The Problem with Purebreds...

"The time has come where we've just got to give up this kind of "master race" mentality that we have about dogs. Our system of breeding dogs, of isolating small populations called breeds and then practicing eugenics, generation after generation after generation, all of those dogs are inbred beyond belief. It's not good genetics and it's not good dog breeding." ~ Ray Coppinger (author of Dogs - A New Understanding of Canine Origin, Behaviour and Evolution) in Dogs and More Dogs (Nova, 2004)

Just for Show
Written and compiled by Derek duToit

There is a common call, among animal welfare workers, for breeding of companion animals to be regulated, because there are too many animals and not enough homes, and that this should be achieved through legislation prohibiting breeding unless done so by 'registered breeders', and by this they mean breeders who are registered with one of the breed associations or 'kennel clubs'. The intention is that breeding should be the province of experts who have the necessary expertise to do the job in a manner that is beneficial to the animals and the community. In principle, I agree with this ethic.

The difficulty I have with linking 'ethical breeding' with the breed associations and the pedigreed breeding community is that there are significant problems with the mindset and practices of the 'purebred' syndrome.

Early dog breeding mimicked natural selection, in that dogs were bred to work = the dogs that could herd sheep or cattle, or that could defend against intruders, etc., were the ones that were bred to produce the next generation. This process over time produced the modern breeds. However, with the advent of dog showing in the middle of the nineteenth century, the focus shifted away from function to aesthetics.

The Show Ring has also been largely responsible for the decline of breed purpose, working ability and temperament in a great many breeds, notably sporting breeds, herding breeds and sled dog breeds. The quick and easy gratification of blue ribbons and gilt trophies all too readily supplants the hard work necessary to preserve and advance canine working abilities.[1]

Competitive dog-showing, in its pursuit of perfection, has driven the various breeds to ever more drastic extremes in body proportion and shape. The Dachshund's legs have become much shorter over the last century, but their long back often gives them spinal problems, and they often suffer epilepsy and eye problems as well. The Bull Terrier's head has been deformed, as has that of the Pit Bull - breeders have contorted the skull shapes showed how drastically these breeds have changed in less than a century. Bulldogs have slower relative growth of the nasal bones, and this causes breathing difficulties and the need to be born by Caesarian section.

The German Shepherd shows that these changes are carried out for purely cosmetic reasons. There are actually two varieties of German Shepherd: the working variety, which is often used in police forces and as guard dogs, and the show variety. The former looks very much like the original German Shepherd, but the show variety has a very different shape, with their back ends slouching. Orthopaedic surgeon Graham

1 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm

Oliver described the gait of the show dogs as ataxic, lacking full coordination and control.[2]

German Shepherds: the european (original German) GSD standard has to a large extent retained the working "fit for purpose" aspect of the breed. It is typically the standard imposed through the AKC (American Kennel Club) which has insisted on the sloping hindquarters which has ultimately resulted in the ataxic gait in the American GSD. As a result the security institutions in the US have largely moved away from using the GSD as a working breed.

Breeds and Pedigrees

Three separate approaches combine to constitute canine breeds. Dogs are distinguished first by **ancestry**, all of the individuals descending from a particular founder group (and only from that group) being designated as a breed. Next they are distinguished by **purpose or utility**, some breeds existing for the purpose of hunting particular kinds of game, others for the performance of particular tasks in co-operation with their human masters, while yet others owe their existence simply to humankind's desire for animal companionship. Finally dogs are distinguished by **typology**, breed standards (whether written or unwritten) being used to describe and to recognise dogs of specific size, physical build, general appearance, shape of head, style of ears and tail, etc., which are said to be of the same breed owing to their similarity in the foregoing respects.

2 http://creation.com/mutant-parade-purebred-dogs

Breeds cannot be distinguished by ancestry alone, by purpose alone, or by typology alone. Unless these three vectors of breed identity interrelate fully and co-operatively, the fullness of that identity is missing or marred. Unfortunately, this full and co-operative interrelationship is a rarity in our contemporary dog world. The criteria of ancestry are applied rigidly and mechanically; the criteria of purpose and utility are subordinated or not considered at all; the criteria of typology are applied in a highly exaggerated, obsessive fashion. The interaction of the three approaches is seldom considered and almost never is a sustained effort made at the integration of the three.

Basset Hound pre-1910 and now...

FOUR ESSENTIAL CHARACTERISTICS usually distinguish the origin in the genetic sense of a new breed (as opposed to the discovery, popularisation and "recognition" of, for example, a breed which may have existed in a particular region for a long time without connection to formal cynological[i] structures).

The first and most crucial characteristic is the **founder event**, in which a finite number of individual canines is chosen to contribute genetic material to found a new and unique canine population. They may all be quite similar, or they may be widely divergent one from another (as when Bulldog and Mastiff specimens were used to create the Bullmastiff breed). What matters is that a finite and sometimes quite small number of individuals are selected from the existing canine population and set apart so that their genetic material alone forms the gene pool for the new breed.

That is in fact the next characteristic: **isolation**. If the founder group continues to exchange genetic material at random with the general canine population, a new breed will not result. Without genetic isolation of the new founder group, the differentiation that creates a new breed cannot take place.

The logical consequence of this isolation is the next characteristic: **inbreeding**. If the founder group is of small or moderate size, such inbreeding cannot help but occur. Even if the founder group should be quite large, ordinarily those who guide the breeding which creates the new breed will find it necessary at some stage to employ a strong degree of incest breeding or inbreeding, to facilitate the weeding-out of undesired characteristics and the fixation of desired traits. Particularly if individuals of widely divergent type and physique are involved, inbreeding will be required to set up a stable genome in which random variability is kept within limits defined by the breeders.

The final essential factor is **artificial selection**, since inbreeding alone will not serve to fix type characteristics and to eliminate unwanted traits. The breeders must select among the individuals produced in early generations so that only those displaying the desired characteristics are allowed to produce subsequent generations. Without the four factors of the founder event, isolation, inbreeding and artificial selection, new breeds ordinarily do not come into existence. These four tools are used to define a new genome which, hopefully, contains only the traits desired by the creators of the new breed and is able to reproduce itself, with its distinguishing characteristics, to a fair degree of stability and consistency.[3]

Suppose we start a new population with only six or eight founders. (A number of breeds have started with that few.) We will get rid of hundreds of bad recipes, but the remaining dozen or two will be encountered much more frequently. Furthermore, if there are several good or excellent recipes, the chance of dropping one of these from the collection grows greater as the number of founders diminishes, and the risk of losing one remains high as long as the effective population size remains low. Working with small numbers will inevitably decrease the diversity, simply because individuals do not pass on their recipes equally to the next generation and some recipes are accidentally lost. This has the superficially desirable result of giving a more reproducible phenotype[ii], but at the expense of an overall reduction in quality, health, and longevity.[4]

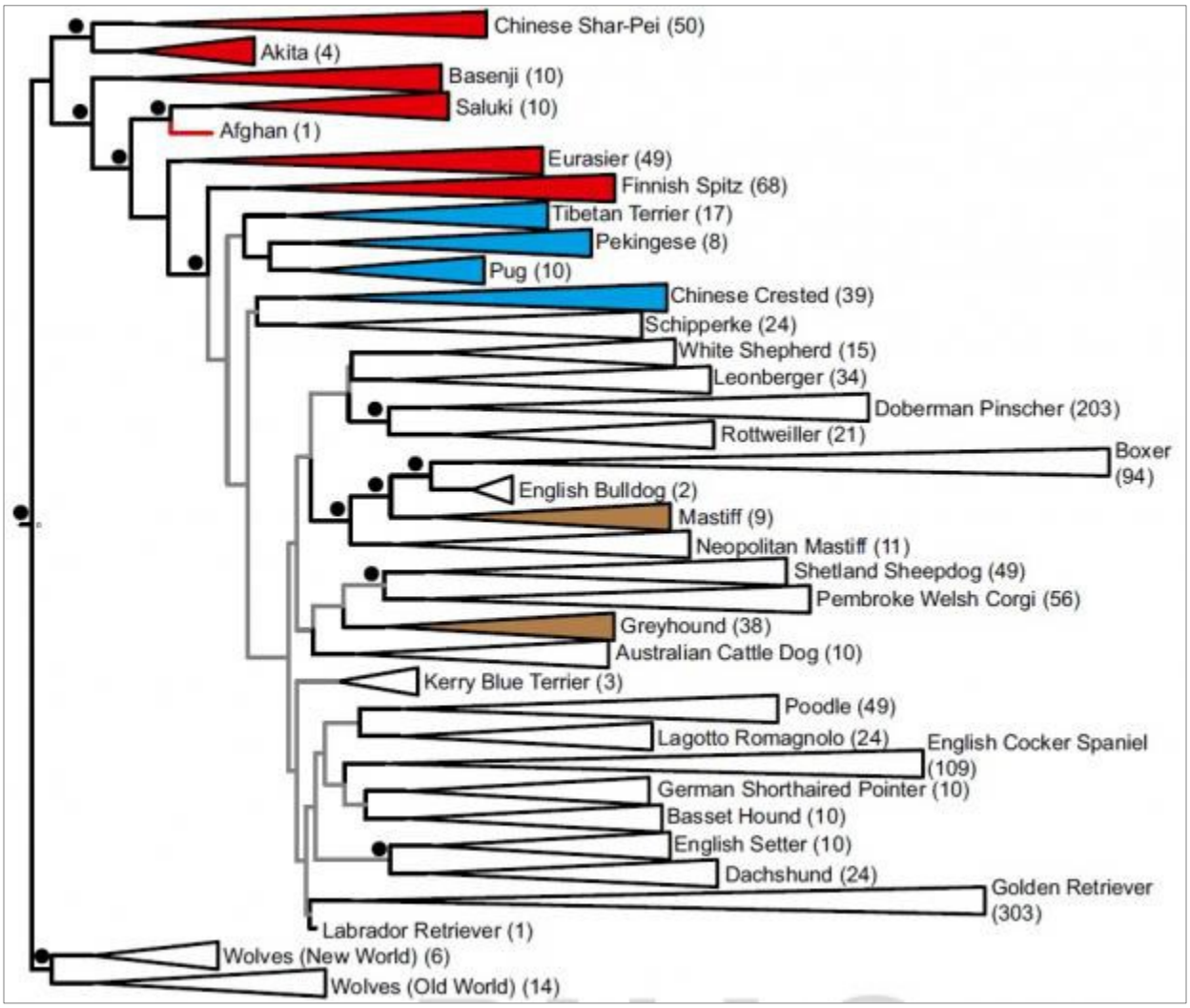
Where breeds came from

Scientists studied DNA from 35 different breeds. The graph shows how closely the various breeds of dogs are related with each other genetically. The name of each dog breed is followed by a number which indicates how many specimens of the breed were studied. Gray lines indicate that the scientists would like to see their results backed up with further data. [5]

3 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm

4 http://www.dogenes.com/essays/cake.html

5 http://sciencenordic.com/dna-reveals-new-picture-dog-origins



There are currently approximately 400 categorised breeds of dog and approximately 73 breeds of cat, depending on the individual registering body in the different countries, which differ considerably. The phenotypic diversity of the world's dog breeds is mirrored in their genetic diversity.

From Charles Darwin to Konrad Lorenz, early researchers believed that admixture with multiple canid species, including jackals, was necessary to explain domestic dog diversity. However, modern mitochondrial DNA[iii] (mtDNA) analysis has instead shown that the gray wolf (*Canis lupus*) was the sole ancestor of modern dogs.

"The earliest remains of the domestic dog date from 10 to 15 thousand years ago; the diversity of these remains suggests multiple domestication events at different times and places. Dogs may be derived from several different ancestral gray wolf populations, and many dog breeds and wild wolf populations must be analysed in order to tease apart

the genetic sources of the domestic dog gene pool. A limited mtDNA restriction fragment analysis of seven dog breeds and 26 gray wolf populations from different locations around the world has shown that the genotypes[iv] *of dogs and wolves are either identical or differ by the loss or gain of only one or two restriction sites*[22]*. The domestic dog is an extremely close relative of the gray wolf, differing from it by at most 0.2% of mtDNA sequence." - Robert K Wayne*

While all dogs are genetically very similar, natural selection and selective breeding have reinforced certain characteristics in certain populations of dogs, giving rise to dog types and dog breeds. Dog types are broad categories based on function, genetics, or characteristics. Dog breeds are groups of animals that possess a set of inherited characteristics that distinguishes them from other animals within the same species. Modern dog breeds are **non-scientific classifications** of dogs kept by modern kennel clubs.

Systematic analyses of the dog genome has revealed only four major types of dogs that can be said to be **statistically distinct**. These include the "old world dogs" (e.g., Malamute and Shar Pei), "Mastiff"-type (e.g., English Mastiff), "herding"-type (e.g., Border Collie), and "all others" (also called "modern"- or "hunting"-type).[6] In short, this means that the notion of 'breed' as a separate scientific category is simply nonsense – it's an arbitrary set of 'types' established by scientifically illiterate people using unscientific criteria.

A dog is said to be purebred if their parents were purebred and if the dog meets the standards of the breed. Purebred dog breeders of today "have inherited a breeding paradigm that is, at the very least, a bit anachronistic in light of modern genetic knowledge, and that first arose out of a pretty blatant misinterpretation of Darwin and an enthusiasm for social theories that have long been discredited as scientifically insupportable and morally questionable.[7]

6 http://en.wikipedia.org/wiki/Dog

7 http://en.wikipedia.org/wiki/Dog_breed

The key issue that has caused the growth in C-sections in the case of bulldogs, was the "massive head" called for by the show standard of points and the relatively small tapering body to the rear. This of course resulted in birth complications as neonate heads could not fit through the pelvic girdle.

Eugenics and the fallacy of breed purity

The Eugenics movement, founded by Darwin's cousin Francis Galton, held that the key to human improvement was in controlling who could reproduce with whom—the idea was to improve the race by eliminating undesirable traits, and in disallowing mixing between 'races'. While we know today that the eugenicists' ideas about purity make no scientific sense, The Kennel Club is one of the few organizations that still operate under the fundamental assumptions of eugenics. Every dog registered with the Kennel Club has an ancestry that goes back to the original registered dogs - no new registrations are allowed, and any litters resulting from breeding with non-registered dogs or breeding between two registered dogs of different breeds cannot be registered.

The fallacy of breed purity, the ideal of the purified lineage, is seen as an end in itself; and accordingly, the studbook has been structured to reflect and to enforce that ideal rigidly and absolutely. This insistence on absolute breed purity arises from nineteenth-century notions of the "superior strain" which were supposedly exemplified by human aristocracies and thoroughbred horses; this same ideal, pushed to an illogical conclusion on the human plane, resulted in the now discredited "scientific racism" of the Nazis, who tried through selective human matings to breed an Aryan superman. The idea of the superior strain was that by "breeding the best to the best," employing sustained inbreeding and selection for "superior" qualities, one would develop a

bloodline superior in every way to the unrefined, base stock which was the best that nature could produce. Naturally the purified line must then be preserved from dilution and debasement by base-born stock. There is no support for this kind of racism in the findings of modern genetics -- in fact, quite the opposite: population groups that are numerically limited and closed to new genetic inflow are now thought practically certain to be genetically inferior.[8]

Non-purebred dogs most certainly can have a pedigree, which is just a record of ancestry. It's not magic. I've got one myself. So do you. So do my crosses and backcrosses.

Because of the eugenicist principles in breeding, puppies that do not conform to the strict requirements of the breed standards are sometimes culled. This is particularly the case with Rhodesian Ridgebacks that lack ridges. While the Kennel Club, both through its spokespeople in the documentary and in the Ethics Code on its site, condemns the practice, the documentary contains statements from breeders saying that they routinely cull puppies without ridges. One even lamented the young veterinarians who refused to cull the healthy puppies! (It should be noted that although the Rhodesian Ridgeback Club code of ethics prescribed the culling of ridgeless puppies before the Pedigreed Dogs Exposed documentary aired, the page has since been modified to prohibit such acts). The ridge is actually a mild form of spina bifida, so a slightly diseased dog is actually preferred to the healthy animal in this breed. This dermoid sinus (D.S.) has been known by many names, a few of which are dermoid cyst, hair cyst, and African cyst. It is a sinus, in that it is tubelike and does drain, and dermoid because it is skinlike. It may or may not contain hair follicles or be lined with hair. As the hair sheds on the outer coat of the pup, so does the hair inside this tube. The body's natural response to dead material is to flush it out and thus the serum builds up and expels the debris. Not all of the dermoid sinuses are true tubes. Some are not hollow and the serum and debris cannot drain. In these cases an abscess forms and the resulting swelling that accompanies can rupture the skin. This results in a very painful situation for the pup. At its worst it is life threatening.[9]

"I have been a veterinarian for 16 years now and I probably hate breeders more than all of you together. Can you even imagine how many breeding bitches got dropped off at my practice to be killed because they didn't produce enough puppies any more? And NO, they didn't come from puppy mills or backyard breeders, they came from registered, well known breeders. The ones you would call "reputable" if there was such a thing. You would not believe how vile these people really are. Lucky for the dogs, those breeders don't wait to see their dogs being put down, they just drop them off. I have rescued more than 10 breeding bitches in the last few years. Yes, I tell them I will euthanize them, take them back, nurse them back to health and find them loving homes. Most of these dogs are under 6 years old! That's why I would appreciate if you

8 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm
9 http://rrcus.org/rhodesianridgebackhealth/resources/dermoidsinus.html

don't post my name, last thing I need is a bunch of greedy assholes attacking my practice.
I really don't understand why anyone would still buy from breeders. They know how many health issues their precious purebreds have, but keep breeding their sickly dogs anyways and sell them for horrendous prices. I know, because they all come here as soon as the issues begin.
If you want a great, healthy companion, adopt a cross breed from the shelter. Hardiest, most thankful dogs I ever had and ever worked with." ~ A veterinarian on Pedigreed Dogs Exposed[10]

Purebred breeding methods replace nature's role and condemn purebred dogs to live with health and/or behavioural problems. Deliberate manipulation of a dog's genome, the essence of its life, is an extreme violation of its autonomy. The 500 genetic diseases that have been documented to date are merely a starting point, and it is irrefutable that these defects cause pain and suffering to the dogs that bear them. Dog breeding principles do not provide beneficence to the dogs; on the contrary, they result in many injustices to them.[11]

Genetic Diversity

Dogs from a limited gene pool will naturally be more prone to inherited diseases. It is a fact that we may not like to admit, but it is nevertheless a fact. Cross-breeds and mongrels are the most healthy. According to the geneticists, if left to themselves, breeding indiscriminately amongst themselves, the dog would end up over the next couple of hundred years to looking like a 15 kg brown whippet-like animal with minimal if any inherited problem diseases.[!]

The founding and maintenance of dog breeds, and to a lesser extent bottlenecks associated with dog domestication, have reduced genetic diversity throughout the dog genome. As a consequence, the genetic background on which a causal variant acts is less heterogeneous[v] in dogs than it is in humans. Artificial selection by breeders dramatically reduces the efficacy of natural and sexual selection, allowing for genetic drift and phenotypic variation in traits that would otherwise be constrained by these forces.

The process of gene replication is naturally fraught with errors, resulting in what we know to be random genetic mutation. In a population which is allowed to reproduce randomly and spontaneously, such errors typically result in a heterozygous gene pairing where one of the alleles may be "compromised" but which is not deleterious due to the fact that ordinarily 2 copies of the deleterious gene will be necessary to result in a

10 http://pedigreedogsexposed.blogspot.com/

11 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950109/

problem being noted in the offspring. The defect is therefore hidden and may be "carried" to the next generation. (Of course, the occasional homozygous gene defect is noted, where because the defective gene is dominant, it asserts itself in the offspring through a single instance, and a problem may be noted - this is easy to spot and eliminate though).

However, when the genetic population is restricted to a few individuals and constant inbreeding is used as a means to attain "desirable" outward characteristics, this also serves to concentrate existing hitherto unseen deleterous genes, resulting in what we now know as breed-specific genetic problems. Examples are well known and can be easily accessed per breed. This explodes the myth of "breeding for health" in the pedigree bloodline of the show breeder.

We humans have created all these different wonderful breeds, originally for different purposes whether it was for hunting, stalking, going down rabbit holes etc. . However, we have also therefore created dogs with certain inherited problems that are kept within each breed because nature is not allowed to rectify the problem.

Without genetic isolation, it would not be possible to control the genome[vi] of a new breed still few in number. It takes time and careful breeding to fix a new combination of characteristics; while that is being done, the regular addition of new genetic material would generally be counterproductive. Yet in the long term, if genetic isolation is maintained, it will necessarily lead to degeneration through genetic drift. Similarly inbreeding, if it continues to be practised after the need for it is past, will lead to a steadily increasing state of homozygosity[ii] which may well destroy the genetic health of the new breed. Even artificial selection, if carried on too strongly for too long, can combine with isolation and inbreeding to reduce drastically the effective breeding population, thus eroding the genetic health of the breed.[12]

The history of the domestic dog is etched in the genomes of dogs today. Outbred village dogs show reduced genetic diversity compared to gray wolves, almost certainly due to a population bottleneck occurring during dog domestication. Within any individual dog breed, genetic diversity is lessened further due to breed-specific bottlenecks and popular sire/inbreeding effects. One way geneticists can measure this loss of diversity is to look at patterns of linkage disequilibrium between genetic markers.

“…when a breed is deliberately created from a small number of founders, the creator(s) generally concentrate first on inbreeding and selection to define the qualities they are after, rather than increasing the initial population and subsequently selecting for those that come closest to meeting their goals. Such a beginning generally removes most of the genetic diversity in the first few generations. If you have been unlucky or chosen badly, there may be little you can do.

12 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm

The same fate may befall a naturally-evolved breed ("landrace") if there is no recognized registry in the country of origin and too few founders are admitted into the registry somewhere else. At least in these cases, the potential exists of petitioning for reopening the stud book and admitting additional "founders". In those cases where there is no such reserve, the solution might be a merger with a closely related breed, or at least provision for some interbreed crosses. There are a few documented cases where this has been attempted in the last 20-30 years, but they have met considerable resistance." [13]

"Hybrid vigour makes more sense biologically (a commercial farmer always crossbreeds beef cattle or chickens, because all he cares about is health and growth) but it causes the loss of certain characteristics that we have selected for for centuries, mostly mental like herding instinct etc, which would be sad to lose. Of course some of the characteristics selected for are really stupid like the bulldog that cant even mate or give birth on its own (or breathe half the time). To me the most important thing is that a pedigree gives an animal a value, a mixed blessing because some breeders are profiteers, but take for example the Africanis, currently getting recognition as a breed while always previously euthanized en masse for being a mongrel. That is why registering authorities have the development registers, so that a mongrel type worthy of a breed name can be given one, and this I agree is a good thing. There should also be a de-development register on which breeds bred to some stupid cosmetic extreme should be forced to return to a functional healthy animal! " – Dr. Shelagh Hahn

13 http://www.dogenes.com/essays/pgbreed.html

Just because the canine genome[vi] is so malleable, doesn't mean that we should continue to do something simply because we happen to like it or we think 'it's a shame that the breed won't exist anymore'. Shame for who?

There is a sense in which the purebred breeding philosophy mirrors apartheid and racism - the notion of the 'separate and distinct' breed (race) in isolation from others, as if there is a genetic basis to the idea. There isn't. It's a human-engineered fiction, with a sad ending. The word "mongrel" is in fact part of the vocabulary of racism, being applied equally to canine stock of no recognisable breed, to animal crossbreeds, and to persons of mixed race!

Genetic Facts[14]

The Institute of Canine, Biology, composed of mainly PhD's in genetic science, and whose goal is 'to provide a global hub for interaction between scientists and dog breeders, as well as information, research tools, and expertise in all aspects of dog biology.', wrote the following list of reasons why population genetics must replace typology as the standard methodology in breeding:

1) All the useful genetic variation your breed will ever have was in the dogs that founded the breed. This genetic diversity is finite.
2) Every generation, alleles[vii] are lost by chance (genetic drift) and also by artificial selection by breeders, who select for dogs with the traits they like, and remove other dogs from the breeding population.
3) Because the stud book is closed, genes that are lost cannot be replaced.
4) So, from the moment a breed is founded and the stud book is closed, loss of genetic diversity over time is inevitable and relentless.
5) You cannot remove a single gene from a population. You must remove an entire dog, and all the genes it has.
6) You cannot select for or against a single gene, because genes tend to move in groups with other genes. If you select for (or against) one, you select for (or against) them all.
7) Breeding for homozygosity[viii] of some traits breeds for homozygosity of all traits. Homozygosity is the kiss of death to the immune system. And as genetic variability decreases, so does the ability of the breeder to improve a breed through selection, because selection it requires variability. The consequences of inbreeding (in all animals) are insidious but obvious if you look - decreased fertility, difficulty whelping, smaller litters, higher puppy mortality, puppies that don't thrive, shorter lifespan, etc. Genetically healthy dogs should get pregnant if mated. They should have large litters of robust puppies, with low pup mortality. Animals that cannot produce viable offspring are removed by natural selection.

14 http://www.instituteofcaninebiology.org/

9) Mutations of dominant genes are removed from the population if they reduce fitness. Mutations of recessive alleles have no effect unless they are homozygous. So rare alleles are not removed, and every animal has them.

10) Create a bunch of puppies that have a (previously) rare mutation, and the frequency of that bad allele in the population increases, so the chance of homozygosity increases.

11) Genetic disorders caused by recessive alleles don't "suddenly appear" in a breed. The defective gene was probably there all along. Make a zillion copies, and you have a disease.

12) Using DNA testing to remove disease genes will not make dogs healthier (see 2, 5, and 6).

13) The breed will continue to lose genes (by chance or selection) until the gene pool of the breed no longer has the genes necessary to build a healthy dog.

14) At this point, the breed might look beautiful (because of selection for type), but will suffer from the ill effects of genetic impoverishment.

15) The only way to improve the health of a breed is to manage the health of the breed's gene pool.

16) The health of individual dogs cannot be improved without improving the genetic health of the population. **Population genetics**[ix] provides the tools for genetic management of populations of animals.

17) Breeders can improve the health of the dogs they breed if they understand and use the tools of population genetics**.**

Incestuous and Vain: Practices and the Lack of Regulation

The ‘show’ model feeds off the proliferation of animals. The lie that has been propagated about "ethical registered" breeders is that their actions are ethical and good for the breed and the community.. And if legislation gets passed, as in Gauteng at the moment where there is a rewrite of the local legislation, and anyone exempts "registered" breeders from controls being imposed, it's open season. The so-called ethical registries will open their doors and provide a haven for anyone who wants to breed, while vastly increasing their revenues from registration and breed fees.

It is important to note that there ARE breeders who agonise over their animals, and it’s likely quite a few of these have left the show scene, or no longer support it. However even these people perpetuate the system by remaining members of registries, which at the end of the day really are doing absolutely nothing for the animals. Merely registering pedigrees and maintaining the system of selective eugenics based on somebody's idea of what they want to see on the outside of the animal does NOT constitute "improving the breed".

"Show homes" are people who buy animals from breeders - often every year - with the express intention of putting them on show. The get the "best" animals based on

conformity to the "SOP" (standard of points) for the breed. e.g. "low on the leg, massive head, stocky body, large round /almond shaped (etc.) eyes and so on. And breeders keep the "best of the best" for themselves to both breed with ("this one's a keeper - it will go into my breed program"), and to put on show themselves. The show process gives the cats/dogs titles and awards (supreme champion, triple supreme, best of group, best of breed, cat/dog of the day etc). And the showing of animals earns points which go toward selecting the finalists to go to cat of the year / dog of the year), and towards breeder of the year / cattery of the year.

Every cat put on show bred by a particular breeder which earns a rosette or award from a judging on a day, earns points towards breeder of the year. Hence the more cats of their breeding, the more breeder points.

A "pet home" is a buyer who is given a cat or dog which will not do well on show. Maybe these are the lucky ones - and hey, somebody has to buy the ones that won't make it. There is a thriving trade between breeders swapping lines, trying for a combination which may produce offspring which could do well on show. And when a cattery / kennel hits the big time, overseas breeders start to ask for kittens - usually female of course. These get sold in the strong currency of the buyer country - always. eg. $2500 US, A$2500, E2500, GBP2500 etc. Cats can range from 800 in currency to 3-4000, depending on "how good" it is supposed to be. This can be very lucrative.

A "Breed home" is another breeder buying the animal to put it into a lifetime of servitude. As soon as it is no longer cutting the mustard via it's offspring with show results, it is shipped off to the up and coming 2nd tier breeders who can't afford to buy bloodstock internationally (since an animal can cost from R25000 upward, plus around R7000 for transport). Every year you will see some breeders trolling for a new import to tickle the fancy of the judges at shows - and so much the better if the judge buys from that breeding, since all judges are breeders anyway.

The registry blames the breeders and the breeders blame the backyard breeders and the pet owners - as well as the registries who just take their money and do nothing about the backyard breeders. And the cats suffer and the registries can do nothing, because they are just registering bodies. And there is somewhere in nirvana an ethical registered breeder. No wonder they love to hear people yakking on about backyard breeders - they HATE competition, and deriding undefined backyard breeders takes the focus off them.

Since breed associations have relatively little real power, they often tend to be less than fully representative of all breeders of a particular breed. Frequently they are more or less run by cliques; they waste much time and effort in wrangling and personalities, being perhaps inadequately supervised and not taken terribly seriously.

Dog rape

"Most of the breeders are very well aware of fertility cycles, and a bitch that finds herself close to the eleventh day is often loaded in a car destined to the breeder's idea of her perfect mate. Since time equals money, it is expected from the bitch that, on arrival, she courteously concedes her rump to the male and lifts her tail out of the way to enable a rapid and uncomplicated mating. Should the bitch, on arrival, refuse advances from the male, she will be characterised as dangerous. Most often she will then be escorted to a small enclosure, have her muzzle tied-up and have her body held still, ready to be mounted by the 'mating machine'.

It is amazing how many breed speciality books advise the newcomers and aspiring breeders about the dangers of mating. The unwilling bitch could bite the stud dog and ruin him for life! Once the stud has penetrated and the genital lock or tie is effective, a restless bitch could remain agitated tot he point that the penile bone causes internal damage or breaks! The authors of such books then advise that the bitch should be muzzled at arrival by tying a silk stocking or pantyhose around her snout and behind her ears, that she should be help up so that the male can easily mount her and that she should be firmly restrained from turning her head back and from growling at the stud. Once the active part of the mating is over, the the owner of the male should carefully lift one of its hind legs over the back of the bitch so that they stand backside to backside, and they should both be restrained until the end of the genital lock and thereupon be separated without allowing further contact between the two partners.

Theoretically speaking, the sperm cells have found their way to the ova and all is well that ends well. This is rape, and what the deep consequences of such an act could be on an animal that genetically has been programmed for reproductive behaviour within its social group, has not provoked one criticism.

It remains a fact that for highly social animals, such as dogs, a 'par force' inducted mating can precipitate enormous stress on the female. Dogs are highly susceptible to stress. In nature and in domesticated dogs, too, stress plays an evolutionary role. It fosters an unyeilding condition or atmosphere i.e. a condition in which reproduction would best be interrupted or terminated.

Therefore, stress can cause the failure of coming in season, re-absorption of the foetus, premature birth or stillborn pups. When a mating is enforced on a bitch with human assistance (it would not happen without) we create a stress situation where the detrimental consequences are beyond calculation. Such a scenario is not only detrimental to the bitch, it actually also works in favour of stud dogs without guts i.e. Those that lack the natural sexual behavioural patterns dictating courtship and the necessary convincing attitude and drive to mate. Human assistance not only tolerates but also encourages males that in nature would never stand a chance to mate. Of course such matings may produce the desired colour, the chiselled head that one is after or improve on any of the external features described in the breed standard, but the

chances that it is instrumental in improving mental stability and true canine behaviour is remote.

Because 'par force' inducted mating brings two individuals together that most likely would not mate under natural conditions, the offspring that they produce are in fact contrary to nature and improvement of the breed concerned. When we are faced in modern dogdom with an endless list of complications in canine reproductive behaviour and with general behavioural disorders, their origins can be found to a large extent in human-induced mating, which in many cases has been applied over consecutive generations." - From SOS DOG: The Purebred Dog Hobby Re-examined by Johan and Edith Gallant.

The Consequences

More than 500 genetic defects exist in today's purebred dogs. Inherited diseases such as hip dysplasia, brachycephalic airway syndrome, cardiomyopathies, endocrine dysfunctions, blood disorders, and hundreds more, affect the quality of life and longevity of these dogs. Over 400 breeds currently exist, but they are artificial constructs of human fancy, instead of the evolutionary outcome of natural selection. The wide array of genetic diseases found in purebred dogs reflects their unnatural development, by kennel club associations and breeders who are largely responsible for this welfare predicament.[15]

"Unfortunately, the restrictive breeding patterns that have been developed as part and parcel of the purebred dog scene have not been without collateral damage to all breeds … Increasingly, inherited diseases are imposing a serious disease burden on many, if not all, breeds of dog." ~ Jeff Sampson

Dog shows began as an arena for the evaluation of breeding stock and continued in the form of a public showcase for purebred dogs. Both functions are now ill-served if not virtually abandoned. Championship shows are now just that, mills for the production of Champions, Best in Show and Group winners, little more. They contribute almost nothing to the true welfare of dog breeds; they have few lasting positive values to offer breeders, only ephemeral fads and fashions.

15 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950109/

Bulldog then and now

Breed purpose and the cultivation of canine utility have a low status in the fancy, compared to what one author called "the glitz and hype of the show world." Those who concern themselves with the working ability of their dogs exist mostly in ghettos where little communication takes place with other branches of the fancy.

Obedience work, begun as a way of initiating dog owners into the fascination and technique of training one's pet to be a pleasant, well-behaved companion, has become largely ritualised and sterile. The pursuit of "Club 200" (the perfect point score) has become an obsession. Intelligent and useful training on the owner's part, intelligent obedience on the dog's part, are now beside the point. What matters all too frequently now is the minutely-perfect performance of a set ritual. Here again we find a canine ghetto.

The worship and exaggeration of type, as already noted, is responsible for a multitude of ills.

Genetic Disease

Modern registries based on a rigidly-closed studbook are throttling the genetic health of all registered dog breeds. Genetic impoverishment is now a real and present threat.

Many breeds now bear a genetic load of defects which has grown totally unmanageable as their respective gene pools have become more and more narrow through imprudent breeding and selection practices.

Incest breeding, once a convenient tool for the rapid fixation of type in newly-registered breeds, has become virtually standard practice for those who seek success in dog breeding. The net effect has been the decimation of gene pools, widespread homozygosity[ii] and the unintended fixation of unknown scores, hundreds or thousands of alleles, many of which are proving to be harmful or lethal to the animals that bear them.

Most diseases are affected to some extent by both genes and the environment. A genetic disorder is one in which an abnormality in the genetic make-up (the genome) of the individual plays a significant role in causing the condition. Although some disorders occur because of spontaneous mutation, many genetic disorders are inherited. These conditions are seen quite often in dogs, mostly but not exclusively in purebreds. These situations are often heart-breaking because the dog is generally a well-loved family member by the time the condition is apparent and has been diagnosed by a veterinarian.

The role played by genes in disease is becoming better understood. Genetic factors are involved to a greater or lesser extent in congenital malformations (conditions with which an animal is born), metabolic disorders, disorders of immune function, disorders associated with aging, and cancer. These categories of disease have become relatively more important as infectious, parasitic, and nutritional diseases have become less common due to vaccination programmes and advancing knowledge about nutrition, treatments and diagnostic methods.

The frequency of inherited conditions can be reduced through good breeding practices. For this to occur, we need to know how the disease is inherited (the mode of inheritance), how to identify the condition as early as possible, and ways to recognize carriers of the disease who, except in the case of autosomal[x] dominant traits, are not clinically affected.

For many of the disorders that are believed to be inherited, the specific pattern of inheritance has not been established. Breeds that have an increased risk for a condition, relative to other dog breeds, are said to have a **breed predisposition**. Preferably, affected dogs and their close relatives should not be used in breeding programmes.

Some examples of exaggerated features are listed below, but there are many more.

- Dogs with short flat faces often have narrow nostrils and abnormally developed windpipes. They can often suffer severe breathing difficulties and may have difficulty enjoying a walk or playing.
- Very large and heavy dogs are more likely to suffer heart, digestion, muscle or joint problems, and live shorter lives.

- Dogs with folded or wrinkled skin are prone to itchy and painful skin complaints, and infolding eyelids that can scratch the eye ball.
- Dogs with very long backs can suffer crippling back deformities.
- Dogs with ridges along their backs are prone to nervous system problems.
- Dogs with very curly or short tails can have trouble communicating properly with other dogs as they can't raise or wag their tails. Dogs with screw tails can also suffer crippling back deformities.
- Dogs with bulging or sunken eyes are prone to injury, pain or discomfort.
- Dogs that have large heads but small hips have trouble giving birth, risking their lives or needing surgery.
- Dogs with long floppy ears often suffer ear infections or injury and cannot move their ears to communicate with other dogs.
- Dogs with very short legs have difficulty moving properly.
- Hairless dogs have trouble keeping warm

Dogs can suffer from a large number of diseases and many of these can be inherited. Pedigree dog breeding and showing rules means that dogs of different breeds have been bred separately for many years. As a result, different breeds of dog not only look different but they show different likelihoods of developing particular diseases. Research has shown that every breed of dog that is well studied is prone to a range of diseases.

What sorts of diseases?

Some inherited diseases are very rare or cause only minor suffering, but there are many inherited conditions that are extremely painful or life threatening.

Some examples of inherited diseases that show particularly high levels in certain breeds are:

- cancer
- blindness
- diabetes
- heart disease
- skin complaints
- epilepsy
- hip dysplasia
- deafness

There's no single site that can tell you every disease prone to each breed, but several websites may help:

- www.upei.ca/cidd
- www.vetsci.usyd.edu.au/lida
- www.vet.cam.ac.uk/idid

An example: brachycephalic dogs and cats

Breeding brachycephalic dogs is unethical. Critics of Pugs, Bulldogs, Pekes, Boston Terriers and other short-faced breeds often focus on the dogs' inability to breathe - but as Dr Hale spells out, in pursuit of "cute" we have created dogs with hideously deformed mouths that often condemn the dogs to a lifetime of pain.

When they DNA tested the 10,000 pugs in the UK, they discovered that only 50 had unique genes! Interpolating, that would leave us with just 10 unique dogs for the whole country! Not a lot to work with. But it is going to be roughly the same for all pedigree breeds.

In animals, brachycephaly is the result of selective breeding to produce offspring with very short skulls, especially the nose and lower jaw regions. This ensures that the snub-nosed appearance of the puppy is retained in the adult dog. With exaggerated selective breeding, an extreme type of brachycephaly occurs. Extreme brachycephaly is a man-made inherited disorder that results in severe life-long health problems for the dog.

A typical pug mouth

“I believe that as protectors of animal welfare, veterinarians should start a public awareness campaign to inform people of the serious, life-long negative impacts of brachycephalism. I believe we must stop referring to these conditions as “normal for the breed” and refer to them as “grossly abnormal in accordance with breed standards” because there is nothing remotely normal or desirable from the animal’s perspective. I believe we must stop using photographs of these deformed but comical breeds in advertising and promotional materials as this just increases public demand because they are ‘so cute’.

I am sure these words are going to stimulate some lively, possibly acrimonious response. I am effectively saying that it is unethical to purposely reproduce animals that are specifically designed to have serious structural deformities. The extension of this thinking would be to ban a great number of breeds. Oh, the backlash! My word! But when one looks at it strictly from the animal’s perspective, there is no valid, logical justification for brachycephalism. Its only positive is that many people find brachycephalic breeds esthetically pleasing (cute) and that is not a valid excuse for wilful perpetuation of these mutations." - Dr Fraser Hale

Severely brachycephalic cats are a bastardisation of all the things that make cats special. They have a nasolacrimal system that doesn't work properly, so tears stream down the front of their face causing staining and secondary dermatitis (picture below). It doesn't help that they often have excessive folds of skin that rub against the cornea. Their orbit is shallow, leading to exophthalmos, the tendency to exposure keratitis and growth of corneal sequestra. The tear film just can't stretch that far! Their teeth erupt at such bizarre angles that they cannot masticate properly; the resulting propensity for food to accumulate between the teeth leads to accelerated plaque formation and periodontal disease. And if you pull their canine teeth out incorrectly, you will damage that kinky nasolacrimal duct.

A typical Persian cat. Note the stenotic nares and epiphora. You can't hear the snoring, but it was present and referable to an elongated soft palate. This individual also had polycystic kidney disease.

But it doesn't stop there. Stenotic nares, stenotic nasal cavities (due to aberrant turbinates) and a soft palate that is too long for the length of the head cause upper airway obstruction, stridulous breathing and possibly obstructive sleep apnoea. Their brain is crammed into the wrong-sized cranial vault, so conceivably we may soon be seeing Budd Chiari-like malformations and syringomyelia, just like in Cavalier King Charles spaniels. To make matters even worse, these cats have long coats that generally require more work to keep in good condition than most owners can expend, so they tend to get knots and mats. In Australia, they need 'lion clips' to keep their coat in check, especially in summer, and, believe it or not, 'Brazilians' have become popular to make sure they don't get poo caught under the tail! They are not as efficient at grooming as normal cats, and this means they are more likely to suffer heavy flea burdens, and there are all sorts of adverse gastrointestinal sequelae that result from excessive ingestion of hair. Finally, they have some sort of defect in innate or cell-mediated immunity that permits the ubiquitous dermatophyte *Microsporum canis* to invade the dermis to produce disfiguring pseudomycetomas that are notoriously hard to cure (picture below).

Pseudomycetoma on the hindlimb of a Persian cat with diffuse dermatophytosis due to *Microsporum canis*. Such cats almost certainly have an inherited immune deficiency affecting either innate or cell-mediated immunity

There is more than enough diversity in coat colour, coat length, size and personality in domestic moggies and the sound pedigree breeds. There is no need whatsoever to perpetuate the breeding of bizarre mutant cats that could not exist without veterinary interventions. We don't want to go down the path of the canine world, where extreme types (the bulldog, for example) continue to be bred despite obvious defects that greatly compromise their health and longevity. Plainly, it would be nothing less than cruel.[16]

16 http://jfm.sagepub.com/content/11/11/889

In our quest for breed purity, the superior strain, and classic type, we have made a sad mess of our dogs -- with unhappy, neurotic temperaments, epilepsy, blindness, deafness, immune system weakness, skin diseases, blood disorders, endocrine system malfunctions, crippling bone disorders, deliberate deformity, and often even the inability to reproduce their kind without breeder and veterinary intervention. How clever we have been![17]

The Solution

Avoid breeders who don't screen their animals for genetic disorders, or who won't show you such health clearance certifications.

"The problem is that what we are fighting is WHO is breeding, not WHAT they are breeding. A litter of mongrels properly bred is better than a litter of pedigrees puppy farmed for profit. THE RESTRICTIONS MUST BE ON THE PEOPLE MORE THAN THE ANIMALS. Like a driver and the value of the car he is driving. It must be roadworthy, but that doesn't help if the driver is a drunken idiot without a licence. A dog breeding licence should be very expensive and harder to get than a drivers licence!
I honestly don't think there is anyone out there worthy of the title professional breeder who is intentionally breeding mongrels, except a few people with breeds on legitimate development registers. And those can also go wrong, the boerboel is a prime example of a few dedicated people legitimately developing a mongrel with many admirable qualities, while thousands of others keep messing the breed up with mass produced problem dogs." – Dr Shelagh Hahn

"But genetic tests will NOT work if people continue to use show winning sires even when they are affected with one or more genetic diseases. So the question becomes how to make the results of the genetic health tests more important to the people who breed dogs than how important winning in the show ring is." Geneticist, Pedigreed Dogs Exposed

The solution is obvious: *ban the breeding of these extreme brachycephalic types*. Some have even been so bold as to suggest banning Persian and Exotic shorthairs entirely!

What would be the best way to achieve this end? For sure, we have to change the breed standards. Now. Not next year. Perhaps we need to enlist the help of organisations such as the NSPCA to press cruelty charges on the breeders of these cats - there is no doubt in our minds that many of these cats will have an unhappy life without reconstructive surgery and ongoing veterinary interventions.

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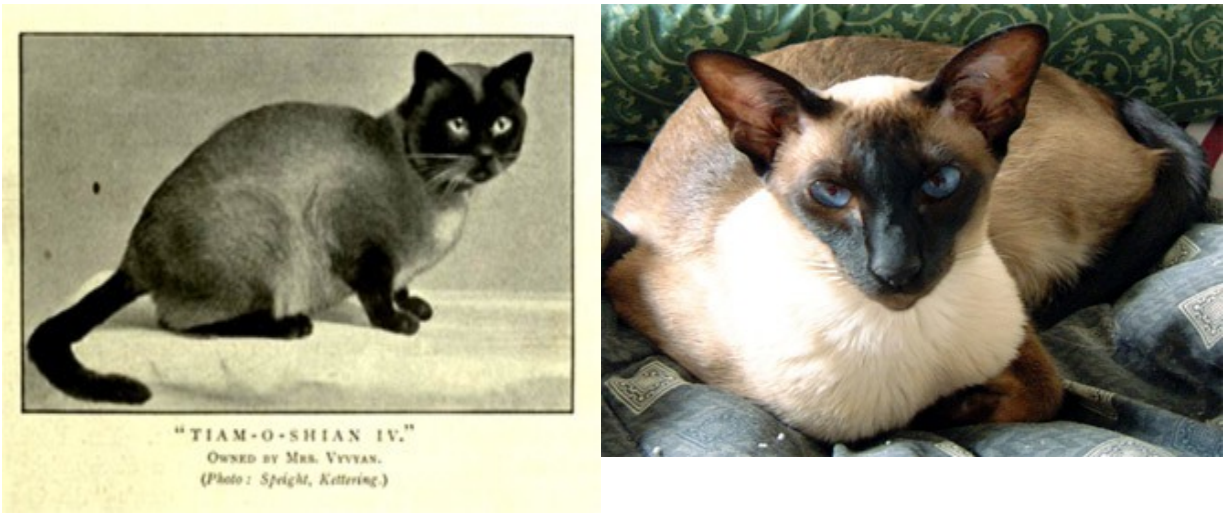
17 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm



Siamese old vs Siamese modern

There is concern, too, about Siamese and Oriental cats. A reasonable proportion of Siamese-style cats have congenital wiring faults in their visual neural pathways causing absent stereopsis with epiphenomena such as strabismus and pendular nystagmus. This has been known since 1971 when it was characterised by Nobel laureates Hubel and Wiesel[6] - but have we done anything about it? Do we need a quantitative volumetric MRI study to show that breeding for the extreme wedge-shaped head conformation has resulted in microencephaly? There are still countries that permit Scottish Fold cats to be shown and bred - even though most of them develop variably severe arthritis for the whole of their life.[7] Similarly Manx cats are prone to spina bifida and associated complications, which may be irreparable or require surgical intervention. Why would you deliberately breed a cat that doesn't have a tail - a structure so elegant and functional, and so 'catty'?[18]

Proposed Interventions

Canine breeds can and should be differentiated, bred and maintained on a dynamically balanced, heterozygous population basis without restriction to a closed, historic founder group. The closed studbook and the breed purity concept are, from a genetic point of view, simply unnecessary. Indeed, as we have seen, from the standpoint of maintaining a genetically healthy limited population, they are thoroughly counterproductive.[19]

18 http://jfm.sagepub.com/content/11/11/889

19 http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century3.htm

The most important change to be initiated is the opening of all dog breed registries to allow an increase in genetic variation. Additionally, kennel clubs should follow the example of the agriculture industry and set minimum numbers for foundation stocks during breed establishment. If dog breeders were to be subjected to a similar stock regulation, the frequency of heritable diseases seen in purebred dogs would decrease, and eventually many diseases would be eliminated. The end in view is healthy stock, not "racial purity".

If kennel clubs permit increased genetic variety amongst registered dog breeds, the inbreeding depression that is so rampant today will eventually decline. Canine breeds can and should be differentiated, bred, and maintained on a dynamically balanced, heterozygous population basis without restriction to a closed, historic founder group.

Many responsible breeders are saddened by the condition of their dogs, but are unable to remedy the situation because kennel clubs bar the introduction of new genetic methodologies. The purpose of cynological associations is to facilitate the work of dog breeders, rather than impede it. Breeders should be allowed to determine where outcross animals may best be obtained for specific breeds, in order to improve their dogs' health. Kennel clubs should not only permit genetic improvement, but they should also reinforce it. In order to motivate breeders to increase their genetic pools, kennel clubs must also redefine their breed standards to include health, vigour, and temperament, in addition to typology. To enforce the maintenance of genetic improvement, tools such as DNA analysis are available and should be used by breed associations to monitor heterozygosity and relationships in major lines by random DNA testing. To introduce new breeds, assortative breeding[xi], rather than inbreeding and line breeding can be implemented.[20]

Population genetics methodology[21]:

STEP 1

Pedigree database The first step in genetic management is to create a single database containing all members of the breed. In most cases, breed records are scattered among the many kennel clubs and registries around the world, and creating a single database will take some work. Rather than postpone all analyses until that can be accomplished, we can start working with what we have, and additional data can be incorporated as it becomes available.

STEP 2

20 http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950109/

21 http://www.breedingfordiversity.com/step1/

Identify the founders *a*s well as potential parents for animals without parents registered is the second step. Preferably also record the place or region where founders were collected. This step will complete the dataset and make it ready for analysis. It is necessary to characterise and maximise genetic diversity..

STEP 3

Identify the genetically important animals Every animal if the breed has a unique mixture of genes. Dogs that have alleles that are relatively rare in the breed are genetically more valuable. One goal of a breeding program will be making sure those rare genes are not lost to the breed.

STEP 4

Breeding The genetic situation and needs of each breed will be different, and within a breed each breeder will have their own goals. Breeding strategies are developed both for the breed as a whole, and for individual breeding programs, using the information produced in the previous steps. As dogs enter the breed as puppies and leave the reproductive population (by neutering or death), the genetics of the population change - breeding the genetically most valuable animals increases their representation in the population (which is good); as dogs leave the population they are no longer considered in the analyses, and so on. So these analyses should be redone periodically so information about the current status of the population is known to breeders and they can structure their breeding plans appropriately.

Advantage should be taken of DNA analysis techniques by using them to monitor heterozygosity and relative kinship in major breeding lines. (It would also be a good idea for the Club to offer DNA profile parentage certification.) This technology already exists and is in use; it is rapidly becoming much more affordable.

Proposed Breeder License System

Since animals are traded across borders, a nationally consistent Breeder License system is needed for anyone who breeds cats or dogs.:

1. Anyone who breeds cats or dogs.should have to be licensed. Qualification should include suitable premises, facilities, accreditation and access to a geneticist. Failure in any of these respects should bring about denial of the license.
2. DNA testing to be conducted on all breeding stock and the breeder must be part of a ‘Population Genetics’ programme.
3. An independent inspection conducted on application for a license and every 3 years.

4. Tests relating to health issues should be mandatory. Results should be recorded in registry databases.
5. Like-to-like matings between breeds carrying lethal or debilitating genetic diseases should not be permitted.
6. Inspections based on compulsory standards including limiting frequency of breeding and rehoming breeding animals.
7. Breeders pay for the Breeder License to cover costs of inspections, providing certification and keeping records.
8. Compulsory publishing of Breeder License numbers so consumers can make more ethical choices when looking for a new companion animal.
9. All animals to be vaccinated and treated for external and internal parasites according to current veterinary advice.
10. Sterilisation of puppies and kittens before sale or transfer. All puppies and kittens required to be sterilised prior to sale or giving away at 10 weeks of age, unless the animal has a health problem or is being transferred to someone with a breeder permit.
11. Any animal born with a defect should be euthanized by a veterinarian if in the opinion of the veterinarian it would be unable to lead a healthy and comfortable life.
12. Home inspections to be conducted by companion welfare organisations at a reasonable price so that the Breeding fraternity support animal welfare
13. All animals must be healthy at time of going to a new home with breeders responsible for their continued health up to two weeks after the relocation.
14. Licensed breeders should be prohibited from selling animals to commercial wholesalers or retail pet dealers.

Questionable Ethics of the Breeding Imperative

Breeders typically fall into one of four types:

1. The Home breeder who somehow did not know that companion animals will mate and give birth to a litter if they are not sterilised, or the ones who want Sophie to have 'just one litter'. Equally ignorant, these two types will add to the problem of overpopulation and will also dump puppies with their local shelter or just dump them anywhere. They also don't know that puppies need to be vaccinated and they often don't have the Mom sterilised after the first batch because they don't have enough money or intelligence or willingness. They also typically advertise

their animals 'free to a good home', thereby inviting those involved in dog fighting to pick up their latest bait dog or fighter.

2. The Commercial breeder who does what they do for money, knowing that there will always be people gullible and ignorant enough to buy pets from pet shops or on the Internet or from a newspaper ad. This type sees the animal as a commodity, nothing more, and any expenditure on vaccinations or vets is just an added cost they can do without. They will breed with their females until they die, with no consideration for their well-being. They knowingly add to the overpopulation but invariably have a deal with a pet shop owner or a media channel so they see only their opportunity and not the consequences of a market that is oversubscribed with animals. They will sell to anyone as long as they get paid; they could care less whether the person they sell to will look after or wants to breed with the animal.
3. The Pedigreed Breeder who subscribes to the maxim that a purebred is a 'better' dog and is very proud of their maintenance of that myth, while at the same time reducing the biological diversity of the species and bringing animals into being that are deformed, suffer from hereditary disease, or have compromised immune systems, and all for the sake of propping up the fragile and desperate egos of their buyers who need to gain acceptance and admiration vicariously through their animals. They claim to be acting for the good of the breed while insisting on remaining ignorant about population genetics and believe that a breeder acting in isolation can enhance the breed, amongst other nonsense. To this breeder, a dog with 'papers' is a good dog. The rest are inferior - mutts, mongrels, children of a lesser god.
4. The Ethical Breeder who understands that diversity is strength, that the good of the species may require outcrossing, who consults with a geneticist and is selective as to who will provide a home for the offspring. The Ethical Breeder is less concerned about breed identity than about health, function, and quality of life, so they breed to develop purposeful traits, not conformance to a petrified cosmetic standard.

In my view, only the fourth one should exist. The rest should be eradicated through legislation and regulation.

If only registered breeders bred registered, pedigreed dogs, and this was the only breeding allowed, then we would be guilty of chronic animal cruelty, since the process of breeding within a narrowly-confined genetic footprint MUST have a negative effect on biological diversity and the natural consequence of that is hereditary defects and reduction of the effectiveness of the immune system - in short, we consign the species to discomfort and pain and increased risk of disease. So NO, I don't support the common call for allowing 'registered' and 'ethical' breeders (if there is such a thing) free rein. It's time we saw that the entire process is contrary to animal welfare.

Derek du Toit.

Hopeful Foundation (http://www.companions.org.za)
On Facebook: https://www.facebook.com/derek.dutoit

More Reading:

http://www.instituteofcaninebiology.org/ The Institute of Canine Biology is an independent, international consortium of outstanding scientists that are working with the global network of dog breeders to manage and reduce the incidence of genetic disorders in dogs.

http://pedigreedogsexposed.blogspot.com/ From the makers of Pedigree Dogs Exposed, the latest news and views regarding inherited disorders and conformation issues in purebred dogs.

http://www.seppalakennels.com/articles/purebred-dog-breeds-21st-century1.htm Purebred Dog Breeds into the Twenty-First Century: Achieving Genetic Health for Our Dogs

http://siriusdog.com/bell-pedigree-analysis-genetic-diversity.htm The Ins and Outs of Pedigree Analysis, Genetic Diversity, and Genetic Disease Control

http://www.dogenes.com/diverse.html The Canine Diversity Project is an attempt to acquaint breeders of domesticated Canidae (dogs) with the dangers of inbreeding and the overuse of popular sires.

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1950109/ Canadian Veterinary Journal: A new direction for kennel club regulations and breed standards

http://www.breedingfordiversity.com/ Conservation is a constant battle with limited resources. Depletion of genetic diversity is the thin end of the wedge of extinction. This website provides guidance for anyone involved in preservation of an endangered species of rare...

http://en.wikipedia.org/wiki/Dog_breed Classification, history and development of dog breeds.

I write booklets like this in order to educate and inform, and I don't sell them, I give them away.

If you think this work is important, please consider making a donation. I have no other source of income; this is what I do.

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Glossary

i **Cynology** is the study of matters related to canines or domestic dogs.

ii**Phenotype** The expressed characteristics, or an expressed character of an organism due to its genotype.

iii**Mitochondrial DNA** (mtDNA) - The genetic material found in mitochondria, the organelles that generate energy for the cell. Not inherited in the same fashion as nucleic DNA.

iv**Genotype** - The genetic makeup of an individual.

v**Heterogeneous** - diverse in character or content

vi**Genome** The totality of all the genetic material (deoxyribonucleic acid or DNA) in an organism, organised in a precise, though by no means fixed or constant way. In the case of viruses, most of them will have ribonucleic acid or RNA as the genetic material.

vii**Allele** - A different form of a gene at a particular locus. The characteristics of a single copy of a specific gene or of a single copy of a specific location on a chromosome. For example, one copy of a specific STR region might have 10 repeats, while the other copy might have 11 repeats. These would represent two alleles of that STR region.

viiiThe variation in alleles is critical to the survival of a species and allows organisms to adapt to changing environments. Allele frequency, or the frequency at which alleles are found at any locus of interest, is used to estimate the frequency of a given genetic profile. Every diploid cell has two alleles, one inherited from each parent. If an individual has two different alleles at a specific locus, the individual is **heterozygous** at that locus; if the two alleles are the same, the individual is **homozygous**. Allele frequency is used to characterize the genetic diversity, or richness of the gene pool, in a population. Populations need variation. The measure of the amount of heterozygosity across loci can be used as a general indicator of the amount of genetic variability.

ix**Population Genetics** - The study of the distribution of genes in populations and of how the frequencies of genes and genotypes are maintained or changed.

x**Autosomal DNA** - The genetic material found in any nucleated cell, excluding sex chromosomes

xi**Assortative Mating** - Assortative mating is a method of selective breeding capable of creating homozygosity for desired traits without having as great an effect on overall homozygosity as does inbreeding. It consists of mating phenotypically similar individuals that are not closely related. This method of selective breeding would be capable of maintaining a reasonable range of breed type in a balanced-heterozygosity breed system with an open studbook