



SCOTTISH TERRIER CLUB OF AMERICA

There is Cramp, and Then There is Cramp!

by Carole Fry Owen

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PART 1

Scottie Cramp is a mysterious disorder. Washington State University test matings almost 30 years ago proved Scottie Cramp is produced by a single recessive gene. It is thought to be autosomal (affecting males and females equally).

Simple ends there, as any breeder who has produced Scottie Cramp will agree. For starters: Why do some affected dogs not show clinical signs of Cramp under normal living conditions? Why do some known carriers produce little or no Cramp when bred closely within their own lines? Why is it hard for many Scottie breeders and owners to identify mild Cramp? If it's so simple, why haven't breeders been able to cut Scottie Cramp's incidence much or any in the three decades since we learned its mode of inheritance?

Official description of Scottie Cramp in Current Veterinary Therapy, VII is: "an inherited neurologic disorder with a recessive mode of transmission characterized by transient episodes of muscular hypertonicity resulting in postural abnormalities, and locomotion difficulties that can be induced by excitement or exercise."

In one layman's sentence: Scottie Cramp is an inherited condition in which exercise, excitement or fear can cause occasional non-painful cramping that may affect movement and posture.

A Widespread, Usually Benign Disorder

"Scottie Cramp is the most widespread hereditary disorder in the breed, and it is also the most benign," states *The New Scottish Terrier* by Cindy Cooke (Howell, 1996). Certainly, it moves none of the breeders or owners I interviewed to tears as did the devastating bleeding defect vonWillebrand's Disease for an earlier Bagpiper article. The STCA Health Survey of 1995 estimates carrier frequency of the Scottie Cramp gene at 29.3%. Many breeders think carrier incidence is higher, some guess as high as 90%.

Neither Cooke, nor Current Veterinary Therapy terms Scottie Cramp as a disease. My dictionary defines "disease" as "a morbid condition of the body, or of some organ or part; illness sickness, ailment." Ailment, yes. A genetic affliction, of course. However, Scottie Cramp does not shorten life, or affect general health, nor does it diminish quality of life, except in severe cases. Researchers emphasize repeatedly that Scottie Cramp does not cause pain. It does not alter a dog's spirit or intelligence. It is not progressive. It is a transient condition, usually quite predictable in individual dogs. Its severity in a given dog is stable throughout life, unless an unrelated disease is at work. Scottie Cramp actually can be a helpful barometer of a dog's health by pointing to undiagnosed ailments, when there are sudden, unexplained changes in

intensity of signs. Simple environmental changes can modify frequency and severity, and nutritional supplementation and/or drug therapy can diminish clinical signs.

Considering all that, if Scottie Cramp were a human problem, and we each had to choose one chronic condition, I believe we might choose Scottie Cramp. We would quickly learn the stimuli that cause cramping and we would avoid them! We'd modify lifestyles, pulling out of the fast lane and steering clear of stress. We also would take our daily Vitamin E to raise the threshold at which symptoms occur. And we would have Valium on hand for times we planned activities that made Cramp inevitable. I could live with a "disease" like that.

I Admit It. Will You?

I write about Scottie Cramp out of personal experience. My first apparent Cramp puppy appeared in 1987 in my second litter, and I have produced other known or suspected crampers since. I am lucky thus far to have a kind of Scottie Cramp identifiable in young puppies, but mild enough that puppies soon learn how to suppress clinical signs. Only one affected adult dog has retained clinical signs of Scottie Cramp when he runs. He would trot for one seemingly long forever on long walks without cramping. I tell new owners if I know a dog has Cramp, but invariably follow-ups show owners have seen no signs of it.

My first Cramp puppy was devastating. I felt like I had produced fire sale merchandise that no one would want. Since then I have watched my Scottie Cramp puppies go through life with no impairment. I am fortunate my Cramp has not been severe, but each time it appears, it is a disappointment -- another failure to escape the gene. I have tried to avoid Scottie Cramp, with no success myself in finding significant Scottie studs that do not produce Cramp with my bitches. However, 10 years after that first Cramp puppy, I am happy to have mild Cramp and not epilepsy, heart, bone or eye abnormalities, or you name it. Still, I don't want to minimize the importance of Scottie Cramp. The Scottie Cramp which breeders produce and sell is a condition that pet owners and the dogs themselves must live with, adapt to, inhibit, treat and control.

Some Scottie Cramp History

Scottie Cramp first appeared in scientific literature in "Een Aavalsgewijs Optrendende Stoornis in de Regulatie van de Spiertonus: Waargenomen bij Schotsche Terriers" in the Dutch journal Tijdschr. Diergeneesk. The year was 1942, and it is amazing to realize that with the Nazi occupying Europe, Scottie Cramp was still worth scientific attention!

Serotonin is a modern buzz word in pop medicine. Serotonin is a primary reason we know so much about Scottie Cramp. Researchers, initially at Washington State University, believed that study of Scottie Cramp might yield important insights into how to regulate serotonergic neuronal function in humans. Scottie Cramp made admirable scientific reputations for a number of young researchers in the 1970s. We owe our knowledge to academicians like Dr. Kenneth M. Meyers, Dr. R. M. Clemmons, Dr. Robert G. Schaub, Dr. R. I. Peters, Dr. George A. Padgett, Dr. John E. Lund and Dr. William M. Dickson. The STCA awarded its Anstamm Achievement Award in 1980 to Dr. Meyers to recognize Scottie Cramp research by him and his colleagues.

The glory days of Scottie Cramp research began in 1966 and ran to the early 1980s, with research funded mostly, if not entirely, by grants from the National Institutes of Health and Washington State Medical and Biological Fund. My pile of scientific research by the above men, which may be incomplete, includes articles in The Journal of Heredity, The Journal of Neurochemistry, Current Veterinary Therapy, Archives of Neurology, Research Communications in Chemical Pathology and Pharmacology, Experimental Neurology,

Life Sciences (British and U.S. editions), Journal of the American Veterinary Medical Association, and The Compendium on Continuing Education. Scottie fanciers can be proud that our dogs advance medical science.

Besides researchers, we owe our knowledge to courageous breeders and owners who provided their own Scottish Terriers for various studies. Dr. Meyers remembers those dogs fondly, ones including Baby Doll, Cuddles, Jiminy Cricket and Rhapsody. Several became his personal pets.

STCA member Jeannie Passmore is a longtime breeder who was a liaison between Seattle area Scottie owners and Washington State researchers. She also helped on production of the Scottie Cramp video of 1983, and Pure-Bred Dogs - American Kennel Gazette (March 1980) ran Passmore's article, "A Second Opinion." "I gathered dogs from everywhere and took them over for testing. By supplying people's pet dogs, we proved it was very widespread. I provided dogs that didn't have Cramp and were genetically free, too. What we accomplished was getting people to talk about Scottie Cramp and open up the subject. Enough credit has not been given to Dr. Meyers for his work. He gave an awfully lot!"

Frank J. "Bob" Bartos, legendary handler of Ch. Bardene Bingo and manager of Carnation Farms breeding program from 1946 to 1979, helped Washington State researchers, too. He's been associated with Scotties for more than 60 years. Says Bartos: "Scottie Cramp has been around the breed all my life. I've never been too upset about it. You could see Cramp, but it wasn't a major problem. Scotties have been free of most genetic problems. It's a very clean breed! If we could have two things we could understand better, it would be Scottie Cramp and dystocia.

Scottie Cramp in the Show Ring

Cindy Cooke's The New Scottish Terrier excerpts an interesting letter about Scottish Terrier of the 1920s and 1930s. One dog was Albourne Wattadorg of Mine Brook, shown in 1932 at Somerset Hills by Jock McGowan: "What made the event noteworthy was that Jock walked in, put the dog on the block, never moved it during Open and Winners, and repeated the performance for Best of Winners and Best of Breed...it was already known, when Jock pulled the stunt, that the dog could not walk two feet without losing control of its hindquarters." Read Coke's entire account (pp. 202-203) for a plausible reason why Scottie Cramp spread so widely and rapidly.

Late breeder/judge/author Dr. T. Allen Kirk was an early leader in Scottie Cramp investigation and education. By 1968 he had gathered information on about 100 cases of Scottie Cramp. His Scottie Cramp articles appeared in Popular Dogs (1965), the STCA Handbook (1974 and perhaps other editions), and Pure-Bred Dogs -- American Kennel Gazette (January 1980). One Kirk article in Terrier Type (July 1968) states of the old-time breeders, "Everyone seemed to think it was a very prevalent condition -- 'every large kennel of Scottish Terriers in the late 40's and early 50's had it.' No matter who you talked to, it was agreed that it was a common illness, and yet, no one was willing to talk freely about it. Everyone acted as if it were in the same category as the idiot child; no! more like the son with congenital syphilis."

"Tom was the first to make a film on Scottie Cramp," collecting film clips of Cramp episodes, said Kirk's widow Evelyn. "We took several dogs that had Scottie Cramp to meetings and shows so people could see what it was. The people had a fit. The subject is more open now." Mrs. Kirk remembers a breeder at one of Dr. Kirk's talks on Scottie Cramp "was furious and got up and walked out, saying, 'I don't have to listen to this.'"

Genetics of Scottie Cramp

More freedom on the subject of Scottie Cramp does not seem to have led to a reduction of gene frequency. The genetics every breeder should know about Scottie Cramp are the following approximations typical of breedings for any autosomal recessive gene.

*Affected dog to affected dog: 100% affected offspring

*Non-carrier dog to non-carrier dog: 100% clear offspring

*Affected dog to clear dog: 100% carrier offspring

*Affected dog to carrier dog: 50% affected offspring, 50% carriers

*Carrier dog to carrier dog: 25% affected offspring, 50% carriers, 25% clear

*Carrier dog to clear dog: 50% carrier offspring, 50% clear; no affected offspring

More important to the pet owner than genetic statistics is what it's like to live with an affected dog. Two vignettes of life with a Scottie Cramp pet follow--

Samson (a.k.a. Sammy or Sam)

by Jim Newton, Columbus, IN

Jim and Donna Newton are longtime backer of the breed as former publishers of Wee Scots' Scottie Sampler. Sammy is almost seven years old and has been the Newton's dog since he was a yearling.

"Our experiences with Scottie Cramp have been minimal. Early-on when we realized Sammy's problem, we learned that excessive walking and/or excitement would trigger an attack. Exhaustion toward the end of our two-mile walk would cause him to cramp up a little (although I sometimes thought he was taking advantage of me to carry him the last two to three blocks). Excitement on the walk, like a bunny or a squirrel chase, would cause an attack. Once he got a cramp when we started on a trip in the van. Any trip will excite him, but this one caused cramp. another time we were on a short trip to meet friends for lunch, and greeting them caused an attack.

We found that Sammy becomes scared and confused at what is happening, and it takes TLC to assure him he is going to be alright. We cuddle him and massage his back legs till he can walk without the "limp" or seems to be normal.

We have been treating him with one Vitamin E 100 I.U. soft gel capsule a day with his meal. He has not had a serious attack for over a year, but then his (and our) lifestyle has changed to a much calmer existence.

Duchess, his litter-mate sister, is not affected in any way. She would be leading the two-mile walk, trying to climb every tree (for fuzzy-tails) and looking under each bush (for floppy ears) ALL THE WAY HOME!

Diamond

by Kellie Verrelli, West Palm Beach, FL

Kellie and Tim Verrelli got their Scottie, Diamond, from a store. The Verrellis learned that 2-year-old Diamond had Scottie Cramp when she was six or seven months old.

"My dog Diamond has Scottie Cramp, and she also has an agility title (N.A.) plus her C.D. title, so it isn't stopping her from doing things, though sometimes we don't finish our agility runs. She cramps up most nights with the excitement of my coming home from work. I have her on Vitamin E (1200 I.U.) daily and blue green algae. I can't say the algae helps, but when I took her off it totally, she was worse. I have found that living in sunny Florida, heat makes her cramp, and she doesn't like to have things hanging off her furnishings like grass clippings.

I have changed vets twice and probably will change again. Most vets don't know what to do. The current one doesn't like to drug the dog, and the last just wanted to drug the dog. Neither wanted to try Vitamin E.

Although I have heard of dogs sitting down when it happens, Diamond gets a determined look on her face and pushes on, which I think makes it worse. I have found by picking her up and flipping her over, she relaxes much quicker. Her obedience training has helped, since I can tell her to DOWN from a distance, and most of the time she listens. Well, she is a Scottie, after all."

Skeletons No Longer

"The majority of dogs with Scottie Cramp are hidden behind the skeleton in the closet," wrote Dr. Kirk in his Scottie Cramp article in the 1974 STCA Handbook. Two earlier STCA Handbooks I own (1959 and 1972) left Scottie Cramp unmentioned and deep in the closet. Be glad that breeders today are opening their closets!

To learn from breeders and additional pet owners, read Part 2, "There's Cramp, and Then There's Cramp" in the next Bagpiper. There also will be testing information, management and treatment ideas, postulations about why Scottie Cramp sometimes is masked in affected dogs, directions our breed might take to reduce incidences of Scottie Cramp, and reference for additional reading. See you next issue.

Some Signs of Scottie Cramp

Scottie Cramp is induced by exercise, excitement or fear. Signs may be apparent by 6 weeks of age, and usually are seen by 12 months. Signs often are more prevalent in younger dogs. Affected dogs may exhibit one, several or all signs, or may remain subclinical with no signs unless tested with serotonin receptor blocking drugs like methysergide.

- *Arching of back.
- *Stiff-legged gait caused by over flexed, rigid rear legs - sometimes referred to as goose-stepping.
- *Adduction (winging out) of front limbs. Front legs may seem to take outward circular motion.
- *Forward movement hindered. May seem to walk or run in place.
- *Flexed or tucked tail.
- *Extended head with nose pointing down.
- *Pronounced rotation of hind quarters when walking briskly.
- *When running, may "ski" with one or both legs flexed against body.
- *When running, may catapult rear limbs in the air - sometimes so much the dog somersaults or falls.
- *Involvement of fascial musculature.
- *Pillar-like stance, with inability to move.
- *Falls down and curls into ball like hedgehog.
- *Possible momentary cessation of respiration, but no loss of consciousness. Scottie Cramp is not a seizure.

IMPORTANT: Learn to recognize inhibitory behaviors which may be masking signs of Scottie Cramp. Dogs may interrupt exercise by frequent sitting, or modify intensity of exercise. Puppies may "hitch" leg and scratch frequently, especially during lead training. Such inhibitory behaviors may be normal behavior, but also may be suggestive of Scottie Cramp.

SPECIAL NOTE: Health status of a dog is almost mirrored by Cramp. If signs become worse, they may indicate kidney, gastrointestinal or hormonal problems, which if corrected will improve the Scottie Cramp. Consider Scottie Cramp a barometer of general health.

PART 2

Where Scottie Cramp is concerned, Scottie breeders are like a big cur scratching at fleas before the days of Program® and Advantage®. We're about as effective in reducing incidence of the Scottie Cramp gene as that cur getting rid of Gulf Coast fleas.

This genetic disorder is so invasive that I've never seen a stud dog ad in The Bagpiper advertise "does not produce Scottie Cramp" or "non-carrier of Scottie Cramp gene." Such ads don't exist. Savvy breeders know these claims would be iffy at best.

"Summer Lightning didn't produce it until he was six years old. We almost had decided he was clear," said Cindy Cooke about Ch. Anstamm Summer Lightning, sire of 54 AKC champions and Anstamm's top-producing stud of recent years. "Happy Venture produced it, too. We've never had a top stud that didn't produce it." Ch. Anstamm Happy Venture is America's all-time top-producing sire of Scottish Terriers with 90 AKC champions to his credit.

"Fully one-third of the champions finished in the five years following his death in 1979 were his descendants," wrote Cindy Cooke of Happy Venture in *The New Scottish Terrier* (Howell, 1996). Statistically, 50% of the sons and daughters of a carrier inherit the gene, and we must remember that the Scottie Cramp gene was common then in other lines, too. Mathematics like this makes it hard to escape the gene in 1997. Also important statistically, 100% of the offspring of an unidentified affected dog will be carriers at best.

The interesting counterpoint here is that the Anstamm ladies (Miriam Stamm, Cindy Cooke and Linda Nolan) haven't seen a case of Scottie Cramp in their own homebred dogs in the last several years. Other breeders may have produced Cramp out of Anstamm studs, but Anstamm's own litters haven't shown it.

Possible explanation for this phenomenon is researcher Dr. Kenneth Meyers' statement about "modifiers" at his 1995 STCA Scottie Cramp seminar: "you have the defective (Scottie Cramp) gene, but you inherit all the other genes, too - some of which may suppress the gene, others that may augment it. Modifiers are important. you are looking at one genetic defect, but you are inheriting those other things that modify the expression of the defect. Those modifiers are important!"

Rather than present a scientific treatise on Scottie Cramp, I will let breeders tell its story -

Miriam Stamm (Anstamm) Kalamazoo, MI

"Buffy" Stamm is one of our most senior breeders. Buffy married Tony Stamm (now deceased) in 1955, and he'd been breeding Scotties since the late 1940s. Anstamm dogs have won the STCA's highest award, the Francis G. Lloyd Trophy, eight times since 1964.

"Yes, Cramp was a problem when I started. My first litter was 1951, and I had a crammer fairly early (1956-57),. Cramp's been around a long time, but people just didn't talk about it. Some of the famous old dogs had it."

Of today: "I don't think you can breed a carrier to a major stud without producing it. I'm surprised it hasn't increased more. There are probably many dogs out there that are affected that you never know about.

"We've got this wonderful hill out back that we run puppies on, with squirrels and rabbits. We haven't seen Cramp in three years ourselves, but it's always the prettiest puppy. Once we had this drop dead gorgeous male. We were watching him, and he took off after a squirrel. He had classic Cramp. Suddenly he became a wonderful pet."

Stamm and her partners haven't used the methysergide test for Scottie Cramp except when it first came out. They found it unreliable. She does think it is important to tell buyers what to look for, so they don't think a cramping Scottie is seizing.

Although Scottie Cramp is probably the most widely spread genetic defect in our breed, Stamm thinks it should not be the top priority for researchers. "First of all, Scottie Cramp is a much less painful and threatening disorder for the dogs than CMO or epilepsy. Secondly, Scottie Cramp does not affect a lot of other breeds, or humans, so there is not going to be much research money."

Charla Hill (Charthill) Piedmont, SC

Charla and Tom Hill bred Ch. Charthill Worthy of Colwick (Bosworth), another of the breed's top producers, a sire of 43 champions. To date, there are over 100 champions descended from Bosworth. The Hills have owned Scotties since 1966, and have a Bosworth son, grandsons, and great grandsons at stud currently.

"Bosworth had 108 puppies in his lifetime. I know of two litters with Cramp. I've heard of another through other people, but the breeder has not told me. I've doubled and tripled back on Bosworth and haven't seen it here in my own puppies. My puppies run and play hard, and aren't crated.

"When I linebreed in my own dogs, I don't see Cramp. I have pedigrees that go back to Bosworth eight times, and I still haven't seen it myself. Years ago I had a puppy out of Bosworth's brother that at six months old would stiffen up in stressful situations, but never fell over. I didn't breed her. I do know of Bosworth offspring that have produced Cramp."

If callers ask about Scottie Cramp, Hill explains it very simply: "I say, it's like your electrical system in the house. If you plug in too many things, it blows a fuse. When you unplug a few things, it works. 'Cramp' is an unfortunate word. 'Cramp' seems to imply pain. People are afraid of that. Scottie Cramp does not involve pain!" Hill prefers to explain the condition before naming it.

You may hear odd names for Scottie Cramp. Hill tells that an unidentified breeder explained Cramp to a prospective owner, then heard: "Oh, that's what my last Scottie had. We called it the "Pick Me Up and Carry Me Home Syndrome."

"Is there more appropriate terminology than Scottie Cramp?" someone asked Dr. Meyers at his 1980 STCA Scottie Cramp presentation. The Bagpiper (March, 1981) reported his response: "I would prefer to call it Canine Muscular Tonicity." So would many of us.

Jane Phelan (Caevnes) Dallas, TX

Jane and husband Bob showed their first Scottie in 1985. They bred and co-own Ch. Caevnes Devils Due, a popular stud that was #1 Scottish Terrier (and Lloyd Trophy winner) for 1995 and 1996. Jane was the first chairperson of the STCA Health Trust Fund. Bob is an STCA Board member.

Jane states that Tony is a carrier of the Cramp gene. The Phelans are open about that fact. Tony is the son and great grandson of Ch. Charthill Worthy of Colwick, also acknowledged by breeder Charla Hill to be a carrier. As someone who used both Tony and Bosworth on a mother (Sister) and a daughter (Tina), I appreciate the openness of the Phelans and Hills. The Cramp puppy from Sister and Bosworth was Bosworth's first recognized crammer. I will always be grateful that Charla did not try to tell me I didn't know what I was seeing. I also appreciate the openness of Anstamm. I co-owned one of the bitches that produced Cramp with Ch. Anstamm Summer Lightning.

Reminds Phelan: "People forget their bitches have to be carriers, too. Too much blame is put on the stud dog. Scottie Cramp is a huge problem. I estimate as many as 80% of Scotties are carriers. Some lines do seem to exhibit it to a lesser degree. I think it's there, but with modifiers, and it's not easily recognized. Cramp is such a nebulous thing that many dogs being bred are actually affected.

"There's a critical need for a test that will show if a dog has it for sure. The current test is hard on dogs and hard on people. Dr. Meyers has said dogs can go through the test and not show it, yet cramp the next day. The first priority is to be able to identify dogs that have Cramp, and I don't think we do now. Then you can decide whether to breed to those dogs or not. Dr. Meyers worked up a research proposal in 1995 to the STCA Health Trust Fund for development of a new drug test. It has not been pursued yet.

"With the number of times Tony's been used, it's remarkable he hasn't produced more. All lines probably have Cramp, or most of them. If a person is knowledgeable enough to recognize it and brave enough to admit it, it doesn't mean the gene is more prevalent in that line. It's hard when a person is honest about Scottie Cramp, when others claim their dogs don't produce Cramp.

"We always sell Cramp puppies with spay/neuter agreements and hold papers until receipt of spay/neuter proof. Price? We sell Cramp puppies at a regular companion price. Many times Cramp is the only reason this pup is being sold as a pet rather than as a show dog."

Vandra Huber (McVan) Woodinville, WA

A new Scottish Terrier judge, Huber has exhibited Scotties with husband Michael Krolewski since the mid 1980s, and owned Scotties many years before. She and Michael co-owned the Westminster Best In Show and multi-National Specialty winner Am./Can. Ch. Gaelforce Post Script.

"My concern is that the issue of Scottie Cramp is so salient to breeders that we too often jump to the conclusion that every movement disorder is Scottie Cramp, when in reality there are many other disorders that may affect movement. A puppy at a show started walking funny and hopping. Everyone said, 'Scottie Cramp, Scottie Cramp.' The owner took the puppy to a vet, and he found a broken toe!

"Of structural disorders, the most likely candidate is hip dysplasia (HD). While few Scotties have been tested for HD, this in no way means we don't have it. Welsh Corgis' structure is similar to Scotties' and 22.6% have HD. It could be a problem in our breed. Years ago a Scottie from my breeding program was thought to have Scottie Cramp. It tested negative for Cramp, but X-rayed positive for HD. I've heard of HD from a more recent breeding similar to mine.

"Other ailments we should consider when deciding about Cramp are elbow dysplasia, patellar luxation and dwarfism. One we really need to pay attention to, since it is common in Westies and Cairns, is Legg-Perthes."

Jorge Torrejon (Nazca) Surrey, B.C., Canada

Immediate past president of the Canadian Scottish Terrier Club, Torrejon and wife Pat have exhibited and bred Scotties since 1985.

"Not too many people know what they're looking at. Many really believe they haven't had it. If you haven't observed Cramp early, the animal learns how to cope with it, and you don't see it later. To the pet owner, Cramp is only a problem if you have a heavy crammer. Obviously, it hasn't been bothering breeders that much. I know a few who run dogs to test them, but I don't think many worry about forcing it.

"Cramp shows up most in grass. We have had dogs that don't show it on concrete, but do in tall grass. Spectators often lay signs of Cramp in the ring to the puppy learning to walk on a lead and acting like a puppy, or think of it as a misstep of the dog."

Sue Martin (Wychwyre) Flushing, MI

Martin is a member of STCA's Health and Education Committee. She chaired, designed, distributed tabulated and edited STCA's 1995 Health Survey. Husband Bill is STCA Public Information chairperson. The Martins have owned Scotties since 1968.

"I'd swear on a stack of Bibles that I've never had a litter with Cramp that I know of. I've only seen it once. That was quite a severe case, very obvious. I've never tested because I never thought I had a reason to test, and I don't know anyone now that tests. It's such a mysterious disorder. I think that's why it's been so hard to get a handle on. Most people have been touched in some way by it if they've done much breeding."

Barbara DeSaye (Sandgreg) Lapeer, MI

DeSaye and husband John have bred some of the top-winning, top-producing Scottish Terriers in the U.S. They started in 1966. Now chairperson of the STCA's Health Trust Fund, DeSaye was the dynamo behind the discovery of the von Willebrand's Disease gene in Scottish Terriers.

"To my knowledge, we came up with our own first case of Cramp last year. I had sold this puppy, and the owners called that she had Cramp. She'd lived here 'til she was seven months old. We have all shapes and sizes of dogs at the boarding kennel, and the Scotties go bonkers, but she hadn't shown Cramp. I had her owners bring her back, and I kept her over six weeks before I could see it." DeSaye neutered and placed her sire: "I'm glad I did. He had been bred to another bitch and produced two out of four with Cramp in that litter. It was devastating to me."

Gail Gaines (Neidfyre) Nashville, TN

Gaines has bred Scotties since the 1960s. She recently chaired the STCA's Health and Education Committee and was one of STCA's initial Health Trust Fund trustees.

"One of the most singular events I ever saw was a stud dog class in which the stud dog and all the offspring were cramping-with an experienced breeder.

"(Name excised) was the first living example of Scottie Cramp I had seen. He was quite a handsome dog. I remember talk at shows, and asking about his movement. They did not use him at stud very long.

"I don't like to see Cramp minimized. Some dogs are put down. Our ignorance is appalling. Cramp, if you have a severe case, is a horror. You shouldn't make light of it, not when you've had strangers call and say, 'I don't know what else to do but put the dog down.' One person said the doorbell ringing would make his dog fall over, that it was at the point the dog couldn't walk across the room."

On a lighter side, Gaines recalls a neighborhood Scottie that loved to chase cars. Trouble was he couldn't make it out to the road without falling over. She mused that Scottie Cramp probably saved his life.

Typical experiences for breeders are two like Gaines reports:

"The owner of seven-year-old I'd sold for \$50 as a young pup called. He had always walked the dog two or three miles. When he stopped working, he and the dog walked more. The dog cramped when he upped the walks to about five miles a day. I wasn't totally surprised since there has been a crammer in the litter. All he had to do was decrease the length of the walks."

Another time: "I let a puppy out of the bathroom. He ran and fell over, and then ran again and fell over. I told myself, 'I'm going to learn something from this. I don't have to put him down. I can keep him.' By the time he was three months old, I never saw Cramp any more. I finally sold him. The owner never saw Cramp, but I told her, 'If he gets sick, you probably will see it.'"

Jeannie Passmore (Passmore) Seattle, WA

Passmore is an important part of Scottish Terrier history. She worked with Washington State University researchers who studied Scottie Cramp in the 1960s and 1970s. Her article in the AKC Gazette (March, 1980, p. 105-106) is a classic. To read Passmore's still timely article, see a rerun of it in the Scottish Terrier column of the November 1997, AKC Gazette.

She begins: "'Scottie Cramp' is a neurological defect of the Scottish Terrier. The mere mention of the word will induce nervousness, tightening of the lips, increased heartbeat and severe misery in the breeder. Violent and irrational behavior is not uncommon.

"Scottish Terriers representing Clans from all over the world are also affected by this defect, although the dog's symptoms are different than the breeder's; dog's symptoms being less traumatic... Unlike breeders, affected dogs seem to feel no pain, although they, too, will feel embarrassment."

Before she knew much about Cramp, Passmore relates:

"The first litter of one of our own dogs sired, a dog we were campaigning and winning with, had four crampers, all the puppies. The literature we read said puppies should be put down. We put all four down. We took for granted that both parents had Cramp, although we had never seen it. We decided to keep showing the dog, but not breed him. Later during Scottie Cramp research we tested both dogs. The bitch was affected. Our dogs was not. He was just a carrier. His father, a dog we used extensively, had never exhibited Cramp, but wen tested, he was the affected one."

Passmore's former husband George was a veterinarian, and they undertook an extensive, and expensive, testing program on their own dogs through W.S.U. researchers. Passmore also became liaison between other Seattle Scottie owners and the research team in Pullman. Her original idea was to try to breed out the gene in her own line.

Passmore watched many Scotties tested with the research drug PCPA (not available to veterinarians or the public) and four tested with methysergide. She recounts that day of methysergide testing in the early 1980s by test developer Dr. Roger Clemmons. She said one Scottie had a reaction to the drug and collapsed so the test couldn't be done. One didn't cramp, and was judged to be no more than a carrier, but "her eyes got big, and she went bananas. They had to give her Valium." Another bitch known to have Cramp from earlier testing as a puppy with the experimental drug PCPA did not even cramp with the methysergide. A male that "would cramp at the drop of a hat, did cramp with methysergide, but no worse than he normally did. I would have expected him to be incapacitated. I did not see any evidence that methysergide did anything. I don't feel that it is a safe drug. I wouldn't use it on my own dogs." Passmore has never tested other dogs with methysergide. (More in Part 3 on Passmore's suggested method of testing.)

Would you consider a dog that cramps only under very extreme circumstances a sound animal? Passmore: "Yes. A well constructed dog that shows Cramp even occasionally can take more extended exercise than a structurally unsound dog-such as a dog with joint problems, front too far forward, or straight or over angulated stifles."

We've come a long way, baby-even if the Scottie Cramp gene has come right along with us. Breeder interviews in this issue prove it! Scottie breeders are talking "Cramp" today and sharing information about their dogs. I wish I could have included material from everyone who shared facts and experiences with me. LET'S ALL KEEP TALKING.

Next issue: Part 3, "There is Cramp, and Then There is Cramp!" Discover new nutritional and drug therapies, medications to avoid, eight reasons why we hear so many claims and disclaimers about Cramp, Primer to Scottie Cramp Etiquette, how to test, new interviews with researchers, ideas to reduce Scottie Cramp in the breed, and references for further reading.

Attention: STCA Scottie Cramp tape (reedited and with new footage showing examples of Scottie Cramp) is projected to be ready by year's end. Additional taped examples of different signs and severity of Cramp are needed. For information: Mary Lou Somma, STCA Health and Education Chairman, 5 Shady Lane, Sparta, NJ 07871; Ph. 201-729-4341; or Gail Gaines, Ph. 615-298-1240.

PART 3

"Did anyone contact you after your articles with information about dogs free of the Scottie Cramp gene? Answer: "No!"

Other questions: "Well, if it's so common, where can I see Scottie Cramp?" "Can I test for it?" "Are there new treatments/" "What in the world can we do about Scottie Cramp?"

Easiest place to spot Cramp is where the most Scotties are - like the STCA national specialty. I always see several affected dogs among the 200-plus Scotties there.

October 5, 1997, was the same-old, same-old. The affected dogs I noticed were simply the ones exhibiting signs of Scottie Cramp in that situation, at that point in time. There were probably not alone in being affected.

My intention is not to shock you, appall you, or to scare you out of breeding. My title emphasizes, "There is Cramp, and Then There is Cramp!" - the severe variety - we should worry about, for pet owners must live with this burden.

How do so many dogs with Cramp escape notice by otherwise knowledgeable breeders? And why do we hear so many vehement disclaimers about "having Cramp" or carrying Cramp? Some possibilities are:

- 1) Owner lacks knowledge or experience to recognize mild Cramp.
- 2) Dog is subclinically affected, and rigorous testing has not been done.
- 3) Dog was tested, but the test was false negative.
- 4) Animal has been bred too few times for accurate assessment.
- 5) Some known carrier mates simply don't produce obvious Cramp when bred together.
- 6) Owner of bitch does not share information about Cramp in a litter with stud dog owner-doesn't want to blame the stud.
- 7) Owner suspects Cramp, but would rather flee from truth. And worst -
- 8) Owner recognizes Cramp and lies.

Jeannie Passmore, Seattle, WA said it so well in the AKC Gazette, march, 1980: "Scottie Cramp is a neurological genetic defect of the Scottish Terrier. The mere mention of the word will induce nervousness, tightening of the lips, increased heart-beat and severe misery in the breeder. Violent and irrational

behaviors are not uncommon. Scottish Terriers representing Clans from all over the world are also affected by this defect, although the dogs' symptoms are different than the breeder's: dog's symptoms being less traumatic." Passmore's article is still timely today and is repeated in the AKC Gazette, November 1997. Read it.

If Scottie Cramp is a fact of life, until we can identify affected, carrier and clear dogs with certainty, we must try to breed the "Good Cramp" and not Cramp!

"Good Cramp" Is:

*So unnoticeable the breeder and the owner don't realize it's there (and we're often accomplishing this right now!):

*Cramp elicited only by high excitement/exercise or

*Cramp a dog can learn to inhibit by modifying behavior.

Testing for Scottie Cramp

How to test for Scottie Cramp is an important skill in avoiding use of affected animals for breeding. However, understand the shortcomings of current testing methods: 1) It is difficult to induce signs of Scottie Cramp to express itself. 2) Testers must recognize the mildest clinical signs. 3) Methysergide, the drug recommended for testing is not reliable in forcing Scottie Cramp to express itself.

The Scottie Cramp video STCA's Education and Health Committee is revising may help breeders and owners learn how to better identify Scottie Cramp, particularly mild Cramp. New tapings will show varying degrees and signs of Cramp.

General guidelines: Don't test dogs that show clear signs of Scottie Cramp. Trust your eyes! If you choose to test other dogs with methysergide, test them first with excited exercise alone. Dogs which show no signs of Cramp, or dogs which show equivocal signs, are the ones to test with the drug.

Unless you live in a metro area, you may be unable to buy methysergide in small quantities. No pharmacy in my town (25,000 population) carries it now. Developed to prevent migraine headaches, methysergide is used infrequently. I'd need to buy a whole bottle of 100 tabs (\$160) to get several tablets.

Testing with methysergide (SansertR, Sandoz Pharmaceuticals) involves giving methysergide orally, then after two hours, challenging the dog with 10 minutes of excited exercise. If no signs of Scottie Cramp appear, another dose of methysergide is given, and the dog is tested again after one hour with another 10 minutes of excited exercise.

A Positive Test is Definitive while a Negative Test is Worthless!

Carla LaCoe, Greater Dallas Scottish Terrier Club president and former STCA Board member, routinely tests pups with methysergide at six months old. She wants to determine Cramp status before investing a lot of time and effort into finishing a dog subsequent to entering her breeding program. LaCoe has helped

numerous club members test their dogs, too. Persons wanting first-hand information may call LaCoe, (817-237-3608).

"Just because dogs don't show Cramp on the methysergide test, doesn't mean they don't have it!" repeats LaCoe. She tells of a friend's litter she helped test in the early 80s. Shortly after having been bred, this litter's sire and dam exhibited Scottie Cramp themselves. The breeder knew all five puppies should be affected. Two puppies were obvious crampers at six weeks of age, without testing.

LaCoe helped test the remaining three pups with methysergide at six months. "Four of us who knew Scottie Cramp helped with these tests. We knew they all had to have Cramp!" Two exhibited Cramp; one did not. We retested the negative bitch at nine months. She still did not have Cramp. We tested her again at one year. Finally she did cramp. All the tests were done with methysergide."

The lessons to be learned are: Take the results of Scottie Cramp testing with a grain of salt-at least negative results. Likewise, regard negatives from tests done at veterinary clinics with caution. Researchers note that apprehension inhibits cramping and that even known affected dogs often won't cramp at the vet's office.

What every breeder can do is to at least test puppies and promising adults without the drug. Veteran breeder Jeannie Passmore suggests the following technique.

Testing Without Methysergide

To Test a Litter of Scottie Puppies: "Test at six and eight weeks. Those are the best times to pick up Cramp. Confine the puppies for a few hours, not letting them play. Then take the puppies outside, especially in the presence of a stranger. Put them in the grass and run with them." She adds that it's important to keep the level of excitement high, and run the puppies as long as possible.

"You usually can pick Cramp up at six to eight weeks-if you want to know. The trouble is most people want the dog to fall over before they'll say it has Cramp." Passmore says the smallest sign should be taken as evidence. 'Rabbit hops' should be considered indicative and the puppy should be tested at a later date.

To Test Adult Scotties: "Put a rat in a cage. Get the Scottie excited, really wild about the rat. Then run the dog. Repeat this several days in a row. You can get a dog really buzzed with a rat. If there is Cramp, chances are you will see it." The key is excited running," says Passmore.

Remember, testing for Scottie Cramp is a challenging physical task-especially for the humans. To test well, you need a partner for running and watching. Use excited exercise for at least 10 minutes. Keep the dog moving and excited with lots of hype-squeaky toys, food bags, whatever.

Test Breedings

Test breedings, either in the flesh or by retrospective analysis, can be used to identify Scotties clear of a recessive gene like Scottie Cramp. No one seems to have tried either technique, at least in recent years.

For statistical probabilities of test breedings, see *Genetics of the Dog* (1989) by Malcolm B. Willis, p. 356. As few as four unaffected offspring from a test mating which includes one affected mate means the test mate has a 93.75% chance of being clear of the gene. If there are 16 unaffected offspring (and no affecteds) from any known carrier females bred to one stud, that stud has a 99% chance of being clear of the gene.

Accuracy of clearances would depend on ability to identify affecteds. Even if some subclinical were missed, I suspect the retrospective technique still could be helpful in identifying studs likely to produce: 1) less cramp; and 2) only mild Cramp.

A Better Testing Drug?

"Identifying affected dogs would be a major step in reducing the incidence of Scottie Cramp," writes Dr. Kenneth Meyers, one of the original Cramp researchers. "Many dogs are mildly affected, and clinical signs are difficult to detect even with long periods of strenuous excited exercise. Some moderately or severely affected will not exercise strongly enough to show signs of Scottie Cramp. In these and other situations, the owner or breeder may not realize the dog has Scottie Cramp and will breed it as though it were not affected. As a consequence, it has been very difficult to eliminate the trait from the breed."

P-chlorophenylalanine (PCPA), the medication Washington State researchers used to elicit Cramp in experiments, was very effective in bringing forth clinical signs in mild to moderately affected dogs after short periods of excited exercise.

"Unfortunately," explains Dr. Meyers, "PCPA was an experimental drug, and it was not then, nor is it now available outside the laboratory. In addition, it takes three days for the drug to achieve a maximal effect."

Methysergide elicits Cramp by blocking serotonin receptors. When methysergide was selected as a drug veterinarians and breeders could use for testing, only two types of serotonin receptors were known. Drugs to block serotonin were rather crude and choices few.

There has been a remarkable increase in our knowledge of serotonin receptors in the last three years," wrote Dr. Meyers in 1995. "Seven receptors have been identified...Several new blockers have been developed that are highly specific for the target receptor."

Dr. Meyers two years ago proposed to the STCA Health Trust Fund that a new study be undertaken to identify a more effective testing drug than methysergide. Research cost would have been about \$31,000 to examine eight different serotonin blockers. The STCA Health Trust Fund did not act then to accept the proposal, but Dr. Meyers study is one our club might reconsider.

Treatment of Scottie Cramp

Dr. Meyers noted in his 1995 STCA Scottie Cramp seminar that fat levels, vitamin levels, corticosteroids and thyroid levels all could change the severity of Scottie Cramp. He also stated that Scottie Cramp can be modified by prostaglandins, and that other antioxidants could work like Vitamin E, but that researchers hadn't tried them.

In other words, there is still much we can learn about the management of Scottie Cramp. Here are some old standard therapies, and a few new ideas:

Behavior Modification

Environmental Change-

1) Acute Signs - Stop exercise. Remove dog from excitement or fear stimulus. Rest dog. Signs of Cramp usually disappear in one to 10 minutes.

2) Long-Term - Maintain dog in a quiet, non-kennel situation. Families with lower activity levels and no small children are ideal. Learn what induces Cramp, and avoid those situations.

Vitamin E Treatment-

Dosage: 125 IU/kg/day. Vitamin E does not prevent Scottie Cramp, but raises the threshold at which it occurs. A common mistake with Vitamin E is to underdose. Some owners get jittery about the classic 1,000 IU/day dosage for an average-sized Scottie. Dr. Clemmons writes about dogs: "There are no known side-effects of Vitamin E at levels less than 4000-6000 IU per day..." (Dr. Clemmons' Vitamin E recommendation for any dog-those without Scottie Cramp-under 2 years old, 400 IU/day; over 1 year old, 800 IU/day.

Medication for Severe Cramp-

1) ValiumR (by Hoffman-LaRoche)

Diazepam was the earliest drug recommended; dosage: 0.5 to 1.5 mg/kg. This relaxant reduces the clinical signs of Scottie Cramp in an acute episode, and prevents expression of clinical signs for up to eight hours.

2) ProzacR (by Dista)-ProzacR (fluoxetine hydrochloride) is a more recent drug which Dr. Clemmons indicates should offer improved treatment over Valium for Scottie Cramp. Dosage: 1 mg/kg once a day. Use only under veterinary direction.

Avoid These Medications-

Compounds which inhibit prostaglandin formation-aspirin, indomethacin (Indocin), phenylbutazone (Butazolidin), flunixin meglumine (Banamine and Finadyne), penicillin G (Bicillin, Combiotic), penicillin derivatives-increase Cramp's severity.

New Nutritional Strategies-

The general rule is that agents that encourage prostaglandin synthesis and increase serotonin production and function are helpful in decreasing severity of signs of Scottie Cramp and lengthening exercise time to elicit signs of Cramp.

Dr. Clemmons suggests Vitamin C and Selenium in addition to Vitamin E for Scottie Cramp therapy. Vitamin B Complex is another promising supplement. Dr. Clemmons, in fact, recommends all dogs receive Vitamin E, Vitamin C and B-complex vitamins. Clemmons' "Alternative Therapy in Dogs with Nervous System Disorders," is a good reference with information on these and other supplements. It is available via the Internet: kitty.vetmed.ufl.edu.

Vitamin C: Works with Vitamin E; helps regenerate Vitamin E, potentiating antioxidant effect. Dogs under 2 years old, 250 mg twice a day; over 2 years old, 500 mg twice a day.

Selenium: Antioxidant properties similar to Vitamin E; may make Vitamin E more effective. Selenium can create toxicity at high levels. Never give more than 100 micrograms per day to small dogs.

B-Complex Vitamins: Give only in the "complex" form. B Vitamins are co-factors in many important biological processes. They are water soluble, so excess is eliminated in urine. Small dogs--Regular B complex twice a day. Medium dogs: High potency B complex (B50s), twice a day.

Late Breaking Therapy: St. John's Wort (*Hypericum* species) is billed as "the wonder weed, the herb of the hour, a natural ProzacR," in *Dog Fancy*, December, 1997, p. 16. St. John's Wort was not a Cramp therapy mentioned by Dr. Clemmons, but in Europe it has been replacing ProzacR in humans after years of study and clinical use. Since ProzacR is suggested as a drug for severe Scottie Cramp, St. John's Wort might be another Cramp therapy. Holistic veterinarians in the U.S. use it to treat separation anxiety and aggression problems in dogs and cats.

Scottie Cramp: A Barometer of Health: If symptoms get inexplicably worse, check other health conditions and treat. Scottie Cramp should return to original level.

Note: Euthanasia is not warranted except in the most unusual Scottie Cramp case!

You Can Be the Expert!

You can be an important reference for veterinarians and pet owners. Most veterinarians treat few Scotties. Many have never seen Cramp, since affected dogs are less likely to Cramp at a vet's office. The three small animal veterinarians in my home town haven't seen Scottie Cramp!

Whereas a Scottie breeder might diagnose a dog from one simple sentence ("The owner was very troubled that her dog fell over when she came home from work"), veterinarians have been known to treat the same dog for seizures, or X-ray for dysplasia.

STCA Corresponding Secretary Polly O'Neal recalls: "I was picking up medicine at my veterinarian's. The tech said, "We have a Scottie boarding that hops and curls up when we let it out of the run. "That's Scottie Cramp!" I told her."

O'Neal fulfills many information requests for STCA. One Montana owner called "scared to death her dog was going to die or be crippled for life. I sent articles which she gave to her veterinarian." The owner later told O'Neal she reported the condition to the breeder of the pet shop Scottie: "The breeder had never heard of Scottie Cramp, and said 'too bad,' they were going to keep breeding Scotties."

Rescue Scotties and Cramp

STCA Rescue Chairpersons Daphne and Marshall Branzell have handled dozens of rescue Scotties in their personal San Antonio area rescue operation. "Lucky" is the only rescue Scottie they've seen with obvious Cramp. My Permian Basin Scottish Terrier Network places about half dozen rescue Scotties annually in West Texas, and I have never seen Cramp in any of those either. Scottie Cramp seems not as common in the general population of casually bred Scotties as among the more concentrated gene pool of show dogs. I expect other Scottie rescue workers could confirm similar low numbers.

New Climate of Openness

It's now up to breeders with a passion for perfection in body and temperament to also lead the way through the mysteries of Scottie Cramp.

We've started. When major breeders are open that their dogs have produced Scottie Cramp (or disease), it frees the rest of [the fancy from a code of silence. Important breeders have been very candid in this Scottie Cramp series. I hope "the ranks" will follow suit.

Comments like the following are eye-opening, but must remain unattributed.

Don't Tell Anyone, But..."

*I would breed to an affected dog if he had the other things I need. Researchers say you don't discard an exceptional animal from a breeding program because it has Cramp."

*I had a bitch come in for breeding that cramped afterwards. What would you do? Tell the owner? I did and I've never heard from the person again.

*Kiss and tell has its merits in breeding healthy dogs."

"Do I always tell the buyer? Not always. If it's a puppy with low incidence and to a slight degree, not always. Is that dishonest? Maybe. Has it ever caused a problem? No."

"If the animal is exceptional, why wouldn't you breed a dog that has Cramp? You risk producing Cramp anyway every time you go to breeders that can't guarantee you won't get Cramp. Any prominent breeders I've gone to: None will guarantee that their dogs will not produce Cramp."

"I've bred litters from several affected animals. I have not noticed any greater incidence of Cramp than in litters from apparently normal dogs."

"Expect the worst, and you're probably right."

*And famous last words of a stud owner: "We haven't had it in a long time, but I suppose it's about time."

Personal Heartache

A breeder who is dealing with Scottie Cramp for the first time, a litter with two known crampers, wrote me after reading Part 1 and Part 2. Nancy Aaron, Morro Bay, CA, has owned Scotties for 23 years, exhibited occasionally for 15 years, bred and whelped four litters, and was involved closely with the late Lena Kardos.

"During all this time, and all this exposure, for us, Cramp was non-existent. We never saw it, nor did we hear of any cases. Such is no longer the situation."

"All of this has thrown us into a dilemma of what-to-do next. We have been struggling with the ethics of the matter for over one year, talking to many breeders, many show people, and a vast number of Scottie pet owners about the problem. Frankly, I'm afraid to breed our bitch again. There are others who strongly disagree."

"It no longer seems a case of isolated incidents, with an occasional Cramp puppy showing up. In seeking that stud dog that does not produce Cramp, we talked to many well known and respected breeders and have been universally told that 90% of the Scotties 'out there' have the Cramp gene, and that we should be willing to accept the likelihood of it occurring if we breed again. Somehow, I am not comforted by the thought that there is 'safety in numbers.'"

What Shall We Do about Cramp?

Aaron challenges us as breeders: 'With respect to the human factor, how can we live with ourselves if we do not consider the trauma, and possible heartbreak, that can take place when an unsuspecting owner sees their 8-month, 12-week, 6-month, one-year-old Scottie suddenly lock up, stiffen, or ball up while at play? Or on a walk? or --- just when the doorbell rings?'

Aaron offers the following recommendations:

- 1) The STCA should formally recognize the seriousness of the proliferation of Scottie Cramp-not just as an inconsequential genetic disorder, but as a problem that could have far reaching effects on the breed...
- 2) The STCA should charge the Health Committee to appoint a special Ad Hoc task force to study and recommend a course of action..."
- 3) It should be acknowledged that, even if Scottie Cramp is considered by many to be a comparatively minor disorder... the human factor must be taken into account. Should a breeder, knowing the statistical probability, and in a suspect situation, so advise the buyer?
- 4) In view of all this, the STCA should implement the 1995 proposed Meyers' study for development of a Cramp drug testing program."

Nancy Aaron's ideas are worthy of consideration.

My own suggestion is that we investigate feasibility of a future Scottie Cramp DNA gene identification project. Money is the limiting factor. However, surely the many breeders and owners that Scottie Cramp has touched would dig deep in pockets.

What are your ideas regarding Scottie Cramp? Please make your wishes regarding Scottie Cramp known to the STCA Health Trust Fund, the STCA Health and Education Committee and the STCA Officers and Board of Directors.

Good References on Scottie Cramp

- 1) Scottie Cramp Video: Produced 1995 by STCA. Contains - a) Dr. Kenneth Meyers' Scottie Cramp seminar, June 8, 1995, at the STCA Rotating Specialty in Washington; b) Scottie Cramp Tape produced in 1983 by researchers Dr. Kenneth Meyers and Dr. R.M. Clemmons; c) early film clips of Scottie Cramp collected by Dr. T. Allen Kirk. (Note: New Scottie Cramp Video is under production. Contact Mary Lou Somma, STCA Education and Health chairperson, 5 Shady Lane, Sparta, NJ 07871.)
- 2)"Scottie Cramp:" R.M. Clemmons, DVM, PhD; STCA 1991 Handbook; pp. 124-126.
- 3)"Scottie Cramp:" K.M. Meyers, PhD, and R.M. Clemmons, DVM; Current Veterinary Therapy VIII, Small Animal Practice; Robert W. Kirk, DVM, editor; pp. 702-704; 1983; W.B. Saunders Co.; Philadelphia, PA.
- 4)"Scottie Cramp: A Review of Cause, Characteristics, Diagnosis and Treatment:" R.M. Clemmons, DVM, PhD; R.I. Peters, PhD; and K.M. Meyers, PhD; The Compendium on Continuing Education, Continuing Education Article #3; Vol. 11, No. 5, May, 1980, pp. 385-388

5) "Scottish Terriers, a Second Opinion:" Jeannie Passmore, AKC Gazette, pp. 105-106, March, 1980.

6) Dr. R.M. Clemmons, Department of Small Animals Clinical Sciences, College of Veterinary Medicine, University of Florida, Box J-126 Health Science Center, Gainesville, FL 32610-0126.

7) Dr. Kenneth M. Meyers, College of Veterinary Medicine, Washington State University, Pullman, WA 99164-7012.

8) Other Scottie Cramp articles include lay features in the STCA's Bagpiper and published research in The Journal of the American Veterinary Medical Association (1969), Journal of Heredity (1970), Archives of Neurochemistry (1977), Pharmacology (1975); Experimental Neurology (1980).

Author's acknowledgment: Thank you to the many breeders and pet owners who offered thoughts, information and anecdotes about Scottie Cramp for this three-part series. Regrettably, space limitations kept me from sharing all the valuable and interesting input. As an STCA Health Trust Fund trustee I welcome hearing from one and all about Scottie Cramp concerns. Carole Fry Owen, 9 Coachman's Circle, Big Spring, TX 79720; ph. 915-263-3404.

Primer to Scottie Cramp Etiquette

- *Be more open. But first be open about your own dogs.
- *Be cautious to claim dogs are not affected. It is almost impossible to be sure.
- *Accept the mystery that some mates you'd expect to produce Cramp together don't.
- *Diagnose Cramp at your own risk, unless asked by breeder or owner.
- *When you see Cramp in the ring, avoid ringside gossip.
- *Ask knowledgeable breeders to help you evaluate your puppies for Cramp.

Fantasy or Future? "The C. Owen Theory of Scottie Cramp"

Don't mistake my hypothesis for scientific fact. Develop and name your own theory! I believe knowledgeable breeders are "breeding down" from severe Scottie Cramp to milder, often subclinical, Scottie Cramp-even as they proliferate the gene.

How? Breeders do not breed grossly affected Scotties. If breeders get severe Cramp, they move elsewhere for the next breeding. Even if we can't identify all the genetically "affected" dogs, we select against breeding dogs that show the disorder.

Genotypically, Scottie Cramp genes rage through the fancy. Phenotypically, more Scotties appear normal. Certain modifying factors can work positively or negatively to impact Scottie Cramp by influencing nutritional efficiency, or by affecting enzymes or metabolism that control serotonin production. Capable breeders unknowingly load their Scotties with Cramp "depressor" modifiers and minimize Cramp "augmentor" modifiers.

I envision a time when most breeding stock of serious breeders will be genotypically affected with few (or none?) of those dogs showing clinical signs. Would we have more Scottie Cramp? Or would we have less?

Prepare for future shock. The Brave New Terrier World may be populated with Scotties genetically pure for Scottie Cramp, which do not exhibit Scottie Cramp. My Philosophical question is: When a Scottie Cramp ceases to be a problem, is it still a problem?