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## ***"BRACKETT'S FORMULA"***

by

Carmen L. Battaglia

By the early 1950's", Lloyd C. Brackett had become a legend in his own time. In part because of the quality of the dogs he produced and in part because of his candor when addressing problems related to the breeding of canines. He had much to say about the selection of sires, how to correct problems and how to make improvements. Brackett was considered one of the fathers of the German Shepherd breed in the United States. At the time of his death he was the oldest living continuous fancier of the breed (since 1912). His kennel was called Long Worth and he is remembered throughout the dog world for his theories about breeding methods. Brackett was well read and a quick learner. Through his writings he shed light on the confusion and misunderstandings associated with line and inbreeding. One of his greatest achievements was to have produced over 90 champions in twelve years.

All of his methods and ideas were not new. For example, he combined the study of pedigrees with the results they produced. After years of watching what combinations produced the better offspring he refined his ideas about how to select breeding partners. Out of these experiences came a formula that later he would make him famous. The formula was not new but his ideas about how to use it attracted attention. Breeders of domestic animals had used it for years. It relied on the principles of line and inbreeding. But it was Brackett and his approach to planned breedings that made it well known. Brackett believed in pedigree analysis, litter evaluation, the use of line and inbreeding and a record system that was easy to use. Those ideas are what set him apart from others who did little more than practice the art of breeding. While Brackett is best known for his emphasis on the use of line breeding he was not afraid to inbreed if the situation dictated it. Brackett believed that it made no sense to go forward with breeding before the needed information about the sire and dam had been collected. He placed great emphasis on health, temperament and breed

characteristics. His planned breedings were based on the results that occurred in his pups. In other words, he learned from his mistakes.

Brackett understood the value of using quality dogs that were related to each other. This approach allowed him to concentrate the genes needed to produce desired traits. His techniques for reducing error and improving quality focused on the careful selection of breeding partners. They were central to maintaining and improving specific traits while at the same time reducing disease and other unwanted problems. Brackett became famous for breeding quality dogs with consistent type. His strategy relied on a series of breedings using relatives. Often times he was quoted as saying, "never outcross when things seem to be going well, do it only as an experiment or when some fault or faults cannot be eliminated". He was careful to study each stud dog and their offspring, eliminating those who did not measure up and those who produced faults. Close inspection of his pedigrees show that many of his sires were themselves inbred or line bred and most were usually related in some way to the bitches in his breeding program. Brackett's success helped to make line breeding popular. He demonstrated how to make improvements by retaining a common pool of genes through the use of related dogs. He believed that out-crossing was the least desirable method because it introduced new genes into his pedigrees, which in turn produced differences and genetic variations among the offspring.

It has been well documented that two full-brothers usually do not have the same genetic potential even though they both come from the same two parents. One sibling might inherit one set of genes from his father and the other might get a different set from an uncle through his mother. While each pup always receives half of its genes from the sire and half from the dam it does not mean that they each will get the same set of genes. This explains why littermates do not always look alike or have the same capacity to produce quality. Brackett kept detailed records on the differences between siblings. He was well read on this subject and occasionally mentioned the works of Aristotle and Mendel in his articles. In practice they all shared similar beliefs.

Brackett was usually quick to comment on what he observed and how things could be improved. In a statement taken from one of his articles, he said, "whenever two or three dog fanciers get together there is almost sure to be talk about linebreeding. The term may be used without anyone of them having a real understanding of what it means. There seems to be much confusion even in the minds of experienced dog breeders about the actual meaning of the terms and how to differentiate between them". He referred to this dilemma in several articles in a variety of scenarios. He once raised several questions when he heard

two breeders discussing a line breeding. He referred to the breeder who recommended it with the statement, “linebred to what? He knew that the answer to the question would be a measure of what the breeder actually knew about the term. It was his way of evaluating the wisdom of others. He knew that line breeding can mean many things. For example, a dog can be line bred on its sire's side of the pedigree or on its dam's side. Those who use the term usually understand it to mean only that the dogs are related to each other.

Brackett was concerned about the future of breeding better dogs and the lack of breeder education programs. He believed that “the majority of dog breeders formulate no breeding plan and seldom if ever, when making a mating consider how or what they will mate any of the resultant progeny.”

The formula Brackett preferred concentrated genes in a pedigree. He did this by placing emphasis on the sire of the sire. In Figure 1, notice that the same dog appears on the sire and the dam's side of the pedigree. Brackett liked to use one important dog and have it appear twice in a three-generation pedigree. The basic formula he preferred can be stated as follows, "Let the sire of the sire become the grand sire on the dam's side". Said another way, “let the father's father become the mothers grandfather”.

**FIGURE 1 PEDIGREE OF A BRACKETT STUD DOG**



The sire that is circled appears on both sides of the pedigree. Because it is the same dog it must be an outstanding dog free of disease because his genes are being preserved on both sides of the pedigree and carried forward to the new stud dog.

Brackett knew that Mendel was able to consistently predict the traits in his offspring especially when he knew what characteristics were carried in the pedigrees of the parents. They both knew that when two individuals with known ancestry are bred there is more certainty about what they are likely to produce than when there is missing information about them. Mendel demonstrated these principles in the 1860's. Brackett used these ideas because he knew that the unexpected is more likely to occur when there are gaps in information about the ancestors and their littermates. While heredity has the tendency to produce resemblance's, the science of genetics teaches us to search beneath the superficial resemblances of the phenotypes for the important clues in the genotypes. Thus, when an individual is said to be dominant for a trait, it should be taken to mean that a large percentage of their offspring were observed to have a certain trait. It does not mean that all of their offspring will have that trait. Figure 2 illustrates how Brackett would approach breeding a hypothetical bitch called "A". The Stick Dog Color Chart pedigree described in Battaglia's book, *Breeding Better Dogs* is used to illustrate Brackett's approach. The stick dog pedigree illustrates how the strengths, weaknesses and trends in a pedigree can be recorded and then easily coded. Notice that each stick figure is drawn with seven structural parts. Using the breed standard each of the seven structural parts are color coded to show there quality or lack thereof. The color-codes for quality:

COLOR	RANK	QUALITY
Blue	First Place	Ideal based on the standard
Black	Second Place	Less than ideal based on the standard
Red	Third Place	Faulty based on the standard
Gray	Fourth Place	Faulty based on the standard

Figure 2 illustrates how Brackett would begin collecting information about "A". The notes that were collected about "A" indicate there are warning signals about several traits. Circles around a trait or ancestor are used to show what information is missing.

A breeder's notes might read:

*"Her parents were of good quality, one of her four brothers was dysplastic, another a monorcid. Two others had missing premolars, one sister was white. All six of her littermates were of average quality".*

It must be remembered that the value of a bitch must also be determined by what she has produced. The breeder's notes about her pups might read: *“Her first breeding was to a quality dog with an open pedigree. All four of her pups were of poor quality, one had a disqualifying color; two others had an undershot jaw, one was dysplastic. Her second breeding was a line breeding to another quality dog. This dog was related to her sire. Two of eight pups died of heart disease, one was diagnosed with clinical hip dysplasia, and two others had missing pre molars“*. The summary notes about bitch “A” are useful because they present an overview of the bitches qualities.

**FIGURE 2 STICK DOG PEDIGREE**



Note 1. First breeding, N=4, to a sire with an open pedigree. Pups produced: 1 with a white coat, 2 with undershot jaws, 1 dysplastic, and 4 of poor quality

Note 2. Second breeding, N=5, A line breeding. The pups: 2 of 8 died of heart problems, 2 had missing pre molars, and 1 was dysplastic, all of average quality

Note 3. Littermates of "A" (N=6): One monorchid, 2 had missing premolars, one sister was white. All average in quality

Note 4. The sire and dam of "A" - Both were of good quality but her dam only produced average offspring when bred to three different quality sires. Little is known about her sire.

Brackett and Mendel would have kept similar notes about the breeding partners of “A” and her offspring. After two breedings that produced unsuitable conformation, health problems and a disqualifying color (white), neither Brackett or Mendel would have bred her a third time even if a top-producing stud were available. Experience suggests that she should not be bred. However, if producing an occasional pup of some quality were the goal, this is still a risky bitch because her pedigree has the potential to produce unhealthy and mediocre

pups, many of which are likely to be carriers. Brackett was concerned about these bitches because he knew that most buyers want to know that their puppy is genetically healthy and that it will not become aggressive or so nervous that it will spook at anything unusual. One of the best reasons for not using "A" is that most of her pups are likely to become someone's house companion and require a lifetime of costly veterinary care.

### **Formula Variations**

Breeders quickly learned that variations could be made in Brackett's preferred formula based on the strengths and weaknesses of the bitch. While they were not as productive as the preferred formula they did work to concentrate the genes needed. The variations of the formula can be stated as follows: Let the sire of the sire be the grandsire of the dam on the sire's side instead of on the dam's side. Another variation let the sire be the result of either a full or half brother and sister mating and thus inbred. In each case selecting a mate for a faulty bitch such as "A" whose wide-open pedigree offers no strength would not be a good use of these formulas.

**The selection of breeding partners must always focus on correcting weaknesses in pedigrees and making improvements. To do other wise is a waste of time.**

### *References:*

- Battaglia, C. L. - Breeding Better Dogs, BEI Publications, Atlanta, GA 1986*  
*Bell, Jerold S. "Choosing Wisely", AKC Gazette, August 2000, Vol. 117, Number 8, p-51.*  
*Bell, Jerold, S. "Developing Healthy Breeding programs", Canine Health Conformance, AKC Canine Health Foundation, Oct. 15-17,1999. St. Louis MO.*  
*Brackett, Lloyd, C. "Planned Breeding," Dog World Magazine, Chicago IL, 1961.*  
*Hedhammer, Willis, Malcomb, "Breeding Dogs" Canine Health Conference, AKC Canine health Conference, Oct. 15-17, 1999. St. Louis, MO.*

### **ABOUT THE AUTHOR**

*Carmen L Battaglia holds a Ph.D. and Masters Degree from Florida State University. As an AKC judge, researcher and writer, he has been a leader in promotion of breeding better dogs and has written many articles and several books. Dr. Battaglia is also a popular TV and radio talk show speaker. His seminars on breeding dogs, selecting sires and choosing puppies have been well received by the breed clubs all over the country. Those interested in learning more about his articles and seminars should visit the website <http://www.breedingbetterdogs.com>*