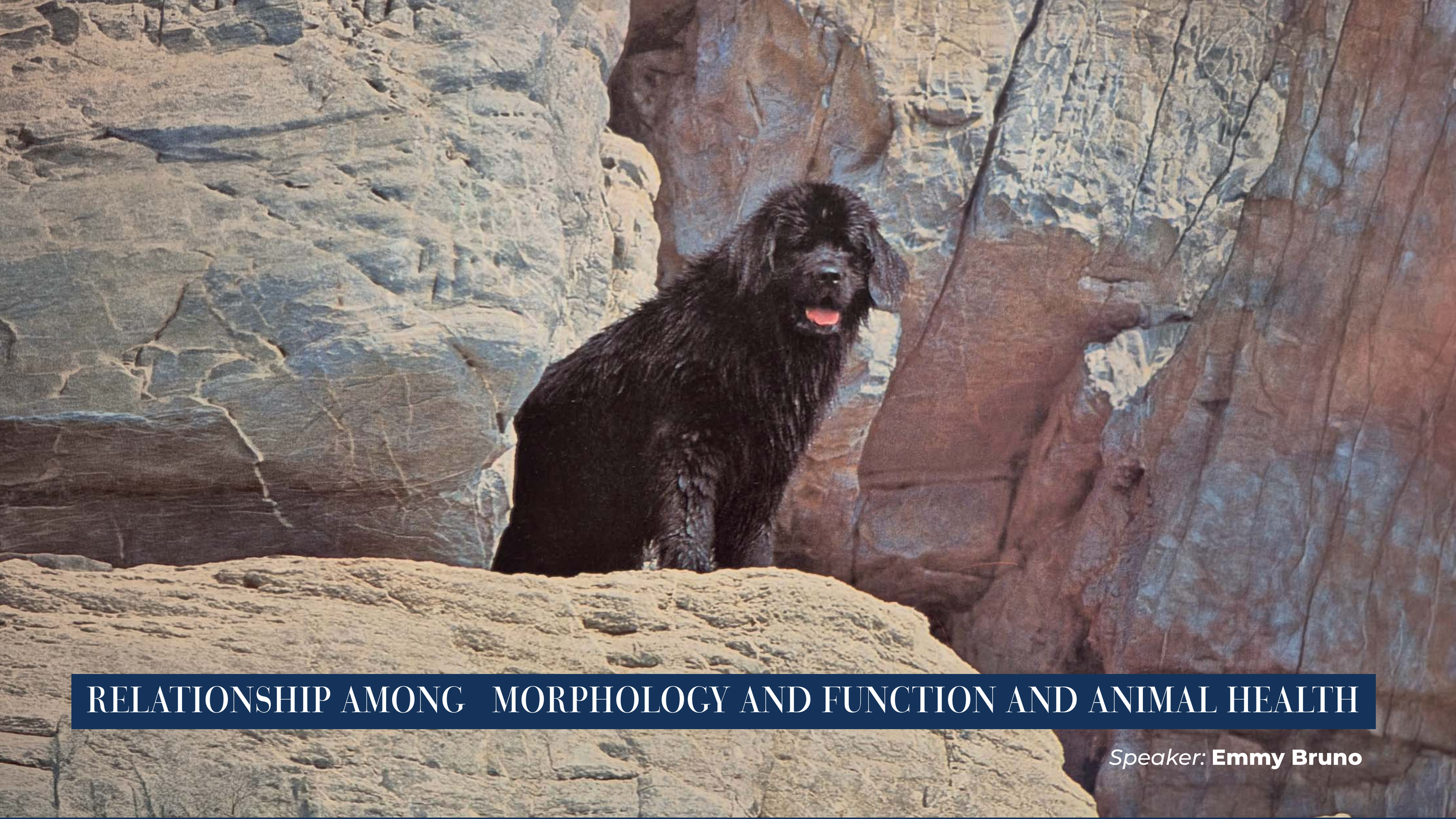


RELATIONSHIP AMONG MORPHOLOGY AND FUNCTION AND ANIMAL HEALTH

Speaker: **Emmy Bruno**

Before starting dealing with the subject which is at the origin of my report I would like to focus on two fundamental concepts.

. EVOLUTION

. SELECTION

Biological evolution is the ever going on process of change and adaptation of the genetic characteristic based on inner mutations and pressures from the outer environment. It is a natural process which requires very long times and a single purpose: to bring out the most useful adaptability and surviving characters.

Selection is the technique by which man intervenes in the animal reproduction to boost certain characteristics he is more interested in.
Experimenting on what great help the dog may be in the various human activities, even in the cynotechnical fields selection has brought on the creation of the many different dog breeds, each one with characteristics which establish the Type and are from time to time pursued for the specific required function.
However, selection operates within a much shorter timeframe than that required by nature, thereby precluding the action of those selective mechanisms capable of curbing errors.

Every characteristic of Type is codified by the Standard and the evaluation in the event of the Beauty Exhibition is based on it. It is worth underlying the fact that they are not Shows but zootechnical manifestations where Functional Beauty is judged. **It is through the phenotype that the genotype which will represent the future of the breed is evalued.**

In the natural selection the characteristics of a type always follow a functional criterion. In the human made selection, however, the functional criterion can eventually being stifled by individual research of what one likes and to fixation of characteristics which have no practical value any more.

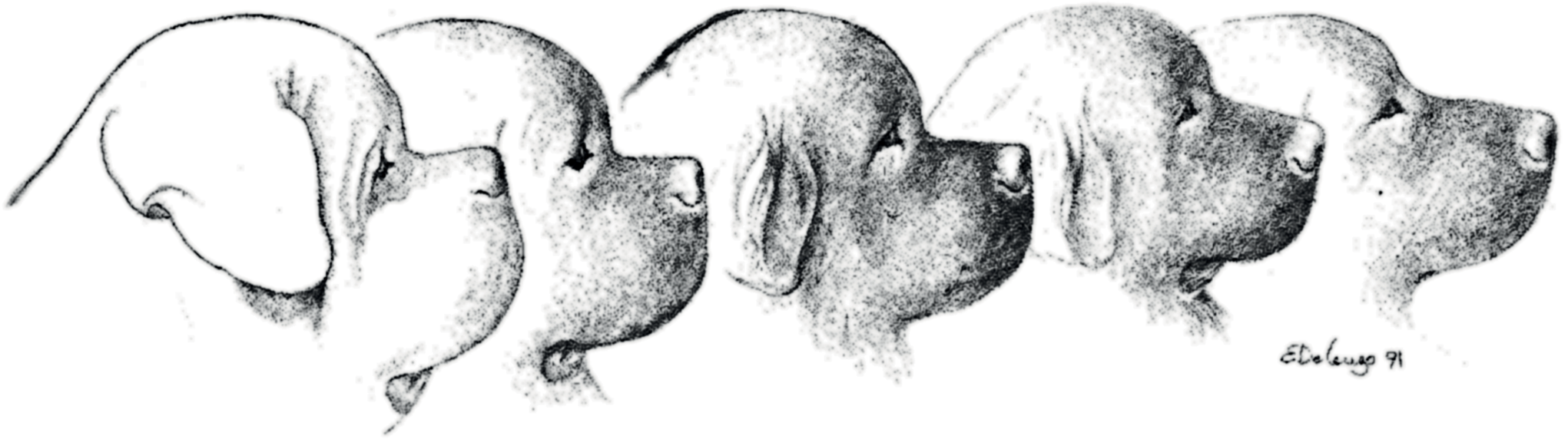
This process may at first happen in a disguised way, and then more and more overbearingly if it meets the favor of the breeders who select it and spread it creating a fashion

At this point, it can happen that, step by step, matters are taken to extremes that no longer take functional considerations into account or that even stand in direct conflict with the function itself.



We all know that in the past centuries the original Newfoundland was cross bred several times: at first with the dogs that fishermen and sailors brought over from Europe (hunting breeds, Mastiff, Pyrenean Mastiff ...) and then, later with other Molossians to Halifax in Nova Scotia and in England to obtainn bigger and more striking dogs. All this introduced in the blood of the breed a series of genes what, still balancing with the original heritage, allowed to obtain that strong harmonious dog built for water and ground work: a **Functional Type.**

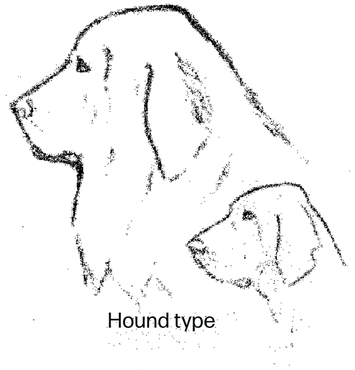




It is well known that in a well fixed breed the type may express itself in a range of characters that go from the **HYPERTYPE** to the **HYPOTYPE**.



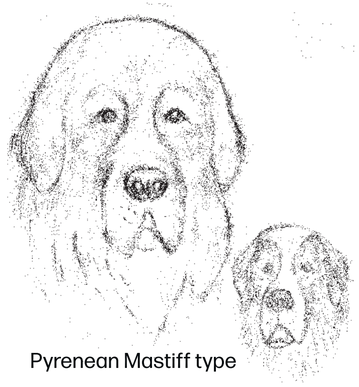
St. Bernard type



Hound type



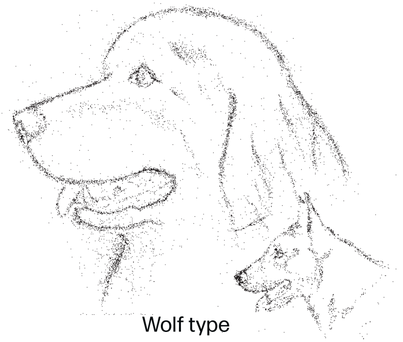
Mastiff type



Pyrenean Mastiff type



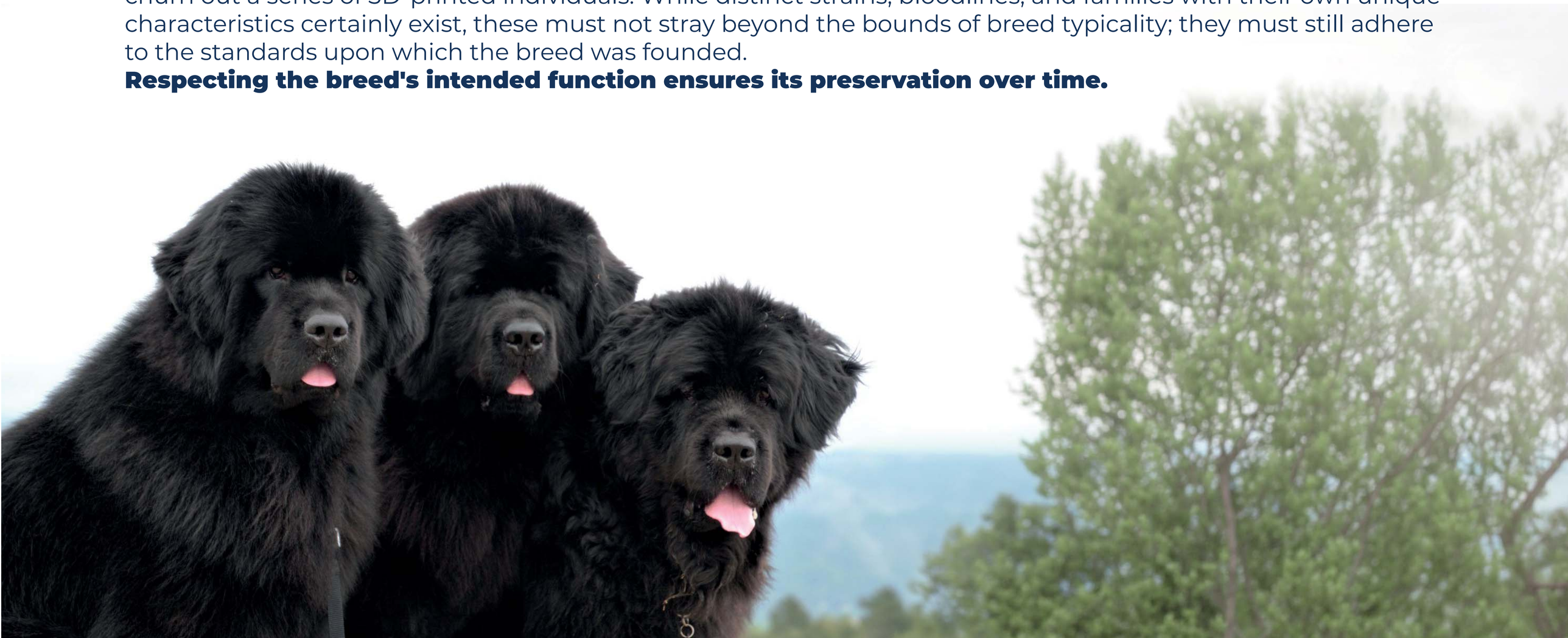
Labrador type



Wolf type

In the genetic game it may happen also that some characters of type of the ancient breeds may resurface creating some variations.
However, whenever a trait crosses into the specific variant of another breed, the concept of type is violated.

It is true that breeding means creativity, taste, research: it is just that each breeder may follow a trend of his, but all this must happen without losing sight of the harmony, and anyway respecting the Standard.
And here we touch upon a sore point.
No matter how well-drafted and detailed a standard may be, it describes an ideal type that must contend daily with real-life examples each the product of interpretation. Clearly, it would be neither right nor appropriate to churn out a series of 3D-printed individuals. While distinct strains, bloodlines, and families with their own unique characteristics certainly exist, these must not stray beyond the bounds of breed typicality; they must still adhere to the standards upon which the breed was founded.
Respecting the breed's intended function ensures its preservation over time.



How will the Newfoundland then be? And which will be the anatomical aspects and the type characteristics to be stressed on the grounds of the functional beauty canons?

Let’s imagine it jumping from a rock to another, strongly swimming, strongly holding in its jaws a rope or the arm of a man in danger.
We will see it stretch its muscles in the effort to support and pull heavy loads, breathe energetically to oxygenate its big muscles under the effort.
From all this the image of a dog with more strength and resilience than velocity.



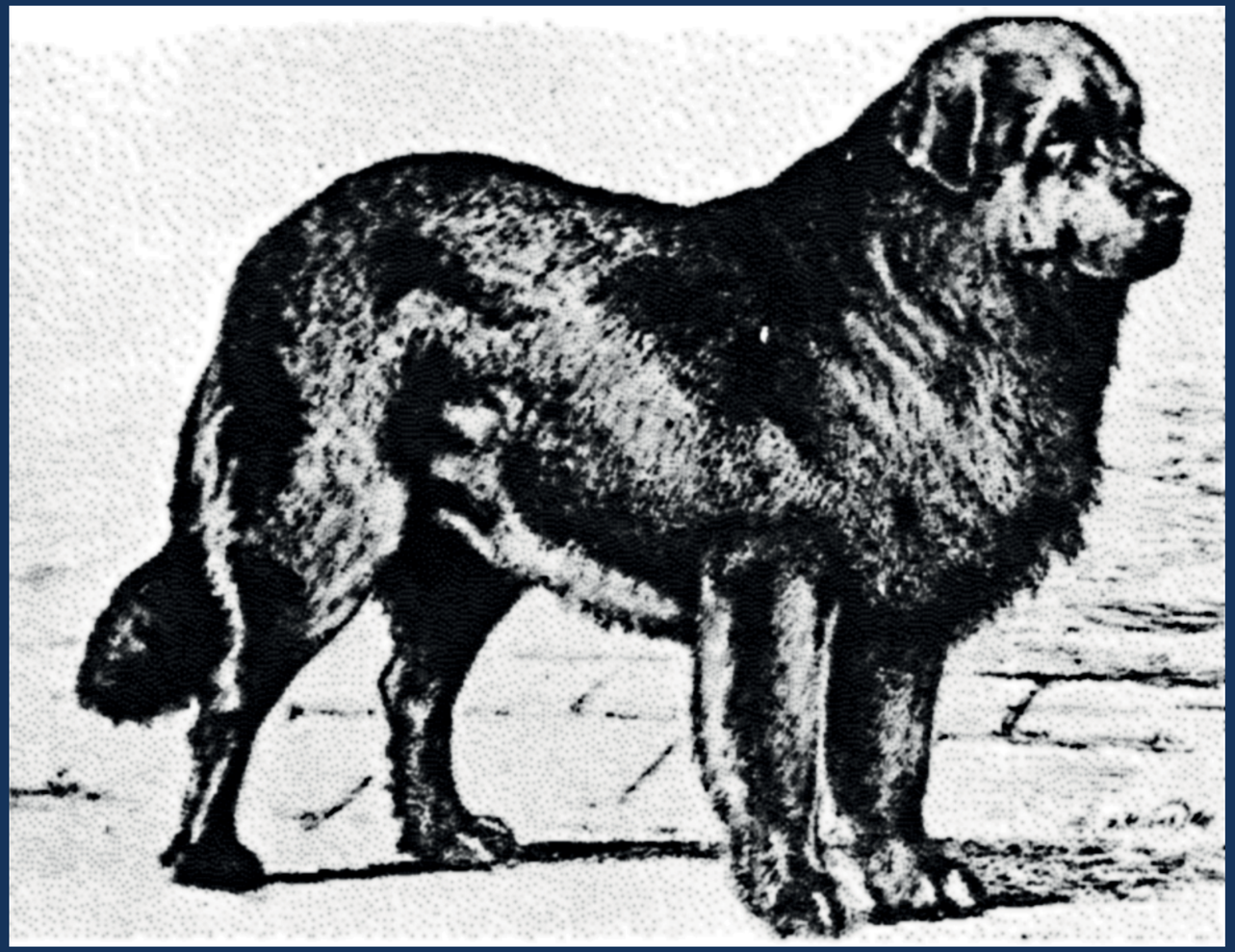






The first thing you notice in front of a good specimen is its size, which must be considered as a synonim of mass rather than height; a solid compact body with a wide and strong chest which will never give the impression of emptyness and narrowness.

The Newfoundland therefore appears as a large size mesomorph, built in the square, with a strong and solid skeletal apparatus, endowed with a powerful musculature which allows his agile and productive movement, notwithstanding his size.



1878 Ch. Black Prince

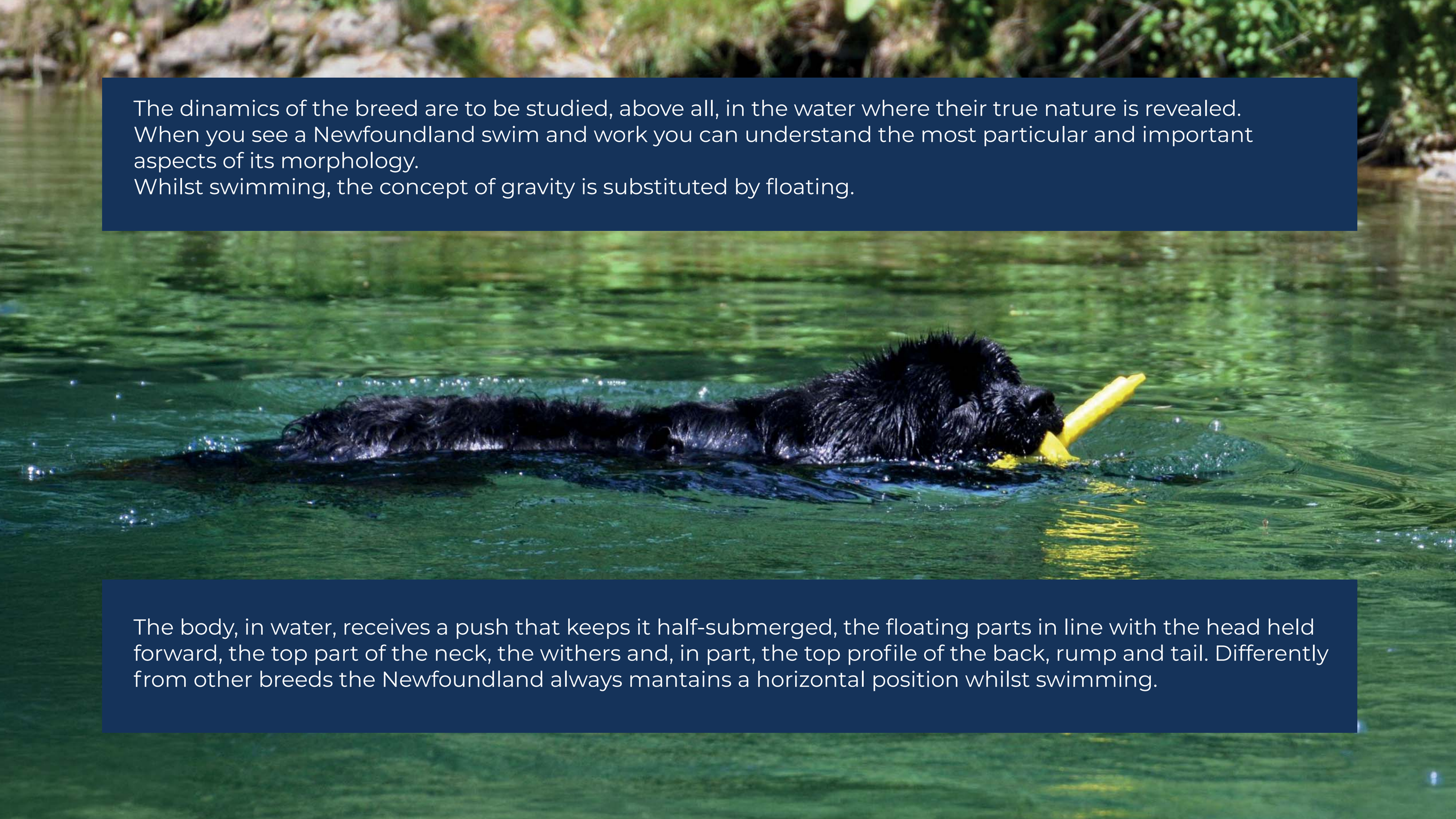
If we observe the photograph of Champion Black Prince of 1878, one of the most important specimens who made the history of the breed after his formation in England, we come to recognise in him the prototype that is still valid today.
Black Prince represented, even then, the much acclaimed “bear look”.



Now let us talk about the modern Newfoundlands and admire them in action; nothing as changed in their function. So here they are gallopping along the beach, climbing up the rocks. Its cat-type foot, indicating strong and arched toes, allows a strong hold, but it is the resistance of the ligaments and the muscular strength that bear most of the effort. Its wide base, in proportion with its size, gives perfect balance.



The dinamics of the breed are to be studied, above all, in the water where their true nature is revealed.
When you see a Newfoundland swim and work you can understand the most particular and important aspects of its morphology.
Whilst swimming, the concept of gravity is substituted by floating.



The body, in water, receives a push that keeps it half-submerged, the floating parts in line with the head held forward, the top part of the neck, the withers and, in part, the top profile of the back, rump and tail. Differently from other breeds the Newfoundland always mantains a horizontal position whilst swimming.

Keeping this line in mind, first of all let’s observe what happens under the surface of the water. The limbs move whith the same sequence of movements it uses on land, varying however the technique. The front legs, relatively short, are flexed most at the humerus. They are pulled up, pushed in front, gone down and forward and backward. This gives them a forceful swimmimg motion, helped by the wide and thick metacarpus and their feet which, by keeping the toes apart, allows them to use their inter-digital membrane.



This oar-like structure is powerfully actuated by the flexor muscles of the metacarpus and phalanges and, above all, by the important anconeus muscle group; these muscles must be highly developed and can be felt as a rounded mass when sliding one's hand from the shoulder to the elbow.

At the same time, the hindquarters perform a similar action, rounded off by a sharp thrust against the water at the moment of full extension.
All this requires strong hocks and, as with the forequarters, powerful musculature.



Lateral movements of the limbs serve to correct deviations from the waterline and to steer in the desired direction. The tail contributes to this; held rigid and horizontal, it acts as a rudder.
It is the suppleness of the body which is slightly elongated that facilitates twisting and lateral movements.
Furthermore, if we observe the part at the water's surface, it becomes evident that the rump and the shoulder lie on the same plane.
In this regard, a steeply sloping topline in the Newfoundland stands in stark contrast to the breed's function. The shoulder could not function out of the water nor the rump under the water.
Above the surface are the witers where the powerful muscles are joined to its neck. Only the top part of this remains visible above the water as it is stretched in front it partly presses against the water together with the head which is held with the chin slightly upward.

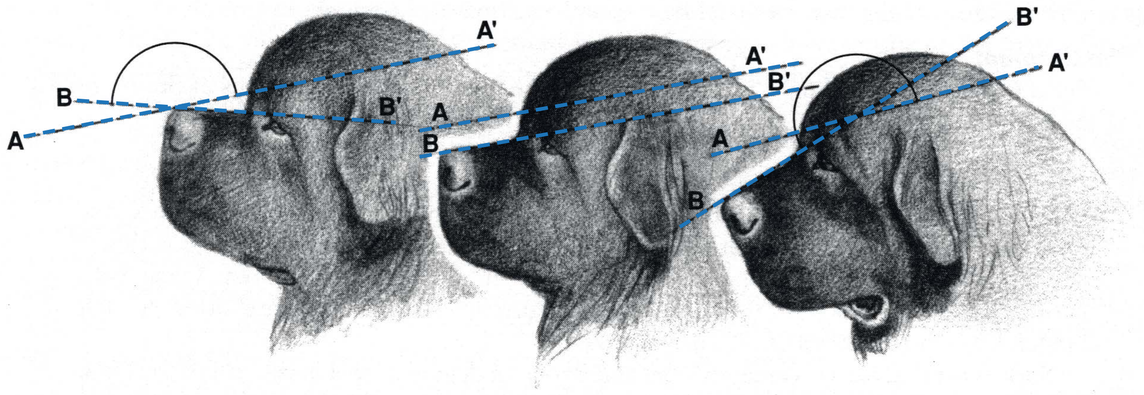




It is fundamentally important to understand the mechanism of these body parts. We can deduce that according to its morpho functional profile, a Newfoundland does not need an excessively long neck, but a very muscolar one, especially when the dog is retrieving an object.
A very long neck would only serve to push the head forward, which would be a disadvantage to the cephalic-cervical balance.
Therefore the neck length, in relation with the inclination of the shoulder blade, should keep the just proportions.
Besides, an excessive length would influence the whole foundation of the subject. A massive head, as required by the standard, on a too long neck, would mean a heavy weight, hard to carry: the neck then points more upwards.
Besides, the effort to win this unfair unbalance would have negative consequences on the spinal column and the back which would be excessively strained.
In this way it would be easier to have dogs which pace.

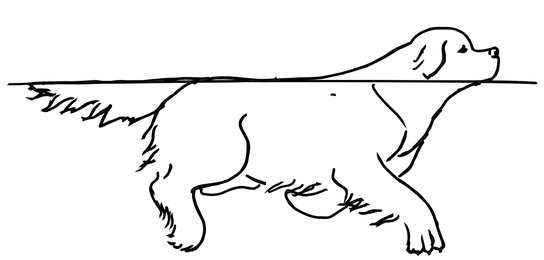


Upright neck



Let’s now examine the Newfoundland profile while swimming. The first thing you notice is the position of the head in relation to the surface line. As we have said before, it is kept slightly inclined towards the sky to keep the nostrils far from the water.
This observation immediately points out the extreme importance of the parallelism of the head planes in the Newfoundland breed.

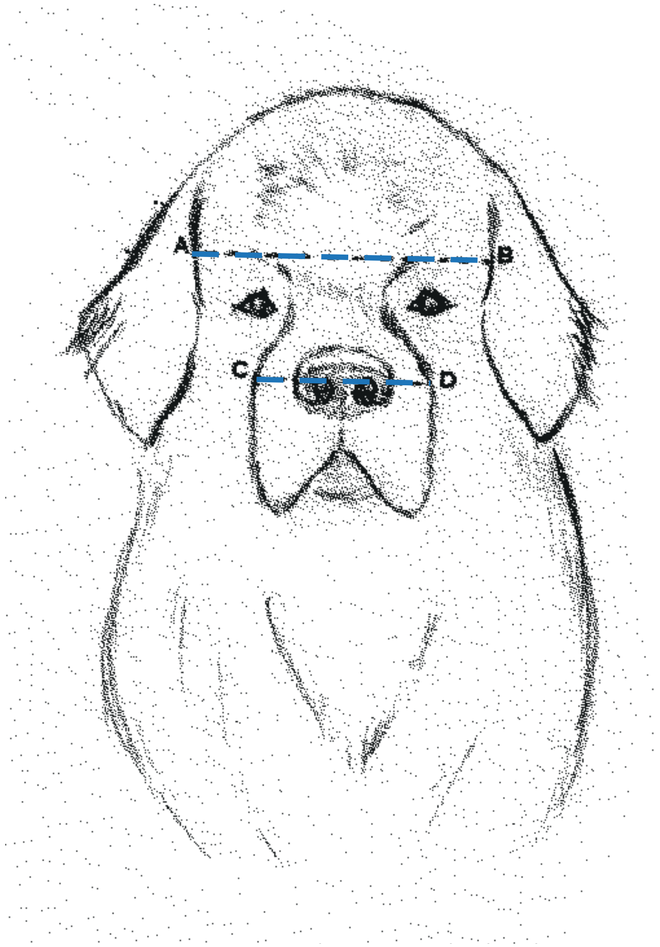
It is a fundamental morpho functional aspect. Individuals whose head planes are not parallel are forced to stretch their heads forward more to obtain useful results, and this implies a consequent decrease of the respiratory capacity. Moreover, this very characteristic represents one of the main qualities for a swimmer.





This is linked not only to an excellent lung and chest expansion but, fundamentally, to wide and well opened breathing airways through which the air can rapidly flow if needed.
Once again, type and function align. In the Newfoundland, in fact, the square shape of the muzzle, determined by the parallelism of its lateral faces, and its depth allow for ample development of these passages, a feature further enhanced by the spaciousness of the frontal sinuses.





A - B = Width of cranium (Bizigomatic diameter)
C - D = Width of muzzle

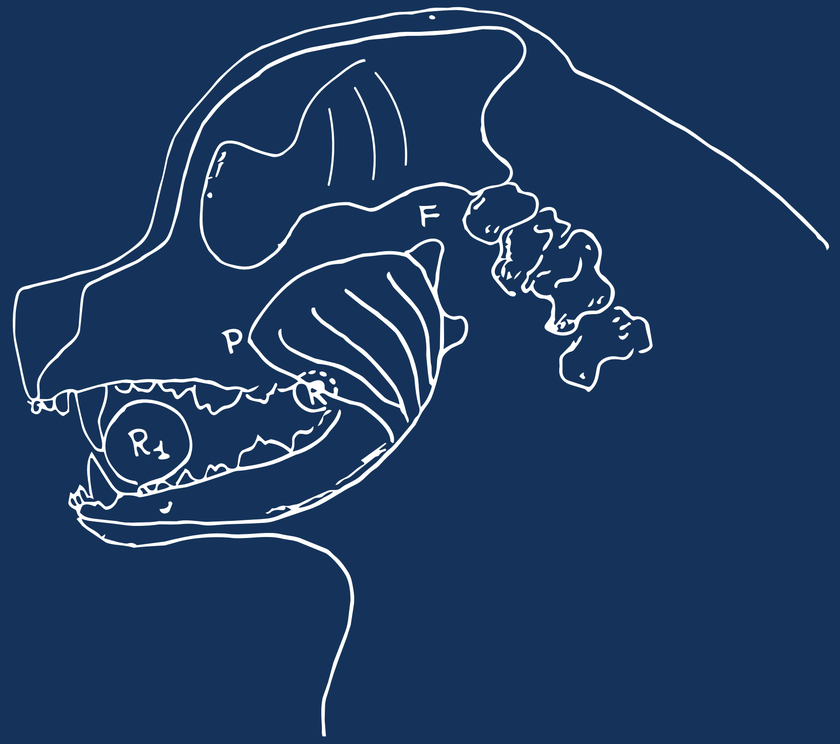
The nose is large, well opened, neatly cut, with wide nostrils, mobile and of moderate thickness to allow a wide dilatation when the ventilation accelerates.

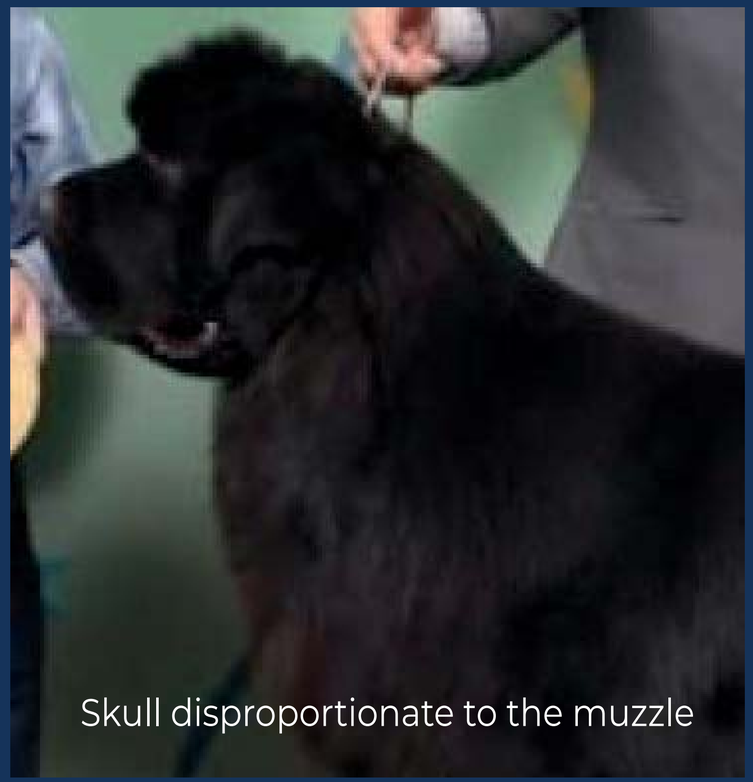
The peculiarity of this characteristics appear even more evident if we consider that, during the retrieving work, when a greater oxygenation is required, the Newfoundland cannot breathe through its mouth, which is firmly closed shut
Small and stiff noses with half closed nostrils are in contrast with the function.



The capability to strongly catch a heavy object and to keep it between its jaws for a long time essentially comes from two factors: a noticeable development of the temporal chewing muscles and masseters and an adequate bone support .
The upper maxillary and the lower jaw must be strong and show a wide entanglement giving adequate support to the lips, which are soft, with the rima oris wide but never hanging down.

The muzzle must always be adequate to the skull because, if the jaws are the lever arms where power and resiliance meet, the head with its muscles is the engine of the hold. Therefore to a deep muzzle must always correspond an important skull.



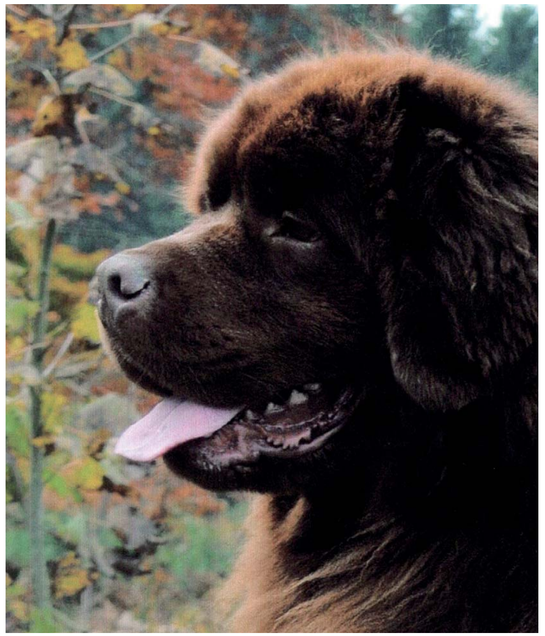

Skull disproportionate to the muzzle

Overdeveloped lips have no functional purpose: they could upset the hold and are the reason why some individuals drool in an unpleasant way.
This fault has become more evident at the end of the 90s, sometimes just slightly discernible, but going as far as assuming macroscopic proportions.

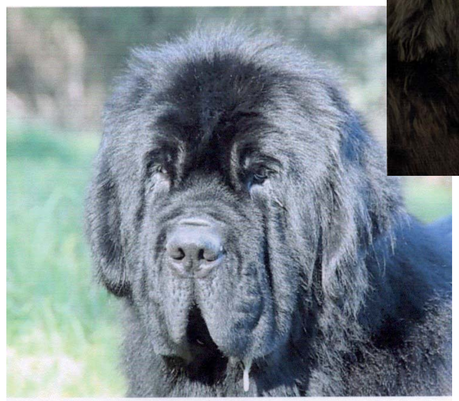
Right lips







Overdeveloped lips

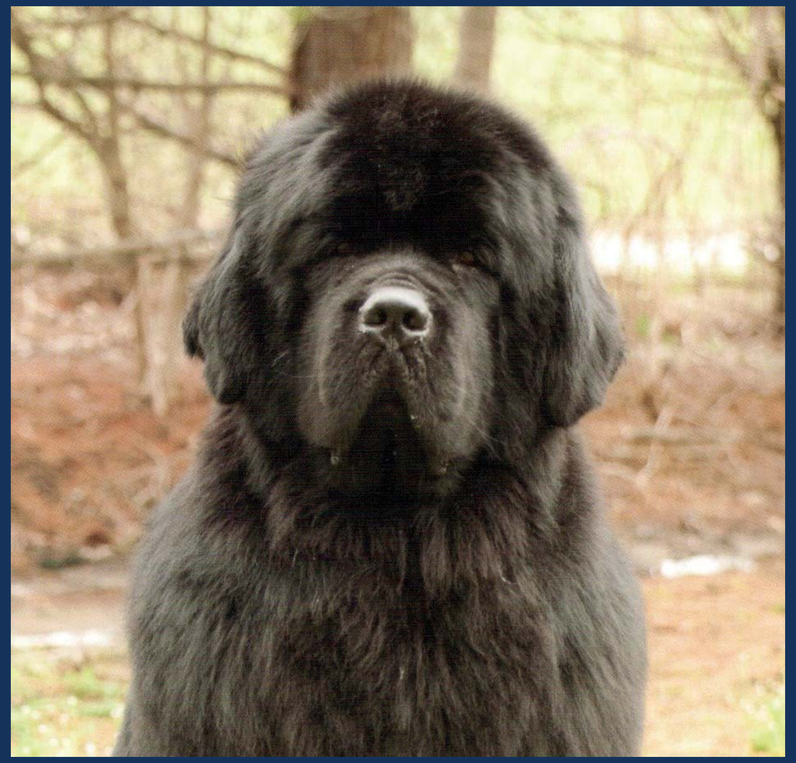






Besides the height of the muzzle must not be determined by the slackness of the skin covering it but by the development of the bones underneath.

The skull, that, according to the standard, is wide and massive, gives an adequate recess to the temporal muscles and a secure base of insertion to the masseters through the lateral extension of the cheeckbone arcs.
The occiput, well developed, should not appear as a bony protrusion, but it works as a solid insertion to the ligament and muscle complex of the neck, which are essential for retrieving and pullling work.





Temporal and masseter muscles



Also the development of the frontal muscles and the brow arches assumes a functional significance because a favorable position of the eye, relatively small and sunken, gives protection from the sand, splashes and bad weather.
A wide skull will allow the orbit to find the right diameters and the eyes the right sub frontal position, while remaining well far a part.
It goes without saying that a skull that is narrow, gaunt, flattened, or too small will prove inadequate for the functions it must perform.

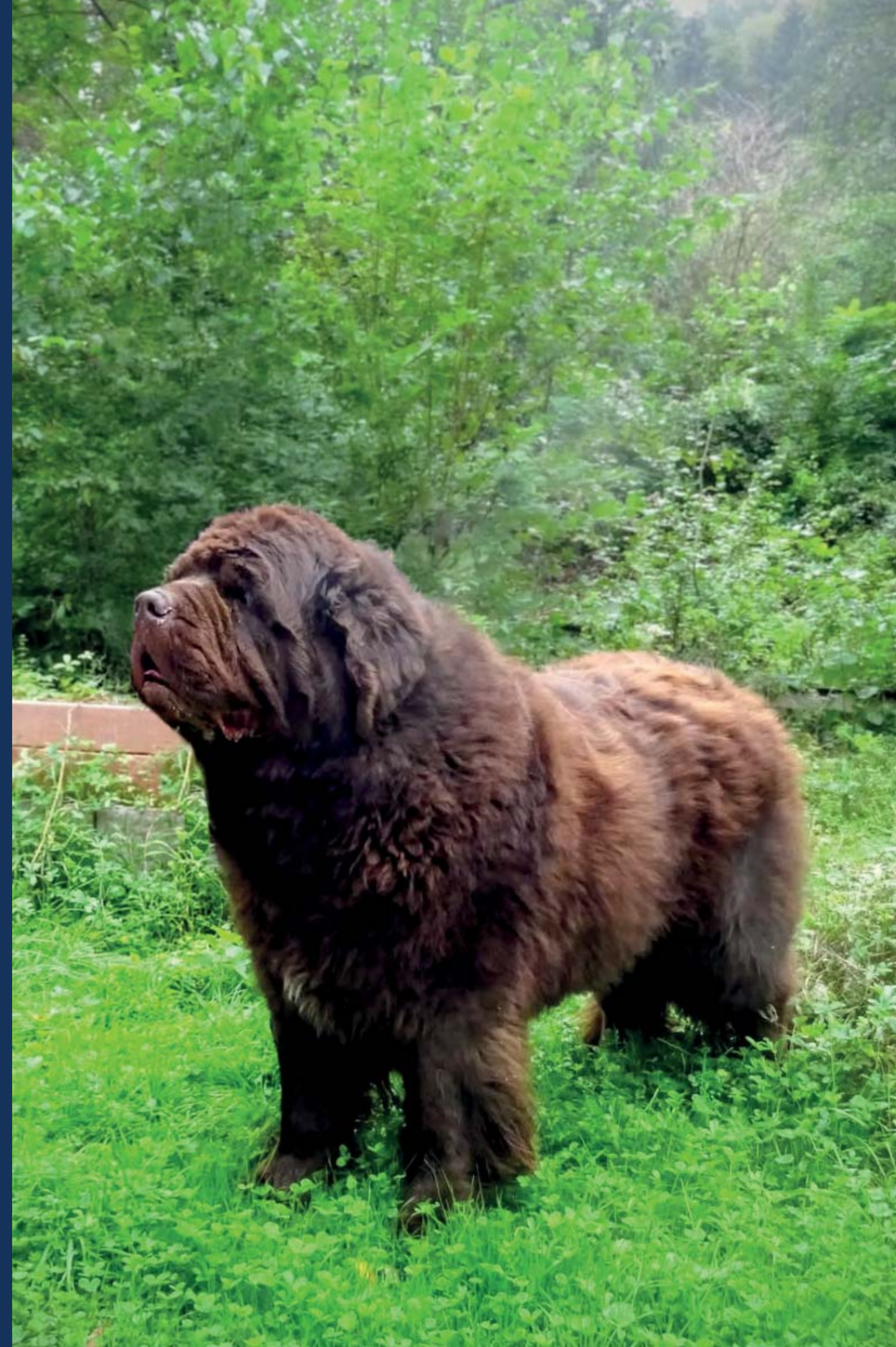


And then, whenever we are faced with variations, we must wonder how much they alter the correct function.
We see as some deviances may interfere with the phenotype, but above all on the functional mechanisms to the point of becoming patological alterations which affact the animal's health and wellbeing. The most important of these is linked to the **slackness of the connective tissue** and it is rather spread in more or less evident gradation in the present population.

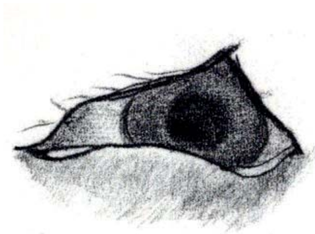
In these individuals, the skin, rather than perfectly adhere to the undelaying structures, has become thick and is badly sustained by a slack connective tissue. This appears first of all on the head: where the skin, under a fine and shiny fur should let the bone and muscolar reliefs appear, we find creases and plicas.



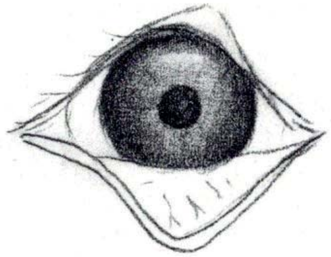
fine and shiny coat



The eye, deprived of a close fitting lid, is more easily irritated by sand and dust or are the very eyelids to hurt he eye bending inside (Entropion) or outside (Ectropion). This causes a continuous suffering. Notwithstanding the various kinds of eye drops put in the eyes before entering the ring, this patology is revealed by a wet eye, a little half closed, winking, with a loss od hair around the lower lid.



entropion

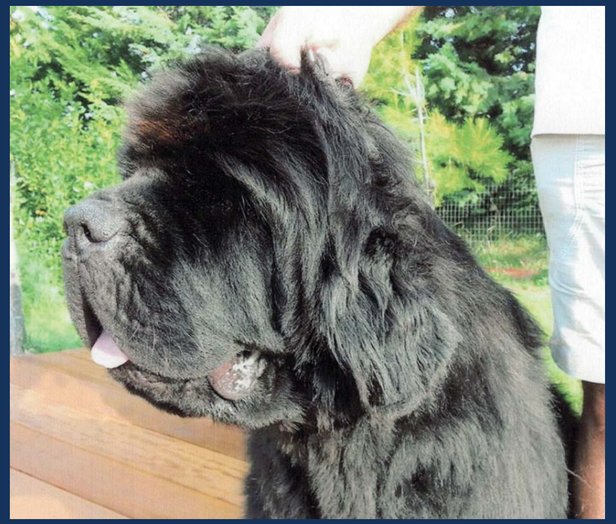
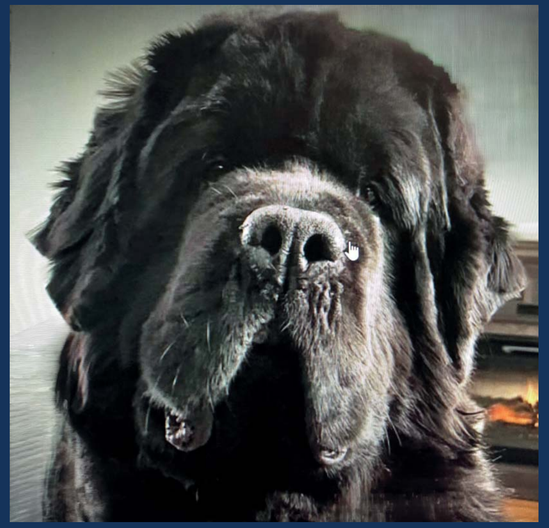


ectropion

Ears which are too long and positioned too low.



The lips become heavy, almost meaty, like a mastiff’s: above they hang farther than the profile of the muzzle which appears higher than its due, underneath they relax outward, creating pockets at time as far as the neck, where it appears, even if hidden by the fur, a large dewlap.
For what all this? Our dogs do not fight, and they do not need to protect their necks with wide skin folds like the mastiffs. The Newfoundland is a dog which needs to live in a family, close to man, but how to react when the saliva, not retained by the lips, gets on our clothes, or on the house walls?


Besides, much more worrying, the slackness of the connective tissues affects also on the other organs. Serious patologies come from this.

. Dermatitis

. Bloat

. Slackness of the soft palate

. Collapse of the trachea

. Weakening of all the ligaments with and increase of the hip and elbow dysplasia

. Break of the cruciate ligaments

. Slackness of the hocks with an excessive overload (Sickle Hocks).

Some research has even supposed that the slackness of the connective tissues may be influenced by a latent hypotiroidism. And here Nature would already have put a stop to it: hypotiroidism is often the cause of unfertility. Beware then of the exasperations and the faults which have an effect on the health of the dogs.

I want to make a reflection: when I started to breed in 1966, Newfoundlands were very rare in Italy. In a few years they spread, meeting the favor of many fans, with a constant increase, till they reached, in 1996, the number of 2.054 registered puppies. From this peak the number slowly started to decrease.
I wondered what pushed the choice towards other breeds (Golden Retriever, Labrador, Bernese Mountain Dog…) Isn’t it maybe an exasperated research with “badly interpreted” competition purposes in mind that has made our dogs appear as eccentric and a little unnatural for the family life?





You then wonder: can our dogs be problematic? Certainly NOT: a correct Newfoundland, bred according to the canons of the breed, if a perfectly balanced animal, endowed with strength and resilience, capable to move with agility, dive, swim and fulfill those purposes for which the breed was originally born.

It depends on us breeders, and Judges, the duty to safeguard this beautiful breed Nature has gifted us with.

There would be many more things to say, but, as my allotted time is almost ended, I invite you to read the official comments to the Italian Newfoundland Club Standard which is published on the ENCI site, translated in English and French too.

Thanks for listening.



https://www.enci.it/media/9330/terranova-commento-allo-standard.pdf