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DOWN TO A SCIENCE:
Combating Breed Discriminatory Litigation with *Frye, Daubert,* and Rule 702[1]

"Clothes make the man. Naked people have little or no influence on society."
– Mark Twain (1835-1910)

Outward appearances often deceive, whether perception runs skin or fabric deep. Except for the overly enthusiastic guardian who has outfitted the pooch in latest canine *haute couture*, the vast majority of dogs walk, run, and play naked but for a collar. Visual first impressions synthesize numerous variables, such as head and muzzle shape, tail and ear length, coarseness and color of coat, sex, culminating in a judgment purporting to sum up everything the dog stands for, and is predestined to be, by the label of "breed."

One might be inclined to regard such designation as merely informational, an effort to catalog the majestic diversity of the canid world. Yet the legal consequences of the breed identification are neither innocent nor trivial.

Functioning much as a scarlet letter or insignia of scorn, the label "Rottweiler" may result in immediate imposition of restraints on control, banishment from the jurisdiction, or confiscation and death due to laws declaring dogs "potentially dangerous" or "dangerous" based exclusively on breed profiling.

Describing a dog as "American Staffordshire Terrier" may alone put the owner, caretaker, and even landlord on notice that the law regards him as inherently vicious and, therefore, civilly liable for injuries inflicted upon people and animals.

The designation "Pit Bull" may serve to enhance criminal penalties or furnish a necessary element to a crime that could result in imprisonment, fines, and forfeiture of the incident dog.

[1] This paper was made possible through a generous grant by the National Canine Research Council.

Resembling a "wolf hybrid" may mobilize condominium association directors to enforce CC&Rs that compel the unit owner to banish the hybrid or be fined, resulting in possible foreclosure.

Rumors of even looking like a pit bull could cause an insurance company to deny coverage for grievous harm inflicted from a bite by such dog. When labeling the dog a "pit bull," Plaintiffs' counsel risk pleading their clients out of recovery by giving the insurer a basis to reserve rights or refuse to indemnify under a breed-specific exclusion. And Defendants who boast their breed may unwittingly hoist themselves on their own petards. Carriers who seize upon the breed exclusion no doubt will invite hearty coverage and bad faith battles resulting in potential fee awards to prevailing insureds.

To avoid the above sequelae requires legal challenge at three levels:

First, the clarity and methodological soundness of the statute or rule setting the threshold to adversely label a dog by breed;

Second, the accuracy, precision, and competency of the individual making the adverse labeling decision against that threshold;

Third, the merit of the nexus between the adverse label and the governmental interest in public health and safety.

These challenges all turn on science – in *identification* of a dog's breed and *linking* that breed to some innate malevolence. Each requires vigorous scrutiny. This paper invites legal professionals to take heed of these scientific questions and to guide such endeavor. In so doing, they will aid the court in fairly adjudicating disputed matters of breed.

Unscientific Opinions

Prosecutors, landlords, homeowners and condominium associations, law enforcement officers, animal control officers, and plaintiffs' lawyers will bear the evidentiary onus of sullying the incident canine with genetic and phenotypic aspersions. Unless conceded by the dog guardian, visual identification by an animal control officer or law enforcement officer remains the most widely employed method by which to attempt same.

First: what is meaning of substantial or element?

A few preliminary remarks will assist the evaluation of breed specific legislation ("BSL")[2]. *First,* many such codes embrace AKC or UKC standards as inclusionary guidelines. These kennel clubs, however, establish standards for *purebreds* only (i.e., without any miscegenistic deviation in pedigree). A dog bred outside its genetic pool is no longer an unadulterated member of any specific "breed." *Second,* there is no breed recognized by any kennel club as a "pit bull." A legal term of art, it conflates several breed standards, often the

[2] Also known as breed discriminatory legislation ("BDL"). This paper uses the more common term BSL.

American Staffordshire Terrier, Staffordshire Bull Terrier, Bull Terrier, or American Pit Bull Terrier.[3]

In 1989, Miami-Dade County, Fla. defined a "pit bull dog" as "any dog which exhibits those distinguishing characteristics which:

> (1) Substantially conform to the standards established by the American Kennel Club for American Staffordshire Terriers or Staffordshire Bull Terriers; or (2) Substantially conform to the standards established by the United Kennel Club for American Pit Bull Terriers." Miami-Dade Cy. § 5-17.1(a) (1989).

To aid the public and law enforcement, the county incorporated the AKC and UKC standards as "Exhibit A" to the code. *Id*., § 5-17.1(b). But they made it clear that prohibition did not require conformational perfection. "Technical deficiencies in the dogs' conformance … shall not be construed to indicate that the subject dog is not a 'pit bull dog' under this article." *Id*., § 5-17.1(c). Concerningly, the code instructed that testimony by a "veterinarian, zoologist, animal behaviorist, or animal control officer that a particular dog exhibits distinguishing physical characteristics of a pit bull shall establish a rebuttable presumption that the dog is a pit bull." *Id*., § 5-17.1(d). The code then declared that the "pit bull" dog's "inbred propensity to attack other animals" and "danger posed to humans and animals alike … when running loose or while running together in a pack" requires uninterrupted secure confinement indoors or in a locked, four-sided, six-foot tall pen with conspicuous "Dangerous Dog" warning signs. *Id*., 5-17.2(a). Other requirements included muzzling and a 50'-no walk zone around public school grounds. *Id*., 5.17-2(b). "Pit bull" dogs were to be registered with animal control, along with furnished proof of $50,000 liability insurance or bond. *Id*., 5-17.3—4. But the County took it one step further by commanding every veterinary office, kennel, commercial breeder, commercial animal establishment, pet shop, and dog grooming business to post signs in three languages pronouncing the danger of pure and mixed breed pit bull dogs, the illegality to acquire one, and that failure to register, muzzle, confine, and insure same subjects a person to severe penalties. In an Orwellian stoke, it then encouraged families to rat out their neighbors by having them call animal control if "pit bull" dogs were in the vicinity. *Id*., 5-17.7(1).

When the dangerous dog investigator (invariably, an animal control officer, not a veterinarian, zoologist, or animal behaviorist) makes rounds through a Miami-Dade neighborhood in response to individuals fingering suspected "pit bull" dog harborers, how does he determine whether the suspect dog "substantially conforms" to one of the three breed standards? And what training and experience qualifies this reviewer to make such a conformation determination, particularly where his evaluation carries presumptive authority?

"Substantially" has no definition within the Miami-Dade Code. While one may challenge such language as void-for-vagueness, the likelihood of defeating the designation on that basis alone remains slim. For while the code itself may not furnish the requisite clarity, courts routinely invoke the common dictionary definition and render the ordinance valid. However, even using terms like "substantially" or "predominantly" can still prove fatal if no attempt is made to specifically identify the prohibited breed, as occurred in *Amer. Dog Owners Assoc., Inc.*

[3] BSL has been known to include the American Bulldog, Presa de Canario, and other Molossoid breeds.

v. City of Des Moines, 469 N.W.2d 416 (Iowa 1991). In 1987, the Des Moines Municipal Code, ch. 7, subch. 2, §§ 7-13, (vi)-(x) defined "vicious dog" to include:

> (vi) Staffordshire terrier breed of dog; or
>
> (vii) The American pit bull terrier breed of dog; or
>
> (viii) The American Staffordshire terrier breed of dog; or
>
> (ix) Dogs of mixed breed or of other breeds than above listed which breed or mixed breed is known as pit bulls, pit bull dogs or pit bull terriers; or
>
> (x) Any dog which has the appearance and characteristics of being predominately of the breeds of Staffordshire terrier, American pit bull terrier, American Staffordshire terrier; any other breed commonly known as pit bulls, pit bull dogs or pit bull terriers, or combination of any of these breeds.

In severing (ix) and the second clause of (x) as unconstitutionally vague, the Iowa Supreme Court reasoned that reference to dogs "known as" or "commonly known as" pit bulls, pit bull dogs, or pit bull terriers, according to unknown persons and unknown standards, would confuse the public and grant enforcement personnel unbridled subjective discretion. *Id.*, at 418. However, the first clause of (x) passed constitutional muster, as the use of the word "predominately" came in the context of specific breeds to which one may consult published standards.

Litigation Tip: Proportion matters. Whether stated quantitatively (e.g., 25%, 50%, two-thirds) or qualitatively (e.g., substantially, predominantly), the proportional adverb seeks to define which of the crossbred canine masses fall within the rule or regulation's ambit. Where no such modifying term can be found, one should restrict its scope to only purebreds. For instance, the following policy came out of a homeowners association in King County, Wash.:

> For purposes of this Policy, the term "pit bull dog" means any of the following: Staffordshire Bull Terrier, American Staffordshire Terrier; American Pit Bull Terrier; any dog which has been registered at any time as a Pit Bull Terrier; any dog which has the appearance of being predominantly of the breed of dogs known as Staffordshire Bull Terrier, American Staffordshire Terrier, American Pit Bull Terrier. A dog shall be deemed to have the "appearance of being predominantly of the breed of dogs" named herein if the dog exhibits the physical characteristics which substantially conform to the standards established by the American Kennel Club or the United Kennel Club for any of these breeds.

In many respects, the labeling convention seen in this Policy resembles that found in antidiscrimination law. For instance, the Americans with Disabilities Act defines a qualified disabled individual deserving of federal law protection as one who is physically or mentally impaired, has a record of being so impaired, or is regarded as having a disability (whether she has one or not). Analogizing "pit bull" status to a disability, then, the first part of this Policy speaks to those who are impaired; the second to those with a record of being impaired; and the

third to those regarded as being impaired. Structural interpretation of the entire policy demonstrates that Part One addresses purebreds only (compare to Part Three and its discussion of "predominantly" and "substantially"), as does Part Two (note that it does not say registered as a Pit Bull Terrier *mix* or *part* Pit Bull Terrier). Part Three drapes the prohibition over crossbreds but without regard for actual genetic content. The phrase "appearance of being" explicitly disregards whether the dog is actually one of the identified breeds. Looking like a duck suffices. Thus, a dog with no genetic history as a "pit bull" dog might be banned if regarded as one according to strictly phenotypic characteristics. Accordingly, a DNA test that proves no "pit bull" dog composition might still run afoul of this rule.

In *State v. Lee*, 45 Kan.App.2d 1001, 257 P.3d 799 (2011), the defendant argued that the failure to define "predominantly" proved fatal to the ordinance. His attempt to distinguish the City of Kansas City's ordinance from the City of Overland Park Police Department's definition as "more than fifty percent" mattered not to the appellate court, since "predominantly" is a "common term used as an adverb and defined by the dictionary to mean 'for the most part' or 'mainly.'" *Id.,* at 1009; see also *Hearn v. City of Overland Park,* 244 Kan. 638 (1989). Thus, where a rule or regulation fails to include such adverbial limitation or chooses ambiguous proportional language, the practitioner should break out the dictionary and prepare to argue void for vagueness or strict construction based on the rule of lenity or forfeiture.

Where codes do not use the terms "substantially" or "predominantly," but instead speak of the word "element," as used in the phrase "an element of its breeding … so as to be identifiable as partially of the breed," as found in the City of Yakima, Wash. Code § 6.18.010, for instance, a vagueness challenge remains viable for a few reasons.

The term element means a fundamental, essential, or irreducible constituent of a composite entity – as in the 102 elements found in the Periodic Table. An element "of breeding" suggests the existence of a single genetic component as in a heritable trait, trait set, or partial DNA fingerprint, which may or may not be physically expressed. Read in isolation, it could thus read so expansively as to prohibit a dog with one confirmed genetic characteristic of the prohibited breed. On the other hand, the words "of breeding" could be used to distinguish those dogs who resemble the prohibited breed for reasons other than by consanguinity – such as surgical alteration, disease, defect, or illness.

However, the connection between the phrase "an element of breeding" and "identifiable as partially" through the bridge "so as to be" serves to restrict such an interpretation in two ways: (1) the adverb "partially" denotes a quantity more than merely a tiny fraction but less than the entirety (in other words, between 1% and 99%); and (2) the adjective "identifiable" suggests capable of being distinguished or recognized but does not specify the mode of identification – whether genetic, visual, documentary evidence, or all. The resulting quagmire of vagary warrants close examination.

Second: what is accuracy of examiner?

As with obscenity, jurists profess to know it (here, a "pit bull" dog) when they see it. But how does one test the integrity of those epistemological moorings? Specifically, what happens

when a court seeks to qualify a law enforcement officer as an expert in "pit bull" dog identification, and then allows him to state that your client's dog substantially conforms to the breed standard of an American Staffordshire Terrier? In *Cardelle v. Miami-Dade Code Enforcement,* precisely this happened.

A. The Lesson of *Cardelle*

Hearing Examiner Alfredo Bared allowed Officer Fernando Casadevall to testify that Bertha Cardelle's dog Kitty, while admittedly a mixed breed, but a dog never accused of aggressively threatening any person or animal,met the definition of a "pit bull" in having physically exhibited more than fifty percent of the agglomeration of traits associated with the American Staffordshire Terrier, Staffordshire Bull Terrier, and American Pit Bull Terrier. Accordingly, Off. Casadevall subjected her to the restraints discussed above. He utilized a *"Pit Bull" Dog Breed Evaluation Form* consisting of a checklist with forty-seven conformation characteristics of the head, ears, eyes, muzzle, neck, shoulders, back, body, legs, tail, coat, and size. Off. Casadevall claimed to have performed the in-person, live evaluation of Kitty from a distance of two-and-a-half-feet over the course of half an hour, resulting in him scoring Kitty with thirty-seven inculpatory characteristics and ten exculpatory, resulting in a final figure of 78.7% conformation. In outlining his expertise, Off. Casadevall recited his certification with the Florida Animal Control Association, training in "pit bull" dog fighting, working with his father in treating animals (presumably his father was a veterinarian), breeding American Staffordshire Terriers, and working fifteen years with the county, seven of which he investigated "pit bull" dog complaints and cruelty calls.

Litigation Tip: When faced with such a proffered "expert," charged with applying kennel club breed standards, would it not seem that the best person to make such identification is an AKC or UKC conformation judge for those breeds[4]? The AKC weeds out conformation judges through an extensive application process. Requirements include: (1) completion of six stewarding assignments at AKC member or licensed shows in three years preceding application; (2) completion of six judging assignments at AKC sanctioned matches; (3) attendance at the Basic Judging Institute at least two years before applying for judge appointment; (4) meeting AKC occupational eligibility requirements; and (5) passing the Anatomy and Procedural Exams. The application is breed-specific.

Further, the applicant must either have twelve or more years of experience in exhibiting in conformation for at least one breed applied for, have bred or raised five or more litters on the applicant's premises for each breed, and have bred four or more champions in each breed. An alternative method permits the applicant to instead prove she has fifteen or more years of experience in conformation in at least one breed applied for and document four of eight components: (1) breeding and raising four litters on premises; (2) receipt of designation of AKC Breeder of Merit for the breed applied; (3) having bred at least two champion in the breed applied; (4) owning at least one dog in each breed applied who sired four champions; (5) owning or maintaining for the duration four dogs in each breed requested and who each earned championships while residing at the applicant's home; (6) personally exhibiting four dogs in each breed requested to their championships, earning all fifteen points and both majors; (7)

[4] UKC and AKC do not condone the use of their standards for enforcing breed discriminatory legislation.

personally exhibiting two dogs in each breed requested as specials for a minimum of two years or sixty shows; (8) documenting twenty-five years of experience exhibiting dogs in conformation. *Images.akc.org/pdf/rjl003.pdf.*

Recruiting AKC judges to BSL-commissioned panels may provide a suitable expert foundation to determine whether an incident canine adheres to a visual ideal of purity, but unless those judges have a system in place to calculate degrees or percentages of nonconformity, a municipality's quest to identify, label, and restrain dogs who closely resemble, *but are not*, purebreds will founder on the shoals of vagueness and due process. This is particularly so where the genetic fingerprint of even proven conformation champions registered as a specific breed will quite likely contain trace DNA from a non-registered breed. This is why many codes allow for some leeway by using such terms as "substantially" or "predominantly." A quantitative or qualitative index may assist in measuring the prohibitive proportion.

A Difference in Judging

However, AKC does not use a scorecard and assign points to each entrant. Rather, judges confer awards to the entrants who – compared *against one another* – most closely approximate the ideal. And since BSL does not judge incident dogs as a group (but instead one at a time), ring judging differs significantly from what occurs in the animal control truck or shelter run. See images.akc.org/pdf/rulebooks/REJ999.pdf.

In other words, animal control does not round up ten dogs in the neighborhood, trot them out one at a time with a handler, and then bestow a "Best in Breed" penalty. Rather, it views each in isolation against the breed standard. The methodological problem comes into clearer focus when one recognizes that the officer is tasked not with determining whether the dog is phenotypically *perfect* but whether it is phenotypically *passable*. Such focus is best described as prequalification, i.e., to see whether the dog can make the cut to even enter the show ring. Yet this furnishes yet another distinction relative to mixed breeds subject to BSL, for only avowed purebreds may compete in AKC conformation shows. Hence, all entrants may compete unless disqualified due to poor training, viciousness, dyeing, or specific disqualifications found within the breed standard itself (such as height or weight).

Remember: AKC judges do not need to decide whether the entrant *is* a particular breed since mere entry into the conformation ring constitutes such an admission by the owner. Instead, the judges decide which of the entrants most conforms to the AKC ideal standard (in other words, all are presumed to substantially conform to the breed standard, but some more than others). For a description of the history, standard, and breed exam for the American Staffordshire Terrier (and other breeds), go to www.akc.org/judges/guides.

Behavioral and Kinesiological Characteristics

It should also be noted that the AKC standard depends on *behavioral* presentation and *gait* as well, not simply static *physical* characteristics. For instance, the American Staffordshire Terrier Breed Standard speaks of "General Impression" for the breed as follows:

General Impression

> The American Staffordshire Terrier should give the impression of great strength for his size, a well put-together dog, muscular, but agile and graceful, keenly alive to his surroundings. He should be stocky, not long-legged or racy in outline. His courage is proverbial.

Accordingly, the judge must determine the dog's agility, grace, aliveness, and courage. If animal control does not purport to test for such behavioral qualities, then the breed declaration should be challenged for lack of foundation. And because the AKC does not articulate a scientifically grounded method to assess this "General Impression," to the extent the law or rule at issue incorporates the AKC breed standard by reference, the breed declaration should be challenged on that additional ground as well, mindful further that environment may contaminate behavior. After all, a dog chased down, snared by a catch pole, and stuffed in a kennel will not behave the same way a competition show dog will in the ring, accompanied by her known and steady handler. Indeed, an impounded dog will not show agility or grace.

The Bull Terrier Breed Standard bespeaks "keen determin[ation] and intelligent expression, full of fire but of sweet disposition and amenable to discipline." The Staffordshire Bull Terrier must have a "Temperament" that shows "character of indomitable courage, high intelligence, and tenacity … coupled with its affection for its friends, and children in particular, its off-duty quietness and trustworthy stability[.]" www.akc.org/breeds/staffordshire_bull_terrier/breed_standard.cfm. How precisely will animal control test for these behavioral traits? Interrogate and test, then move to disqualify the purported animal control "expert."

Additionally, breed standards are based on kinesiology (or study of movement as it relates to physical activity, exercise, sport). Staffordshire Bull Terriers must possess "Gait" that is:

> Free, powerful and agile with economy of effort. Legs moving parallel when viewed from front or rear. Discernible drive from hind legs.

Accordingly, if animal control does not evaluate the incident dog in motion, that serves as yet another basis to challenge the designation.

Disqualifications and Faults

Because every breed standard contains Disqualifications, those should be invoked as an absolute bar to an adverse declaration. For instance, if a bull terrier has "blue eyes" or "is predominantly white." www.akc.org/breeds/bull_terrier/breed_standard.cfm. Also look to Faults which, while not serving as an absolute bar, will no doubt undermine or diminish the contention that the dog is identifiable as a member of a prohibited breed or substantially conforming to same. For instance, an American Staffordshire Terrier with "Dudley nose, light or pink eyes, tail too long or badly carried, undershot or overshot mouth" will be penalized. www.akc.org/breeds/american_staffordshire_terrier/breed_standard.cfm.

In light of the above, would Casadevall's credentials pass AKC muster? Hardly. And the Florida Circuit Court (Appellate Division) recognized as much in its decision of Mar. 30, 2010, found at 17 Fla. L. Weekly Supp. 923a, pet. Denied, 44 So.3d 1183 (2010), where it concluded:

> The first violation of due process concerns the hearing officer's erroneous qualification of Officer Casadevall as an expert in "pit bull dog" identification. "[A]cceptance or rejection of expert testimony is a matter within the sound discretion of the lower tribunal, and such decision will not be overturned on appeal absent a showing of abuse of discretion." Gray v. Russell Corp., 681 So.2d 310, 316 (Fla. 1st DCA 1996). The U.S. Supreme Court in Daubert v. Merrell Dow Pharm., 509 U.S. 579, 594 (1993), set forth a series of criteria against which to measure scientific or technical methods and principles, which include: testing; peer review and publication; potential error rates; standards of operation; and general acceptance in the relevant community. Officer Casadevell offered nothing about the process of measuring the data for error rates, because no such statistics are kept; no objective standards for comparison exist. This Court finds that the County applies a subjective criteria and there is little or no peer review.
>
> The hearing officer erroneously concluded, "This is a with 15 years and all of this background, so I would qualify as an expert witness."

Cardelle, at *5-*6. In dissipating the undeserved aura of veracity the Hearing Officer bestowed upon Casadevall, the court observed:

1. Casedevall freely admitted that while he performed over 1000 "pit bull" dog inspections, he did nothing to gather data, perform quality control, or validate existing data;
2. Casadevall did not have his inspections peer reviewed; and
3. Casadevall admitted that verification of his "pit bull" dog identifications falls outside his specialization as an animal control officer.

In other words, quantity does not create quality. *Id.,* at *7-*8. This 2-1 decision remanded for a new hearing that would likely result in reversal of Kitty's designation, for without Casadevall's testimony given any weight, the examiner could only consider that of Cardelle's veterinary experts Drs. Tess Wenzl and Manuel Morales, who both did not identify Kitty as a "pit-bull" dog and stated Kitty did not conform to the breed standards. *Id.,* at *3-*4, *13. As discussed below, however, it would appear that Drs. Wenzl and Morales would also suffer from the same criticisms leveled at Ofc. Casadevall.

B. The Lesson of *Michigan Wolfdog Assoc.*

In *Michigan Wolfdog Assoc. v. St. Clair Cy.,* 122 F.Supp.2d 794 (E.D.Mich.2000), admitted owners of wolf-dog mixes challenged Michigan's Wolf-Dog Cross Act, M.C.L. § 287.1001-287.1023 as void-for-vagueness in lacking a qualitative or quantitative measure by which to determine the prohibited proportion of wolf or wolf-dog cross genetic material and, further, that the definitions were scientifically flawed (i.e., neither appearance nor behavior nor DNA test serves to distinguish wolf from dog). Plaintiffs' own exhibit undermined this position,

however. Prepared by the U.S. American Wolfdog Association, their own expert Dr. Raymond Pierotti *could* identify wolf-dog crosses within 0.25%. That Plaintiffs admitted to owning crosses additionally hampered their argument. Still, they contended that the ordinary person could not make such a studied determination and, for that reason, the Act violated the Fourteenth Amendment.

Litigation Tip: facial challenges require proof that the ordinance in question cannot be applied constitutionally in any circumstance, a significant burden only made more onerous by holding the plaintiff to a beyond-a-reasonable-doubt standard. Most courts will only give strong consideration to the law as-applied to the petitioner, which happened here.

The Act defined wolf-dog cross as "a canid resulting from the breeding of any of the following: (i) A wolf with a dog; (ii) A wolf-dog cross with a wolf; (iii) A wolf-dog cross with a dog; (iv) A wolf-dog cross with a wolf-dog cross." M.C.L. § 287.1002(p). The code further defined "dog" and "wolf." M.C.L. § 287.1002(d, o). Despite imposing criminal penalties for violation of the Act, meriting stricter scrutiny, the district court found that Plaintiffs did not have a substantial likelihood of prevailing in their argument that the Act was unconstitutional and dismissed the notion that some "mathematical certainty" was required. *Id.,* at 804 (citing to several cases that rejected similar vagueness challenges); but see *People v. Howard,* No. 93-2722, slip. Op. at 2 (Mich.Dist.Ct. Mar. 18, 1996)(Benson, J.)(acquitting man charged under at St. Joseph County animal ordinance for owning an alleged "wolf-hybrid type animal" due to a vague prohibition against possessing a "wild/exotic animal").

Though an unfavorable outcome, the decision identified features of the Act that might serve to distinguish it from other BSL. For instance, the Act states that if "the owner of the canid is unable or unwilling to verify that the canid is a wolf-dog cross, the law enforcement office, before enforcing this act, shall consult with an expert on wolf-dog cross identification," and that such expert "shall consider all relevant aspects of identification, such as behavioral characteristics, and morphological traits, including gait, and any necropsy results." M.C.L. § 287.1013(3). Said expert must have "cumulatively, at least 10 years of training and field experience in wolf and wolf-dog cross behavioral and morphological characteristics and who is recognized as an expert at the state and national levels by others in the same field." M.C.L. § 287.1002(e). The reader may wish to cite this case for the proposition that the absence of expert-based pre-enforcement identification weighs against constitutionality.

C. *Admissibility of Scientific Evidence in light of Frye, Daubert, and ER 702*

Cardelle and *Michigan Wolfdog Association* illustrate the vital importance of examining the mechanical underpinnings of an adverse identification. Such an approach has fomented debate in other contexts, as in the use of visual analysis of spectrograms ("voiceprints" or "voicegrams") to convict a man of first-degree murder, kidnapping, and extortion (see *Com. v. Lykus,* 20 Mass.L.Rptr. 598 (Mass.Super.2005, unpub.)), at *3). Though *Lykus* did not permit a new trial based on the trial judge's decision to permit testimony from a lieutenant who claimed that the defendant's voice exemplar matched that of the recorded ransom telephone call, it examined the shifting standard for admissibility of scientific evidence.

In 1973, Massachusetts followed *Frye v. U.S.,* 293 F. 1013 (D.C.Cir.1923), a case permitting a jury or judge to consider only those opinions founded on generally accepted methodologies deemed reliable within the relevant field: those methods clamoring for, but not yet achieving, majority acceptance would fail *Frye.* In *Frye,* the federal circuit court determined whether to permit a polygraph test result as evidence by setting forth this principle:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while the courts will go a long way in admitting experimental testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made *must be sufficiently established to have gained general acceptance* in the particular field in which it belongs.

Id., at 47 (emphasis added). Presently, only a handful of states apply the *Frye* standard. The rest, and all federal courts, use *Daubert.*

Seven decades after *Frye,* the United States Supreme Court decided *Daubert v. Merrell Dow Pharm., Inc.,* 509 U.S. 579 (1993). It provided an alternative to the *Frye* general acceptance test where the opinion could otherwise be shown reliable or valid (i.e., even if still gaining adherents but not yet reaching the level of scientific consensus). Considerations included (a) the ability to test the theory or technique; (b) whether the theory or technique has undergone peer review or publication; (c) the known or potential error rate; (d) presence of standards to operate the technique; (e) and degree of general acceptance in the relevant scientific community.

In *Lykus,* the court discussed the effect of a post-conviction, 1979 report from the National Research Council's ("NRC"), titled *On the Theory and Practice of Voice Identification,* commissioned at the request of the FBI. It found that the "technical uncertainties concerning the present practice of voice identification are so great as to require that forensic applications be approached with great caution." *Id.,* at *12 (quoting *NRC Report,* at 2). The Report acknowledged that, though widely used, voiceprinting lacked a "solid theoretical basis of answers" regarding its scientific foundation and that it "probably fails the [*Frye*] test." *Id.,* at *14 (*Report,* at 42).

The reason? In 1979, voice identification science did not "stand on a thorough foundation of quantitative information describing its capabilities through forensic practice." *Id.* (Report at 69). Yet it is important not to misstate the Report's position on voiceprinting in the courtrooms: instead of calling for its prohibition, the NRC instead urged that courts instruct juries on the possibility of error inherent in deciding whether two voices match. *Lykus* provides a suitable point of comparison in answering questions of admissibility under *Frye* and *Daubert* as to the science of breed identification (visual or genetic), as well as the purported link between breed and aggression.

Over a decade ago, the Washington Court of Appeals decided *State v. Leuluaialii,* holding that the state of canine DNA science was not sufficiently developed or recognized as scientifically valid to warrant its use in a murder trial where the prosecution attempted to place

the defendant at the scene by matching dog hair found on his jacket to the deceased canine. Gang members George Leuluaialii and Kenneth Tuilefano were convicted of two counts of aggravated murder in the first degree and first degree animal cruelty based on allegations that they killed Chief, a part "pit bull" dog, Jay Johnson, and Raquel Rivera while searching their home for money and drugs. To overcome their alibi of absence during the crimes, the State introduced forensic canine hair DNA evidence tying both defendants to the scene. The strongest DNA evidence boasted a 9-marker (of 10) match, with a probability that another dog shared Chief's DNA profile of 1 in 18 billion. Leuluaialii and Tuilefano challenged the admissibility of the canine DNA evidence, claiming that this form of identification was unreliable and suffered from numerous procedural and statistical limitations. The trial court admitted the evidence without a *Frye* hearing (to determine its probativity or general acceptance in the scientific community). Defendants appealed, asserting that admission of forensic canine DNA evidence constituted reversible error.

Unanimously, the Washington Court of Appeals deemed dog DNA evidence unreliable and inadmissible, though, in this instance, the evidentiary gaffe was harmless, so the convictions remained. In astounding detail, the Court surveyed the science of human DNA identification along with principles of genetic diversity in canines, concluding that while they "have genetic diversity similar to that observed in humans" with highly polymorphic "loci and alleles that might be appropriate for forensic use," the court lacked faith that all loci used in the case were polymorphic. It also questioned the accuracy of the frequency estimates upon which the 1 in 18 billion probability was calculated. Since *Leuluailii,* however,[5] the state of science has improved, as noted in *Illinois v. Stover*, 791 N.E.2d 568 (Ill.App.2003)(affirming order releasing cat hair for DNA test); *Comm v. Treiber*, 874 A.2d 26, 27-33 (Pa.2005)(allowing consideration of canine DNA to incriminate defendant for murder of daughter); *Arizona v. Bogan*, 905 P.2d 515, 520 (Ariz.1995)(discussing plant DNA under *Frye*). *See also* Antoinette E. Marsh, *Paw and Order: Using Animal DNA as Forensic Evidence –Not Yet Ready for Prime Time,* 3 J. Animal L. & Ethics 53 (2009); and Katie Bray Barnett, *Breed Discriminatory Legislation: How DNA Will Remedy the Unfairness,* 4 J. Animal L. & Ethics 161 (2011).

Cautionary observation: DNA-based breed identification products have enjoyed tremendous popularity of late, and embracing them to prove or disprove a dog's status under BSL may, in the individual animal's case, result in acquittal or release. However, to date no court has actually entertained a *Frye* or *Daubert* motion challenging its accuracy and reliability. Among professionals, however, the tests have been regarded as a gold standard and far more suitable to the task than visual identification. Yet such reliance may establish harmful precedent. If such tests garner general acceptance among scientists and judges, they will quickly become a litmus test and municipalities may go so far as compelling the dog owner to authorize release of blood draws or buccal swabs. Results could incriminate both canine and owner.

Whether such mandatory swabbing or blood draw violates the Fourth and Fifth Amendments to the United States Constitution remains to be seen. Where BSL does not deem certain breeds or as contraband, for which possession constitutes a crime, the Fifth Amendment right against self-incrimination would not apply, but the Fourth Amendment right against

[5] Note that the DNA methodology and database used for identity-matching in *Leuluailii* is not the same as that used for modern breed-matching. *See* US Patent No. 7729863 B2 (describing Mars DNA process).

unreasonable search and seizure might. Much will come down to at least seven legal questions: *first,* whether to ascribe a more protective legal standard to people versus canines generally, as "effects"; *second,* whether non- or minimally-invasive DNA sampling meaningfully interferes with the possessory rights of the dog (i.e., is it a "seizure"); *third,* whether DNA collection through venipuncture or swabbing constitutes an unreasonable "search" (see *Schmerber v. California,* 384 U.S. 757, 771 (1966)(blood test intrusion insignificant as test is commonplace, quantity of blood taken is minimal, and involves virtually no risk, trauma, or pain); *Nicholas v. Goord,* 430 F.3d 652, 65 n.5 (2nd Cir.2005)(buccal swab less invasive than blood draw); *fourth,* whether DNA processing and creation of a DNA profile constitutes an unreasonable "search"; *fifth,* whether the DNA collection may prove overly expansive by collecting "junk DNA" that might later be used to reveal traits and other genetic details unrelated to breed profiling; *sixth,* whether there is a right of privacy for dog owners in their dogs (it goes without saying that dogs themselves have no such right); and *seventh,* whether to treat canines as more akin to free citizens or detainees, arrestees, and parolees (who enjoy fewer protections under the Fourth Amendment, due in part to the federal and many state DNA collection laws; note also that suspicionless or "blanket" fingerprinting of all free citizens does violate the Fourth Amendment (*Hayes v. Florida,* 470 U.S. 811, 813-18 (1985))? *Cf. Friedman v. Boucher,* 580 F.3d 847 (9th Cir.2009)(finding that shackling detainee, chaining him to bench, forcibly opening his jaw and extracting DNA sample without warrant, court order, reasonable suspicion, or concern about facility security clearly violated Fourth Amendment rights); *U.S. v. Mitchell,* 652 F.3d 387 (3rd Cir.2011)(discussing constitutional implications of preconviction compulsory DNA extraction); Anna C. Henning, *Compulsory DNA Collection: A Fourth Amendment Analysis,* 7-5700 (R40077), Congressional Research Service (Feb. 16, 2010) www.fas.org/sgp/crs/misc/R40077pdf.

Litigation Tip: Litigators should be prepared to invoke ER 702, and the *Frye* or *Daubert* test applicable in the jurisdiction (a minority of states apply *Frye* in state court, while *Daubert* is the standard for all federal courts (FRE 702 supersedes *Frye*) and state courts that do not embrace *Frye*). Since turnabout is fair play, however, be prepared for the inevitable motion to disqualify a veterinarian who testifies to an exculpatory genetic identification.

To summarize, begin with an objection on grounds that the proffers of breed identification and nexus to aggression are inadmissible under ER 702, the rule limiting testimony by expert witnesses. In federal court, FRE 702 states:

> A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:
> **(a)** the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
> **(b)** the testimony is based on sufficient facts or data;
> **(c)** the testimony is the product of reliable principles and methods; and
> **(d)** the expert has reliably applied the principles and methods to the facts of the case.

State court analogs invariably embrace prong (a) but not all adopt (b) through (d). For instance, Wash.Evid.Rule 702 says:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

Oreg.Rev.Stat. 40.410 codifies ER 702 identically. Idaho R. Evid. 702 duplicates the Washington rule verbatim.

Next, seek a *Frye* or *Daubert* hearing to bar admission of such expert testimony.

Lastly, remember that the personal opinion of an expert witness, regardless of the impressiveness of credentials, is not admissible under ER 702, as "[A] trial court must 'determine whether the evidence is genuinely scientific, as distinct from being unscientific speculation offered by a genuine scientist.'" *Group Health Plan, Inc. v. Philip Morris, Inc.,* 188 F.Supp.2d 1122, 1131 (D.Minn.2002)(citations omitted). Focus on evidence-based conclusions rather than authority-based opinions. To learn more, read Terence M. Davidson & Christopher P. Guzelian, *Evidence-Based Medicine (EBM): The (Only) Means for Distinguishing Knowledge of Medical Causation from Expert Opinion in the Courtroom,* 47 Tort Trial & Ins. Prac. L.J. 741 (Wtr. 2012); Stephen Collier, *Breed-specific legislation and the pit bull terrier: Are the laws justified?,* 1 J. Vet. Beh: Clinical Applications and Res. 17, 17-22 (2006).

Third: what is nexus?

In 2012, the Maine Supreme Court decided *Morgan v. Marquis,* 50 A.3d 1 (Me. 2012). It refused to create a breed-specific absolute liability standard, remarking that the trial court correctly decided not to treat "pit bull" dogs as *per se* abnormally dangerous to the class of domestic dogs. Generalities as to "pit bull" dogs "are not sufficient to survive the Restatement section 509 test for common law strict liability because that test requires a showing that the Marquises knew that Beans was dangerous[.]" *Id.,* at 5. However, in deciding negligence, the jury was free to determine if breed enhanced the duty owed due to some propensity to bite and harm. *Id.,* at 4-5.

The last case to decide the question of rational basis has determined that a jury must resolve it. In *Dias v. City and County of Denver,* 567 F.3d 1169 (10th Cir 2009), the Tenth Circuit Court of Appeals reversed a Rule 12(b)(6) dismissal of plaintiffs' substantive due process claim, concluding that the allegations construed in the light most flattering to the plaintiffs urged the conclusion that the breed ban of the City of Denver was not rationally related to a legitimate government interest:

> Specifically, the plaintiffs contend that although pit bull bans sustained twenty years ago may have been justified by the then-existing body of knowledge, the state of science in 2009 is such that the bans are no longer rational.[FN12] This claim finds some support in the AKC and UKC standards themselves, to which the plaintiffs direct us. The official UKC breed standard for the American Pit Bull Terrier, for instance, ***1184** states that "[American Pit Bull Terriers] make

> excellent family companions and have always been noted for their love of children." Official UKC Breed Standard, American Pit Bull Terrier, Appellant Br. Ex. 4. American Pit Bull Terriers are an "extremely friendly" breed "even with strangers. Aggressive behavior toward humans is uncharacteristic of the breed...." *Id.* Similarly, the AKC breed standard for Staffordshire Bull Terriers states that, "with its affection for its friends, and children in particular, its off-duty quietness and trustworthy stability, [the Staffordshire Bull Terrier is] a foremost all-purpose dog." AKC Staffordshire Bull Terrier Breed Standard, Appellant Br. Ex. 2. Without drawing factual inferences against the plaintiffs, the district court could not conclude at this early stage in the case that the Ordinance was rational as a matter of law.

Id., at 1183-84. On remand, the District Court of Colorado denied the City's motion for summary judgment dismissal of the substantive due process claim, finding that on the record amassed by Plaintiffs, "a reasonable trier of fact may find that Plaintiffs' experts are correct and there exists no rational basis for a breed specific ordinance." 2010 WL 3873004, at *7 (D.Colo. Sept. 29, 2010)(also noting, at *6, that the 2000 Center for Disease Control study cannot be used to infer any breed-specific risk for dog-bite fatalities); *see also Hopkins v. McCollam,* 300 P.3d 115, at *2 (Kan.App.2013)(quoting *Dias*).

Litigation Tip: With respect to mixed breeds, the substantive due process argument will carry even greater force.

Challenging the Designation

Over two decades ago, the Massachusetts Supreme Court in *Assoc. Dog Owners Assoc. v. Lynn,* 404 Mass. 73 (1989), observed that there was "no scientific means, by blood, enzyme, or otherwise, to determine if a dog is a particular breed or any mixture thereof[.]" *Id.,* at 79. Twenty-five years later, however, such means arguably do exist and furnish the basis to challenge the uneducated and unleashed discretion of an officer eyeballing the suspected dog. Accordingly, consider having a veterinarian draw blood and test DNA. At the present time, the MARS Wisdom Professional Panel arguably yields the best results for breed identification and does not risk DNA contamination potentially arising by the alternatively employed buccal swab test (when wielded by a person lacking adequate skill to ensure a clean specimen), since a dog who licks another dog's body, another dog's bodily secretions, or even a person's face and hands, could introduce traces of multiple DNA signatures into the mouth. The veterinarian should, in advance, commit to confidentiality, label the file confidential, and instruct staff not to reveal any information contained in the file to any person without a court order. She should test the dog but not share the results with the client. Instead, such information should pass to the attorney through the work product privilege with a nonconsulting expert. Only if the results are favorable should the expert be disclosed as "consulting," and the results released. If the DNA result is unfavorable, advise the client of the risk.

Cautionary Note: MARS explicitly disclaims the use of its Wisdom Panel by animal control officials to determine whether a particular dog should be banned due to BSL . "*Wisdom Panel* ®

is designed and intended to be used solely to identify the breed history of a dog and no other purpose is authorized or permitted." Furthermore, as to the bedeviled "pit-bull," MARS states:

> The term "Pit-bull" is a bit of a misnomer and does not refer to a single, recognized breed of dog, but rather to a genetically diverse group of breeds which are associated by certain physical traits. … Due to the genetic diversity of this group, Mars Veterinary cannot build a DNA profile to genetically identify every dog that may be visually classified as a Pit-bull. When these types of dogs are tested with the *Wisdom Panel* ®, we routinely detect various quantities of the component purebred dogs including the American Staffordshire Terrier, Boston Terrier, Bull Terrier, Staffordshire Bull Terrier, Mastiff, Bullmastiff, Boxer, Bulldog, and various other Terriers. Additionally, there are often other breeds outside of the Guard and Terrier groups identified in the mix depending on each dog's individual ancestry….

www.wisdompanel.com/why_test_your_dog/faqs/#785 (Mar. 22, 2014). In 2014, Mars changed its terms of service, stating:

> Many countries and provinces have breed-specific ordinances and laws that may require special handling or prohibit the ownership of some dogs with a particular breed in their genetic background. **Wisdom Panel 2.0** is not intended to be used by regulatory or animal control officials to determine whether a particular breed is legislated or banned in a particular country or province. Nor is **Wisdom Panel 2.0** intended to be used in any judicial proceedings. Rather, it is intended to be used as a tool or resource in determining a dog's genetic history. Neither Mars Veterinary nor any related company is responsible for compliance or notification regarding these matters.

That the manufacturer has refused to give a stamp of authoritativeness to its breed detection test would appear to undermine any use in court under *Frye, Daubert,* and/or ER 702 – by the government to inculpate or the dog owner to exculpate. Presaging this legal evidentiary problem, the Kansas Court of Appeals evaluated the trial court's refusal to grant a continuance so the State or Lee could cajole a reluctant representative from MARS to testify as to the significance of the DNA results and thus lay a foundation for admissibility. Finding no abuse of discretion in denying a continuance, it added that:

> even if a witness was willing to testify, the probable testimony was not critical to establish Lee's theory of defense. As a preliminary matter, the information in the report does not support a finding that the dog falls outside the purview of the ordinance. … Although the report states that the dog was a mix of breeds, the analysis specifically detected the breeds of American Staffordshire Terrier, Bull Terrier, and Bulldog. To that end, the report indicates that although the dog matched strongly to American Staffordshire Terrier and Bull Terrier, the strongest breed signature match was American Staffordshire Terrier. Because the report itself did not favor Lee's theory of defense, we find it unlikely that any proposed testimony about the report would do so.

Lee. 45 Kan.App., at 1014. What if the DNA test made no mention of one of the prohibited breeds? Without a Mars representative willing to testify,[6] would a jury even hear the results over an objection on grounds of hearsay and foundation? On par, is it strategically preferable for the dog owner to object to the use of any form of identification (visual or DNA) as untenable under *Frye, Daubert,* and ER 702, thereby preventing the BDL enforcer from satisfying the threshold burden of production?

Though suffering some measure of discrepancy in consistently reporting the breeds of a specific dog's grandparents and great-grandparents, but which otherwise has proven more reliable than visual identification, might the dog owner find some evidentiary work-around to ensure the DNA test's admissibility? One possibility is to pass through the results through an expert whose field routinely relies upon DNA-based breed evidence, using FRE 703 or FRE 807 and state analogs.

Shooting the Messenger.

But such DNA-based evidence relied upon by, say, a veterinarian or an animal control officer results in an opinion that is only as reliable as its source. If the foundation remains impervious to critical scrutiny due to Mars's refusal to share its proprietary methodology, then one must indirectly challenge the professional qualifications of the expert who purports to testify in support of the technique under FRE 703 and FRE 807. Rule 703 permits an expert to given an opinion based on hearsay if of the type of evidence regularly relied upon by experts in that field. This technique of backdooring otherwise inadmissible evidence through an expert witness has spilled a great deal of ink. Daniel D. Blinka, *Ethical Firewalls, Limited Admissibility, and Rule 703*, 76 Fordham L. Rev. 1229 (2007); Ian Volek, *Federal Rule of Evidence 703: The Back Door and the Confrontation Clause, Ten Years Later,* 80 Fordham L. Rev. 959 (2011); Laura Owen Wingate, *Louisiana Code of Evidence Article 703: Is it a Hidden Exception to the Hearsay Rule?,* 53 La. L. Rev. 1605 (1993); Ronald L. Carlson, *Experts as Hearsay Conduits: Confrontation Abuses in Opinion Testimony,* 76 Minn. L. Rev. 859 (1992); Laura F. Levine, *Locking the Backdoor: Revised MRE 703 and its Realized Impact on Bases of Expert Testimony,* 87 U. Det. Mercy L. Rev. 505 (2010); Paul F. Rothstein, *Rule 703. Bases of an Expert's Opinion Testimony,* Fed. Rules of Evidence Rule 703 (3d ed.).

Two relatively recent United States Supreme Court decisions prove instructive – *Crawford v. Washington,* 541 U.S. 36 (2004) and *Williams v. Illinois,* 132 S.Ct. 2221 (2012). In *Crawford,* a felony assault and attempted murder case, the State offered a recorded statement of Crawford's wife during a police interrogation to prove that the stabbing was not in self-defense. Due to marital privilege, his wife did not take the stand. Over his objection, the trial court allowed the recording to be heard by the jury, whereupon he was convicted. In reversing, the Supreme Court held that such ruling violated Crawford's Sixth Amendment right to confront witnesses for the wife's statement was testimonial in nature. In *Williams,* a rape case, forensic specialist Sandra Lambatos, working for the Illinois State Police lab, testified that she matched

[6] To date, no court has compelled a MARS Representative to testify. A successful motion to quash a prosecutor's or defense attorney's subpoena may effectively negate any foundation and serve as a dispositive procedural impediment to admissibility.

the DNA profile from a sample of the petitioner's blood (run by her lab) against a DNA profile produced by an outside laboratory, Cellmark. The sum total of her knowledge about Cellmark's processes consisted of testifying that Cellmark was an accredited lab and that its business records showed that the vaginal swabs from the victim were sent to Cellmark and returned. She could not speak to the accuracy of Cellmark's profile, nor how Cellmark handled or tested the sample. Defense counsel objected on grounds that Lambatos sought to introduce hearsay evidence that Williams could not challenge, violating the Sixth Amendment's Confrontation Clause (which, incidentally, only applies to "criminal prosecutions"). The prosecutor urged that Illinois Rule of Evidence 703 permitted Lambatos to disclose facts upon which she based her opinion even if she lacked competency to testify to those underlying facts. The trial court agreed and convicted Lambatos. A 5-4 plurality affirmed his conviction on the basis that Cellmark's test results were nontestimonial (i.e., the unsworn data did not "bear testimony" against Williams in the sense of a "solemn declaration of affirmation made for the purpose of establishing or proving some fact" or made with "a primary purpose of creating an out-of-court substitute for trial testimony," and "to establish or prove past events potentially relevant to later criminal prosecution." *Michigan v. Bryant,* 131 S.Ct. 1143, 1153-55 (2011)).

Typically, sworn statements in a judicial proceeding are testimonial, and include declarations, affidavits, depositions, and confessions. So do police interrogations, such as that of Crawford's wife, who was in custody, under suspicion, and answering leading questions from detectives. Business records, such as cell phone logs, are nontestimonial. However, laboratory reports and certificates presented in affidavit form will fall within the core class of testimonial statements. *See Melendez-Diaz v. Mass.,* 557 U.S. 305, 310-11 (2009)(finding analyst affidavits concerning composition, quality, and net weight of cocaine were testimonial statements and analysts were "witnesses" for purposes of Sixth Amendment; absent showing they were unavailable to testify and Melendez-Diaz had opportunity to cross-examine them before trial, his right to confront them was violated); *see also Bullcoming v. New Mexico,* 131 S.Ct. 2705 (2011)(BAC analysis report testimonial in nature). While *Melendez-Diaz* and *Bullcoming* appear to categorically exclude most lab analyses per the Sixth Amendment, remember the evidentiary bypass of Rule 703 as discussed in *Williams* above.

But then one must face the inevitable challenge that the test is not recognized as probative for BSL litigation purposes by the lab itself and, furthermore, that Mars Veterinary will not reveal its proprietary methodology, thereby preventing replication and objective analysis by third parties. Moreover, admission would amount to the court involuntarily and indirectly designating Mars as a court-appointed expert – without the formal appointment. The court and parties, therefore, would be forced to simply take Mars's word for it. How does this compare with other attempts to introduce novel analyses and proprietary testing?

In *Cooper v. Brown,* 510 F.3d 870 (9th Cir.2007), the Ninth Circuit refused to admit EDTA testing in a murder trial, finding that it had not gained general acceptance in the scientific community, adding that with one exception (the OJ murder trial), no court ever admitted EDTA test results, and Dr. Ballard's credibility was "soundly rejected," along with his EDTA testing as unreliable in *New Jersey v. Pompey.* And the only reason EDTA made it into the Los Angeles courtroom was because, "[T]he testing protocol … was never called into question. It was simply

a matter of interpretation." Furthermore, "[T]he results of the tests permitted both sides to claim a measure of victory." *Id.,* at 944. *Cooper* alerts the litigator to the lesson that:

> A scientific test is not automatically admissible. For example, a polygraph test can reliably measure a person's heart rate, blood pressure, and breathing. However, a polygraph test is inadmissible to show that person's veracity.

Id., at 945 (cit.om.). Similarly, assuming the Wisdom Panel can reliably measure a dog's breed composition,[7] it is admissible for legal calibration against a BSL standard, merely for entertainment, or for a very limited veterinary medical purpose of identifying potential genetic predispositions?

More critically, though, can the Wisdom Panel be deemed reliable in identifying dog breed whatsoever? *Cooper* rejected EDTA testing as admissible under *Daubert* by noting its "inherent problematic nature," described as:

> Like polygraph testing, the error rate of EDTA testing cannot be determined. … There are no industry standards that bind the testing scientist to a certain test protocol. If anything, this problem is more pronounced in the EDTA testing field, where Dr. Ballard appears to be almost the only individual who performs this type of test.

Id., at 945. The court added that EDTA testing was not scientifically accepted and not subjected to peer review or publication. Further, because there are no standard EDTA levels against which test results may be compared, results may be significantly manipulated and prevent definitive conclusions. *Id*., at 945-47.

Other examples of scientific tests deemed inadmissible for failure to comply with *Daubert* include astronomical dating of a photograph (*U.S. v. Tranowski,* 659 F.2d 750 (7th Cir.1981) (rejected because there was no evidence procedure had ever been attempted previously by anyone, no published work outlined the necessary methodology for such dating convention, no control experiments were performed to verify the technique's accuracy, and the calculations did not demonstrate indicia of reliability); topographical brain mapping (*Head v. Lithonia Corp.,* 881 F.2d 941 (10th Cir.1989); forensic linguistic analysis, i.e., identifying authorship of a writing by comparing syntax, spelling, and paragraphing styles (*U.S. v. Clifford,* 543 F.Supp. 424 (W.D.Pa. 1983) (method not shown to be trustworthy, reliable, accurate, or conforming to a generally accepted scientific theory); silicone antibody blood test (*Cabrera v. Cordis Corp.,* 134 F.3d 1418 (9th Cir.1998)(did not meet *Daubert* standards of reliability). By contrast, the gold chloride microcrystalline test to determine the chemical composition of l-cocaine was deemed

[7] The Wisdom Panel 2.0 does not, at this time, detect the American Pit Bull Terrier ("APBT"), placing in doubt the test's probity where BSL excludes or includes the APBT. For instance, if excluded from the legislation, the subject dog's genetic composition might be mistakenly matched by the Wisdom Panel to other BSL-prohibited breeds for which Mars does test (e.g., Staffordshire Bull Terrier ("SBT")). The risk of a false positive for SBT might increase by the absence of APBT in the breed detection database. Accordingly, reliance on the MARS test may violate equal protection since its database excludes APBT genetic markers. Such a dog simply cannot be tested reliably, and would be erroneously reported as genetically comprised of other breeds. Further, MARS sends a form letter explaining that different specimens from the same animal may produce different results.

admissible (*U.S. v. Luschen,* 614 F.2d 1164 (8th Cir.1980), the oil identification technique deemed highly reliable and gaining sufficient adherents within the scientific community (*U.S. v. Distler,* 671 F.2d 954 (6th Cir.1981), and though not yet having gained general judicial recognition, the immunobead assay procedure to detect antibodies in semen samples and thus identify semen was sufficiently reliable to admit expert testimony concerning test results (*U.S. v. Gwaltney,* 790 F.2d 1378 (9th Cir.1986)).

If Mars is unwilling to disclose its proprietary methodology, none other presently performs the test,[8] and the method has not been subjected to published peer-review, how can a proponent of such evidence ever hope to demonstrate general acceptance or reliability?

On Apr. 15, 2014, the City of Yakima, Wash., amended its BSL to permit "pit bull service animals" within city limits. YMC 6.18.030(C)(IV) seeks to provide an exclusive DNA exception to the City's labeling of a dog as a pit bull (and the sequelae of such an adverse determination, such as impoundment and criminal prosecution), saying that the dog will only be released "as a result of DNA testing." In so doing, however, the City narrowed the scope of admissible evidence, arguably in conflict with not only the state and federal constitutions, but the Washington Supreme Court-enacted rules for courts of limited jurisdiction and the rules of evidence. Further, where DNA evidence is almost certainly not even admissible under ER 702 and *Frye*, given that Mars Corporation recently reiterated that its tests are not to be used for enforcement or in litigation, the City has furnished an illusory exception that gives the owner essentially no evidentiary basis by which he can challenge an also scientifically invalid and inadmissible visual identification by a Yakima animal control officer or law enforcement officer. That this DNA defense must be also borne at the expense of the dog owner only deepens the constitutional objection.

Of course, turning to visual identification only compounds the morass of unreliability. Dr. Victoria Voith and colleagues recently published *Comparison of Visual and DNA Breed Identification of Dogs and Inter-Observer Reliability* in 3(2) Amer. J. of Sociological Research 17 (2013). She reached these conclusions:

(a) Known crosses of purebred dogs (i.e., mixed breed dogs) may not look like either parent and may, in fact, more closely resemble other breeds.

(b) There is little correlation between DNA identification of breeds that comprise mixed breed dogs and visual identification by professionals familiar with dogs, including animal control and veterinary medical personnel. DNA identification is reasonably relied upon by experts in my fields of expertise in forming opinions and inferences upon the subjects described herein and more accurate than visual. Visual identifications by people assumed to have special knowledge in breed identification of mixed breed dogs (e.g., animal control and veterinary medical personnel) is less than 50% accurate – worse than chance. Thus, visual identification of the breed composition of mixed breed dogs is frequently inaccurate.

[8] Biopet Vet Lab, Inc. was a competitor but since became the target of a patent infringement action by Fred Hutchinson Cancer Research Center, Argus Genetics, LLC, and Mars, Inc. *Fred Hutchinson Cancer Research Center v. BioPet Vet Lab, Inc.,* 768 F.Supp.2d 872 (E.D.Va.2011).

(c) There is a low level of agreement among professionals (familiar with dogs, including personnel in animal control and veterinary medicine) as to the most predominant breed (or any breed) in a mixed breed dog. That is, they often disagree.

(d) Even if some professionals (familiar with dogs, including personnel in animal control and veterinary medicine) agree as to the breed composition of a mixed breed dog, the DNA analysis of breed composition may not verify the agreed-upon visual identification.

(e) Lists of breeds who allegedly bite, attack or injure people, as contained in some of the widely-quoted, peer-reviewed articles identified above, are not validated and are unreliable. The majority of the lists were compiled from newspaper accounts that were not verified as to breed of dog or who identified the dogs. Indeed, most of the authors warn, in the articles themselves, that this information is derived from unverified, potentially inaccurate sources, and there was no accurate data available regarding the population of dogs, much less the representation of specific breeds. The articles themselves caution that the breeds listed in the articles cannot and should not be used to infer any breed-specific risk. These articles also usually emphasize that other factors contribute to the aggressivity of dogs, such as their environment, individual histories, and circumstances in which the dogs were aggressive. Furthermore, these lists were derived before the advent of DNA breed identification and revelation of the large discrepancy between visual and DNA identification of mixed breed dogs. In summary, reports that appear to target particular breeds as being more dangerous are not based on validated breed identifications or the known proportion of those breeds in the community. Recent articles supporting the above statements include A community approach to dog bite prevention, AVMA Task Force on Canine Aggression and Human-Canine Interactions, JAVMA 218(11):1732-1749 (2001) and GJ Patroniek, M Slater, A Marder, Use of a number-needed-to-ban calculation to illustrate limitations of breed-specific legislation in decreasing the risk of dog-bite related injury, JAVMA 237:788-792 (2010).

(f) The use of the phrase "element … as to be identifiable" as contained in many BSL codes is ambiguous and unclear. If interpreted to mean a feature or anatomical characteristic, it cannot be concluded with any certainty that because a dog in question appears to have some or any feature that is similar to those in a purebred dog, that the dog in question is partially that breed of dog. If "element" is meant to be a portion of the dog's genetic breed make-up, this cannot be validly or reliably visually determined. Even whether or not a dog is a purebred can be difficult to determine visually. For instance, Scott & Fuller's studies and published pictures (Scott JP and Fuller JL. Genetics and the Social Behavior of the Dog: The Classic Study. 1965 (Univ. of Chic. Press, Chicago) clearly show that mixed breed dogs of known crosses of purebred dogs (i.e., mixed breed dogs) may not look like either parent and may, in fact, more closely resemble other breeds. See attached pictures from this article. Further, a paper published in the Journal of Applied Animal Welfare Science (Voith VL et al. Comparison of Adoption Agency Breed Identification and DNA Breed Identification of Dogs. JAAWS 12:253-262 (2009)), a peer-reviewed scientific journal, reported that eighty-five (85%) percent, or 17 of 20, of the dogs identified by the adoption agency as having either a type or specific breed in their ancestry did not have representative breeds detected by DNA for each of these types or breeds. If "shepherd" type indicated German Shepherd Dog, then ninety (90%) percent, or 18 of 20, of the dogs identified by adoption agencies were not reported by DNA. That is, most of the time, adoption agency identifications did not match DNA identifications. See attached copy of poster of these

dogs. Lastly, my colleagues and I recently completed a study (to be submitted for publication in a peer-reviewed scientific journal) in which several hundred people, primarily in animal control and veterinary medical fields, were asked to visually identify breed composition of the same twenty dogs after viewing one-minute video clips of each dog. More than half of the time (>50%) the visual identifications did not match DNA breed identifications. For only thirty-five (35%) percent of the dogs, 7 of 20, did more than half (>50%) of the respondents agree on the most predominant mixed breed; and in 3 of those 7 cases, the DNA breed analysis did not match the respondents' visual identifications. The deposition testimonies of Dean Mitchell and Santiago Reyna illustrate these points.

(g) The "methodology" used by many cities to declare dogs dangerous based on if a dog appears to be a specific breed or partially a specific breed is subjective, variable by different observers, is not based on solid evidence or sound scientific principles, and lacks rational basis.

Challenging the Association

But the use of DNA begs the question: is DNA the answer even if it exonerates in a particular dog's case? By struggling to genetically decontaminate the dog at issue through the use of DNA that shows a composition that does not contain one of the prohibited breeds (i.e., "Trixie is *only* 25% American Staffordshire Terrier"), do we still end up damning the pit bull terrier-type dog with faint praise? Should not the focus be demonstrated behavior?

BSL suffers from the fundamental, flawed presumption that breed reliably predicts vicious propensity. It draws from retrospective review of anecdotal evidence based on questionable phenotypic and genotypic identifications (not double-blind, randomized trials that follow breed-confirmed dogs till the triggering event, while controlling for confounding variables), that suffer from several degrees of critique under ER 702, *Frye* and/or *Daubert,* not to mention standard objections of hearsay and authenticity. BSL proponents will point to dogbite-related fatality ("DBRF") data, but a 2013 JAVMA publication casts deep doubt on the attempt to invoke some breed association. Gary J. Patronek, Jeffrey J. Sacks et al., *Co-occurrence of potentially preventable factors in 256 dog bite-related fatalities in the United States (2000-2009),* 243 J. Am. Vet. Med. Assoc. 1726 (2013)(co-occurring and owner-preventable factors forecast DBRFs; breed did not).

Be prepared to present an expert to challenge the nexus between identification and dangerousness. In 2011 litigation against the City of Moses Lake, Wash., and challenge to its BSL, plaintiff Nicholas Criscuolo retained Dr. Kristopher Irizarry as an expert. He reached these conclusions:

1. The increasing practice of defining members of some breeds of dogs (or mixes of those breeds) as dangerous or aggressive (regardless of an individual dog's temperament) is an unfortunate consequence of ignorance and misinformation regarding dog genetics that have led to scientifically invalid dog laws.

2. The biology and genetics of dogs and dog breeds have been heavily studied during the last ten to fifteen years as a direct result of genetics and genomics discoveries made possible by the genome sequencing era and, specifically, the canine genome sequence (released to the public in

July 2004). Some of these discoveries include: (1) identifying the single region within the dog genome responsible for encoding small dog size, (2) the extent of genetic similarity within and between breeds, (3) the specific regions of the genome responsible for breed-associated anatomical and morphological traits, (4) methods to determine relative contributions of ancestral breed compositions in mixed breed dogs, (5) the identification of thousands of dog genes as well as the commercial development of clinical genetic diagnostics for use in canine veterinary medicine.

3. The avalanche of canine genomics research has placed the dog in the same research arena as the white laboratory mouse and, in doing so, elucidated a significant amount of knowledge regarding the evolutionary genomics of their domestication as well as the genetic basis for the production of modern dog breeds such as those represented in the American Kennel Club. These discoveries have placed age-old questions about dogs within a 21st century scientific framework backed by very large data sets (on the order of thousands to millions of data points in each genetic experiment). This means that the speculation, myths and misinformation regarding dogs and genetics can be identified and supplanted by scientifically valid findings derived from the reproducible analysis of particular dog genetics data sets subsequently published in specific high-impact, peer-reviewed journals. The authors who published these findings are some of the most well-respected and renowned today and reside at research institutions such as Harvard University, Massachusetts Institute of Technology and the NIH to name a few.

4. Many of the myths regarding dogs and genetics are widely believed to be true and shared among intelligent and educated people, some of whom may be veterinarians and doctors, teachers and business owners. We may personally count them among our friends and family. Part of the reason for this phenomenon is that many of these “myths” have been passed on in the same manner as other cultural myths, by word of mouth, from one generation to the next. In the absence of irrefutable evidence to the contrary, many of these myths may sound like “common sense,” but this is not the case: rather, they are scientifically invalid and wrong. This is not the first time we had to change the way we view the world, as we used to believe it was flat but now know it to be round. Similar pseudoscientific doctrines have fallen into disrepute and eventually debunked as scientifically unsound, such as phrenology (using human skull morphology to predict cognitive function and behavior) and eugenics (the Nazis are the most notorious endorsers of this movement).

5. The Current Status of Genetics Knowledge Regarding Dogs and Dog Breeds. The biomedical literature provides a record of the discoveries and accumulated knowledge in medical and clinically related biology. One such database offered by the National Institutes of Health (http://www.ncbi.nlm.nih.gov/pubmed/) contains more than 20 million biomedical citations. These scientific publications are indexed by key words and one can search for specific combinations of keywords and retrieve the subset of citations associated with those terms. As of September 2011, there are 37,179 citations for the search of dogs and disease. There are 20,611 citations associated with dogs and a list of specific genetic terms. This is an extremely large body of scientific knowledge about dogs and genetics from which society and the law can free itself from myths about dogs and genetics.

6. Common Myths about Dogs and Genetics. The common view of dogs and dog breeds includes a number of misconceptions for which recent discoveries in the field of canine genetics provide

dispositive empirical evidence demonstrating how and why these views are wrongheaded and irrational. Some of the most common and wide-held misconceptions/myths about dogs are:

Myth 1: Dog breeds were created through the selection of breed-specific behavioral traits. This is not true and not supported by the analysis of dog genomes within and across breeds. The current state of knowledge proves that dog breeds were selected for specific anatomical traits such as short hair, long legs, pointed ears, and long snout (for example), not behavior.

Myth 2: The breed composition of a mixed breed dog can be determined by visual observation. This is not true because very few genes encode breed-associated morphological traits (on the order of 50 genes), compared to all the genes in the canine genome (on the order of 19,000 genes). Consequently, the person visually observing a dog is unable to assess the contribution of the other 18,950 genes. DNA analysis provides state-of-the-art breed determination.

Myth 3: All members of a dog breed share the same traits and behaviors. This is not true as recent discoveries in the field of canine genetics have demonstrated that members of a breed have no genetic variation in breed-defining anatomical traits (i.e. German Shepherds do have the genes to make the very short snout found in French bull dogs or pugs), but do exhibit extensive genetic variation in regions of the genome associated with other traits. This "footprint" in the genome means that the only common genetics among breed members occur within anatomical (i.e., not behavioral) genes. Therefore, some members of the breed may develop a disease that other members of the breed do not. Some members of the breed may be very shy while others may be comfortable around strangers and loud noises.

Myth 4: The presence of ancestral contributions of a specific breed within a mixed breed dog "contaminate" the mixed breed dog with undesirable traits derived from that specific breed. This is scientifically unfounded and lacks validity as a breed is defined as a lack of genetic variation within specific regions of the genome (for example in genes encoding coat texture and color or genes encoding head shape and ear morphology). The notion that "any amount of ancestral component from a specific breed" might confer stereotyped traits from that breed is illogical and not rationale. The dog genome is diluted at every subsequent generation by ½. A fifth generation descendent of a specific dog would have (½ x ½ x ½ x ½ x ½) only 1/32 of its genome derived from that ancestor. In other words, it would 31/32 of its genome derived from dogs that are not that ancestor. Ancestral DNA is not a virus that infects all descendants and should not be used to classify dogs in terms of behavior or anticipated safety.

7. Dog breeds have been selected and differentiated based on anatomical features.

8. Anatomical features associated with dog breeds are found in many different breeds.

9. AKC dog breeds are defined through a closed breeding pool.

10. Dog breeds can be defined at the genetic level as lacking genetic variation in some regions of the genome, i.e., German Shepherds lack the genetic variants associated with the very short snout found in the French Bull dog.

11. A mixed breed dog is not a member of a breed.

12. The defining anatomical features of dog breeds are the result of a handful of genes that have been identified and listed in peer-reviewed scientific publications.

13. The anatomical features associated with dog breeds do not encode the brain or the connections of brain cells and are not involved in encoding the behavior of a dog.

14. Unlike identical twins in humans – who have identical DNA, members of dog breeds may look the same and have very different DNA.

15. Dogs with open breeding pools, such as mixed breed dogs, cannot be considered a member of a specific breed.

16. A dog that is 25% Labrador Retriever is not eligible to compete in an AKC dog show for Labrador Retrievers.

17. Visual identification of dog breeds is inaccurate.

18. Visual identification of dog breeds differs from DNA identification of dog breeds.

19. The lack of efficacy in identifying dog breeds is the result of relatively few regions of the genome being associated with anatomical traits.

20. The anatomical similarity of dogs within a breed causes people to assume that dogs within a breed share other traits, such as behavior, health and disease susceptibility, yet this assumption is flawed.

21. Animal professionals, including veterinarians, dog breeders, dog show judges, animal control officers and others are not capable of accurately identifying breeds in mixed breed dogs.

22. The manner in which mixed breed dogs are visually identified is so subjective as to be arbitrary and capricious.

23. An "element" is undefinable in terms of mixed dog breeds.

24. Even using DNA, an "element" is vague and unable to be intelligently applied since all dogs share 99.9975% of their DNA across breeds.

25. An element cannot be reliably visually identified in a mixed breed dog.

26. The notion that the presence of an anatomical feature, i.e., smooth coat, correlates with behavior is not rational.

27. Visual identification of mixed breed prohibited dogs does not reliably or rationally meet the purported goals of BSL (i.e., to ensure that dogs are classified accurately and banished or euthanized to protect the public safety).

28. Breed bans do not work because bite rates do not go down; thus, there is no rational basis in terms of increasing public safety.

29. There is no scientific evidence that the prohibited breeds are more aggressive or dangerous than other dogs. This is due, in part, to the problem of acquiring accurate statistics on the total number of dogs. N.B.: the CDC specifically stated that its fatal study was not to be used for breed bans.

30. Since studies regarding breeds and bites rely in the end on visual identification by lay people, they are totally inaccurate and unscientific.

31. The science of dog DNA is the most accurate method to determine mixed breed dogs and will supplant visual identifications.

32. Most people erroneously believe that dog breeds were bred for specific behaviors. This is a stereotype unsupported by the recent scientific findings that identify anatomical traits as the foundation of breed stratification.

33. Most people erroneously believe that a mixed breed dog that contains an anatomical component in common with a specific breed must be a member of that breed. However, by definition, a mixed breed dog is not a member of a specific dog breed.

33. The stratification of dogs into breeds reduces the genetic variation within a breed. Once a member of the breed is crossed with other breeds of dogs, it gains the genetic variation from these other dogs and loses the genetics associated with a single breed.

34. Regardless of whether someone inaccurately believes that a specific breed has a certain behavior or "dangerousness," a dog with moderate or minor/trace amounts of that breed has the majority of its genome derived from breeds other than the breed in question.

35. It is not rational or scientifically valid to assume that a dog can be defined as dangerous by virtue of having "any element" of a particular breed.

36. The visual identification of dogs has been used to identify the dangerousness of specific breeds historically. My review of this practice leads me to conclude, however, that whatever breed is arbitrarily defined as dangerous gets blamed for dog bites by the media. Furthermore, none of the mixed breed dogs previously involved in dog bites have been accurately assessed for breed composition.

37. The notion that any element of some breed would make a dog dangerous is not rational and metaphorically akin to stating that "any car that has the same color as a car driven by a drunk driver is a dangerous car."

Litigation Tip: BSL assumes a connection between breed and volatility. Force proof on this point to the requisite threshold of *Frye, Daubert,* and ER 702. It might help to conceptualize viciousness or dangerousness as a disease or medical condition. Does a physiological, anatomical, genetic, or other explanation or anomaly within the prohibited breed (assuming, of course, a proper identification has and even can be made) give rise to such hazardous defect? In short, where are the peer-reviewed studies showing general acceptance in the relevant scientific community to endorse such an innate threat threshold?

Epidemiological studies provide a suitable basis for comparison, as they have attempted to establish causation or association between human health maladies and exposures to harmful chemicals. In *Re "Agent Orange" Product Liability Litigation,* 611 F.Supp. 1223 (E.D.N.Y. 1985), the court found the methodology sound but the opinion inadmissible under FRE 703 and FRE 403 since the expert did not examine any of the persons in question or their medical records but simply opined that cross-species inferences drawn from animal studies supported the conclusion that the defoliant caused human ailments. *Allen v. Pennsylvania Eng'g Corp.,* 102 F.3d 194 (5th Cir.1996) deemed inadmissible expert testimony that ethylene oxide caused decedent's brain cancer, due to the dearth of any conclusive studies establishing a statistically significant connection or evidence of the decedent's level of exposure. *Grant v. Bristol-Myers Squibb,* 97 F.Supp.2d 986 (D.Ariz.2000) rejected expert testimony that silicone breast implants caused systemic disease in fact of opinion not having gained disciplinary acceptance nor based on scientific methods practiced by a recognized minority in the field, nor sufficient to outweigh over twenty epidemiological studies finding no risk of autoimmune disease from implants. Similar challenges to the breed-viciousness nexus can and should be made to any expert on grounds of ER 702, 703 and 403.

Preparing the Expert Declaration

To avoid unnecessary delays and technical objections, draft the declaration to include the following:

1. Begin by roadmapping what expert opinions the court may find elucidated within the body of the declaration.

2. Catalog all documents reviewed by the expert to establish a familiarity with the facts at bar. Be exhaustive.

3. Add that the expert generally depends on the professional literature in the relevant sciences (for breed identification and association, genomics, genetics, animal behavior, veterinary medicine, and public health) as well as specific texts that should be enumerated within the opinion; and that the expert draws upon higher level academic education (e.g., D.V.M., M.A., M.Sc., and Ph.D.) which provides the background to evaluate and analyze data and solve problems.

4. Note that the body of articles (specify if peer-reviewed), research, the expert's education and experience informs the professional opinions given.

5. If available, list all published abstracts of papers presented at professional conferences or association meetings, as well as any presentations delivered by the expert that pertain to the opinions given. Attach copies of highly probative exhibits used by the expert during those deliveries.

6. Recite that the expert's opinions are accepted by well-read, academically trained experts in the germane fields (here, veterinary animal behavior, applied animal behavior, and epidemiology).

7. If true, note that the expert is unaware of any dispute, much less a significant one, by qualified experts in these scientific communities concerning the theories and methodologies employed by the expert in drawing these conclusions.

8. Finally, after prefacing that the expert's opinions are given with a level of confidence of reasonable scientific certainty and beyond evidentiary preponderance, and based on the expert's training, professional literature, and experience, generally accepted methodologies and reasoning, articulate each of the expert's conclusions.

Conclusion

The blindfolded greek goddess Themis, wielding a sword and balance scales, metes out justice objectively and without regard to identity, mindful that irrelevant dissimilarities, whether external physical characteristics or the more recent emphasis on intrinsic genetic features, serve only to distract from the path of justice. The time has come for all good advocates to challenge BDL with each evidentiary, statutory, and constitutional arrow in the quiver. Particular focus should be given to firewalling quasi- and junk expert opinions relative to identification and predictive viciousness. May the foregoing assist the reader in that effort.

Fiat justicia ruat coelum,

ANIMAL LAW OFFICES

Adam P. Karp

SUGGESTED WEBSITES:

- www.nationalcanineresearchcouncil.com
- www.animalfarmfoundation.org
- www.bestfriends.org

SUGGESTED RESOURCES:

- AVMA Task Force on Canine Aggression and Human-Canine Interactions. (2001). A community approach to dog bite prevention. *J. Am. Vet. Med. Assoc., 218*(11), 1732-1749.
- AVMA Animal Welfare Division. (2012). *Welfare implications of the role of breed in dog bite risk and prevention*. Available from: https://www.avma.org/Advocacy/StateAndLocal/Documents/Welfare-Implications-of-the-role-of-breed.pdf
- Bradley, J. (2011). *The Relevance of Breed in Selecting a Companion Dog*. U.S.: National Canine Research Council Vision Series.
- Bradley, J. (2014). *Dog Bites: Problems and Solutions*. Ann Arbor: Animals & Society Institute.
- Boyko, A.R. et al. (2010). A Simple Genetic Architecture Underlies Morphological Variation in Dogs. *PLoS Biology, 8(*8*).*

- Clarke, N.M. & Fraser, D. (2013). Animal control measures and their relationship to the reported incidence of dog bites in urban Canadian municipalities. *Can. Vet. J., 54*(2), 145-149.
- Cornelissen, J.M. & Hopster, H. (2010). Dog bites in The Netherlands: A study of victims, injuries, circumstances and aggressors to support evaluation of breed specific legislation. *Vet J., 186(*3), 292-298.
- Duffy, D.L., Hsu, Y., & Serpell, J.A. (2008). Breed differences in canine aggression. *Appl. Anim. Behav. Sci., 114*(3-4), 441-460.
- Gunter, L. (n.d.) *Breed Stereotype & Effects of Handler Appearance on Perceptions of Pit Bulls.* Available from: http://www.maddiesfund.org/Documents/Institute/Breed%20Stereotype%20Effects%20of%20Handler%20Appearance.pdf
- Hoffman, C.L., Harrison, N., Wolff, L., & Westgarth, C. (2014). Is that dog a pit bull? A cross-country comparison of perceptions of shelter workers regarding breed identification. *J. Appl. Anim. Welf. Sci., 17*(4), 322-339.
- Klaassen, B., Buckley, J., & Esmail, A. (1996). Does the dangerous dogs act protect against animal attacks: a prospective study of mammalian bites in the accident and emergency department. *Injury, 27*(2), 89-91.
- MacNeil-Allcock, A., Clarke, N.M., Ledger, R.A., & Fraser, D. (2011) Aggression, behaviour, and animal care among pit bulls and other dogs adopted from an animal shelter. *Anim. Welfare, 20(4),* 463-468.
- Martinez, Á.G., Pernas, G.S., Casalta, J.D., Rey, M.L.S., & Palomino, L.F.dlC. (2011). Risk factors associated with behavioral problems in dogs. *J. Vet. Behav., 6*(4), 225-231.
- Mirkó, E., Kubinyi, E., Gácsi, M., & Miklósi, Á. (2012). Preliminary analysis of an adjective-based dog personality questionnaire developed to measure some aspects of personality in the domestic dog *(Canis familiaris). Appl. Anim. Behav. Sci*., *138*(1-2), 88-98.
- Olson, K.R., Levy, J.K., & Norby, B. (n.d.) *Pit bull identification in animal shelters*. Available from: http://www.maddiesfund.org/Documents/Resource%20Library/Incorrect%20Breed%20Identification%20Study%20Poster.pdf
- Ott, S., Schalke, E., Hirschfeld, J., & Hackbarth, H. (2009). Assessment of a Bullterrier bloodline in the temperament test of Lower Saxony—comparison with six dog breeds affected by breed specific legislation and a control group of Golden Retrievers. *Deutsche Tierarztliche Wochenschrift, 116*(4), 132-137.
- Ott, S.A., Schalke, E., von Gaertner, A.M., & Hackbarth, H. (2008). Is there a difference? Comparison of golden retrievers and dogs affected by breed specific legislation regarding aggressive behavior. *J. Vet. Behav., 3*(3), 134-140.
- Patronek, G.J., Sacks, J.J., Delise, K.M., Cleary, D.V., & Marder, A.R. (2013). Co-occurrence of potentially preventable factors in 256 dog bite–related fatalities in the United States (2000–2009). *J. Am. Vet. Med. Assoc., 243*(12), 1726-36.
- Patronek, G.J, Slater, M., & Marder, A. (2010). Use of a number-needed-to-ban calculation to illustrate limitations of breed-specific legislation in decreasing the risk of dog bite-related injury. *J. Am. Vet. Med. Assoc., 237*(7), 788-792.
- Rosado, B., Garcia-Belenguer, S., León, M. & Palacio, J. (2007). Spanish dangerous animal act: Effect on the epidemiology of dog bites. *J. Vet. Behav.,2(*5), 166-174.

- Schalke, E., Ott, S.A., von Gaertner, A.M., Hackbarth, H., & Mittmann, A. (2008). Is breed specific legislation justified? Study of the results of the temperament test of Lower Saxony. *J. Vet. Behav., 3*(3) 97-103.
- Scott, J.P. & Fuller, J.L. (1965). *Genetics and the Social Behavior of the Dog.* Chicago: University of Chicago Press.
- Simpson, R.J., Simpson, K.J., & VanKavage, L. (2012). Rethinking dog breed identification in veterinary practice. *J. Am. Vet. Med. Assoc., 241*(9), 1-4.
- Svartberg, K. (2006). Breed-typical behaviour in dogs—Historical remnants or recent constructs? *Appl. Anim. Behav. Sci., 96*(3-4), 293-313.
- Topál, J., Miklósi, Á., & Csányi, V. (1997). Dog-human relationship affects problem solving behavior in the dog. *Anthrozoös, 10*, 214-224.
- UF Maddie's Shelter Medicine Program Study. (n.d.). *DNA & Survey Results: What Kind of a Dog is That?* Available from: http://sheltermedicine.vetmed.ufl.edu/library/research-studies/current-studies/dog-breeds/dna-results/
- Voith, V.L., et al. (2013). Comparison of visual and DNA breed identification of dogs and inter-observer reliability. *Am. J. Sociol. Res., 3*(2), 17-29.
- Voith, V., Ingram, E., Mitsouras, K., & Irizarry, K. (2009). Comparison of adoption agency identification and DNA breed identification of dogs. *J. Appl. Anim. Welf. Sci., 12*(3), 253-262.