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Primitive and Aboriginal Dog Society

Dear members of the Russian Branch of Primitive Aboriginal Dogs Society!

We offer you the 20th issue of our Newsletter. Here, you will find article by Tatyana Mikhailovna Ivanova about livestock guarding dogs and problems of their preservation, article by Carla Cruz about livestock guarding dogs used in Portugal, article of Gertruda Hinsh, in which she is discussing origin and evolution of first sighthounds and article by Michelle Morgan about recent history and modern state of aboriginal dogs of Mongolia. All articles listed above were planned for Proceedings of the first international cynological conference "Aboriginal Breeds of Dogs as Elements of Biodiversity and the Cultural Heritage of Mankind".

Sincerely yours,
Curator of PADS, Vladimir Beregovoy

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THE CENTRAL ASIAN OVCHARKA
On some problems of preserving the breed

Tatyana Mikhailovna Ivanova
St Petersburg, Russia

Photo 1.Tajikistan, April, 2001.

The observations on the dogs of Central Asia, the visit to Turkmenistan in 1990, the All-union Conference on the Central Asian Ovcharka, Ashkhabad, Turkmenian SSR, 1999, Tajikistan in 2001, 2002, 2004, 2006 and 2007, the Caucasian livestock herding dogs in Daghestan, 1992 and the search for Mongolian dogs east of Chitah Province in 1997 showed in different countries that dogs of similar purpose and methods of breeding have the same problems.

Among all the trips to Tajikistan for the purpose of investigating sheep herding dogs, the most important one was made in 2001. The leadership of Sogdia Province provided us with an opportunity to examine sheep herds in the two largest districts of the province. We visited sites with sheep herds together with leading animal scientists and veterinarians of these districts. Watching sheep herds on pastures, we carried away the impression that this had been so for many centuries in the past. Photo: 1-4.

Different peoples, depending on the natural conditions, have been involved in nomadic livestock grazing and during recent time in grazing on pastures near villages. They all had to keep dogs for the purpose of protecting livestock herds against predators and protecting their own property. This was done by developing and improving populations of dogs, each of which was best adapted to its own specific conditions, which were sometimes drastically different. Some of them had to live in a climate similar to the subtropics, with a large amount of sediments [is this right or do you mean rainfall?], while others had to live and work in a continental arid climate, or in high mountains. Every such population had adapted to the local environment, including local diseases.

Photo 2. Tajikistan, April, 2001.

For millennia, in Central Asia populations of local dogs were shaped to meet the requirements of the people, who wanted them to protect livestock from predators and thieves. The landscape and climate determined the way of life of the people. Their major occupation was breeding sheep and grazing herds on pastures near the village. To save the herds and to survive, they needed dogs, which would be well adapted to local conditions, to be well adjusted to living with

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Photo 3.Tajikistan, April, 2001

sheep and to protect the sheep from predators. For this purpose, puppies were raised from birth with the sheep herd. The sheep herd becomes their home and their territory. Dogs grow up and learn to live in a pack. Selection was made by humans by saving the best puppies that resembled their outstanding ancestors, but only those, which passed the test of nature, survived. Natural selection eliminated dogs with poor health, dogs with a weak character were killed by predators or they were not capable of competing with stronger males in the pack. In nature everything is designed wisely. A member of the Academy of Sciences of Turkmenistan, Professor W. M. Mason (1998) wrote that chobans (herdsmen) rejected cowardly or lazy or those dogs that were aggressive to humans, as well as dogs that barked and howled at night. Frequently fighting predators and competitors for mating sharpened their fighting skill. As a result of centuries of selection by humans and nature, a population evolved of strong, hardy, good size dogs, confident, independent, fearless, capable of making their own decisions, reliable dogs with innate guarding instinct and ready to defend themselves, their territory and the property of the master.

States, rulers and forms of government have changed, but the landscape has remained the same, except for insignificant changes in the climate. The constancy of natural conditions determined the constancy of the way of life and making a living by the people. Here, the only source of sustenance is sheep breeding and it has remained the same for centuries. Experience accumulated during hundreds of years is passed on for generations and it has achieved a high degree of perfection that cannot be improved any further but only preserved. Here, sheep guarding dog will be needed for as long as these conditions for life remain and the local dog is the best adapted for its work, including resistance to endemic diseases.

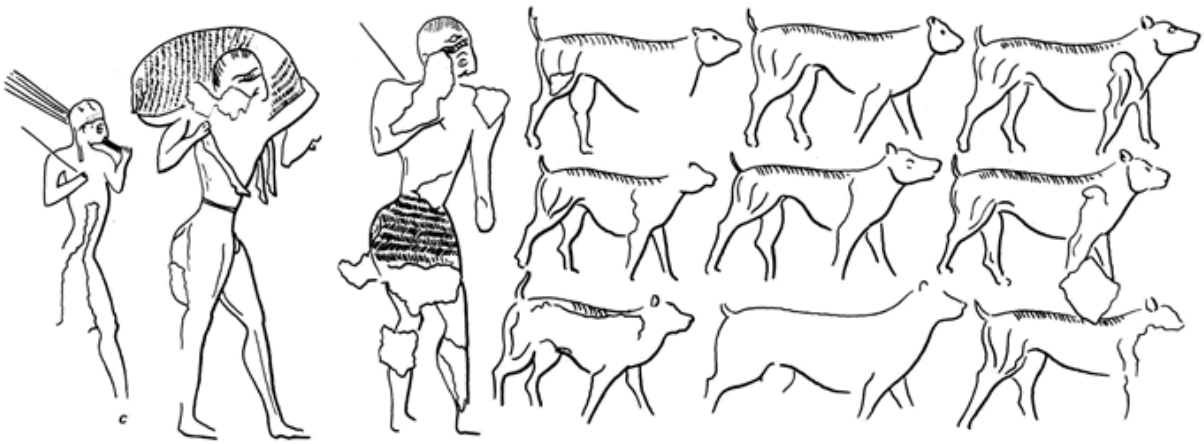

Photo 4. Image on silver cup, made over 4000 years ago, found in Northern Afghanistan (The cup is stored in Louvre, France).

Only some of the ancient sheep guarding dogs have survived until the present. They are an inseparable part of the way of life and the cultural traditions and essentially are a part of the national heritage of the native people. It is important to save this and other populations of aboriginal dogs with a similar purpose in their original ranges of distribution.

In the XXth century, the ancient population of sheep guarding dogs of Central Asia has suffered a serious set back. The social structure of the local people has changed. Chobans (herdsmen) have lost their

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nomadic way of family life and have had to settle in villages. Only men migrated with the herds, often hired by seasonal workers not familiar with the experience of true nomads.

In the 1930s, there was a demand for dog's skins and, as a result the biggest dogs were killed. As a measure of rabies control, often a campaign for the wholesale extermination of dogs was carried out, including dogs belonging to families. In the early 1980s in Turkmenistan, all dogs were actually killed.

Since the late 1970s, the mass migration of people of European origin moved into Central Asia, which brought European breeds and mixes there. This resulted in mixing and new diseases, against which local dogs had no immunity. The East European Shepherd Dog (the Soviet version of the German Shepherd Dog) became widely distributed.

Photo 5-11. Tajikistan, 2001-2006. Sheep herd dogs of Matcha and Gaininsky regions.

A major problem was the decline of pastures and sheep population and the loss of old traditions.

I am convinced that the problem of the preservation of aboriginal dogs in their home countries can be solved only with the involvement of governments, who can make decisions and laws.

When the Chairman of the Association of Nature Lovers of Sogdia Province and the Chairman of Executive Commettee Peoples Democratic Party of Sgdian Province Kosim Rakhbarovich Kosimov created a kennel and put on dog shows, I was anxious to use this opportunity in the hope of attracting the attention of lawmakers to the problem of preserving aboriginal dogs. It is hard to solve the problem of preserving aboriginal dogs without the legislative bureaucracies. Photo 5-14.

To attract more attention to preserving aboriginal populations of dogs the maximal use of the media is necessary to convey information to the local powers and governments of different countries.

Problems associated with the preservation of aboriginal dogs are very complex and one difficulty is how to survey the dogs in a specific region.

Interest in aboriginal dogs is high; they are exported to different countries and are bred far away from their natural environment. It is well known that, as experience shows with breeding different aboriginal animals under different climate conditions, they deviate from the original type.

At present, in addition to the problems of preserving dogs in their native regions, we have problems of their preservation outside their natural range and under conditions of different use. Here we

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have problems with standards written for types of dogs away from their home countries but under the name of the geographic region of their origin. Some of such breed standards do not fit the type of aboriginal population and even the most characteristic of dogs from the natural region find themselves thrown out (for example the Caucasian Ovcharka).

There will always be enthusiasts, who will be keenly interested in aboriginal dogs, breed them and write standards and fight for their recognition by international cynological organizations. It is ideal, when enthusiasts of the breed exist in their country of origin, who take care of their preservation and recognition. However, not all aboriginal breeds are lucky.

We have become familiar with many aboriginal dogs from enthusiasts from other countries. Cynological clubs, which produced the standard of the aboriginal breed, are not the owners of the breed but, according to international rules, are only curators of the breed. Not all statements in the breed standard are shared by lovers of the breed in other countries, but they can bring changes to the standard. This order of application and approval of a breed standard does not always help the preservation of aboriginal breeds.

When breeding dogs beyond their historical home country, it is important to take care that the offspring of the aboriginal dogs do not loose their basic characteristics. The breed should be preserved as it was created and we should foresee what kind of deviations would be possible and acceptable, when it is bred outside its natural range, and what kind of changes should never be allowed, and we should watch that the standard of the breed under the name of its geographic home country does not describe an entirely different dog that was obtained during breeding away from its natural environment in the home country. Actually this is a substitute of the breed by using a different standard under the name of the same region of origin, where aboriginal dogs are being replaced by their new version in their home country.

Great Soviet Encyclopedia, Vol. 1, 3rd Edition

ABORIGINES (Latin Aboriges, from ab origine – from the beginning),the original inhabitants of a country, opposite to newly arrived settlers.

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ABORIGINAL LIVESTOCK, local livestock of a particular region or country, which have never been interbred with other breeds and are well adapted to local climatic and husbandry conditions and posses their own peculiarities.

The problem of deviations from established breed standards in dog breeding exists also with pedigree cultured breeds and it is well known to the FCI. It is created by dog breeders and judges. President of the FCI, Hans Muller wrote about this.

One should choose thoughtfully the correct criteria for dogs selected for breeding. One major trait of the breed is behavior. If the behavior was changed, the breed was also changed. As an example, let us take a look at the history of the German Shepherd Dog.

This breed began with different sheep working dogs, which had been used for controlling livestock herds. Over many years they developed a very good scent and working instincts. A creator of the breed called the German Shepherd Dog, Maz von Stefanitz, had the goal to create an ideal dog capable of defending the master and the herd. With time, German Shepherd Dogs were increasingly often used as protection dogs and, as a result of further training and selective breeding, at protection dog trials. As a result, on the basis of the original livestock herding dogs, an excellent personal protection dog evolved. However, in Germany, the breed has never stopped being used in the traditional way as a livestock herding dog. The dogs are still trained as herding dogs and trialling and working herding dogs are shown separately from dogs used for personal protection purposes. Thus, the different capabilities of one breed are preserved and each of these capacities of the breed is used, depending on the individual qualities of dog.

This experience of work with the German Shepherd Dog and the preservation of its historical role should also be applied to the Central Asian Ovcharka, when it is bred away from its historical home country.

Without descriptions of populations, it is impossible to preserve the breed. It is necessary to know what to preserve.

We have to send an appeal to leaders of cynological organizations, primarily the FCI and others, about the need to accept special programs for the preservation of ancient aboriginal dogs, which would be adequate for the preservation of the biological diversity on the planet, by accepting aboriginal breed standards developed in countries of their historical origin. Aboriginal breeds and their standards, if they are presented by a country that does not own the breed, should be supervised by an international cynological organization and any changes in it should be accepted only under condition of obvious necessity. It is very important that the standard of an aboriginal breed should include its range of distribution and use and that the dogs must be bred as working dogs. The name of the breed should include either its geographic region of origin or the name of the breed used by people in the country of its origin.

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The problem of preserving for aboriginal breeds their place in group classifications of the world cynological organizations is important.

Cynological organizations of the world run extensive promotional campaigns popularizing dog breeds. Dog shows allow the public to become familiarized with dogs of different breeds. The FCI unites over 80 countries and has approved standards of more then 350 breeds.

The standard of the Central Asian Ovcharka was accepted in the former USSR and was written for dogs in the entire natural region of Central Asia. In 1989, this standard was approved by the FCI, No. 335, which says: "the major range of distribution is the republics of Central Asia and adjacent regions". Now, the republics of Central Asia are independent countries.

The FCI divides dog breeds into 10 groups. Group 2, Section 2 has a general name of Molossoid Breeds and it is further subdivided into two subgroups: 2.1 – Mastiff type and 2.2 – Mountain type. The Central Asian Ovcharka belongs to the second subgroup 2.2. Mountain type. However, to some dog judges and dog users, the general name Molossoid breed becomes an incentive to breed dogs similar to typical Molossers, not Central Asian Ovcharkas.

Photo 12.Tajikistan, May, 2007г. Sheep herding male. Along the highway to Tobashar we met several sheep herds. Near one herd, on the hill near the roadside, a male dog stood. The herdsman stood between the male and me and warned me that it would be dangerous to come up close to the dog, when I was taking pictures. Central Asian Ovcharkas do not like it, when the camera lens is poking at them. The male was looking at me with a characteristic sharp glint in his eye. I endured this and had enough time to take three shots. The male headed along the herd, trotting without hurrying. His gait was amazingly beautiful and perfect.

The Central Asian Ovcharka was developed by the native peoples of Central Asia to fit their nomadic way of life. The specific nature of their way of life has determined the need for a reliable protection dog. This is an ancient livestock guarding breed with innate instincts for guarding animals and property. In different countries with nomadic life and sheep breeding, there was a need for a reliable guard dog that did not make demands on the conditions of life.

It is important to ask the FCI to separate the Central Asian Ovcharka and similar related breeds from section 2.2 of Molossoid dogs and to distinguish them as a separate section of ancient livestock guarding dogs.

A noted expert on mastiffs, a reporter of the English edition of "Dog World", Douglas B. Oliff (1996 translated from the English edition of 1998) wrote that in ancient times, all big guard dogs were called "mastiffs". Meaning the size of dog, not just any dog and that the term "molossus" meant Molossian hunting dog. In some languages this is a synonym of "mastiff". Large Epirian dogs of coastal Greece next to Corfu Island were called molossers.

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In cynological literature, the term mastiff is usually applied to mastiffs and to livestock guarding dogs as well. However, livestock guarding dogs represent the first general stage, whereas Mastiffs represent amore specialized stage of the same type of dog. (Epstein, 1969).

Douglas B. Oliff (1996, translation of 1998) calls dogs similar to the Central Asian Ovcharka pseudo molossers, and Yu. K. Gorelov (2005) places them in a group of pro molossers.

In the classification of dogs by the FCI, the Central Asian Ovcharka and similar breeds are placed in the group of Molossers, perhaps because the dogs are older and they had been created specifically for the protection of livestock from predators. The differences of these breeds from true molossers, such as the Mastiff, Bull Mastiff, Bordeaux Dog, Canary Islands Dog, etc. are more profound. Large dogs existed in Central Asia long before Roman civilization; Rome was founded in 753 BC. In spring, 2003, Italian archeologists from a research center in Ligabue, Venice, excavated in the desert in Turkmenistan the remains of a city, which existed here 6000 years ago. At the burial place they found well-preserved skeletons of a man and a woman and a large dog. Livestock guarding dogs were bred everywhere in the pastoral regions of Manchuria, Inner Mongolia, Hong Kong, Tibet and the adjacent agricultural regions of Western China (Epstein, 1969), Iran, Afghanistan, Central Asia and Kazakhstan. An image on a silver cup made over 4000 years ago, which was found by archeologists in Northern Afghanistan, represents a livestock guarding dog. This indicates that these dogs were a breed at that time. The cup is kept in the Louvre.

Photo 13.Tajikistan, May 2007. In Karatala, a sheep shed is in the low land. Sheep were on the pasture. We saw two dogs of light color. While our car was running on the road, the dogs did not react, but when we stopped and we went out of the car, one bitch was right with us and did not allow us to make a step. The male remained lying, not seeing any threat in us. The noise made by the bitch raised the herdsman. He said the bitch was 10.5 years old and that she was a very aggressive and reliable guard dog.

Here, as well as everywhere, bitches and young dogs start barking first and males join them, when the danger is real and requires their effort!

Selection over any centuries helped to develop the particular behavior of livestock guarding dogs. The way of life and work, which required independent decision making, helped to develop a high intelligence. Both behavior and intelligence must be preserved in this breed. The special nature of their work requires a certain body construction; the dogs must by sturdy, strong and with lightning fast reaction.

It is not permissible to change the name of the breed and using it as a reason for selecting the dogs by different criteria typical of Molossers. It would be correct, if the FCI would separate the Central Asian Ovcharka and breeds with a related purpose in the 2nd group of classification as a separate section of Mountain and Livestock Guarding dogs; this would preclude their treatment as Molossers and it would help the preservation of these ancient breeds, which were developed by peoples with a nomadic pastoral way of life over large territories in many countries.

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I believe that an international conference should offer the FCI to change the classification of group 2 and designate an additional subsection 2.2, because it is very important to remove the Central Asian Ovcharka and related breeds from the group of Molossoid dogs as more generalized and ancient dogs. This would be the most realistic and feasible measure directed towards the preservation of ancient breeds, which such a conference can take.

This would be justified historically. The holy book the Avesta describes the role of dogs in the life of the Zoroastrians (Kryukova, 1997). The dogs were subdivided into dogs guarding livestock, dogs guarding the home, hunting dogs and young dogs. The most severe punishment was given to a person who hurt a dog guarding livestock. This shows the importance of livestock guarding dogs in the life of the people.

Photo 15. Euro Dog Show 2007. On the left a Bull Mastiff, FCI group 2, Section 2.1. On the right a Bernese Sennenhund, FCI, Group 2, Section 3. In the center a Tibetan Mastiff, FCI, Group 2, Section 2.2.

Moving dog breeds from one section to another and even into a different group when it is necessary is not new in the FCI. Thus, in group 2, Sennenhunds are separated into section 3, because of their different use and structure. The American Akita was moved from group 2 into group 5. To move a breed into a different section, an application with appropriate justification is needed.

There are very few breeds remaining in the world that were formed naturally and this makes us even more responsible for their preservation. The Central Asian Ovcharka is one of the few breeds that have survived until the present in its original form. Strict selection during millennia has created a breed appropriate to the demands and character of man; it was created to help with work and by its long cooperation over centuries it deserves the right to be preserved.

Photos by T. Ivanova

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LIVESTOCK GUARDING DOGS FROM PORTUGAL
A Review of Current Knowledge

Carla Cruz
Portugal

Introduction

Portugal is a small country located at the western edge of Europe, in the Iberian Peninsula, bordering Spain and the Atlantic Ocean. With an area of 92391 Km2, it is comprised of mainland Portugal and the archipelagos of Azores and Madeira.

Ten breeds are currently recognized by the Portuguese Kennel Club, and at least one more racial population of hunting dogs is aspiring to get recognized. All are working breeds, used for hunting (Portuguese Pointer or Perdigueiro Português and Portuguese Warren Hound or Podengo Português), fishing (Portuguese Water Dog or Cão de Água Português), herding (Portuguese Sheepdog or Cão da Serra de Aires, Azores Cattle Dog or Cão de Fila de S. Miguel and Barbado da Terceira) and livestock guarding (Castro Laboreiro Watch Dog or Cão de Castro Laboreiro, Estrela Mountain Dog or Cão da Serra da Estrela, Alentejo Mastiff or Rafeiro do Alentejo and Transmontano Mastiff or Cão de Gado Transmontano). Only two are from the Azores Islands – the Azores Cattle Dog and Barbado da Terceira, the rest are from the mainland.

The Portuguese livestock guarding dog (LGD) breeds have been used for centuries to guard sheep and/or goat flocks kept in extensive husbandry systems, in which the livestock is grazed mostly in uncultivated pastures at variable distances from the villages and in mountains. However, the loss of interest by people in livestock husbandry (especially in extensive systems), which begun in Europe in the 17th century and has increased in the past decades, and the reduction in predator pressure, lead to the reduction in the use of these dogs, leading to a marked reduction in their populations. However, following the trend seen in several countries over the past few years, there is a renewed interest of the general public in national dog breeds, leading to a greater demand of animals as pets. This leads to decreases in population sizes in the areas where these dogs are needed the most (Coppinger & Schneider, 1995). This is a potentially worrisome situation as selective pressures imposed on livestock guarding work are different and often opposite than those exerted in animals meant to be companions to people. This

difference will only tend to increase if animals are breed independently for work or pet duties, without mixing these subpopulations.

Breed characterization is thus of crucial importance in retaining its unity, in order to preserve its functionality and promote its integration in modern societies. This knowledge will have important scientific and practical implications, leading to a better adjustment of livestock guarding dogs in the rural economy and in society in general. It will also benefit conservation efforts of large predators, such as the Iberian wolf, as predation damages on livestock can be reduced through the use of morphologically and behaviourally efficient livestock guarding dogs.

History of Livestock Guarding Dogs in Portugal

Based on writings from the end of the 17th century, it has been speculated if these dogs were already present in the area which would be known as Portugal over 1000 years ago (Augusto, 1987).

It is interesting that the first written reference of dogs in Portugal, in the 12th century already mentioned LGDs – a law from Guarda municipality1 stated that "every man that kills a sighthound or warren hound or livestock dog shall pay two maravedis" (Braga, 2000). Through the 12th and 13th centuries, other towns also issued laws imposing penalties for similar crimes towards alaunts, sighthounds, warren hounds and livestock dogs. In the 15th century there are also reports of complaints of the citizens of Évora to the crown that they could not keep guarding or shepherd dogs due to the existence of hunting grounds at the edge of town2, where the dogs would often go hunting without their owners' knowledge (Braga, 2000).

LGDs are also present in the collective imagination, not only through popular sayings (e.g. "lost is the cattle if there is no dog to guard it", dated from before 1800) but also through stories and tales. For example, in 1789, the book "The Blind Man's Dog, defending its race", tells the story, real or fictitious, of the guard dog of a church in the centre of the country who, upon seeing a flock whose shepherd had fallen asleep and that for some reason came without its dogs, drove away the threatening wolves, gathered the flock and took it to the churchyard; the dog was found there the next day, with the flock safe and sound (Braga, 2000).

Despite their ancient origins and usefulness to the shepherd, only in the second quarter of the 20th century some attention was paid to these breeds and studies were done. It is interesting to notice that the first Portuguese book on dogs written in the 20th century (Valdez, 1911) foreign breeds were discussed in greater depth than the Portuguese ones. Of these, the book only briefly mentioned the Estrela Mountain Dog, the Castro Laboreiro Watch Dog, the Alentejo Mastiff and the Portuguese Mastiff or Island Dog3. This situation was partially corrected in later versions of the book (e.g. Valdez, 1951), thanks to the studies that had since begun. However, even then not all breeds existing at the time are focused (such as the Portuguese Warren Hound). In 1955 the first book with the standards of the Portuguese dog breeds is published (Cabral, 1955). Although it admitted it did not focus on all the Portuguese breeds believed to exist, due to the almost extinction of some (Fila da Terceira) and to the cross-breeding with other breeds leading to the extinction of others (Galgo Anglo-Luso, Galgo Indígena and Barbaças), it intended to serve as a guide to the breeding of these dogs.

As a curiosity, it is also worth noticing that at least the Estrela Mountain Dog was known well enough in the first quarter of the 20th century for it to be mentioned in comparison with the wolf in a national school book : "the wolf is similar to an Estrela Mountain dog, from which it can be distinguished for having a hanging bushier tail and straight and prick ears" (Aires, 1923). It can also be assumed from this sentence that it the wolf had a bushier tail, the variety known at the time was the Smooth-haired Estrela Mountain Dog. A book on Portuguese ethnography published in 1933 also mentions the livestock

[1] Interestingly, this town is located in the same area mentioned in the speculation of the existence of LGDs in Portugal over 1000 years ago.

[2] Évora is a town located in the South of the country. At the time, hunting was a privilege of nobility, and severe penalties were imposed on trespassers.

[3] This name referes to the *Fila da Terceira* (Terceira Cattle Dog), a cattle dog breed that was once recognized but which is now extinct.

guarding dogs, specifically saying that "the mountain dogs belong to the Mainland, as livestock guarding dogs, those from the Estrela Mountains and Castro Laboreiro; the Alentejo Mastiff is also a livestock guarding dog" (Vasconcelos, 1933).

Transhumance and Livestock Guarding Dog Breeds

The places of origin of the 4 Portuguese LGD breeds (fig. 1) cover most of the country, particularly the mountainous areas of the North and Centre. Although the Estrela Mountain Dog has a relatively restricted point of origin (the Estrela mountain range and surrounding areas), it is actually the most spread and best known breed, due to the transhumance routes which took place until some decades ago and which spread it across most of the country.

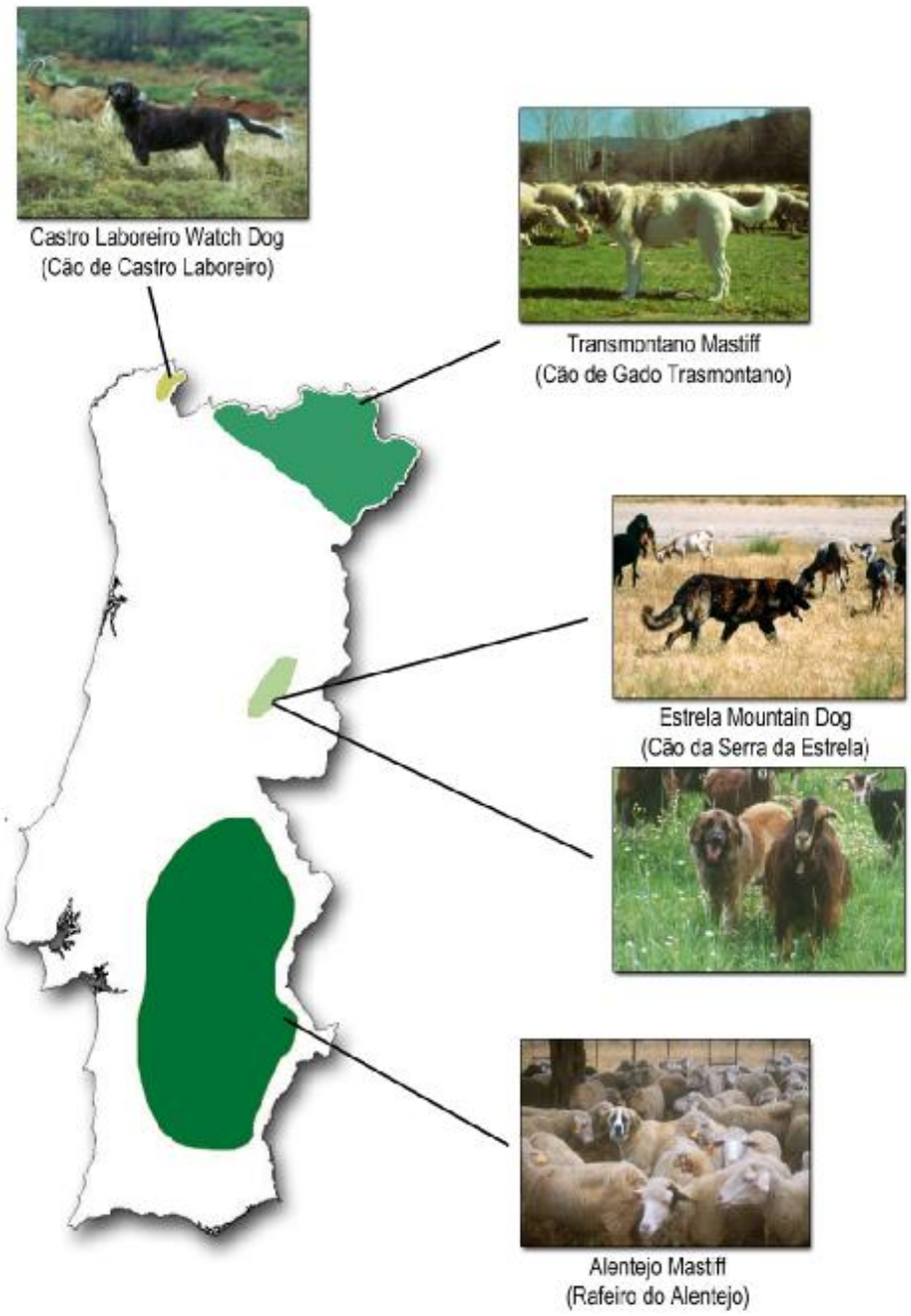

Figure 1 – ***Portuguese livestock guarding dog breeds and their areas of origin***

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Transhumance is a form of mobile shepherding typical but not exclusive of the Mediterranean people. In this system flocks (mainly composed of sheep, but may also be of goats, cattle and pigs; Angioni, 1994) spend part of the year in one area and part of the year in another, using different pastures as weather and agricultural needs demanded. Transhumance movements lead to the gathering in one place of flocks (and therefore dogs) from different areas, thus providing ample opportunities for genetic exchange between populations or breeds, leading to type uniformity.

Transhumance in Portugal was common until the beginning of the 20th century and decreased dramatically since then, mainly since the 1950s (Martinho, 2000). Nowadays it is no longer done, and the last rout was walked in 1999, mainly as a reconstruction for a journalistic article. Figure 2 shows the mains transhumance routes that were done in Portugal and the places of origin of LGD breeds.

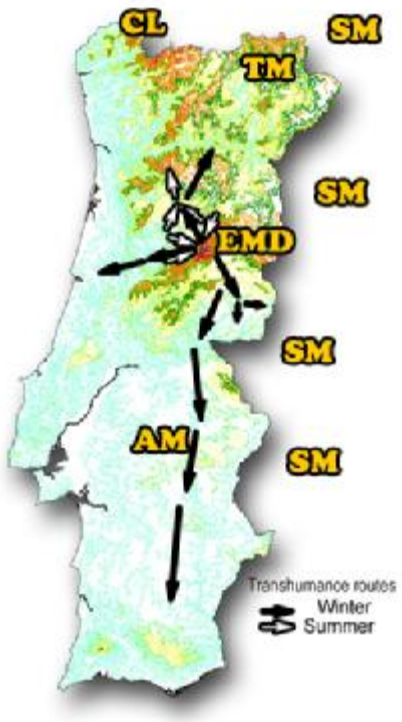

Figure 2 – ***Transhumance routes in Portugal and places of origin of LGD breeds. CL-Castro Laboreiro Watch Dog, TM-Transmontano Mastiff, EMD – Estrela Mountain Dog, AM-Alentejo Mastiff, SM-any of the local varieties***

There are records dating from the 15th century of transhumance movements from Castro Laboreiro to the shore, but these were small scale and did not occur in recent times (Lima, 1993), so their influence on LGDs and namely on the Castro Laboreiro Watch Dog must have been minimal, as there are no other functionally similar dogs in the area, only smallish Podengo-type dogs with which it would be difficult to breed.

The most important transhumance areas are the Estrela Mountains, with reports of it being done since the 12th century (Antunes & Santos, 1942; Silva, 2000). There were winter and summer paths, with the winter transhumance being the most important due to the distances covered (up to 9 days of travel; Martinho, 1972) and the logistics involved (several flocks each typically with 1500 to 2500 animals, 7 to 20 shepherds and 7 to 10 dogs (Dias, w/d; Daveau & Ribeiro, 1978). The most important route taken was the one leading to the south, to the Alentejo area.

Spanish flocks would also come to the Alentejo area in the Winter (Amaral, 1970; David de Morais, 1998), when Portugal was under Spanish ruling (Ribeiro, 1998), as well as to the Estrela Mountains area (Agelán & Casar, 1999). In lesser scale, some Portuguese flocks would also go to Spain (David de Morais, 1998).

As can be assumed from the analysis of transhumance routes, there were plenty of opportunities for LGDs to meet, especially in the Alentejo area in the south. And indeed the 3 types of dogs which could have been found there – Alentejo Mastiff, Spanish Mastiff (or any of its varieties) and Estrela Mountain Dog (especially the Smooth-haired variety, more common in the Estrela highlands where the flocks came from) are morphologically very similar. Even today, after decades of selective breeding, it is sometimes difficult to assess phenotypically to which breed some specimens belong to. And as a curiosity, some Spanish authors believe that the current Smooth-haired Estrela Mountain Dog corresponds very accurately to the model designed in the first Spanish Mastiff breed standard in 1946 (Peña & Fernandez, 1998).

The Transmontano Mastiff probably did not suffer an important direct influence from transhumance movements, as there were no direct routes reaching the breed's area, but it may have been influenced mainly by ancient transhumance Spanish Mastiffs across the border.

The Portuguese Livestock Guarding Dog Breeds

Estrela Mountain Dog (Cão da Serra da Estrela)

The Estrela Mountain Dog (EMD) is the breed from the Estrela mountain range, in the centre of Portugal. The area of origin ranges from the top of the mountains (at almost 2000 m, it is the highest in the mainland) to the slopes and neighbouring valleys, and it is speculated that the breed may already have

existed 1000 years ago (Augusto, 1987, Veiga, 2002). Due to the transhumance, it was very well known in rural environments all over the central area of the country. When tourism started to head towards the Estrela Mountains, after the railroad reached the mountain slope in the end of the 19th century, it became well known across the country (Pye, 1980, Augusto, 1987). Nowadays it is the most well-known native breed in Portugal, and is present in numerous stories and chronicles about the mountain (e.g. Abreu, 1906, Lacerda, 1980 in Cândido, 1997; Guerreirinha, 1985; Augusto, 1987; Sousa, 1999). Even in scientific studies about Portuguese rural life, where normally no attention is paid to dogs there are reports on the presence with the flocks of these dogs, armed with collars with "irons", iron spikes or nails, in order to help in their protection work (e.g. Dias, w/d; Almeida, 1970; Abrantes 1995; Ribeiro, 1998).

There are 2 varieties in the breed: in the southern slope and valleys long-haired dogs where more common, whereas in the inner and higher mountains smooth-haired dogs were the most common (Valdez, 1911; Vasconcelos, 1995; Parada Monteiro, 2001a). Smooth-haired dogs, which were the most common variety in the beginning, were preferred by the shepherds, as dogs with this type of coat did not accumulate snow in the Winter and were cooler in the Summer. Long-haired dogs are occasionally born out of these dogs and were normally disposed of by the shepherds. However, when tourism begun in the area, also begun a demand for the long-haired dogs as pets, as they are visually more attractive. Therefore, long-haired dogs began being sold to outsiders, who started breeding them. On the other hand, smooth-haired dogs remained almost exclusively in the hands of shepherds. As the wolf disappeared from the mountains in the 1970s/80s (Petrucci-Fonseca, 1990; Cândido, 1997), and as shepherding habits begun to change, and the need for a large guard dog became scarce, this variety begun to disappear, in benefit of the long-haired variety which boomed as a pet/house guard dog elsewhere in the country. Only in the last few years a real recovery work has been done, based on the work of a handful of enthusiastic shepherds and breeders aiming to preserve this variety, focusing not only in the morphological aspects but also in the behavioural issues of livestock work.

Although there were some breeders already in the beginning of the 20th century, the first studies on the breed were only done in the 1930s, culminating on the writing of a breed standard (Marques, 1934), aiming to differentiate the mountain dog from the mastiff from the Alentejo plains.

Nowadays, the Estrela Mountain Dog is the best known Portuguese breed in Portugal, and has been consistently in the top 10 registered breeds over at least the past decade (CPC, 2007). Along with the Portuguese Water Dog, it is also the best known Portuguese breed outside national borders, with well established breeding populations in several countries (e.g. United Kingdom, Belgium, France, Sweden, Norway, Finland, Czech Republic, Brazil, United States of America). These nuclei are of the long-haired variety and used mostly as pet dogs, with very few animals being used as LGDs. The Smooth-haired EMD is very scarce even in Portugal, and international presence of this variety is very discrete - only a handful of specimens have been exported to Brazil, Germany and the United States, to work as livestock or farm guarding dogs.

This breed original work is guarding livestock from predators (namely wolves, the only large predator still remaining in Portugal). In small scale, it was also used as a draught animal, pulling small karts with milk and cheese to be sold at the local markets. Some animals have been used in large game hunting packs. Nowadays it is mostly a home guardian and companion. It has also been used in the armed forces, namely in the Marine Corps.

Morphologically, the Estrela Mountain Dog is a large-sized dog – the standard mentions males should measure 65-73 cm and females 62-69 cm; however, especially in the Smooth-haired variety, it is not uncommon for animals to be above the standard. The ears are pulled back against the sides of the head and the long tail forms a hook at the bottom. Single or double dewclaws are common and considered typical. Colours accepted are fawn and wolf-grey in all shades, solid or brindle, with or without small white spots in the chest and toes. In the beginning of the century dogs with large white markings or black and white were common (Valdez, 1911). Regardless of the colour, there should be a black mask on the muzzle. Shepherds tended to prefer dogs with black muzzle, ears and limbs and with dewclaws, claiming those were the best for guards for their livestock (Marques, 1934).

Castro Laboreiro Watch Dog (Cão de Castro Laboreiro)

The Castro Laboreiro Watch Dog (CLWD) comes from the Castro Laboreiro plateau, a remote rural area in the north of the country. Originally, the breed could be found there and in the neighbouring mountains at heights up to 1400 m. The plateau was virtually inaccessible from the outside until 1945, when a road was opened (Lopes de Oliveira, 1968). This, allied with very limited transhumance movements (only a few kilometres long between winter and summer settlements), lead to high isolation of this dog.

The breed has been closely linked to the Castro Laboreiro traditions. It is mentioned that in the 13rd century locals had to yearly give the crown 5 “hounds” and that they used to complain to the king about foreigners coming into the area to kidnap their women and “pure” dogs (Lopes de Oliveira, 1968). Even Spanish writings on shepherding on the Spanish side of the mountain mention the dog used in the Portuguese side to guard the flock from the wolf (Fernandez, 1959). It is also claimed that in the Middle Ages shepherds in Castro Laboreiro had to reserve one specimen of their litters for King D. Pedro I to use in bear hunting (Borges, 1989).

Although the breed has been recognized and has a standard since 1935 (Marques, 1935), in the past decades the CLWD has been threatened by decrease of population and by mixing with other dogs, due to the increase of tourism and important emigration waves, leading to a greater number of exotic dogs being introduced in the area. However, the village priest, father Aníbal Rodrigues, played a major role since the 1950s until his death in 2001 in promoting and recovering the local breed, namely through the engagement of the local population, cooperation with the Portuguese Hunters Club (which latter became the Portuguese Kennel Club, CPC) and the armed forces for the use of these dogs and by implementing a yearly dog show (Lopes de Oliveira, 1968). This show, the most ancient in the country (it has been taking place since 1954, on the 15th of August), is considered by the local population as very important in the improvement of the breed.

Although the CLWD is relatively known inside of Portugal, it is almost unknown outside the country, with no known regular breeders.

The breed’s major function is livestock guarding, working alone or with a shepherd, as well as house guarding. Some animals are also used in large game hunting. The breed has also been used as a police and military dog, namely in the Marine Corps, and in the 1960s some specimens have even been successfully tried by the Spanish Police School in Madrid (Parada Monteiro, 2001b). One dog was also used as a seeing-eye dog, having been trained for it by its owner (Petrucci-Fonseca, 2000).

Morphologically the Castro Laboreiro Watch Dog is a medium to large sized dog – according to the standard, 52-60 cm, but in the breed’s area of origin it is common to find larger typical dogs, up to 70 cm. The coat is short and dense. The colour is brindle, with more or less dense stripping.

Alentejo Mastiff (Rafeiro do Alentejo)

In Portuguese, the word “rafeiro” has been associated with the meaning “mongrel dog” or “dog of no breed”. However, unknown to most people, it actually refers to a “farm guard dog”, a meaning dated at least from the 1700s (Braga, 2000).

Like the Estrela Mountain Dog, the Alentejo Mastiff (AM) is believed to have resulted from transhumance and adaptation of dogs to different conditions. So, whereas in the Estrela Mountains a type was selected with longer or shorter coat, in the warmer southern areas a type with shorter coat was established, subject to different section pressures (Alpoim, 1999). CPC (1990) mentioned not only the Estrela Mountain Dog as one of the AM’s ancestors but also the Spanish Mastiff and the Castro Laboreiro Watch Dog. As previously seen, the Spanish Mastiff influence is very likely. Vasconcelos (1995) even mentions the use of the Spanish Mastiff in more recent times to help recover the breed when it almost went extinct in the 1970s. However, it is unlikely that the Castro Laboreiro had any contribution in the origins of the AM, due to its historic distribution and absence of long-range movements in the breed, especially to the Alentejo area.

Although the Alentejo Mastiff was widely spread throughout most of the southern areas of the country, studies on the breed only begun in the 1950s (Abreu, 1996), leading to the writing of a breed

standard in 1953 (CPC, 1990; Alpoim, 1999). However, interest in the breed by the local population was such that between the end of the 1970s and the mid-1980s a breeding nucleus of the AM was even established in Évora University (Abreu, 1996), which is located at the heart of the breed's area of origin.

Although this breed is well known in Portugal, it is rare abroad. However, the Netherlands and France have already started breeding it.

The breed's main work is guarding flocks and estates. Another work for which it has been used is large game hunting, and it seems to have been part of royal hunting packs in the beginning of the 20th century (CPC, 1990; Vasconcelos, 1995; Alpoim, 1999). Its main aptitude in this work is pursuit and catching the prey (Formosinho, 1991).

Until recently, the Alentejo Mastiff was the largest of the Portuguese breeds, with the standard calling for a height of 66-74 cm for males and 64-70 cm for females. The coat is smooth or half-long. Colours are fawn, black, wolf-grey or yellow, solid or brindle, with or without white patches. Patched dogs are preferred and traditionally considered more typical.

Transmontano Mastiff (Cão de Gado Transmontano)

The Transmontano Mastiff is one of the most recently recognized breeds in Portugal, having been provisionally recognized by the CPC on April 2004 (the final recognition should occur in 2009). It is not internationally recognized. In Portuguese, its name specifies the work and place of origin of the breed – it is the livestock guarding dog (Cão de Gado) from the Trás-os-Montes region (Transmontano). Its origin is similar to the other Portuguese LGD breeds. The type of dog that developed in the North-eastern region, due to the environmental conditions similar to those in the Alentejo region became somewhat similar to the Alentejo Mastiff. However, livestock husbandry in the area persisted as an extensive system with flocks grazing in uncultivated areas kilometres away from the villages (unlike what happens in the Alentejo, where most flocks are kept in bigger or smaller enclosed pastures). This, and the continuous presence of the wolf as a predator (a species which disappeared from the Alentejo in the 1970s, Petrucci-Fonseca, 1990) lead to the need of a dog selected on strict functional parameters, and a breed was achieved proportionally more square than the Alentejo Mastiff, with longer head and better limb angulations due to the need of being able to keep up with the moving flock al day long, whether in plains or in the mountains.

Even nowadays the breed is still first and foremost a livestock guardian, being breed almost exclusively by shepherds. Some specimens are also used in hunting packs. However, there are more and more specimens being sent to other regions of Portugal and even abroad (there are already dogs at least in Spain, France and Germany), as pets and house guardians, and breeding within traditional cynological parameters is booming. The Portuguese Kennel Club, namely its president, has been intensively promoting this breed, inclusively to the risk of having it become a "fashion breed" within its functional group, with all the risks that come from the phenomenon.

The Transmontano Mastiff is the largest Portuguese breed, with the standard calling for a height of 74-82 cm for males and 66-76 cm for females. The coat is smooth. The most common colours are black, black and tan, yellow, fawn and wolf-grey, solid or brindle, with large white patches. They may have ticking. Tricolour dogs (black and tan dogs with white body and coloured head) are preferred by the shepherds, as that colour closely matches the colour of the local sheep breed (white with black spots on the head and limbs), and a dog of this colour goes by more easily unnoticed in the flock. Shepherds also prefer dogs with whiter bodies and tend not to appreciate solid coloured animals.

Demography

Analysing the number of specimens of each LGD breed in Portugal since they've started being registered by the CPC (1932 for the EMD and CLWD, 1933 for the AM and 2004 for the TM), and assuming a life expectancy of 10 years, three major population trends are clearly noticeable (fig. 3).

Until the mid-1970s, population numbers were low, but all breeds had a number of registered dogs roughly in the same range. In 1974, a revolution occurred in Portugal which liberated the country from decades of dictatorship and lead it into democracy and better living conditions for most people. Since that

time breed population sizes increased drastically, but lead to magnitude differences between populations – the greatest increase was for the long-haired Estrela Mountain Dog followed by the Alentejo Mastiff; the Castro Laboreiro Watch Dog and specially the Smooth-haired Estrela Mountain Dog remained relatively discrete breeds, sought mostly by locals near the area of origin of the breeds4. However, since the beginning of the 21st century population sizes have stagnated or decreased, as a reflection of an economic recession in Portugal, more severe over the past 3-4 years. This decrease is particularly notorious in the number of new dogs registered each year (fig. 4), as given the life expectancy assumed in this analysis, there is still not enough time for the trend to be clearly noticed in most breeds apart from the Long-haired Estrela Mountain Dog - this variety is the population who has been suffering the most from fashion events (while the others tend to be sought after more by people who actually know and look specifically for that breed or variety), so it is the first to suffer the effects of the decrease in buying power.

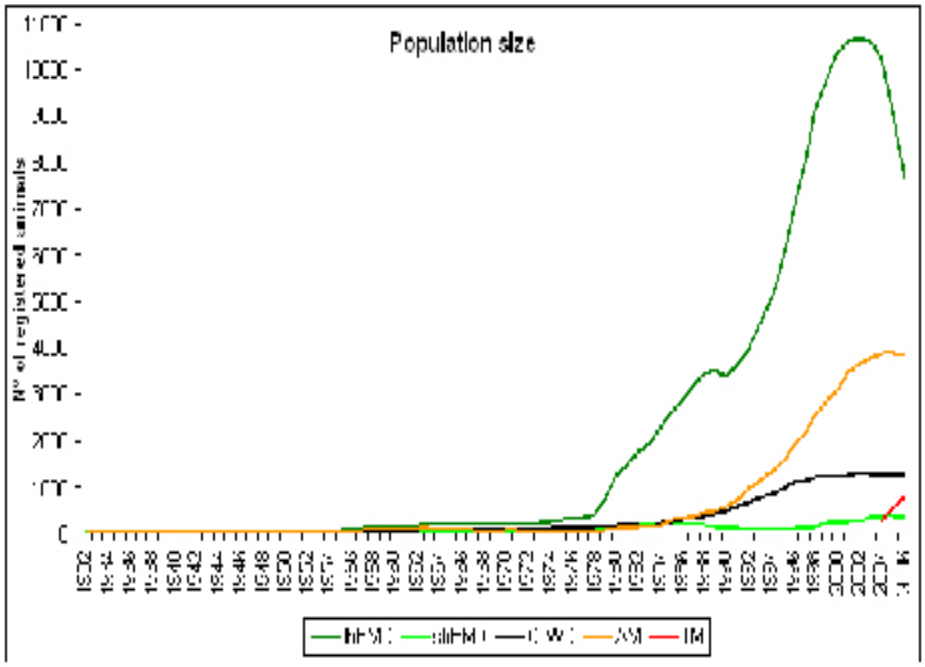

Figure 3 – ***Evolution of population size in the Portuguese livestock guarding dog breeds, assuming a life expectancy of 10 years (population data based on Gomes, 2003 and CPC, 2002, 2003, 2004, 2007).***
lhEMD-Long-haired Estrela Mountain Dog, shEMD-Smooth-haired Estrela Mountain Dog, CLWD-Castro Laboreiro Watch Dog, AM-Alentejo Mastiff, TM-Transmontano Mastiff

Since 2000, only two populations appear not to be influenced by the decrease in puppies produced – the Castro Laboreiro Watch Dog and the Smooth-haired Estrela Mountain Dog. However, their numbers are actually due to one or two breeders in each breed who took in hand the duty of helping to recover their breeds, through studies on the breeds' area of origin to locate new specimens, have them registered and using them in intensive breeding and working programs.

However, total population sizes may be misleading, as in each breed there is an important (albeit unknown) number of specimens which are not registered and which may constitute important sources of genetic variability, breed type and working aptitude in their breeds. For example, a census on the Castro Laboreiro Watch Dog breed, done between 1997 and 1999, assessed that only 35% of the censed dogs

[4] But interestingly, according to registry numbers, the Smooth-haired Estrela Mountain Dog was more popular than the Long-haired variety in the first 23 years of registries (Gomes, 2003).

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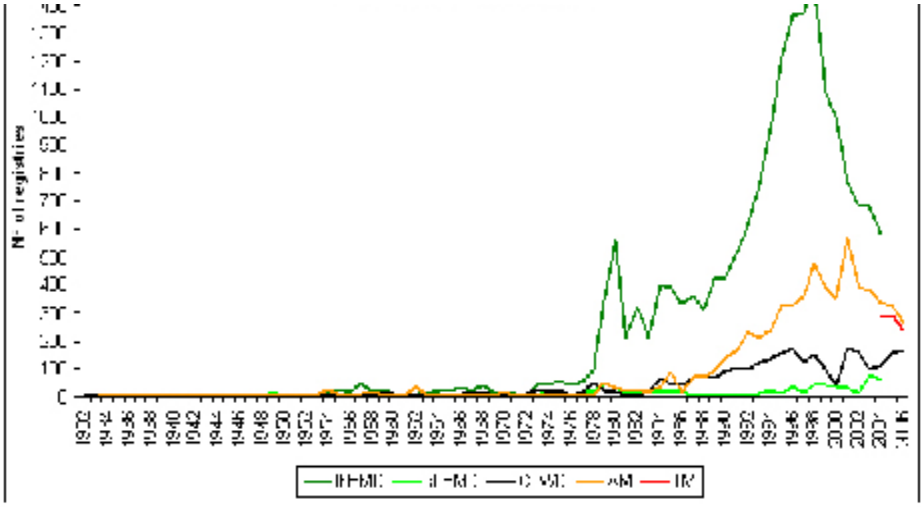

*Figure 4 – **Evolution of number of Portuguese livestock guarding dog breed specimens registered yearly (population data from Gomes, 2003 and CPC, 2002, 2003, 2004, 2007).***
lhEMD-Long-haired Estrela Mountain Dog, shEMD-Smooth-

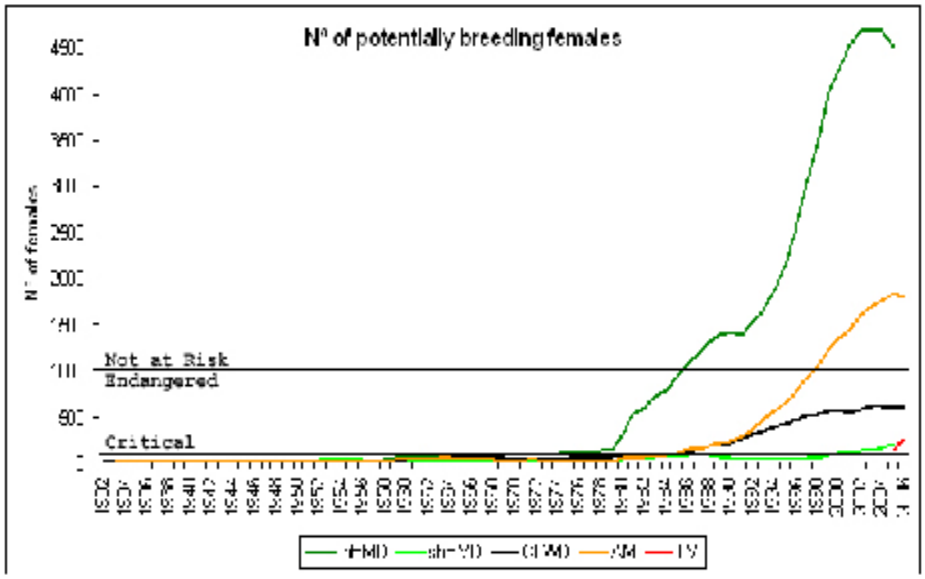

*Figure 5 –**Evolution of Portuguese livestock guarding dog breeds and varieties' potentially breeding female population size and relationship with risk categories under FAO's criteria (population data based on Gomes, 2003 and CPC, 2002, 2003, 2004, 2007).***
lhEMD-Long-haired Estrela Mountain Dog, AM-Alentejo Mastiff, CLWD-Castro Laboreiro Watch Dog, shEMD-Smooth-haired Estrela Mountain Dog, TM-Transmontano Mastiff

were actually registered in the Portuguese Kennel Club (Petrucci-Fonseca et al., 2000). In the other breeds (apart from the Long-haired Estrela Mountain Dog), an important part of the dogs registered in each year is composed of dogs of unknown origins and 1st and 2nd generation offspring of these animals.

Risk Status

The United Nations Food and Agriculture Organization (FAO) has a program on animal genetic resources conservation for domestic livestock species. Its definition for characterizing these resources concerns "those animal species that are used, or may be used, for the production of food and agriculture, and the populations within each of them. These populations within each species can be classified as wild and feral populations, landraces and primary populations, standardized breeds, selected lines, and any conserved genetic material". (Scherf, 2000). Dog breeds are currently already considered as genetic resources within this organism (Telo da Gama et al., 2004). Undoubtedly their use in the rural scene, as herding, livestock guarding or hunting dogs, has contributed for this.

This organism also established criteria to be used in the definition of a breed's risk status (FAO, w/d, Scherf, 2000), and according to them, figure 5 shows the risk status of the Portuguese LGD breeds, assuming a life expectancy of 10 years and that all potentially breeding females begin breeding at 1 year of age.

The Long-haired Estrela Mountain Dog ceased to be in "critical" status in 1974 and achieved the "not at risk" status in 1986. The Alentejo Mastiff and the Castro Laboreiro both came out of "critical" status in 1985, but while the AM stopped having a risk status in 1998, the CLWD never came out of it. The Smooth-haired Estrela Mountain Dog only came out of "critical" status in 2000, and is still considered "endangered". As for the Transmontano Mastiff, although presently it may be considered as "endangered", it is still too soon to make any comments regarding its risk status.

FAO's criteria are meant mostly for livestock, which are kept in a harem system in which most females breed every year, whereas dogs have a theoretical sex-ratio of 1:1 and currently most of the animals do not breed. A recent study (Cruz, 2006a) on the Azores Cattle Dog, a Portuguese cattle herding dog breed showed that considering the number of potentially breeding females a breed can be considered "not at risk" for many years, but when analysing the number of actual breeding females, the status can actually change seldom from "critical". This is an important issue to consider when applying these risk factors to dogs.

It is also important to consider that the data in this analysis refers to dogs registered in the CPC, but the numbers of unregistered animals may actually lead some breeds to change their risk status, if they become known.

Morphology of the Portuguese Livestock Guarding Dog Breeds

All of the Portuguese LGD breeds have been the subject of morphological research in the past years, based on direct measuring of animals. However, some severe flaws influence data interpretation and invalidate rigorous direct comparisons. Marques (1998) studied the Castro Laboreiro Watch Dog, but limited attention was given to the correct positioning of the animals, a critical issue when measuring live animals. The Alentejo Mastiff breed club (Associação dos Criadores do Rafeiro do Alentejo) and Carvalho (1999) sampled Alentejo Mastiffs and analysed the breed evolution in the previous 50 years, but the use of some "handy-crafted" instruments casts some shadow on the accuracy of measurements. Oliveira (2003) analysed the long-haired variety of the Estrela Mountain Dog, but half the sample consisted of dogs between 1 and 2 years of age, a period when animals are still growing up and getting larger, so his data cannot be considered an accurate analysis of adult animals. Oliveira (2002) did a biometric characterization of the Transmontano Mastiff. This work has been continued by the Montesinho Natural Park, which has been keeping data on the measures of puppy and adult Transmontano Mastiffs for some years, yet apart from an arguable use of some measuring instruments, limited attention is placed on the correct positioning of the animals.

Over the past years, I have been measuring specimens of the Portuguese livestock guarding and herding dog breeds with 2 major goals: (1) contribute to breed characterization and (2) compare animals from working origins with animals from cynological origins. Unlike the previous studies, I have not limited my data set to the measures traditionally used in breed standards, but rather use a set of 34 biometric variables and several indexes in order to help get an overall picture of the dog. Particular attention is given to dog positioning, as even the smallest differenced in correct posture can lead to flawed data. Another major difference towards the other studies done in Portugal is that the dog's body length is not measured from the frontal point of scapula to the point of ischium, but rather from the tip of the sternum to the point of ischium, a more reliable measure in a dog. Sampling included dogs from working origins (aboriginal (A) nucleus, animals bred based on the work aptitude of their parents, of unknown origins or origins known for only one generation) and from cynological origins (kennel-bred (K) nucleus, dogs bred based on their parents adjustment to the breed standard, with origins fully known for at least 2 generations). Table 1 summarizes major biometric ranges and morphological proportions in the Portuguese LGD breeds.

Morphological relationships between these breeds are discussed in greater depth in another article in these proceedings, but breed nuclei did not tend to cluster together, showing the morphological uniformity presupposed by the existence of a breed standard as a guideline does not strictly occurr.

Considering each breed specifically, in the Estrela Mountain Dog, differences between the EMD varieties occurred in 21.6% of the biometric variables and 41.2% of the indexes. In the Smooth-haired EMD, dogs from working origins tended to be larger than dogs from cynological breeding; the differences were statistically significant between animals in 2.9% of the biometric variables and 21.4% of the. In the Long-haired EMD, dogs from cynological breeding tended to be larger than animals from working populations, but no statistically significant differences were found, most likely due to sampling artefact due to very small sample of working animals – these are very difficult to find, since shepherds prefer Smooth-haired dogs to guard their flocks.

In the Castro Laboreiro Watch Dog, animals from working origins tend to be larger than those from cynological breeding; these differences were even statistically significant or marginally significant in 44.1% of the biometric variables and in 7.1% of the indexes analysed. This breed showed the greatest differences between population nuclei in the 7 breeds analysed. This is probably due to the fact the population being breed according within the official cynological scenario was based on only few individuals selected several decades ago, which had been breeding as a closed nucleus until a few years ago, leading to phenotypic divergence from the working populations, namely in size reduction

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Table I – Summary of major biometric ranges and body proportions in the Portuguese livestock guarding dog breeds (from Cruz, 2007)

	lhEMD	shEMD	CLWD	AM	TM
Body Size between nuclei	K>A	A>K	A>K	A>K	-
Height at withers (cm)	63.2-73.5	59.2-75.3	54.3-68.5	53.9-73.4	65.3-80.8
Weight (Kg)	38-60	27-49	23-40	28-64	41-59
Body Size	Hypermetric	Hypermetric	Hypermetric	Hypermetric	Hypermetric
Cephalic Index	Mesaticephalic (49.06)	Mesaticephalic (49.45)	Mesaticephalic (50.35)	Mesaticephalic (51.25)	Mesaticephalic (50.87)
Length/height Relation	Body 15.2% longer than height at withers	Body 11.6% longer than height at withers	Body 12.6% longer than height at withers	Body 11.3% longer than height at withers	Body 7.0% longer than height at withers
Body Index	Longilinear (94.91)	Longilinear (92.94)	Longilinear (92.72)	Longilinear (91.98)	Longilinear (89.77)
Legginess Ratio	Endurance trot (1.03)	Endurance trot (1.06)	Between endurance trot and gallop (1.13)	Endurance trot (1.09)	Endurance trot (1.02)

Legend: lhEMD-Long-haired Estrela Mountain Dog, AM-Alentejo Mastiff, CLWD-Castro Laboreiro Watch Dog, shEMD-Smooth-haired Estrela Mountain Dog, TM-Transmontano Mastiff, K-kennel-bred nucleus, A-Aboriginal nucleus

Regarding the Alentejo Mastiff, dogs from working origins tend to be larger than those from cynological breeding, but these differences were not statistically significant. However, this breed showed the highest sexual dimorphism, with 58.8% of statistically significant differences between sexes in the biometric variables and 5.8% in the indexes.

Finally, although the standard of the Transmontano Mastiff calls for a high sexual dimorphism in the breed (Molinari & Cabral, 2003), I did not find a higher percentage of statistically significant differences between sexes than those found in the other Portuguese LGD breeds.

Part of this study has been recently presented as a Master of Sciences thesis (Cruz, 2007) and in some congresses (Cruz et al., 2004, Cruz, 2006b,c). It has been appreciated by several breed clubs and by the Portuguese Kennel Club, with requests to include it in breed books which have been published on some Portuguese breeds (e.g. Cruz, 2004a,b, 2005, in press). Some breed clubs have also requested data to assist in the review process of their breed standards, which occurred recently. This is actually an issue where it would be important to have more morphological data from reliable sources, as I have shown that at least in the Estrela Mountain Dog, population biometric data does not totally agree with what the standard calls for, even when considering only dogs that are breed based on their supposed agreement to that standard (Cruz, 2006c).

Health Issues in the Portuguese Livestock Guarding Dog Breeds

Traditionally, these breeds have been considered very healthy, with few problems being admitted in them – mostly bloat, hip dysplasia and occasional episodes of epilepsy. However, systematic health screenings are not a norm in Portugal but rather the choice of individual breeders, who seldom make those results known to the public. Health studies on these breeds are rare and have been occurring only in the past few years, so concrete knowledge is still improving.

A decade ago it was common to hear from Estrela Mountain Dog breeders that the breed had no hip dysplasia (HD) otherwise the dogs would not be able to keep up with the flocks in the mountains. However, a recent study on the breed, from the Trás-os-Montes and Alto Douro University through a protocol with the 2 Portuguese breed clubs, and including dogs from cynological breeding and from working LGD origins, has showed an incidence of 67% of dogs with HD grades C, D and E (Ginja, 2006). This study also included screening of elbow dysplasia and several innovative analyses in order to try to assess a method to detect early signs of HD in puppies, with very promising results, and is continuing with an analysis of genetic values regarding HD. In the breed, this study pioneered health screenings and greatly contributed to change many breeders mentality about hip dysplasia and health screening.

Currently there is a new on-going health study on the Estrela Mountain Dog, screening dilated cardiomyopathy (DCM) (Lobo, 2007). This study took place after an article 9 years ago warning about the existence of idiopathic DCM on the breed (Sales Luis et al., 1998) and an alert by a breeder. Even more than in the case of the study about HD, this study was initially greeted with vast rejection by most breeders, using similar arguments than those used in the beginning of the HD study – if the breeders don't see it, then their dogs don't have it so such a health study could only contribute to make people reject the breed due to health problems. However, more than 2 years after the initial information about the study and after beginning of the actual screening, the opinions of many breeders have changed and many of those who rallied against it are now among the ones most contributing to it. Preliminary results show that 17.2% of the screen dogs have DCM; half of these animals did not show symptoms of heart problems prior to the screening.

In the Castro Laboreiro Watch Dog there was also a pilot study on DCM with a few animals, but apparently it did not get past that stage.

In the Alentejo Mastiff, there is a protocol with Évora's University for hip dysplasia screening.

In the Transmontano Mastiff, a research is being planned to analyse the causes of death of animals, along with any health information that can be acquired from dead animals.

Biochemical studies in the Portuguese Livestock Guarding Dog Breeds

Pires (1996) did a study trying to detect biochemical differences between wolf and dog scats. The dog breed used in the study was the Castro Laboreiro Watch Dog. Unfortunately, results were inconclusive due to the methodology used and, mostly, the very small sample (2 sub-adult dogs and 2 wolves).

Genetic aspects in the Portuguese Livestock Guarding Dog Breeds

As with other domestic species, over the past years numerous genetic studies in the Portuguese dog breeds have been promoted (e.g. Lopes & Ferrand, 1999; Lopes et al., 2000; Petrucci-Fonseca et al., 2000; AACCBIT, w/d; Amaro, 2001; Machado, 2001; Gomes, 2003; Ferrand et al., 2004; Ferreira et al., 2004; Pires et al., 2004a,b, 2006; van Asch et al., 2005; Pires, 2006). The Portuguese Kennel Club has even sponsored a genetic study on the Portuguese dog breeds (ICETA, 2003), but unfortunately, final results on that project have not yet been made available by the researching team. Interestingly, many studies have focused specifically in the LGD breeds, either because they were conducted within broader projects regarding these breeds or because of the problematic associated with the recognition of the Transmontano Mastiff as an independent breed population.

Early studies based on the variability of proteins and microsatellites revealed the Transmontano Mastiff and the Alentejo Mastiff as the genetically most variable breeds, thus showing proximity between them (Lopes et al., 2000; Amaro, 2000). However, subsequent studies (not involving the TM, but also considering other Portuguese breeds) on mitochondrial DNA (mtDNA) (Van Asch et al., 2005; Pires et al., 2006), microssatélites (Gomes, 2003; Pires, 2006) and AFLPs (Pires, 2006) revealed the Estrela Mountain Dog as the genetically most diverse breed.

It is consensual that the Castro Laboreiro Watch Dog is the genetically least variable Portuguese LGD breed (Lopes et al., 2000; Amaro, 2000; Gomes, 2003; van Asch et al., 2005; Pires et al., 2006; Pires, 2006), probably as a consequence of severe bottlenecks suffered in the past. This breed shows very little genetic variation, both at the mtDNA (van Asch et al., 2005; Pires et al., 2006; Pires, 2006) and the microsatellite (Gomes, 2003; Pires, 2006) levels, and its heterozigoty does not correlate with current population size (Pires, 2006). When analysing mtDNA in this breed, one team actually found one exclusive haplotype which could provisionally be considered a breed-specific marker (Pires et al., 2006).

When trying to assign the sampled individuals to their breeds based on their genetic data, it has been found the breeds are not completely individualized, and although individuals tend to cluster within their own breed, they do not always cluster together and breeds can overlap (Ferrand et al., 2004; van Asch et al., 2005; Pires et al., 2006; Pires, 2006). Variation in the breeds could not be explained in terms of their geographic origins (Pires, 2006).

Most genetic studies conducted have focused on the genetic diversity of the Portuguese breeds, and little attention has been paid to inbreeding analysis. One preliminary study on the Castro Laboreiro Watch Dog and the Estrela Mountain Dog found significant inbreeding levels on the CLWD but not on the EMD (Ribeiro et al., 2000), but when sampling was increased, no significant inbreeding levels were found (Ribeiro et al., 2005). However, this is most likely a sampling artefact, as an effort was made to ensure sampled animals were unrelated up to the 3rd generation. Indeed, the Castro Laboreiro Watch Dog, the Estrela Mountain Dog and the Alentejo Mastiff have all suffered from proximal “popular sire” phenomenon, and at least some of them also suffered from genetic bottlenecks in the past. Even in the Transmontano Mastiff, with the popularisation of dog shows in the breed, a preference for mating with specific sires is already apparent, potentially leading to a problematic situation in the future.

Studies based on pedigree analysis of Portuguese dog breeds are scarce – there was one on the Castro Laboreiro Watch Dog (Carvalho et al., 2004) and another on the Azores Cattle Dog (Cruz, 2006a). Main reasons for this may be the difficulty in compiling the data and, more importantly, the lack of reliability on the accuracy of the stated pedigrees.

Behaviour of the Portuguese Livestock Guarding Dog breeds

Working behaviour

A livestock guarding dog is only truly effective in guarding its flock if it has been raised the correct way, in order to bond with the flock so they come to view it as their own pack, and after it has reached physical and psychological maturity, often not before 1.5-2 years of age. Efficiency of a LGD is usually considered to be due to 3 components: attentiveness, trustworthiness and protection (Coppinger et al., 1983). Attentiveness implies the existence of a social bond with the livestock and results on a dog that keeps close contact with the flock, following it (Coppinger et al., 1983). Trusthworthyness is the absence of predatory behaviour of a dog towards livestock (Lorenz & Coppinger, 1986). Protection is the interruption of potential attacks to the flock (Coppinger et al., 1983) and is due to the other two behaviours (Lorenz & Coppinger, 1986).

In Portugal, in the areas of origin of LGD breeds where wolves are still present, most dogs are still properly raised way – they are kept since early puppyhood with their flocks, sleeping in the stable at least until they are adults, and starting to go out with the grazing flocks as soon as they are able to accompany the livestock. However, in other areas of the country, even within predator territory, knowledge on the proper use of LGDs is being lost. In many occasions inadequate dogs are used (like warren hounds, which although they may alert to the presence of a disturbance, cannot warn off a predator and cannot be reliably left alone with the flock, due to their hunting instincts) and/or dogs are incorrectly raised, leading them to bond with people instead of with the livestock, rendering them useless in frequent situations where the shepherd is not with the flock, or is too far away from it.

In Portugal, 2 high-profile projects regarding the use livestock guarding dogs have been going on for over 10 years5.

The Montesinho Natural Park, located in the Northeast of the country, has been implementing since 1994 a project to reduce wolf predation on flocks. In it, shepherds associated to this program receive puppies of the local LGD population (Transmontano Mastiff) to use in their flock protection. This project has had a huge acceptance by the rural population, with several hundreds of pups placed. Puppies are delivered with their first shots, but although dogs are followed upon by the park technicians, limited monitoring is done on their behavioural development. As a "by-product", this project also lead to the recognition by the CPC of the local LGD population as an independent breed.

Since 1996, the Grupo Lobo (a Portuguese wolf conservation association) and the Sciences Faculty of Lisbon's University have been implementing research projects on the use of LGDs to protect domestic livestock from wolves. This has lead to several studies on the behaviour of these dogs (Cruz, 1998, 1999, 2007; Petrucci-Fonseca et al., 2000; Ribeiro, 2001; Santos, 2002; Almada, 2003; Simões, 2003; Martins; 2004; Ribeiro et al., 2005). In these projects, selected puppies of the Castro Laboreiro Watch Dog, Estrela Mountain Dog (both varieties) and Alentejo Mastiff breeds are placed in chosen flocks within wolf and/or feral dogs' areas. Instructions are given to the shepherds on how to raise the puppies (always keep them with the flock, minimize human contact apart from the shepherd and immediate family, feed them in the stable), and health and nutritional support is given during at least the first year of the dog. The animals are monitored regularly in order to analyse the evolution of their behaviour and correct any undesired behaviours. Although this line of action is of more limited scope than the Montesinho Park project, due to the effort put on each dog and its goal to serve as a pilot and demonstration study, with over 100 dogs placed and monitored it has provided much information about the behaviour of LGDs.

Regarding attentiveness, Petrucci-Fonseca et al. (2000) showed that over 90% of the dogs placed under their project were attentive to their flocks. Monitoring of Castro Laboreiro Watch Dog and Estrela Mountain Dog puppies into adulthood shows that up to 4 months of age they tend to stay closer to the shepherd than to the flock; from that age on, the dogs tend to remain closer to the flock than to the shepherd, thus being more attentive to the livestock (Cruz, 1999; Petrucci-Fonseca et al., 2000; Martins, 2004). Nevertheless, when the flocks move, the dogs tend to stop their activities (even if they're playing) and start following it.

Regarding trustworthiness, studies on CLWD and EMD puppies have shown that the analysed dogs did not show agonistic behaviours towards the flocks. During the juvenile period dogs tend to show more

[5] There was another small project involving the Castro Laboreiro Watch Dog, sponsored by the breed club, but information on it is sketchy and similar to the second project mentioned in the main text.

social behaviours towards the flock, interact more with the livestock, namely through play behaviour, exploratory behaviour and agonistic behaviour started by the livestock. Adult dogs interact much less with the flock and show less diversity of behaviours; no play behaviour directed to the livestock was observed, there was more exploratory behaviour and an absence of agonistic behaviour, showing these animals are trustworthy with their flocks (Cruz et al., 2003; Martins, 2004).

In the conducted studies it was not possible to observe confrontation between the dogs and actual predators. However, the dogs (especially the adults) tended to display appropriate protective behaviours, barking and looking menacing on the approach of strange situations, placing themselves between the flock and the potential threat and pursuing strange animals. When the flock is resting, the dogs tend to remain in high places, from where the flock and its surroundings can be observed. All dogs showed proper protective behaviour towards wolf attacks, but regarding stray/feral dog attacks, not all dogs showed adequate behaviour, and not all dogs prevented attacks (Ribeiro et al., 2001)

When studying CLWD puppies, I found that the dogs' behaviour could not be predicted by its age or type of flock (sheep and/or goat flocks) in which the dog was placed, leading to the assumption that their behaviour is not typical of a given age but rather conditioned by intrinsic factors and their handling and education (Cruz, 1999). Santos (2002), working on the same dogs as adults and comparing them to their puppy behaviour also found it was not possible to completely define their behaviour based on the dogs' age and flock type. Martins (2004) found that Estrela Mountain Dogs placed in mixed flocks (sheep and goats together) tended to stay closer to the flock than dogs placed in sheep flocks, but that the differences were probably due to different husbandry systems in those types of flocks. She also found behavioural differences between coat varieties in that breed, but those were most likely due to the different flocks (and therefore handling systems) where dogs were placed, with Smooth-haired EMDS being placed preferentially in mountain environments and Long-haired EMDs placed mostly in flocks in plains and which don't graze far from the village.

It has also been shown how shepherds influence the successful raising an efficient livestock guarding dog, with proper attitudes encouraging adequate behaviour from the dogs and inadequate attitudes promoting the incorrect behaviour of dogs which latter, on different flocks and adequate shepherds, proved to be effective (Petrucci-Fonseca et al., 2000; Cruz & Petrucci-Fonseca, 2006a,b).

General behaviour

I conducted a study on the general behaviour of the Portuguese livestock guarding and herding dog breeds, based on enquiries to their owners (Cruz, 2007). Sampling included dogs from the aboriginal (A) nucleus, and from the kennel-bred (K) nucleus, and questions intended to asses the dogs' natural behaviour without having been conditioned by specific training. Although some statistical differences were found between breeds (Cruz et al., 2006), results are inconclusive due to small sample size and the design of the questionnaire, and it was not possible to assess behaviours typical of a given breed.

Cluster analysis was done based on the answers provided in each breed in order to try to assess which breeds were behaviourally more similar. With the performed analysis it was not possible even to separate the behaviour of herding dogs from that of the livestock guarding dogs, but instead, a different and unexpected trend was apparent – regardless of breed function, dogs from the same origin (working vs. cynological) tended to cluster together in different sub-groups (fig. 6). This occurs even if many of the sampled dogs from the aboriginal nucleus are kept by dog breeders in the same environmental conditions as their dogs of the kennel-bred nucleus.

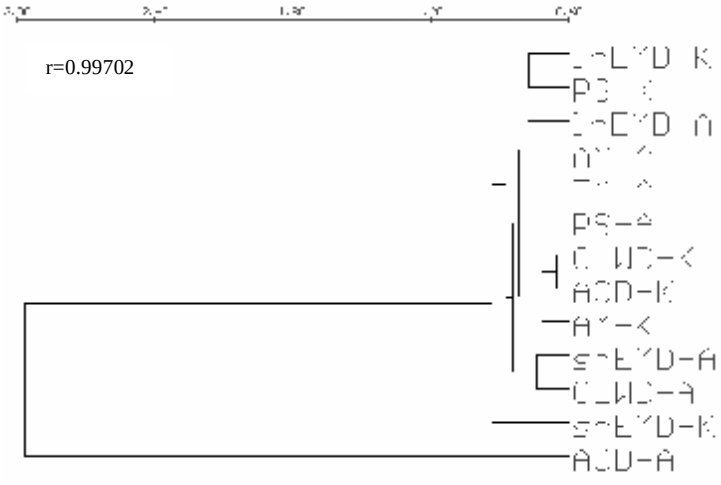

Figure 6 – ***Dendrogram computed with UPGMA method, using average taxonomic distance coefficient in behavioural data from enquiry. The cophenetic correlation coefficient (r) is shown. (from Cruz, 2007). lhEMD-Long-haired Estrela Mountain Dog, shEMD-Smooth-haired Estrela Mountain Dog,***

Economic Factors on the Use of Livestock Guarding Dogs

Economic factors regarding the use of LGDs are usually neglected when studying these dogs, but can have an important impact on the shepherds' lives. These impacts can be direct or indirect.

Indirect influence occurs through the number of livestock these dogs can save from predator attacks, thus helping to sustain the income the shepherd gets from the flock (milk, meat, sale of animals). Petrucci-Fonseca et al. (2000), analysing a small sample of sub-adult Castro Laboreiro Watch Dogs and Estrela Mountain Dogs found trends showing that efficient LGDs do help to decrease the number of losses to predators, when comparing to losses before the introduction of the dog in the flock and when comparing with surrounding flocks in which LGDs had not been introduced. The reduction varied between 33-100%, even when the flock and surrounding flocks continued experiencing attacks. Depending on the specific individual used, its behaviour, the husbandry system used and health care the dogs receive, LGDs can be a cost-effective means of protection even since their first year of age, especially in areas of high predatory impact (Ribeiro et al., 2005).

A more direct impact of this indirect economic factor is that, by law, wolf damages on livestock will only be paid by the stat if the flock has at least one LGD of an adequate type for every 50 heads of livestock, up to a maximum of 4 dogs by flock. However, in stray/feral dogs attacks, no compensation is paid.

Direct economic factors to the shepherd come from the sale of puppies bred. Although in Portugal, as a whole, in rural areas there is usually not the tradition of selling puppies, in some of the areas of origin of the LGD breeds, the situation is different, and sale of pure-bred puppies (although usually without registration papers) is common.

In the Castro Laboreiro region, most puppies are killed at birth, with the shepherds leaving usually only one or two puppies if they have requests from their friends and neighbours. However, in litters born near the summer, more puppies are typically left alive, to sell to tourists that visit the area.

In the Estrela Mountains, "Sabugueiro" is a very touristic area, as it is the highest village in the country. It has an important commercial activity through the sale of more or less pure Estrela Mountain Dog puppies (or other racial types of puppies which are also sold as EMDs) to visiting tourists. They are

bred by shepherds or other private owners and bought at very cheap prices by traders which then re-sell them in the village to tourists, often in questionable housing establishments.

In the Transmontano Mastiff breed, the Montesinho Natural Park has a protocol with the Portuguese Kennel Club, and most puppies are sold through the Park; also, the Park and the breeders' association created a website where available litters from shepherds or other breeders are announced.

In the Alentejo area, no means of shepherds profiting from the sale of puppies are known.

Outside official cynology, in Portugal there is not the tradition of paying stud fees to the owner of the sires. However, if it was a planned breeding with a specific dog, it is common to offer the owner of the male a puppy from the litter.

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CANINE ANTIQUITY: THE ORIGIN OF DOGS. DID THIS OCCUR BY EVOLUTION OR DOMESTICATION? WITH PARTICULAR EMPHASIS ON THE SALUQI/TAZI.

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The history of the universe and its life forms have been of interest to mankind from earliest times. Archaeologists, paleontologists and many other scientists have used the tools of their times to learn and describe the origins of many animal forms. Here we will devote our attention to the origin of canines.

The earliest history of carnivores is literally "written in stone". Fossils identified as early carnivores are believed to have originated some 40-60 million years ago (Olsen, 1985), More recently division into two superfamiles- Canoidea-canids and the Feloidea- cat-like animals occurred. The cats were then found primarily in Asia. The dogs were in North America until about 7 milion years ago when some crossed over a land bridge into Asia. These superfamilies were based on morphological differences and similarities seen in the skeletons, skulls and dentition of the fossils. These served as the basis for the establishment of an evolutionary tree of carnivores. Over time, changes to this evolutionary tree were made based on new morphological findings.

A comparison of the morphological features of different canids provided a means of establishing relationships between different species. Generally, the most important differences revolved around the cranium and jaw structures and associated dentition when comparing fossils. From fossil remains, it is believed that wolf-like canids separated from the foxes and raccoon dogs about 5-10 million years ago (Tsuda et al. 1997). Using DNA hybridization studies, Wayne and

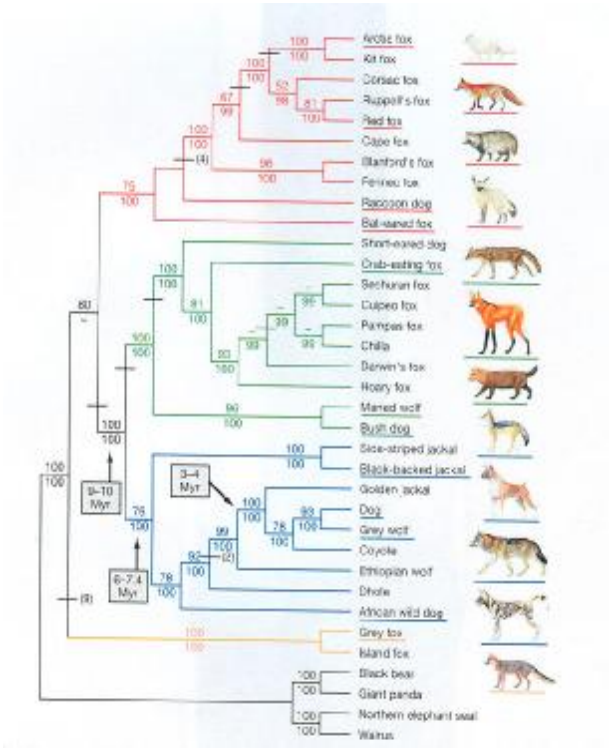


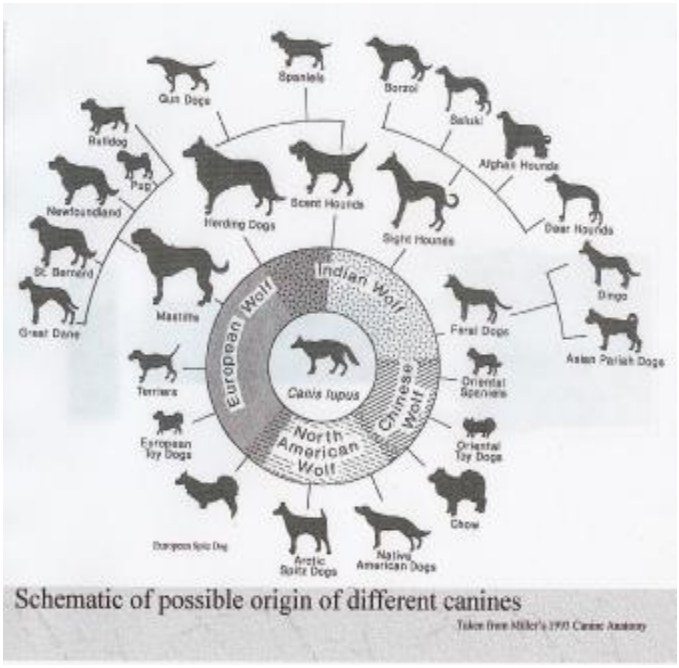
Fig. 1 Canid phylogeny as modified by Lindblad-Toh,et.al 2005

Ostrander (1999) proposed four phylogenetic divisions. each shown in a different color in Fig. 1, indicating when the molecular divergence occurred. The molecular timing of divergence fits the range recognized in the fossil record .

More recently, oral tribal recitations, myths, legends and written histories and novels have historically attributed the origin of dogs to a wide range of canids including wolves, jackals or coyotes. Based on morphological studies, the wolf, specifically the Asian wolf has been accepted as giving rise to dogs.The Asian wolf and dogs show the same presence of a posteriorly directed curve of the coronoid process on the mandible (Olsen, 1985; Hemmer, 1990). This served as further evidence for the origin from this subspecies. As recently as 10,000 yrs BP, the fossil remains of wolves and dogs have been difficult to distinguish between conclusively. In separating dogs and wolves, morphologists based their indentication of the presence of a stop, changes in skull shape, shape of the brain case and spacing of the dentition along the jaws.

Accepted as the progenitor of dogs, in recent times, the various wolf subspecies were postulated to give rise to those dog breeds seen today (Fig.2). This scheme from a vet text shows the different wolf subspecies and those breeds that are assumed to have given risen from them. In some cases,

interbreeding of wolf subspecies where their ranges overlapped was believed to have given rise to some of the breeds as well.



Schematic of possible origin of different canines

The recent emergence of molecular genetics was to play a significant role in the study of the origin of dogs. Using mitochondrial DNA from140 dogs and 162 wolves as well as samples from coyotes and three types of jackals, Vila et al. (1997) suggested that the wolf was the origin of the domestic dog. The origin of domestic dogs was divided into four phylogenetic clades based on mt DNA from dogs from different geographic areas. Vila, et al. (1997) Fig. 2

calculated that the timing of these events based on divergence of DNA structure in the mitochondria to range from 100,000-135,000 years ago. More recently, Savolainen et al. (2002) in a study of mt DNA from hundreds of dogs published a more conservative estimate for the origin of the dog to be 15,000-40,000 yrs BP. Villa et al. suggested the possibility of at least four bitch origins based on maternal mitochondrial DNA. Savolainen believes that at least five female wolf lines were involved. More recently, Parker, et. al. (2004). also using mt DNA suggested multiple origins of several ancient dogs.

Based on morphological structure, the Asian wolf was believed to be the subspecies of wolf from which the domestic dog arose. This is based in part on the similiarity between some jaw structures. A newer cartoon was created which traced the origin of dogs to at least four maternal lines (Fig. 3). Again classification into groups of dogs was based on morphology and function in creating this chart.

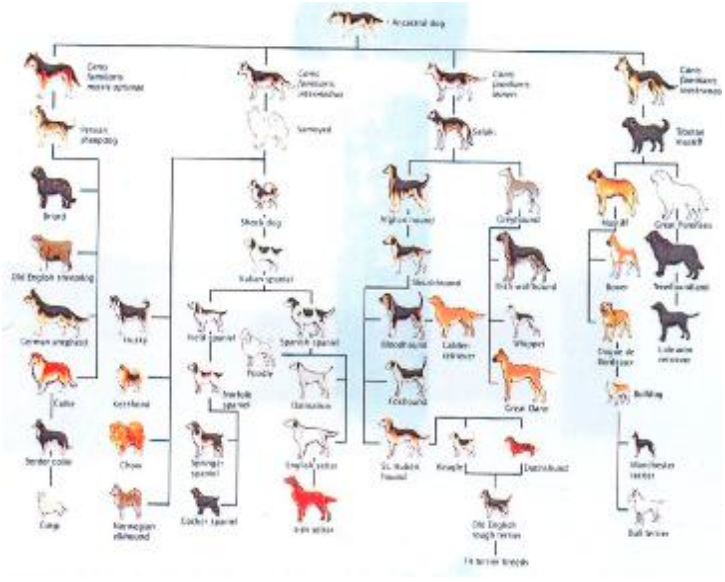


Fig. 3 Breed chart based on four female lines derived from the Asian gray wolf.

The publication of the canine genome based on samples from 86 breeds of dogs registered by the American Kennel Club (Parker, et al., 2004) confirmed the gray wolf as the origin of the domestic dog. This study was able to identify 4 groups of dogs- ancient, herding, hunting and guard dogs- based on the mt DNA structure.

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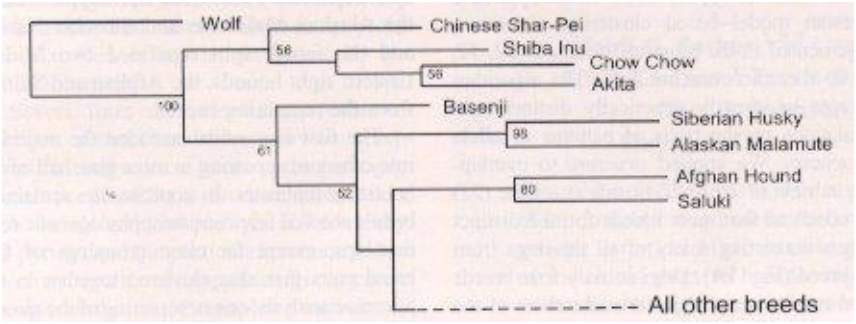

Fig. 4 Clade of ancient dogs from Parker, et al., 2004

The ancient group include an initial group to be formed which contained the Asias breeds, the Shar-Pei, the Shiba Inu, Chow Chow, Shih-Tzu, Pekingese, Tibetan terrier, Lhasa Apso and Akita. The second group formed was the African basenji. The third group included the Arctic breeds- Siberian Husky, Alaskan Malamute and Samoyed. The last group were the sighthounds- the Afghan and Saluki/Tazi. All of these breeds shared some fragments of mt DNA with the gray wolf. The authors were able to identify relationships between the rest of the breeds and to some degree the ancient breeds. They believe that the majority of the breeds recognized today are man made, probably sometime during the last 3-4 hundred years.

The various primitive breeds identified by Parker .et al. (2004) shown inside the yellow circle. The herding dogs are within the green circle, the guard dogs in the blue circle and the red circle includes the hunting dogs. The overlapping of the colored circles shows the relationships between the different breeds today.

Continued work on the dog DNA is telling us much more about the relationships between different breeds of the domestic dog.

Aboriginal dogs include the groupings of Dingo/pariah, Nordic/Spitz, Prick-eared hounds and gazehounds. Three of these groupings would coincide with the groupings presented in Fig. 5.

Fig. 5 Diagram of intertwining of the different groups

EVOLUTION vs DOMESTICATION. In spite of all the recent evidence from the molecular and behavioral studies to the effect that wolves do not become domesticated, many still seem to emphasize that domestication of wolf pups as the necessary step to the creation of the domestic dogs. Indeed, it would appear that all breeds are considered to have arisen by way of domestication. Oral histories, novels, movies and more recently television programs have seemed to accept that domesticated dogs arose from young wolf cubs which were captured and raised by early man. Wolves were believed to follow the human nomads and eat from their refuse piles. Interestingly, Koler-Matznick (2002), lacking much of the molecular data now known rejected the hypothesis that humans created the dog by purposefully domesticating the wolf. More recently, Raisor (2005) wrote an in-depth study reporting on the molecular, behavioral and archaeological studies as pertinent to the domestic dog.

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Domestication as such implies that there is human control over the reproduction of the domesticated animal. Morey (2006) has suggested that dogs cannot be considered to be domesticated until such a time as an association between man and dogs can be shown, specifically the burial of dogs with humans. Such burials have been found to occur worldwide except for Antarctica. The earliest burial is from approximately 14,000 BP. Other burials of later date show different sized dogs suggesting that breed differences existed even during those early years.

How and where then did the dog arise? Is it possible to hypothesize another way than capturing wolf pups? Certainly, the molecular evidence suggests that a genetic separation occurred when the wolf and dog became separated some 15,000 to 40,000 yrs. BP. What can be said regarding climate, human presence and the development of the dog? The major events of world glaciation occurred around 40,000 yrs ago at approximately the same time as the appearance of the first dogs. The maximum extent of the glaciers occurred about 20,000 BP. After which time the glaciers began to recede. Most of China and southwest Asia were never covered by glaciation. The Tien Shan mountains in that area would have provided the necessary environment for the development of many things. Based on the abundance of different Asian or Oriental breeds, Savolainen et al. (2002) suggested that Asia might be the area where the first dogs appeared.

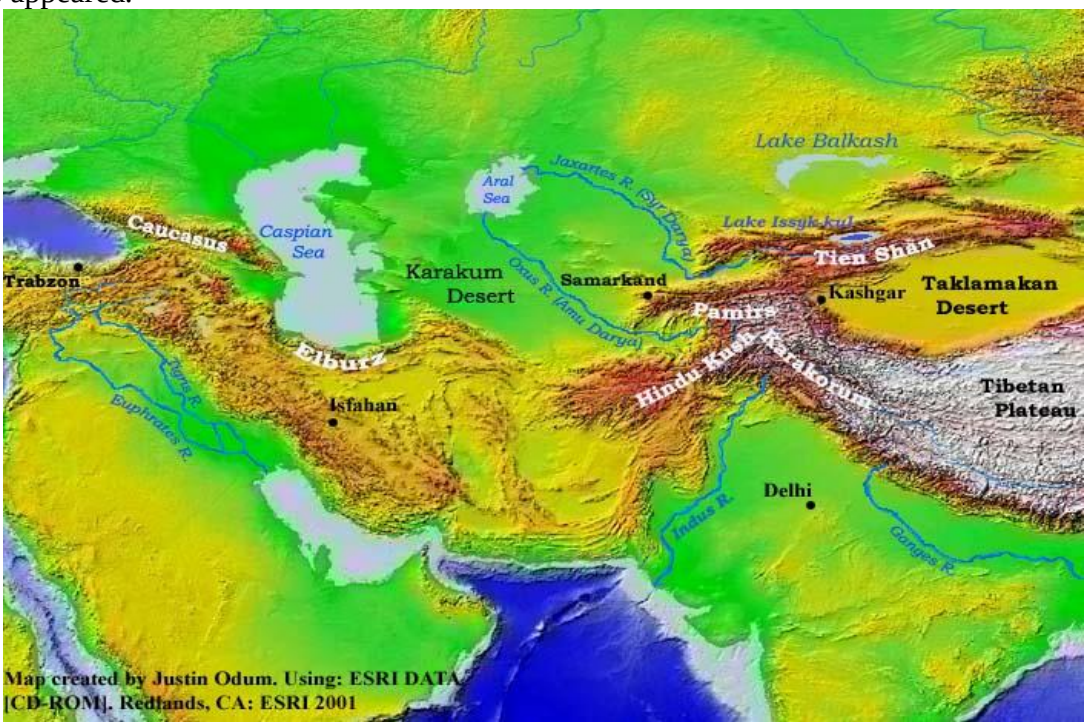

Fig. 6

As the glaciers withdrew, oak forests appeared in many areas including the Fertile Crescent. With the glacial retreat, the large herds of herbivorous animals disappeared to be replaced with smaller animals. In their caves and homes in the oak forests, the Neolithic humans started the beginnings of the first civilizations.Early Neolithic humans survived on their major food- the acorn (Logan, 2005). In time as their numbers grew, these people moved down and out into the grassland areas where they began farming grains. About the same time as grains became part of their diet and evidence gathered form the remains, suggests that smaller mammals as well as birds had become part of the diet. Evidence suggests that falcons were used as well by early man in hunting. An early tablet from Sumeria shows a hunter with falcon on his hand and a dog appearing to be a saluki as well. Was this the beginning of domestication of the saluki? At the time of the beginning of civilization in the Fertile Crescent, Egypt, Sudan. Libya and Chad were humid grasslands.

If we accept that the wolf and dog became separate species those many years ago, why do we continue to hypothesize that the dog was domesticated/lived on human garbage piles, etc.?

The separation of wolf and dog would have occurred as some complex genetic/mutational event which created an animal that was different from the wolf. As such, the first dog would have fit into some environmental niche that differed from that of the wolf. Changes seen in the new species would have included differences in size and behavior. Though some molecular scientists feel that there was continued breeding between wolves and early dogs, it seems likely that the new dogs would have become reproductively isolated from the wolves as they survived in their new niche.

. Early dogs probably looked very much as the pariah dogs of today. They were probably medium sized, with prick ears and a ringed tail. We now know that a single gene controls size in wolves and dogs (Sutter et al., 2007). Wolves today carry only the allele coding for the large size of the wolf. An early dog which was smaller than the wolf would have fit into a different niche and as a predator would probably have hunted smaller prey. We do not know for how many years these dogs roamed the countryside of their origin. When did the separation into the ancient breeds occur? Did the first dogs survive as such for thousands of year or did further mutations occur while the dogs were still in Asia?

If we accept the Tien Shan as the likely area of origin of the first dogs, we can visualize how the ancient Asian breeds would have migrated to the east, ultimately to become associated with the early man (See Fig. 6). Some obviously crossed the land bridge with the first humans who migrated to the Americas. The dogs of the Americas are related to those of modern day.

Others of the Asian breeds would eventually spread to Korea, Japan as well as the Pacific islands. It was a single Asian female dog which gave rise to the Dingoes of Australia (Savolainen, et. al. 2004).

At some time later, the second separation occurred which gave rise to the Basenji and the third which gave rise to the Arctic/Spitz type dogs. These Arctic dogs moved up into Arctic areas following the retreat of the glaciers and served as the progenitors of those herding dogs of large mammals.

The last of the ancient dogs to arise were the gazehounds- the Afghan hound and the saluki. The modern day representatives of these breeds are found over a very large geographic range. The salukis' countries of origin (COO) extend from western to Central Asia, into the Middle East and northern Africa. The afghan hounds were to be come localized within the area now known as Afghanistan. These gazehounds would have exhibited somea change in body shape, narrow heads. And had droop ears. One can suggest that they probably have moved out into the grasslands where they followed and hunted the smaller game animals. They like early and modern man would have followed the game trails created by their prey. These trails which were probably what ultimately became the Silk Roads. Often when seeing references to the early dogs, one finds note of a large dog with large rounded head and a smaller narrow-headed dog. One can speculate that these were some of herding types derived from the Arctic breeds as well as the saluki.

There are many people/countries who feel that they are responsible for the development of the saluki. As an ancient breed did the saluqi/tazi evolve or was it created by one or several groups of nomads? If the latter, which? How did this breed get from somewhere around the Tien Shan mountains to the area encompassing Central Asia, the Middle East, Africa, and Russia? In ancient times as today, animals and humans migrated around the world by following the game trails. While the wolf hunted large game, the sighthounds tended to hunt much smaller game. It is likely that it is the ancient game trails of antelope into the savannas and grasslands were what the early sighthounds followed on their journey west. It is hard to conceptualize different bands of nomads domesticating/creating a breed of dog which is recognized over such a vast geographical area.

How did the association between dog and Neolithic man occur? That early tablet from Sumeria shows a dog which looks like a saluki. Can we postulate that the breed had evolved earlier and that early Neolithic man as he moved out into the grasslands saw the canine hunters and recognized their skills? One can easily think of early man watching salukis take down a gazelle. They probably would even run off the dogs to acquire the kill. Did the saluki itself play a role in its domestication? If early man did not harm the hunters but merely took the kill, the salukis might have become accustomed to the presence of humans. There seems to be one further behavioral difference which separated the dogs from wolves. Wolves will not go near fires while dogs seem attracted to them. During post glacial times when cold was a given, dogs would have been attracted to the campfires with warmth. Dogs around the campfires

for warmth would also have announced the presence of danger beyond the limits of the camp. It is possible to consider that domestication of these many breeds occurred as multiple separate events. We can only speculate on how it occurred. The most common scenario is that of a scavenger of human refuge piles. In Neolithic times, it is unlikely that dogs could have found sufficient food in such piles to

We do not currently know what actually happened during those years between 15,000 and 40,000. If we accept that wolves and dogs became genetically separate as species, then we can also consider that the ancient breeds arose by further mutations. These breeds were not created by early man bringing wolf cubs into their caves. Once the split occurred, wolves continued on in one way and dogs were a separate species. Historically, there is no evidence that dogs which have become feral ever become wolves. Domestication probably occurred a multiple times, each of the ancient breed becoming associated with Neolithic man. Once man had control of the breedings of the domesticated dog, he could identify and perpetuate any new mutants as a breed if they performed a specific function.

The saluki is/was found over a very wide and varied geographic range. It's time and place of origin has been much discussed. We cannot at this time state when or where the first saluki originated. As one of the ancient breeds, we can suggest that originated as a product of natural evolution subject to natural selection over a long time. The first salukis probably had more coat than today's do since the climate would have been quite cold at times. Once they were distributed over their geographic range yet another mutation could have occurred creating the smooth variety. It is unlikely that the feathering was as suggested elsewhere created by breeding a smooth saluki to a shepherd breed. We know that the smooth coat is dominant to the feathered condition. In their COOs salukis have been reported to have coats of all colors and patterns. In all of these countries as well they exhibit slightly different types, what the biologist would probably call eco-types. These have been retained for eons by the various tribesmen who recognized and perpetuated this marvelous breed.

In the middle of the 19th century registries were formed to register and maintain records of the pedigrees of purebred. These have recognized salukis and registered them. The earliest imports to the western world came from different areas of the Middle East and Africa. Then as now, several different types were recognized as being members of the breed. The Arabs called the breed the saluqi. In those areas which were part of the British protectorate, these dogs became the saluki. The same dogs in the French protectorate countries became the sloughi. In the other countries of origin along the Silk Roads, the Farsi term for the breed was tazi or a tribal dialectic form of this word..

Many of the earliest imports of the 20th century imports came from Egypt and Syria, with others from the Arabian peninsula. By mid-century, many salukis were brought to the west by individuals working for the oil companies. These specimens often were selected for many reasons. Some colors were excluded. Some individuals did not like the smooth coat while others felt there was a problem with black or brindle dogs. Following the Russian Revolution, many of the countries of origins (COOs) were closed to most of the western world. When the Iron Curtain fell in 1989, the fancy became aware of all those tazi, tazy, etc. who looked just like their western salukis. One common factor seen in all the various COOs is that there were salukis of different types . some with smooth and some with feathered coats. All colors and a variety of coat patterns are also apparent. As registries are established in countries, it is often customary to select but one type of saluki/tazi as the proper type and to write a standard such that is excludes all the other types of naturally existing salukis.

In a breed which still exhibits a wide range of genetic heterozygosity, this is the first step in isolation of the genome and will lead to the loss of this heterozygosity. Once an eco-type is recognized as a specific breed, it becomes cut off from the rest of the salukis/tazi of established registeries. This can be most unfortunate for the survival of the breed and certainly for that isolated type.

At this time, it is important for fanciers of the ancient breeds as well as the aboriginal breeds not included by the major registries to protect their breeds and to perpetuate such as best they can. All too many fanciers today strive to improve the breeds rather than perpetuate these old breeds. Such improvement leads to little more than homogenization to create by a single type rather than a variety of types.

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MONGOLIAN NATIVE DOGS AND THE CULTIRAL HERITAGE OF PASTORAL NOMADISM

Mishelle Morgan

Introduction and Preface

Although not an expert in cynology or native dog breeds of any kind, I have written this brief paper on Mongolian Native Dogs at the request of Vladimir Beregovoy, with the wish to contribute to the Almaty conference some information about Mongolian dogs. Mongolia has been my home for over seven years, and I have traveled extensively throughout the country, driving thousands of kilometers every year. I am always on the lookout for Mongolian dogs of the traditional types. Much of the information in this paper is just part of Mongolian oral tradition. There are few resources here for obtaining information on Mongolian Dogs, and much of what I have gathered has been related to me by nomads, or taken from articles that Mongolian authors have written about Mongolian Dogs. This paper is not a scientific one, nor

do I believe I am the most well informed person on the subject. I am only someone who is interested in native dogs and their traditional functions, and has been trying to learn as much as possible about dogs in Mongolia, their relationship to nomadic herdsmen, their working ability, and how they are raised. I apologize in advance for what must be many errors and omissions in this article. I hope that my imperfect effort will encourage others with better information and resources to step up and correct me, and fill in the gaps in the information given here. My only wish is that more people become aware of the dwindling numbers of native Mongolian dogs and help to preserve them and the cultural heritage and history they embody.

Mongolian Pastoral Nomadism

Encompassed by Russian Siberia to the north and China to the south, Mongolia has a continental climate characterized by extremes of temperature ranging from -40 to +40. A wide swath of the Central Asian steppe runs through Mongolia, banded to the north by taiga forest and to the south by the Gobi Desert.

Mongolian society is founded upon horse based pastoral nomadism, an adaptation to the extreme variability in temperature and precipitation that makes intensive agriculture in a fixed location almost impossible. Mongolian nomads herd sheep, horses, cattle, goats, camels, and yaks. Although horses are the most valued animal, sheep are the basis of their livelihoods, being the primary source of meat and skins. Cattle and yak provide milk and horses and camels transportation. Today, goats are a primary source of cash income earned from cashmere, which is combed and sold each spring. The different types of domestic animals are herded separately, depending on their requirements for grazing and water. Small animals, the sheep and goats, are usually herded together although some herders now separate sheep from goats to prevent contamination of the valuable goat cashmere by the coarse sheep wool. Cattle and yak are herded together, and horses and camels herded in their separate groups. Herders must balance the benefit from keeping each type of animal against the availability of family members or helpers to watch each herd and move it between suitable pasture and to watering places.

Herding is often supplemented by hunting of game and fur animals large and small, and gathering of fruits and wild herbs, but the mainstay of the Mongolian diet is meat and dairy products. Traditionally hunting is done on horseback. Accompanying hunters were dogs which helped to drive game such as deer, elk, gazelle, or wild ass towards hunters where it could be shot with a bow, although with certain forest dwelling fur animals dogs were used to locate and tree the animal, or with boars, to locate and hold the boars at bay until the hunter could arrive. Marmots hunted for their skins as well as for meat were more commonly trapped or shot by a stalking hunter, as it was important not to damage the skin. Wolves were also hunted in drive-hunts, with beaters surrounding mountains to drive wolves out into the open. Historically, Mongols also hunted small game on the steppe with falcons and eagles, although hunting with eagles is now confined mainly in Western Mongolia among the Kazakh.

Native Dogs and their Historical Roles

The types of native dogs found in Mongolia reflect the demands of a pastoral nomadic existence. Ancient rock paintings in Mongolia show nomads using dogs for protecting their flocks and in hunting scenes. Graveyards of Hunnu people often contain metal embroidery and pottery with pictures of hunters with dogs or dogs buried along with their masters. Dogs were also used for guarding camps. The same functions are still served today by the primary types of native dogs found in Mongolia, although the number of native dogs has declined. According to Mongolian experts, these are:

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1. Khonch Nokhoi, (Mongolian Dog). Ancient Chinese historical records describe the Hunnu dogs of Mongolia as "very big and ferocious dogs with strong legs and wide chests". This description was most likely a description of the Khonch Nokhoi. Bearing a strong resemblance to the Tibetan Mastiff, but with distinct differences in morphology, the Khonch Nokhoi is has a shorter coat, is broad through the chest and, and is generally of a more agile build than the Tibetan Mastiff. Some individuals can have longer coats or be very large. Almost always black and tan, with tan spots above the eyes which also give this dog the nickname "four eyes". Mentioned in historical texts as the favorite dog of Chinggis Khan, it is primarily the guardian of the home and of flocks. Khonch Nokhoi as guardian dogs are famous for their ferocity and hostility to strangers. They alert the family to strangers entering the camp, keep unfamiliar people and animals away from the camp, and protect the flocks from wolves or other predators, particularly at night when the animals are penned in corrals or shelters. Most working dogs today do not accompany flocks to pasture, with few notable exceptions. Typically herders go out with the animals during the day, and dogs guard the camp. Small animals are herded back to camp every night, where they are under the protection of the dogs which roam the perimeter of the family camp and sleep near the pens.

2. Gharts (gharzh) – Tibetan Mastiffs. For centuries Mongolia had close ties with Tibet, from which Mongols adopted the Buddhist Lamaist religion of the Yellow hat sect. Over hundreds of years of cultural interaction and pilgrimage, thousands of Buddhist monks traveled each year between Mongolia and Tibet. Tibetan monks maintained a separate district in the capital city of Mongolia. Tibetan Mastiffs accompanied these monks, and were widespread, serving as guard dogs at monasteries and in small villages or camps. Only a few pure Tibetan Mastiffs remain in Mongolia, most of them living at monasteries in isolated areas of the country. On special occasions, Tibetan Lams visiting Mongolia or Mongolian Lams returning from pilgrimage to Tibet will still bring a Tibetan Mastiff puppy as a gift to a monastery in Mongolia.

3. Taig (taiga, taigan) – Most certainly related to the Taiga of Central Asia, this sight hound is used for hunting and is found primarily in the grassy steppe of southeastern Mongolia. Black, brown, sable and white are common colors.

4. Siberian Laikas. - Accompanying Tungusic reindeer herders whose seasonal migrations took them from Northern Mongolia to the Northern reaches of Siberia, Laiki may have existed in Mongolia centuries before they were recorded in history. Although Mongolia's Tsaatan, or Reindeer People, are now to be found only in the province of Huvsgul in Northern Mongolia, Buryat Mongols also brought Laiki into Mongolia from Siberia. Found now mostly in the forests and mountains of northern Mongolia, the Laika is primarily used for hunting but is also helpful in watching herds and guarding camps. Laiki in Mongolia are almost exclusively black, white, or black and white. Mongols do not like to keep grey dogs, particularly agouti grey.

5. Borz .- A type of Central Asian sight hound, the name of this type implies some relation to the Borzoi, to which the borz bear some resemblance although they are slightly heavier in build and have a coarse head. Often called "Fast Brown" they can be found in the north-east steppe lands and are primarily a hunting dog. Most Borz are brown or brown with white markings.

Khonch Nokhoi, or Mongolian Dogs.

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As Tibetan Mastiffs, Taig, Laiki, and Borz are breeds somewhat familiar to the conference attendees, this paper will focus primarily on the Mongolian Dog, or Khonch Nokhoi. Considered by some to be a Mongolian variant of the Central Asian Shepherd Dog, and by others to share a common background with the Tibetan Mastiff, the origin of the breed is still a matter of debate. Mongolia's territory has been occupied by waves of various Central Asian nomadic tribes since before recorded history. Archeological evidence points to contact between the tribes of the steppe and Cimmerian culture from around 1200 BC, and Assyrian and Babylonian culture as early as 700 BC, with the migration of Scythians, Sarmathians and other Indo Europeans from the east to the west, where the Hunnic Turko-Mongols already laid claim to the eastern steppe. Hunnu petroglyphs of the time already show large molosser type dogs in hunting scenes.

Later waves of Turkic Uigurs, Tungus from northern Asia, Kirgiz from Western Siberia, Tangut from Tibet, Khitan from Eastern Asia, and others would all establish claim to some part of the territory now known as Outer Mongolia. It is probable that molossers and hunting dogs accompanied traders and missionaries traveling along the silk road, as well as the camps of the barbarian hordes that ebbed and flowed across the steppe. It is also likely that while ancient Indo European and Central Asian molossers and sight hounds from as far away as Asia Minor made their way to present day Mongolia prior to the 13th century, that later versions of the Mongol dogs made their way north, south, and west during the conquest and subsequent occupation by the Chinggis-Khanite Mongols of Central Asia, Asia Minor, Russia, China, parts of Eastern Europe as far west as Hungary, and of most of the Indian subcontinent down to the Indian ocean west of the Indus. What is certain is that descriptions of the Mongolian dog from the beginning of Mongolian history as recorded by the Chinese indicate that the large, broad chested, and fierce molosser of the Mongols has been a feature of nomadic camps since the reign of the Hunnu in the sixth century.

It is rare today to see a Mongolian Dog of the pure traditional type, or any of the traditional native breeds including Tibetan Mastiffs, Taig, Laiki, and Borz. The best examples of Mongolian native dogs are found now in areas far from main roads in isolated areas, where few western breeds have been introduced and crossbreeding has been minimized. Khonch Nokhoi or Mongolian Dogs, which were so widespread in pre revolutionary Mongolia, have all but disappeared. In parts of the South Gobi and mountainous areas in the provinces of Bayanhongor, Gobi Altai, and a few other isolated pockets, it is still possible to see the massive individuals herders speak of as the "true Mongolian Dog" while in the rest of the country most dogs have the typical coloration and markings but are of a smaller size or obviously of a mixed breeding.

According to A. Osor, director of the dog training school in Ulaanbaatar who has studied Mongolian Dogs, males average 63 cm at the shoulder +- 9 cm, with an average chest width of 18.7 cm, length of 108 cm, and a weight of over 38 kg. Females average 58.7 cm at the shoulder +- 3 cm, with an average chest width of 16.1 cm, length of 101 cm, and are somewhat lighter than males. The dogs are mostly black with tan (called yellow) or white spots markings on the chest, face, legs, and tip of the tail. The sign of a true Mongolian dog is considered to be the pair of yellow or tan spots above eyes. The coat is usually is 3-4 cm long, and is double coated, with a dense undercoat. Many dogs now exist in Mongolia and Russia with shorter coats. Old paintings, postage stamps, and descriptions of the dog all point to a medium length coat, sometimes with a longer mane and heavily feathered tail. Older herders relate that Mongolian Dogs should be thickly furred, and that it was traditional to rub butter or fat into the dog's coats to help it mat and stand up, making the dog look even more formidable and frightening. It is doubtful that this effort would have been made on a short coated dog, as the effect would have been minimal, therefore it is more likely that Mongolian Dogs typically had medium length coats.

The Mongolian Dog's voice is low and deep, and they have excellent hearing. Most Mongolian dogs. Their scenting ability is moderate. Females go into season twice a year and the average litter size is 5-7 puppies. The life span of Mongolian Dogs has been recorded at 15 – 16 years, but this is an upper limit. Mongolian dogs are quiet

animals, generally lethargic but capable of quick action if there is a threat. They are attentive to their surroundings, and their gaze is usually focused on the horizon. A. Osor remarks that they have stamina and are brave, and they are intently observant. Their character has not changed much from the times of the Huns, and they are still fiercely protective and suspicious of strangers. The standard Mongolian greeting upon approaching a camp or ger is to shout "hold the dogs!" Visitors only get out of a vehicle or dismount from their horse when a member of the family comes out and orders the dogs to stand down or restrains them by the collar. Difficult to train and highly independent, even when they are taught commands they often ignore them or obey them lazily. Osor remarks that they respond better to verbal praise than to food or treats. Only in specific situations, as when wolves attack a sheep herd do they show how fast and deadly efficient they can be. Their response is not limited to alarm barking or pure defense of the flock. Many dogs will pursue wolves over long distances away from the camp, chasing the intruder. If there are sufficient dogs in the herder's pack, they will attack the intruder.

There seems to be no tradition in Mongolia of training livestock guardian dogs to protect flocks of small animals on open pastures during the day, or herds of large animals at night. It may be that this tradition is lost among modern Mongols, or that herders have always gone out with their animals in the day because of the necessity of directing them to appropriate pastures and leading them to and from water. In all instances where herders speak of dogs that remain with their flock or herd at pasture, they imply that this is an unusually dedicated or good dog, indicating that no special effort is made to condition or train dogs to stay with the flock. The author has observed very few dogs actually with flocks at pasture in the daytime. Most dogs stay around the immediate area of the camp, day and night.

Mongolian Dogs Historically

Written journals or historical commentary by various travelers in different periods up until the Mongolian Revolution in 1924 often mention the great numbers of dogs that Monglians kept, and most commonly referred to the fierce Khonch Nokhoi. According to veterinarian D. Tseveenjav, some 200-300,000 dogs lived in the country in 20s. Since the total population of that time was approximately half a million people, the number of dogs was truly amazing. Dogs are often mentioned in historical documents or literary epics: as being the most loyal of friends, and an old Mongolian saying is: "Dogs will never trade a poor master for a rich herder. Raised by a poor nomad a dog will never follow even a Khan". Ch. Jugder, an expert on medieval Mongolian philosophy, notes that "Mongols deeply respected and revered their dogs." Mongolian Codes of Law from 1640 and 1709 (enforced until 1921) both contain provisions prohibiting killing or beating dogs. While Mongols often give other animals such as horses nicknames that describe their color or other physical attributes, dogs are the only domestic animals that Mongols give true names to. During special celebrations when fresh meat is slaughtered for a feast, a dogs share is usually set aside. Along with the revered horses of the Mongols, dogs were buried on the hills so that people would not walk over their remains. The dog's tail is cut off and placed under the head, and a piece of fat was put into the mouth, and the master would speak a wish over the grave for the dog to be reborn as a human being in the next life. Mongols believe that dogs are the last form of incarnation before humans in the reincarnation process.

Selective breeding of dogs is not practiced in Mongolia, but traditionally Mongols did not like to get puppies from a place far from their traditional pastures. It was also not customary to keep dogs of different breeds or mixed breeds, and Mongols dislike gray dogs with wolf-like coloring. Stray dogs or puppies of unknown origin were rarely taken in, as it was believed that these might have run with feral dogs or wolves, and would attract predators to the camp. These traditional practices would have contributed to maintaining distinct types of dogs as it would have been relatively rare for cross breeding to occur in nomadic camps that had only one breed of dog and would have rarely been in contact with other camps.

In selecting puppies, there are several rules that Mongols follow to choose good dogs. Some of these are even documented in medieval scripts, while other criteria are part of an oral tradition. Coloring and markings are

important. Dogs should not be grey, and white chest markings, especially if they are heart shaped, indicate that the dog will be very brave and loyal. White toes or spots near the claws will bring wealth to the owner, but a dog with white socks and a tail tipped with white might mean the dog will steal food and be cowardly or lazy. A red cast to the eyes meant that the dog would be a fierce fighter and never give up in a fight. Mongols always give preference to the last puppy born, as it is believed that the puppy that was closest to its mother's heart, and had more room to develop in the chest of its dam would be the strongest. Shorter and softer fur, a loose and flexible skin, a wide chest and a short back are also considered to be signs of a good dog.

A basic temperament test consists of lifting a puppy by the tail or a back leg. If the puppy remains silent but struggles to right itself, it will be a strong dog and a courageous fighter. All puppies are born outside with no particular shelter provided. Traditionally, dogs are fed scraps and occasionally a soup made with leftover food from the family's meals, but most days dogs receive mainly bones already stripped of most the flesh. On occasion the dogs will receive scraps from slaughtered animals. Given Mongolia's harsh climate and the poor rations dogs receive, it is not unusual for only one or two puppies to survive in each litter. This natural selection combined with a preference for puppies that have a high tolerance for pain or discomfort as well as a strong struggle response is most likely responsible for the strength and extraordinary tenaciousness of the Mongolian dog in fights with predators, as well as its fierceness towards human strangers.

According to tradition, puppies are gifted, and the new owner should bring gifts to the owner of the dam to present as a thanks when the puppy is taken. The new owner should also bring food for the dam. Sometimes, before bringing home a new puppy a Buddhist lama is consulted to see if the dog's birth year is favorable to the owner, as well as to decide a good day and hour to bring the puppy home. When the puppy arrives at its new home it is offered milk and the base of its ears and the tip of its tail are smeared with fat with the wish that it should turn into a lion. Then the new owner whispers the dogs name into its ear. Each dog's name usually has a meaning, such as lion, falcon, hunter, shepherd, fast, or lucky, or the dog may be named after a hero, like Khasar, a brother of Chinggis Khan who was a giant of a warrior and fierce in battle.

The Decline of Native Dogs in Mongolia

"Save Bankhar!" is the motto of Mongolians now worried about the decline of the number of Mongolian dogs. Bankhar is a term used for any large dog, and it literally means "flat faced" although it implies an intimidating or impressively sized animal. If 20 years ago they comprised about 30% of all registered dogs, these days it is hard to find one typical individual even in remote areas of the country.

In 1921, Soviet troops entered Mongolia and helped Mongolian revolutionaries set up a republic. On November 26, 1924, Mongolia became the second communist country. For the next 70 years Mongolia was a satellite country to the Soviet Union. Mongolian communism remained fairly independent of Moscow until Stalin gained absolute power in the late 1920s. In the Stalinist purges that followed, almost all Mongolian monasteries, were destroyed and thousands of monks were executed. It is believed that by 1939 around 27,000 people had been killed, and some estimates put the massacre at up to a third of the male population. Along with the destruction of the monasteries went the dispersion of the Gharz or Tibetan Mastiff, the traditional monastery guardian.

Mongolia became a puppet state of the Soviet Union, and the command economy imposed collectivization of herder's livestock, gathering the animals into large single species herds. Each herder was allowed to keep only seven animals per person as private property, and herders became employees of the state and caretakers of the state herds. Under these conditions, it is most likely that Khonch Nokhoi began to suffer a decline in numbers as it was neither possible to own domestic animals as private property beyond the allocated livestock, nor would it have been easy to keep family dogs fed given the handful of domestic animals each herder was allowed to keep and dispose of according to his own wishes.

Cross breeding began in late 1940s, when the Trans Siberian railroad was built by prisoners of war and soldiers in the command of General Vlasov fighting on the side of Nazi Germans during WWII. When the Vlasov's unit withdrew they left behind empty labor concentration camps and hundreds of abandoned guard dogs, most of them German Shepherd Dogs. Mongolian writer Dogmid recalls that when he was a child almost every family in

Zuun Bayan town had a German shepherd dog. The second wave of cross breeding began with the arrival of more than 100,000 Russian military personnel and technical advisers in the mid-60s. The Russian military brought installation guard dogs, including Caucasian Ovcharkas, and other personnel also brought their own family pets.

When the Communist government collapsed in 1990, the Russian military withdrew leaving behind hundreds of guard dogs. Most Russian technical advisors and all but a couple thousand ethnic Russians also left Mongolia, but the imported dog breeds they introduced has already left an impact. It became fashionable among Mongolians to own foreign dog breeds, from German Shepherds, and Pitbulls to Dalmatians and a number of toy breeds. Some are abandoned by their owners or simply wander off and join the army of stray dogs that roam the capital and other larger towns. Puppies from these imports are also given to countryside relatives, while dogs traveling with their owners and running loose in the countryside are breeding with native dogs. It is rare in Mongolia to see a purebred dog of any breed unless it is recently imported or being bred by a small handful of entrpreneurs for the market. In the main market of Ulaanbaatar one can find many imported breeds from Rottweilers to Cocker Spaniels, although typically of questionable parentage. It is very rare, however, to see a Mongolian Dog puppy on sale.

Laiki, Borz, and Taig have also declined in numbers, and cross breeding has drastically reduced the number of individuals true to original type. In the communist era, hunting changed from a supplemental source of meat and furs for trading to an extractive industry that supplied the national government and the Soviet Union with cheap meat and commercial furs for export to the west. Wild ass and gazelle were hunted in great numbers to supply meat to the Russian and Mongolian armies, slaughtered by machine guns from the back of open trucks used to pursue these animals across the steppe. Historically, Mongolians hunted fur animals in relatively small numbers, sufficient to meet their needs for producing clothing and trading. During the communist era and up until about the early 1980s, fur animals were hunted intensively included sable, marten, ermine, wolverine, bear, lynx, and mink. These furs were supplied to Russia under contract, with Mongolian hunters employed by the state given quotas for specific species. The intensive hunting of the 1930s to 1980s drastically reduced populations of these species. Wolves were hunted under a bounty system but wolf skins were also a valued commodity. At the same time, Mongolian forests were being logged for timber and gatherers of pine nuts set up camps in the forest to harvest nuts throughout the winter for export to China. Deforestation and disturbance of their habitats by humans has further affected populations of forest dwelling fur animals, which are now rarely found except in isolated pockets near the Russian border. The disappearance of game animals has meant that Mongols who traditionally kept hunting dogs no longer have reason to, except for nostalgia. The wolf population has been the least affected, since it is not dependent on a forest environment, and can easily maintain itself on a diet of domestic animals where wild game has become scarce. The diet of wolves was supplemented in the 1990's and in the early 2000's by the large numbers of domestic livestock in the care of inexperienced herders that died in severe weather conditions, and herders believe this contributed to a subsequent increase in the wolf population. Thus, a few wolf hounds are still to be found, particularly taig in the eastern parts of the country.

Saving Bankhar

Many Mongolians interested in the survival of their own native dogs question whether it is indeed possible to "save Bankhar". The great numbers of cross breeds in almost every part of the

country combined with the fact that a nomadic herdsman has no building or structures in which to effectively confine a bitch in heat and therefore control matings means that mixed breed litters are almost a given. Mongols avoid killing dogs whenever possible, so the armies of cross breeds continue to multiply, and spaying or neutering is not a viable option for most herders. Countryside veterinarians don't have the training to perform spays, and the practice of neutering dogs is almost unheard of outside the capital. A mobile population also makes spaying local males less effective, as new intact males will eventually invade the territory. It is likely that only a controlled breeding program by dedicated and educated breeders in Mongolia could preserve the Mongolian Dog, although if the type is to maintain its working ability, the puppies would need to be placed with nomadic families.

Since it is rare for nomads to purchase dogs, an effective breeding program that seeks to preserve the cultural heritage of the breed would need to be non commercial. Few herders as yet have much appreciation of the cultural importance of preserving the Mongolian Dog. It is hoped that further publicity about the disappearance of Mongolian Dogs will help stir national pride and encourage more people to be interested revival of this brave guardian of the steppe.

Currently, efforts are being made in Mongolia to find typical individuals and define what constitutes the "true Mongolian Dog". In this respect, it would appear that there are more experts outside of Mongolia on the subject of "true Mongolian Dogs" and the correct conformation and temperaments of Khonch Nokhoi than there are in the country itself. Many of these experts have never been to Mongolia, but this does not reduce the influence that foreigners have had on outlining a breed description, even an unofficial one, of the Khonch Nokhoi, the Mongol Ovcharka, or the Mongolian Shepherd Dog. It is hoped that more Mongolians will take an interest in preserving this native dog and work with what remains of the gene pool in Mongolia to revive the breed.

Resources

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