs are dangerous to man primarily in packs and groups, and cats simply do not form groups. Dogs are useful in cooperative work primarily because of the inherent social structure of the ancestral canids. Taking a wolf for training is extremely difficult, but when derived canids can be integrated into the human social structure training becomes enormously successful and useful.

So how can you domesticate what you cannot tame? The answer would seem to be that you cannot, but the dog evolved independently of man's direct intervention as a scavenger on the edge of human society, perhaps most importantly on the edge of villages as man converted from hunting and gathering to agriculture. In this process they became smaller, with proportionately smaller skulls and teeth, as adaptations to living in a world of scarce food. In a similar way, as the Coppinagers point out, the tight, cooperative pack structure gave way to much more independent existence, for in scavenging others are there to share the food but not particularly useful for obtaining it as they are in the hunt. At the edge of the village, other canids are competitors rather than partners.

Koler-Matznick's differing view, via private communication, is that

> "the dog ancestor was not a cooperative pack hunter of large game and instead had the most common form of canid social organization, the mated territorial pair that hunts small game. Note that the mid-size canids, the coyote and Golden jackal, have the ability to be flexible in their social groupings, and where there is plentiful larger prey like deer, they can form long-term family groups to take advantage of the larger game."

At this point I leave the discussion to the experts, for I certainly do not have the credentials to affirm or discredit any particular theory of the canine domestication process. The purpose of this discussion has been to emphasize that dogs are much more and much less than domesticated wolves, and that we need to be more careful in statements beginning with "Since dogs are just domesticated wolves..."

The taming or domestication process for the dog occurred very rapidly, for after millions of years of separate existence the dog emerged as part of mankind's transition to agricultural and pastoral existence. This is in some ways contrary to evolution as an acumination of random, accidental genetic modifications, implying that the genetic basis of the dog was latent in the wolf for a very long time.

Key insights to the special nature of this canine domestication process have been provided by the groundbreaking work on the taming of the silver fox by the Russian scientist Dmitry Belyaev, commencing in the 1950s. Beginning with a foundation population of foxes selected for apparent tameness, from existing stock being raised for their pelts, and then in each generation selecting based only on tameness, within 30 to 35 generations the population had become to a very significant extent domesticated. But, even though tameness had been the only selection criteria, there were dramatic physical changes including floppy ears, short tails, short legs, lighter colors and dental malformations, attributes generally associated with the canine. Physical and psychological traits seemed locked together genetically in a way very similar to that of the domestic dog. (Wang & Tedford, 2008)

There are significant ramifications here for the training and application of dogs. In recent years the social structure and dynamics of the wolf pack has provided a lot of the theory and verbiage in dog training literature and like many newly fashionable concepts is perhaps taken beyond what is really warranted. If the self-domestication scenario popularized by Coppinger, but growing out of extensive earlier work, becomes the new conventional wisdom, perhaps too literal an interpretation of wolf pack structure and dynamics will come to be seen as misleading as a guide to canine training and application.

In recent years analysis of human mitochondrial DNA sequence variation has indicated a common female ancestor for mankind about 100,000 years ago in Africa, leading to the popular Out of Africa theory of human origins. Similar genetic analysis techniques have more recently been applied to the domestic dog.

A 2002 article in *Science* Magazine by Dr. Peter Savolainen, of the Royal Institute of Technology in Sweden, reported on the analysis of mitochondrial DNA sequence variation among 654 domestic dogs. Savolainen concluded that the most likely scenario for the emergence of the domestic dog is from a common origin in a single gene pool for all dog populations in a relatively short time about 9,000 to 14,000 years ago in eastern Asia, that is, the general region of China and South East Asia. The canine DNA evidence indicates three females rather than a single maternal origin for the domestic canine. Subsequent breeding back to wolves in some canine populations is also supported by this evidence. (Savolainen, 2002)

Although there were subsequent claims of much earlier origination, a 2009 report of much more comprehensive research by this group, which includes Dr. Savolainen, lends further support to the earlier date:

> "The mean sequence distance to ancestral haplotypes indicates an origin 5,400–16,300 years ago from at least 51 female wolf founders. These results indicate that the domestic dog originated in southern China less than 16,300 years ago, from several hundred wolves. The place and time coincide approximately with the origin of rice agriculture, suggesting that the dogs may have originated among sedentary hunter-gatherers or early farmers, and the numerous founders indicate that wolf taming was an important culture trait." (Pang, 2009)

Notice that while these genetic analyses of current dogs are of primary interest, none of this eliminates the possibility of previous instances of regionalized sub populations of wolves adapting physically and psychologically in an ongoing relationship with primitive men. Such populations of pseudo dogs may have emerged any number of times, only to become extinct as circumstances changed and thus leave no genetic remnants in our dogs of today.

Although there was at one time speculation of genetic contributions to the domestic dog from the other canids such as the jackal or coyote, these results of DNA analysis and other evidence clearly indicate that this was never so. While it is possible for a dog bred to a jackal or coyote to produce fertile offspring, the occurrence of this is so unusual, virtually absent in nature, that no detectable contribution to the current domestic dog gene pool is known to exist.

By saying indirectly descended it is meant that man did not domesticate the wolf but rather a pariah like intermediate species. Regardless of the exact details of the domestication process, and the fact that dogs and wolves can interbreed and produce fertile hybrids, the dog is seen today as a separate and distinct species. The fact that dogs returning to the wild do not take on the type, form and character of the wolf but rather become very similar to the common pariah or the Dingo is strong supporting evidence for this view.

Subsequent to the initial domestication, and during their long association with mankind, many fundamental differences in appearance, character and genetically determined behavior propensities have evolved and been selected for to produce the many diverse breeds now existent, further distancing the domestic dog from the wolf and intermediate species. Thus while there is potential insight into dog behavior to be gained from a study of the wolf and his social structure, it must be applied with care and caution and only where actual experience verifies speculation.

To some it has seemed plausible that pastoral existence, that is, gradually guiding and controlling a herd of Reindeer, sheep or other stock animal in the process of domestication may have had a different mechanism, that is, been a process of concurrent domestication of the stock animal and the appropriate herding dog. This seems not to be the case. According to Dr. Myrdene Anderson (Anderson, 1986) the domesticators of the Reindeer, the Laplanders (or more correctly people of the Saami culture) brought preexisting dogs with them as they migrated into the area from the east. (Private communication) Although the Saami reindeer-herding dog was fundamental to the domestication of the reindeer, it was never used as a sled dog, transport being provided by the Reindeer, usually castrated males. (Anderson, 1986)

The use of the dog for the sled team was typical of the Inuit or Eskimo cultures of Siberia, the far north of America and on to Greenland. These dogs are also believed to have gradually migrated into these northern areas along with the original populations, as ongoing existence in these extremely cold regions without these dogs was likely not possible.

In many regions, even to some reduced extent today, sheep are maintained in massive herds and moved many miles, even hundreds of miles, yearly for forage in the presence of serious predators such as the wolf. This process is highly dependent on the use of herd guarding dogs, and although some postulate that this way of life involved the concurrent domestication of the dog along with the sheep it seems likely that the evolution of this way of life was dependent on the adaptation of the necessary guarding dogs from preexisting domesticated dogs. Furthermore, as the Coppingers point out, these guard dogs are not really bred by man in the sense of selecting particular stud dogs for females in heat, since even today breeding occurs to whatever dogs are acceptable to the female and litters likely produce pups from several sires, with a preponderance of herd guarding dogs the norm because of proximity but not excluding local dogs of every description. It is the selection process subsequent to birth rather than the human directed selection of breeding pairs that maintains these herd guarding dogs.

The emergence of the pastoral or herding dog is of particular interest and significance in the story of the protection dog, for the modern police patrol dog, the ultimate example of the genre, has emerged primarily from one very specific region and culture, that is, the Northern European tending style sheep dogs and the cattle dogs of the same general region, such as the Belgian and German Shepherds.

Even from the beginning the dog, even the quasi-domesticated scavenger, would provide a warning at the approach of other animals or hostile human beings on a raid. The human-canine partnership evolved through many phases and in many different settings, and the ability to alert and warn of, and possibly also fend off or attack, intruding adversaries was a primary benefit of the association. Especially at night the dog’s sensitive hearing and sense of smell provided security both to the people and to the domestic or quasi domestic animals their sustenance depended on. Intrusion detection, protection and defense were from the beginning a major part of what the dog brought to the partnership with mankind.

The popular vision of the first dogs as hunting partners for wandering bands of hunter-gatherers is problematic on two levels. If dogs were actually directly tamed

wolves – doubtful in light of current science – taking their food away from them would have been extremely difficult, and in such a scenario the question becomes what advantage the partnership would have provided to the newly tamed wolves. Modern attempts to tame wolf pups taken days old from the nest never produce adult dogs remotely useful for the sort of hunting envisioned. And if such a partnership was viable, why did it only come into existence just before widespread agriculture, rather than during the thousands of years when the wolf and hunter-gatherers coexisted? If on the other hand if the direct ancestor of the dog was the thirty-pound scavenger from the village edge these incipient dogs would not have been powerful hunters, but perhaps would have at best been useful for seeking out smaller prey animals, perhaps for the human beings to dispatch.

Coppinger speculates that although there is scattered, often indirect, evidence of canine associations as far back as 12 or 13 thousand years, the comprehensive human-canine partnership began to flourish with the advent of agriculture, that while the evidence for partnership in the hunt is tentative and sparse the evidence for dogs as integral to the advent of widespread agriculture is broad and robust. This would mean that the foundation canine roles were the herding dog and the varmint or pest eradication dog that kept wild animals from consuming crops before they could mature and be harvested. (Coppinger & Coppinger, 2001)page 283

Our knowledge of the evolution of the dog is ongoing and will without doubt become more detailed and nuanced as archaeological discoveries are made and the evolving tools of modern science such as genetic DNA analysis provide more firm information as a basis on which to speculate. But for our purposes present knowledge is more than ample to establish that the protective function of the dog has played a major and perhaps at times irreplaceable role in the story of European civilization from the very beginnings, as evidenced in the mythology of Rome where Romulus and Remus, abandoned in the wilderness, were suckled by the she wolf and thus survived to found the city and the empire.

In summary, the state of current science is that the domestic dog is descended, probably indirectly, but primarily or entirely from the gray wolf. Earlier speculation of genetic links to the jackal or coyote have largely gone out of favor. While this had been the growing consensus over many years, the twenty first century canine genome research has served to confirm and emphasize this, as well as promise much future knowledge. (Ostrander & Wayne, 2005)

Over more than twenty centuries, from before the Greeks and Romans, and well into the twentieth century, a good dog was a necessity for virtually every European farmer, stockman and herdsman. As Justin Chastel, Belgian working dog breeder born prior to the First World War, said to me in recalling his childhood "when the sun went down, all a farmer and his family had was his dog. There were no lights, no police patrols and no telephones to summon help."

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