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Inuit and dogs, with loads, travelling overland to the fishing lake southwest of Bernard Harbour, N.W.T. (Nunavut). 27 June 1915. Photo: Sir George Hubert Wilkins, 1888-1958. Courtesy of the Canadian Museum of Civilization: 50968; CD96-654-018

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The Concept of an Aboriginal Dog Breed

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Introduction

There was a time when aboriginal dogs were the only dogs available. All of today's popular dog breeds have been derived, at one time or another, from ancient aboriginal dogs. Since then they have been "improved" by deliberate selection and crossbreeding to achieve the desired combination of characters of appearance and behavior. Through long histories of life in confinement, good care, and trainability for obedience, they became more or less helpless if left on their own. They are sometimes called man-made breeds or cultured breeds. Many other animal breeds were also obtained by selective breeding and keeping under conditions of good care in a strictly controlled

environment and they also declined in fitness and became more dependent on food and protection provided by people. The modern concept of a breed is based mainly on knowledge accumulated during work with these kinds of breeds. Dogs that do not fit any known breed listed in the catalogs of cynological clubs remain "invisible" to the public and most often are not considered as breeds at all. On the other hand, if the major kennel clubs adopt an aboriginal breed, it also becomes changed and converted into another cultured pedigree breed. Thus, each of such transactions does not help the preservation of most of the remaining ancient unchanged breeds in the world, which aboriginal breeds are.

The aboriginal breed and subspecies in zoology

Aboriginal dogs are natural breeds, which have never been developed by any planned genetic manipulation, deliberate selective breeding and intentional crossing of one breed with another. Old travelers, when they found them with people in far away countries, commented about the benefits, intelligence and serviceability of the local dogs to native people. At the same time, they used unflattering epithets calling them "mongrels", "poorly bred Collies", "mangy beasts", "ugly dogs", etc. Generally, travelers whose eyes were trained on European purebreds, considered aboriginal dogs just local mongrels and it was not too far from the truth. However, those were peculiar mongrels, which now we prefer to call aboriginal race or type dogs; some dog lovers and experts are reluctant to apply the term "breed", when discussing aboriginal dogs, because they have never been developed in kennels by systematic selective breeding. Aboriginal dogs have drawn the interest of professional biologists only recently, because of raised public concern about the preservation of nature and national heritage. There are surprisingly few serious scientific studies on aboriginal dogs per se. In fact, they are very much like wild animals, because nobody can claim authorship over any particular type of aboriginal dog. The most that we could do is to discover and describe them like we discover and describe wild species and races. Geographers and ethnographers discovered aboriginal dogs and left a few more or less sketchy descriptions, from which we now are trying to collect

knowledge about their origins and historical past. Now, many of the aboriginal dogs are extinct or have become seriously threatened with extinction and an increasing number of enthusiasts are eager to get involved in their rescue by importing them from their native countries and taking good care of them, popularizing and keeping pedigree records with the hope of the AKC, FCI, national kennel clubs, etc. recognizing them. Usually, there is no lacking of interest to try a new "unspoiled" breed. The question is: to what end? Do we need to spoil aboriginal dogs, too? Before getting seriously involved in projects of rescue and preservation of aboriginal dogs it is necessary to understand how and why they are different from cultured breeds and to take a closer look at the very concept of an aboriginal breed. The real preservation of aboriginal dogs can be only their recognition and preservation as aboriginal races of dogs together with their environment and work for people.

One of the most striking traits of all aboriginal dogs is their naturalness. Actually, they are more similar to subspecies (race) of wild animals described by zoologists than to classic breeds (cultured breeds) of domesticated animals. Indeed, each population of a peculiar race of aboriginal dog has its own unique geographic range of distribution and it is always associated with a certain ethnic group. Because they are domesticated animals and associated with people, they may be safely called, therefore, ethno-geographic races of dogs. At the same time, like wild animals, each of such ethno-geographic races is a product of slow evolution under conditions of life and work for people. It has been subject to natural selection and selection driven by people in favor of better working qualities. Selection by people has been very subtle. Sometimes it is called "unconscious" selection, which may be considered rather like another form of natural selection, than what we call selection based on modern knowledge of animal husbandry, animal science and genetics. This is because aboriginal dogs live and work for people under conditions of nearly unlimited freedom, are never, or rarely, confined, are irregularly fed (sometimes not fed for weeks), mate freely and sometimes raise their puppies without the assistance of people. They live with humans rather like symbiotic animals than like animals captured, forced, "enslaved" or spoiled by domestication. Of course, the aboriginal dogs obtain their own benefits from sharing their lives with people, such as protection from wild predators, sometimes from the weather and from food shortage. The latter is particularly obvious, where people and dogs live in extremely harsh climates, such as in the polar north or in deserts, where both people and dogs became literally interdependent for survival. However, everyone, people and dogs, had to work to obtain

their daily bread. For example, a bad working dog would most likely not be treated very well, would possibly be left unfed and most likely not bred; and it would be left to die in time of famine or it would be killed for its pelt to make mittens. Although dogs never or rarely lived confined and mated freely, puppies of favorite bitches or puppies sired by the best working males, if the sire was known, were spared more often to be raised as a replacement for adult dogs growing older. This kind of selective mortality worked rather by eliminating the least fit, than by preserving a few of the best dogs. Cyclic fluctuations of productivity in nature, game density and all kinds of natural calamities affected both dogs and their owners. Natural selection never stopped.

Another similarity of aboriginal dogs to subspecies of wild animals is in the fact that aboriginal dogs are the oldest unchanged kinds of dogs in the world. Indeed, according to fossil and archeological evidence, dogs of the Laika or sled dog type have been around people since Neolithic times. Excavated Saluki type skeletons were dated to 2,500 years BC and so was the Australian Dingo. Powerful livestock guarding dogs are very old as well.

The similarity between aboriginal dogs and wild animals extends even further if we take a closer look at their behavior when they are working for people. Among dog trainers, aboriginal dogs are well known by their independent character. They often call them hard heads, stubborn and even stupid. This is because aboriginal dogs easily get bored when taught to do circus type tricks or other behavior unnatural to them. So are tame wolves. This is what happens when wolves are trained to do similar unnatural things. Nobody calls a wolf stupid. However, in their native environment, aboriginal dogs show great intelligence, performing amazingly complex tasks, and they do it all by themselves. They quickly learn what and how something should be done without much teaching, training and directing by people. They all work naturally. To start working, the aboriginal dog does not need a "stick and carrot" training system. The very work is the reward to them. To start working, an aboriginal dog puppy needs to be raised in the right environment. At a certain age, every puppy easily picks up the idea what to do and how to do it. Thus, aboriginal sight hounds called Tazy, Saluki, Afghan, Bakmul and Taigan learn to hunt by themselves when they are taken into an environment where fast running animals occur. In fact they are born, grow up and live in such an environment near their owner's tent or yurta. A hunting Laika puppy starts finding squirrels and barking under a tree with squirrel or grouse from the age of several months if allowed to run free in the woods, and the same puppy will switch to higher value game without much encouragement when it matures. A good Laika knows what should be

hunted and how. Sled dogs start pulling from the age of four months, being harnessed with older dogs or helping women or children to pull small sleds with firewood. Aboriginal sled dogs are excellent hunting dogs and are used to hunt big marine mammals. Livestock guarding dog puppies start working in concert with older dogs, taking part in the protection of the herd by running free with older dogs and under conditions of being raised with the herd. To all these dogs, their work is a natural part of their everyday life. This behavior is very different from the behavior of "willing to please", quickly learning how to sit, come up, and roll over and other similar things done by cultured breeds. The aboriginal dog is doing work beneficial to people but it acts like a wild animal because it is preprogrammed genetically. The whole chain of action at work of an aboriginal dog is strikingly similar to the chain of action of wolves which are also preprogrammed to live and hunt in a pack. However, with dogs, human masters and other domesticated animals became either a part of their pack or a vital element in their life and environment. To them livestock is no longer game but a part of their protected territory. To a hunting dog the game shot or caught also belongs to the master. He will feed the dog later on.

Now, I will illustrate conceptual difference between an aboriginal breed and a cultured breed based on the observations of people with experience of dog behavior.

This is the Basenji, one of wildest aboriginal breeds, and the Cocker Spaniel, one of most admired cultured breeds. Coren (1994), a dog trainer, compared the behavior of 79 breeds and evaluated their intelligence by comparing a dog's capability to learn and obey the commands of the trainer. In his book, *The Intelligence of Dogs: Canine Consciousness and Capabilities* he wrote that the Cocker Spaniel was among the most intelligent of dogs, while on his list the Basenji was 78th among 79 breeds he tested. This book was among the best sellers of that time and it was even discussed on morning TV programs in the USA. The poor Basenji was publicly humiliated! However, by coincidence, there was a serious scientific study done almost 30 years before Coren's book was published in which Scott and Fuller (1965) compared the behavior of the Basenji and the Cocker Spaniel in experiments designed for obedience and problem solving. The authors also used the Sheltie, the Fox Terrier and the Beagle in their research project on the genetics and the social behavior of dogs. Among these five breeds, only the Basenji was a truly primitive aboriginal breed. In experiments involving voice, such as to stay quiet on the scales, restraining the dog's activity by being put on the leash, obedience, being inactive and remaining on a platform at a distance from the trainer, the Cocker

Spaniel was the easiest to train. Basenjies were the hardest to train. The other three breeds tested fell in between the two. In goal orientation tests nine-week-old puppies were trained to run and solve problems to reach the goal. In this and other problem solving experiments of different difficulties, the Basenji turned out to be the most intelligent of all five breeds and the Cocker Spaniel was the least. This became particularly obvious in experiments where flexibility of feet and toes and the dog's inventiveness were required. Thus, the aboriginal "wild race" breed showed its merit where independent thinking, motivation and initiative were needed. Remarkably, the man-made breed, the Cocker Spaniel, was most successful in passive obedience tests. In fact, here we deal with two different concepts of breed. Both the cultured breed and the natural breed (wild race) are very good dogs, but they had been made by different forces and for different purposes. The Basenji is more like a wild subspecies of *Canis familiaris* and the Cocker Spaniel is a cultured breed of *Canis familiaris*. Natural breeds (aboriginal dogs) originated due to natural selection and adaptation to relatively free life near people, with people and, on many occasions, serving people. Cultured breeds evolved in process of selective breeding in isolation during more recent time.

Here is my favorite definition of subspecies offered by Mayr (1963): "A subspecies is an aggregate of local populations of a species, inhabiting a geographic subdivision of the range of the species, and differing taxonomically from other populations of the species." The word taxonomically means that a population is uniquely different enough to be recognized by scientists as a subspecies and given a unique scientific name in Latin. Add to this definition a human comparison, belonging to an ethnic group, and you will get a good definition of an aboriginal breed. In fact, attempts at describing aboriginal breeds as subspecies of *Canis familiaris* were done repeatedly, but this did not get much support among zoologists simply because *Canis familiaris* is a domesticated animal and its varieties do not belong to traditional subjects of interest to taxonomists. Actually, each aboriginal breed is best characterized by its capability to do specific work, its appearance and by its unique geographic range together with its place in the culture of a certain ethnic group (or closely related groups), with which it lives. Its coat color is quite variable individually, including one particularly striking phenotype with white spots, a trait developed under domestication and living under human protection. Both ideas of subspecies and aboriginal breed are applied to real populations with a real geographic range and their recognition as entities with a name are supported by conventional wisdom and practicality. This makes them an important and very

conspicuous part of biological diversity. The conventional definition of breed is weakly supported by hard science, because the idea of a breed (here again comes the similarity to the subspecies of wild animals) is always something vague and usually it is nothing more than what we agree upon collectively. The definition of 'breed' by Merriam Webster Dictionary: "Breed is a group of animals or plants presumably related by descent from common ancestors and visibly similar in most characters." It also emphasizes the appearance, although traits of productivity and function are not less important.

Here is a definition of 'breed' put together by a well noted American geneticist Jay L. Lush, (1994): "Animals that, through selection and breeding, have come to resemble one another and pass those traits uniformly to their offspring." Aboriginal dogs, living in a certain region and used for the same purpose are quite well covered by this definition, because they have come to resemble one another through the process of selection and they pass their traits to their offspring. Calling aboriginal dogs of a certain ethnic group and geographic region breeds is very common in scientific and popular literature. The arguments sometimes are going on about which principle to choose, geographic or ethnic (national). Separation of them would always be artificial. This is what was done in the former Soviet Union where today four known hunting Laika breeds had been designated. Although the words "to resemble one another" mean chiefly the appearance, in agricultural species the productivity traits of animals may be not less or even more important than traits of their appearance and it is equally true for aboriginal breeds.

Creative breeders of agricultural animals may develop and keep their own unique breeds. Therefore, here is a more liberal definition of breed: "A breed is a group of domestic animals, termed as such by the common consent of the breeders, ... a term which arose among breeders of livestock, created one might say, for their own use, and no one is warranted in assigning to this word a scientific definition and in calling the breeders wrong when they deviate from the formulated definition. Their word and the breeder's common usage is what we must accept as the correct definition." (Lush, 1994)

In the free world, any breeder or group of breeders of dogs, or other animals, can try their hand at the art of breeding, and the future of any of their newly developed breeds would depend on their acceptance and usefulness to their users. However, aboriginal race dogs are very different. Essentially, they are naturally occurring geographical variants of the domesticated dog (*Canis familiaris*), equivalent to a subspecies in zoology. Each of them is unique and came into existence by evolutionary process. Aboriginal breeds are natural monuments of nature

and culture, because they have proven their usefulness and passed the test of time. Their most important conceptual difference from the constantly changing and newly emerging man-made, or cultured breeds is in the fact that they have been developed by the ability to perform a specific function. Their appearance is of secondary importance and it is always expressive of the function.

Cultured breeds

Aboriginal breeds are the predecessors of all man-made breeds. The ability to hunt certain game and in a certain way was very important to hunters of past centuries. Those dogs still resembled very much their ancestral aboriginal breeds; they were hardy and tough dogs because they were bred by hunters for other hunters. Although dogs of different breeds had different names and purposes, crossing different breeds was common and mixes resulting from interbreeding were still named rather by their purpose and performance than by their appearance, such as scent hounds, sight hounds or bird pointing dogs, regardless of admixtures of other breeds in them. Every dog was valued for its ability to hunt the right way and this kind of genetic "alchemy" continued in dog breeding as long as dogs were bred for performance in field. However, radical changes took place in late 19th century, when dogs were bred pure with pedigree records and used for show contests. Dog shows renewed the popularity of hunting breeds, which had declined in numbers during the previous period due to the loss of land available for hunting and the growth of urban populations in Europe. Now, more city dwellers became breeders of dogs, including hunting dogs, which became ornamental rather than hunting breeds. They sold puppies for profit to dog show enthusiasts and as pets. Because the breeders were most often not hunters, the appearance of the dog became more important than the original purpose of the breed. To the show fancy, all those hunting or guarding instincts became atavistic traits of the past and not taken seriously any more. It is interesting that even now some show fans and even some judges seriously believe that as long as the conformation is good, the functional qualities are also automatically present in the dog. Therefore, it is believed that show winning lines would be very good field performers, if given the chance. This is unlikely because first, many traits highly valued at shows actually do not have any functional meaning for hunting and second, there are anatomical traits, which are misinterpreted by show judges if they are not hunters themselves. This is why many hunting breeds became split into two groups, one for show and one for hunting.

However, the problem with show breeds does not end here. Using a few show winning males as sires and breeding dogs with maximal similarity to the ideal

described in a breed standard leads to a loss of genetic heterozygosity in the population. Persistent inbreeding sooner or later results in the fixation of deleterious alleles and the appearance of genetic anomalies in the offspring with increasing frequency, such as missing teeth, wrong bite, obsessive compulsive disorder and other nervous disorders, endocrine and reproductive anomalies, hereditary blindness, epilepsy, hip dysplasia, etc. Interestingly enough, we already have several breeds that were derived from aboriginal stock during relatively recent times and transformed into popular pedigree show dogs. Each of them suffers hereditary ailments and the older the breed's history as a show dog, the more it genetically deteriorated. Here is a list of such breeds: the Finnish Spitz, the Samoyed, the Siberian Husky, the Alaskan Malamute, the Karelian Bear and the Basenji. Each of them has a list of hereditary health problems. Several other breeds with only aboriginal ancestors, but bred to a standard, such as the West Siberian Laika, the East Siberian Laika, the Central Asian Ovcharka, and the Caucasian Ovcharka, remain in better shape because they were all meant to be used for field work not just for show. Nevertheless, they too underwent various changes away from the ancestral aboriginal type dogs. All kennel bred aboriginal breed dogs follow the same pattern of changes: they become bigger and heavier, voracious eaters, prone to obesity and slower at work. These changes become particularly noticeable after the age of about five years. Their aboriginal ancestral populations still survive and comparisons permit us to observe and investigate the differences. The differences between kennel bred show lines and their ancestral aboriginal populations can become quite noticeable very soon even without clear knowledge by their breeders.

There is a book based on investigations into hereditary health problems of purebred dogs: *Medical and Genetic Aspects of Purebred Dogs* (Ross.D. Clark, J. D. Steiner and H. David. Haynes, editors, 1983). This is a book of 576 pages about hereditary problems of AKC and FCI recognized breeds. Can you imagine how much the authors of this book would write on this subject if they were to study aboriginal dogs uncontaminated by interbreeding with cultured breeds? Perhaps they would find not very much, because among aboriginal dogs, mutations like these are wiped out by natural selection. Probably recessive alleles with deleterious effect on the phenotype occur among them at frequencies similar to those found in wild species. I remind readers that in the not so remote past up to 90% of the Collie population were carriers of hereditary blindness. Discussion and bibliography on this subject can be found in Beregovoy and Moore Porter (2001) and Derr (1997).

Degenerative selection

The very life style of dog owners and the reasons why they breed or keep dogs are major parts of that environment, which is reshaping every dog breed in the long run, even contrary to the good intentions of dog owners to breed better dogs. This is a result of unconscious selection under conditions of passive life in kennels, inside homes or restricted physically by other means. The life of dogs in commercial kennels is particularly detrimental to an aboriginal dog breed, which is a discriminating, faithful, energetic, independent and capable field performer – all qualities not needed in a commercial style kennel. Indeed, the favorite dog of a show breeder, especially of a mass breeder, is a dog convenient for feeding, breeding, petting and, of course, for showing. Such a dog should be content with being locked up in the kennel for many long days without freedom to run and interact with the outside world. Kennel training became a routine requirement even for many family dogs. The dogs have to learn all kinds of things not to do: not to express craving for personal attention or for freedom by barking or trying to escape. In short, good kennel dogs should be dogs that are the least demanding for physical and mental activity and less responsive to all kinds of environmental stimuli. Their character should be closer to a pig or a rabbit than to a dog, "man's best friend". Moreover, the most convenient potential show winner, regardless of the original purpose of the breed, should allow an unfamiliar person to lead it away and to inspect it by touching without protest. The dog should stay calm for many hours of boring time when being transported and waiting at the show event. All these qualities are conducive to a natural indifference and sluggishness in the dog. Under these conditions, the high energy, full-of-fire dog is a disadvantage. Inventive 'escape masters' are the most likely category that a commercial breeder or an average backyard breeder, living in a friendly neighborhood, would want to get rid of first. Dogs with a long history of selection to be "good kennel dogs" do not need any innate desire or skill to find their home, because they would never be tested on the matter, being condemned to stay in kennels and never meant to be field performing dogs. They live life and are bred like rabbits and they are changed accordingly. Some may argue that they take their dogs to different organized activity events specifically designed to keep the dogs and their owners busy, such as agility, weight pulling, lure coursing or water retrieving, schutzhund and obedience contests. All these are better than nothing, but with an aboriginal breed, this cannot replace real hunting, pulling sleds or protecting livestock one day after another. All these city dog activities are like a drop in the bucket and they are moreover different activities, which require a different dog. To an

aboriginal breed, work is a part of life; to a cultured breed, work is periodic active entertainment.

Another degenerative form of selection contrary to the traits of most biologically perfect dogs is linked with the basic biological function of reproduction, from mating to giving birth to puppies. Some breeders treat their dogs as if they were agricultural productive animals or even ornamental plants. Females with more than one estrus per year and producing larger litters have a natural selective advantage and this is good for making a profit from selling puppies. Females that do not accept males without prolonged courting and foreplay are at a disadvantage, especially if they had been flown or given a ride far away for mating with a choice sire. All naturally designed forms of behavior, such as courting, fighting, sometimes exhausting chasing have an adaptive purpose of preventing the unfit males from reproduction. Breeders prefer females readily mating with any male. Males, selected among show winners are "precious" potential sires and are usually being helped to mate by constraining the female, which otherwise would reject it, sensing its biological inferiority. The dogs must mate, especially if one of them was shipped away just for mating with a choice dog.

Writers of product oriented junk literature about dogs tell you, "Call your vet!" prior to birth of puppies. A good aboriginal dog female is a good mother and it does not need any assistance, except a place protected from bad weather, timely provided food and a bowl with water. Mother knows best and it is better to allow nature to take its course. Do not call your vet, but if the dog cannot breed the natural way, do not breed it at all. Even feeding kibble dry dog food, if continued for generations, will change our dogs genetically. Commercially produced dog food, does not exercise jaws and muscles, makes teeth dirty and overloads a dog's digestive system with all kind of ballast. It makes eating, digesting and defecating almost like a herbivore, with plenty of excrement. In the long run, it may trigger certain adaptive changes in the dogs. Feed it natural foods!

Commercial dog breeders prefer younger females for breeding. Many hereditary health problems start showing up with age, especially, when the dog is over three to four years old. Commercial breeders do not like taking chances with breeding older dogs. Thus, deleterious mutations with an effect on phenotype at an older age are avoided. This is why we have so many show dog breeds which are not very smart, are spontaneous unprovoked biters, don't develop a bond with the master or a natural attachment to the place where they live, and get lost once allowed off leash, especially if left for some time unsupervised, etc. We have armies of dog behavior therapists, dog trainers, animal psychologists and veterinarians. Our cultured breed dogs keep them busy. With aboriginal dogs,

these specialists would lose their earnings simply because they are all healthy physically and mentally. Native breeders of aboriginal dogs simply kill all abnormal individuals.

Preservation of heterozygosis of aboriginal breeds

Finally, there is another important feature of aboriginal breeds which is still poorly investigated. Every aboriginal breed in its own environment should have a high level of heterozygosis, similar to wild animal species. Much of the variation is of a polygenic nature. The high heterozygosis in aboriginal population can be expected a priori because of the known wide range of phenotypical variation in their populations and because stabilizing natural selection favors heterozygous organisms. This is how balanced polymorphism is maintained in populations of wild animals. This is how a natural population absorbs, like a sponge, alleles from other aboriginal populations. This happens when dogs come in a direct contact as a result of transhumance. Hybrid vigor has a selective advantage, especially if newly obtained alleles are beneficial ones, and this is why aboriginal populations are always somewhat mongrelized. Despite the fact that certain types of aboriginal dogs prevail locally, under conditions of uncontrolled breeding or frequent genetic exchange between populations of adjacent and even far away regions, they are open to new possibilities occurring naturally. Variation caused by contacts between dogs during seasonal migration (transhumance) is very old and well described by Cruz (2007) in livestock and herding dogs of Portugal. This kind of variation existed long before the recent influx of imported dogs and should not worry anyone. Trading caravans, regional fairs, hunting parties far away from home, war parties and the very nomadic way of life of aboriginal dog owners with their livestock have helped to maintain the general similarity of dogs of the same purpose over large territories, despite some local differences among dogs that have survived over long periods of time. Variation caused by mixing aboriginal dogs of similar purpose is not a problem, because they all can do the same job and their ability to survive does not diminish. Examples of this kind of mixing are in Kyrgyzstan between Taigan and Tazy, in Afghanistan between Afghan Hounds and Saluki, in Azerbaijan between shorthair and longhair Caucasian Mountain Dogs, in Siberia between hunting Laika types belonging to neighboring ethnic groups, between different types of contiguous populations of northern sled dogs, etc. It would be entirely different, if aboriginal breeds were mixed with imported cultured breeds. Even a small admixture of cultured breeds would be wiped out by natural selection. However, mass interbreeding, when imported breed dogs even outnumber aboriginal ones,

is a death sentence for the aboriginal breed. Although aboriginal breeds came into existence at the hands of native dog breeders, purging alien genes from it would be difficult without some knowledge of animal science, genetics and good understanding of the breed. Because preservation of an aboriginal breed means preservation of a population, not just a few appealing looking dogs picked up by tourists, it should always be a collective effort by truly concerned breeders.

Saving aboriginal breeds from extinction

The avoidance of unconscious negative selection is very important for a long-term breeding program of any aboriginal breed and it is a challenging task. For example, if a well-informed dog lover imports a pair of aboriginal dogs from their native land, he would certainly take good care of them. He would do his best to find a good home for the puppies. However, the natural selection stops here. Now, it is up to the diligence of the breeder how not to destroy the dog's fitness and its working ability, which fascinated him in the first place. This work ought to be well organized and the breeding must be selectively aimed primarily at working performance, traits of endurance and physical vigor. The dogs must be kept and evaluated under conditions as natural as possible. Keep them busy hunting, pulling sleds, herding or guarding, according to the respective breed's profession, and ensure diverse interactions with other dogs and the rest of the environment. This helps to know the dogs and find out the best dogs for breeding. Indeed, how will you find out if your dog is smart and capable of work if you keep it locked up all the time? Many of us would give up the idea of having such a dog because not everyone has the time and conditions to keep it the right way. To succeed, the breeder of aboriginal dogs should focus on their better performance.

At present there are a few enthusiasts who are trying to breed better dogs by using performance in the field as the sole criterion of the breed. This means selecting for a certain function instead of a certain appearance.

In the USA, coyote hunters in central and western prairie states have been developing the Coyote Hound for at least 100 years (Eliason, 2007). One may ask why develop another kind of sight hound when we already have several excellent sight hound breeds for hunting all kinds of game? The problem is none of them satisfies a coyote hunter. Under existing conditions in American prairie and western states, Greyhounds do not endure hot weather and can even die of overheating if sent on a hot day after some quarry. Besides, they can break their legs on the rugged terrain. Scottish Deer Hounds have enough guts to fight a coyote but they are not fast enough to catch it. Borzois can run fast, but they are not

maneuverable enough when the coyote starts weaving under barbed wire fence and shrubs; besides, they too do not like hot weather. A good Coyote Hound must be fast, maneuverable, bold and aggressive, strong and skillful for catching such a strong and fast predator as is the coyote. Coyote hunting enthusiasts are crossing all kinds of sight hounds and even non-sight hound dogs to add the necessary qualities to their major mixed breed origin stock. Trial and error continues and anything goes, which helps further to improve the breed functionally. Is it a breed? Yes, this is the breed which is the best at catching and killing coyotes. Its appearance does not matter much, but in the functional part they all are very good and similar anatomically. Their appearance is variable but this is unimportant for their function. Some dogs have a wiry coat and have a beard, like the Scottish Deer Hound, and some are smooth. Some have one ear upright and the other hanging and any coat color is accepted. Their functional anatomy and vigor are perfected to the limit, but some less important traits of the appearance, such as ears or coat color, are allowed to vary. Owners and users of the Coyote Hound think that their dogs are beautiful, but to the traditional "purist" dog breeder, this is hard to accept. The coyote hunters see beauty in their dogs' performance. The Coyote Sight Hound is truly a unique dog breed with one single and most important trait – they can catch and kill coyote better than any other existing purebred.

Another example is the Alaskan husky. What kind of a dog type is it? The Alaskan husky is a dog that can pull sleds very fast and very far. Function comes first. What do the dogs look like? Very much like the northern Spitz (or Siberian sled dog). Any coat color is acceptable; some dogs do not have perfectly prick ears or have asymmetric ears, but because of the function and the northern environment, the classic sled dog appearance prevails, although any deviations are acceptable as long the dog pulls sleds well. This seems like a process of formation of a new aboriginal type of dog. Genetically this type of dog is in a constant flux because its enthusiasts cross again and again, trying to improve the function of pulling sleds fast and long. All kinds of breeds of aboriginal origins have been added to the breeding stock, such as North American sled dogs similar to the Inuit Sled Dog, the Alaskan Malamute and the Siberian Husky. Since the Gold Rush era sight hounds were added for speed, scent hounds for endurance, Irish Setters for hyper temperament, and more recently the German Shorthaired Pointer, the German Shepherd Dog and, sometimes, wolf. All this was recombined and reselected to improve one function, which is always the same, running very fast and for very long. The appearance is subordinate to the function. Perhaps

under pressure of natural selection and life in the north, at a glance the Alaskan husky is a northern sled dog. Alaskan huskies may not look beautiful enough to some, but they win races. However, one fact makes a big difference: the dogs are heavily supported during their life and particularly during races by veterinary supervision, feeding regimen, booties, heated jackets, straw bedding, etc. Selection of survival under conditions of minimal care is out of the picture.

These two examples deserve the serious attention of zoologists and geneticists. Some dog experts decisively refuse to recognize these two breeds, but in fact, these dogs are as much breeds as any other pedigreed breed, but they are based on a different concept of breed. In these two cases, appearance is subordinate to working ability and dogs of each of the two breeds are quite uniform in their functional anatomical features and behavior anatomically and behaviorally. Perhaps this is how all aboriginal breeds started in prehistoric time when their ancestors initially looked like the Dingo or other generalist aboriginal dogs?

Selection for performing a certain job began from the time when the wolf was first domesticated. Perhaps the job of the first dogs was just being a pet and occasionally food. This is that ecological niche which was occupied by the Australian Dingo before it was discovered by Europeans. Being selected over millennia for different functions and adapting to different geographic environments, they diverged producing Laika, Saluki, livestock guarding dogs and other races of aboriginal breeds. Their further fate would depend on the fate of entire ecological systems, from where they came to us. Breeding for preservation is not the same as breeding for improvement. Even if we know what any particular aboriginal breed should be able to do and how it should look, breeding it in "captive" can help only as a temporary measure. If continued for too many generations, it will change the breed for the worse, because of degenerative selection.

Some aboriginal breeds are highly variable morphologically and are even polytypical, which means they have more than one type in one population or several close sub-races. Understandably, their natural diversity cannot be preserved by breeding to a traditional breed standard that reduces variation as much as possible. The standard of an aboriginal breed must be more liberal, descriptive and include more than one type found in the home country of the breed. A. Sedefchev and S. Sedefchev (2007) already put it to work with the Karakachan Dog. The best dogs suitable for breeding should not be show champions, but rather best rated dogs. Entire dog shows and trials of aboriginal breeds should be redesigned to emphasize field behavior and

physical performance.

The preservation of maximal heterozygosity within breeding stock could be achieved beneficially by running several parallel lines with periodic subsequent crossbreeding. Breeders of productive agricultural animals commonly use this method.

Using and breeding aboriginal dogs for performing a different job that is new to them would change them, especially if they were selected for greater trainability. This would change them by making them more responsive to trainer's commands, but this may come at the expense of their ability to work independently in their native countries.

Owners of cultured breeds will continue breeding and taking their dogs to shows and many do not mind to picking up some of the aboriginal breeds to keep and breed them for the same purpose. Some strains derived out of aboriginal breeds, after a number of generations, will be selectively modified for a different use, or even transformed into a different breed under a different name. Adding healthy and vigorous genes of aboriginal "wild type" breeds to ailing genetically cultured breeds can be a benefit. However, this activity is irrelevant to our goal of preserving indigenous ancient aboriginal breeds.

Preserving aboriginal breeds should be a part of a broader nature conservation project, involving landscapes, vegetation and wild animals, such as hares, antelopes, jackals, foxes, wolves, coyotes, bears, etc. Of course, people with their traditional ways of land use with their livestock and dogs would be a vital part of such projects. Effective conservation cannot be achieved unless the people who live and rely on these lands are an integral part of the conservation process. Nature Conservancy and various charitable funds and associations should support such projects and aboriginal dog lovers would benefit by saving the truly "wild race" core populations of aboriginal breeds. At this conference, we had an opportunity to hear about interesting studies and developments in the history, variation and preservation of the Tazy in Central Asia and in Kazakhstan. The breed is certainly on the way to recovery (K. N. Plakhov and A. S. Plakhova, 2005). The authors have done tremendous work to save the breed in the country and have accumulated very interesting knowledge of the breed's history and existing variation. However, their recent idea of developing a separate breed, the Kazakh Tazy, is potentially dangerous to the very idea of preserving this breed as an aboriginal one. It would simply be transformed into another cultured breed with all the subsequent changes, such as a reduction of variability and isolation from its still surviving really aboriginal populations. Very interesting results from scientific in-depth studies on the aboriginal breeds of Portugal were presented by Cruz (2007). An example of

progress in the preservation of the Karakachan Dog was made by A. Sedefchev and S. Sedefchev (2007) in Bulgaria. The Sedefchevs, did not fly to Almaty as they planned, but they sent their article recently. They are conducting an exciting project for preserving three of the oldest animal breeds still surviving in Europe: the Karakachan Dog, the Karakachan sheep and the indigenous breed of horse. This work is a part of an integral project of nature preservation, including wolves and bears. Such efforts can serve as an example to others how to obtain financial support and tackle such difficult and complex problems.

Breeders, actively using aboriginal dogs for work and for sports are exactly those people who must seriously contribute to their preservation for future generations. Nevertheless, saving aboriginal dogs in their countries of origin is the most reliable way of securing the survival of these unique remarkable dogs. Strains of aboriginal breeds in possession of dog owners far away from countries of their origin would need periodic genetic exchange with core populations of the "wild race", just as the ancient Greek giant Antaeus needed to touch mother Earth to regain his strength.

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In 1979, Beregovoy emigrated with his family to Vienna, Austria and in 1980 to Oregon, USA. He worked on series of research projects in North Dakota State University and in 1989 accepted a position as Senior Agriculturist in the Department of Entomology, Oklahoma State University, where he worked until retirement in 2000.

From 1991 to 1996, he imported five West Siberian Laikas, three males and two females, as the foundation stock of this breed, newly introduced in North America. Currently, he lives with his wife, Emma, and their favorite Laikas on a small, 90-acre farm in Virginia.

Beregovoy has published several articles in popular magazines and two books: *Primitive Breeds-Perfect Dogs* and *Hunting Laika Breeds of Russia*. He is also the advisor and curator of the Primitive and Aboriginal Dog Society, International (PADS) as well as a member of the editorial board of the PADS, International Journal.