Today's Animal Health

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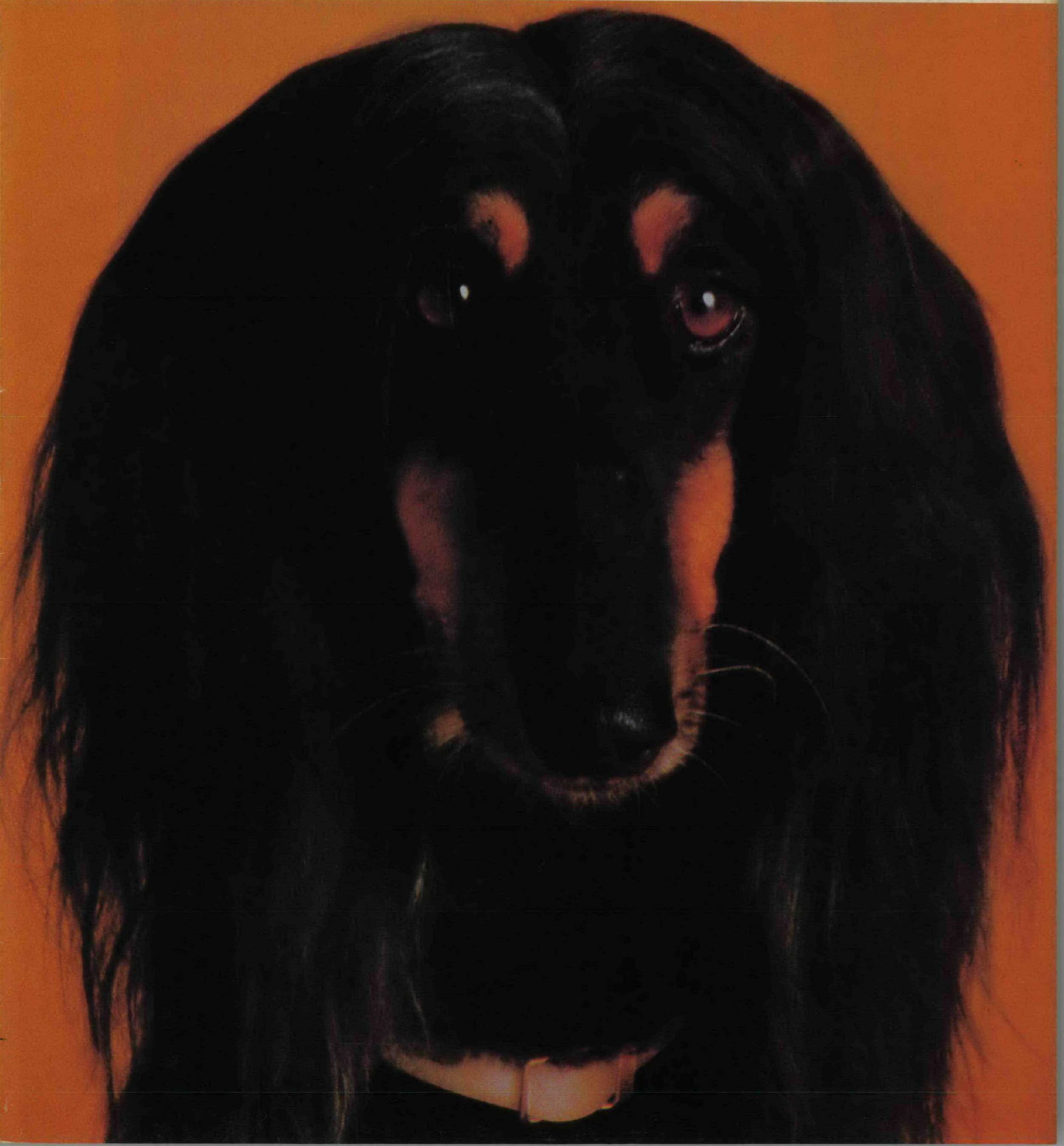

Today's Animal Health

Volume 9/Number 5 September/October 1978

TODAY'S ANIMAL HEALTH is published bi-monthly by the nonprofit charitable Animal Health Foundation
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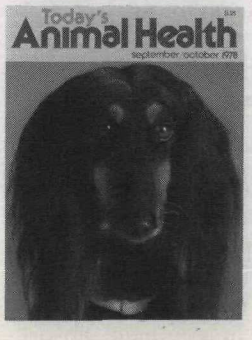
TODAY'S ANIMAL HEALTH is published to inform animal owners about responsible animal ownership and animal health. There are subscribers in all 50 of the United States and in 17 foreign countries. The magazine is used as a tool for client education by veterinarians and for educational purposes in classrooms and school libraries.

The ANIMAL HEALTH FOUNDATION supports research in animal health and pet population control. The Foundation also provides free veterinary care to pets belonging to elderly persons living entirely on social security benefits and those living on Aid to the Totally Disabled in the Southern California area. This program is made possible through the cooperation of local veterinarians. These activities are supported by donations from the public and can be maintained only through your continued financial support. Your contributions to the Foundation are tax deductible.

FEATURES

DEPARTMENTS

COVER PHOTO:
Compliments of Haver Lockhart



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dialogue

I reviewed Today's Animal Health at my Veterinarian's office and I was impressed by the articles, graphic pictures, and level of writing.

Christine Baumann Horn
Student of Veterinary Medicine
Brooklyn Park, Minnesota

Your magazine is terrific, the best one on animals ever!! May I suggest one should be sent to every veterinarian in the country for his office. I certainly save mine . . . . they are a treasure.

I am an A.P.I. member for years. Your article on Tanya Tucker reminds me of myself . . . . her love and concern for animals. I too will not go anyplace without my 2 Shepherds and cat. Tanya's face radiates love, and so much inward beauty, a gift from God. How about starting a column about good deeds that teenagers do for animals — dogs, birds etc. in your magazine?

So happy to have found your magazine at my vet's!

Cecili M. Gross, Animal Lover
Fort Lauderdale, Florida

My husband and I wish to express our appreciation for the renewal of a subscription to Today's Animal Health.

We enjoy the magazine — it not only gives informative information but we also feel the organization is for a good cause, being pet owners ourselves.

Please thank Dr. H. A. Weyker for his kindness in renewing for us.

Clyde and Eleanor Smith
Long Beach, Calif.

On a recent drive with my family, our sixteen year old son, who "reads" his subscription copy of OUTSIDE in about three minutes and ROLLING STONE in five, read TODAY'S ANIMAL HEALTH in complete absorption for over an hour.

This is a fine magazine and deserves success. Keep up the good work. Best wishes.

Hooper Fowler, Circulation Director
Western Outdoors Publications
Newport Beach, Calif.

P.S. The selection of cover art is outstanding.

While looking for homes for kittens given to us, I came across a very good organization I thought you would like to know about.

The parent group is Pet Welfare, located at 382 Van Buren Avenue, Oakland, California 94610. Membership is $5.00 a year, tax deductible. They find homes for lost animals and others, board them, do not destroy, and run a spay clinic. A branch of this group is headed by Alice Trevino, 4341 Railroad Avenue, Pleasanton, who runs St. Mary's Thrift Shop.

These people are certainly meeting a need in this area and I just wanted to tell you.

Janet Hunter Scheer
San Ramon, Calif.

I received my first issue of Today's Animal Health, and to say the least I'm crazy about it.

I'm currently a student of the North American School of Animal Sciences, and through my studies I'm learning quite a bit in the animal care field. I am happy to see the very accurate information in your various articles on Animal Care, because today some magazine articles don't print the complete information on a subject which your articles do. This will help me in my studies. I can't wait for my next issue.

I thank you for an informative and a very good magazine.

Robin Santiago
Vacaville, Calif. 95688

There's good, sound advice in your magazine. Please send some subscription blanks, as several clients have asked if they could receive copies of your magazine.

Lawrence T. McAfee, D.V.M.
Valparaiso, Indiana 46383

dialogue →

If any Today's Animal Health readers have wondered how much they should feed a dog; how they can housebreak a puppy; what the signs of illness are in dogs, the answers to these and many other common questions are offered in a new 32-page booklet published as an educational service by Ken-L Ration.

Titled "How to Care For, Train and Feed Your Dog," the free booklet uses easy-to-understand language and creative illustrations to explain the importance of well-balanced meals (not table scraps), regular grooming, obedience training, litter clean-up, regular health check-ups, and the dog owner's responsibility to the community.

Also included is information on neutering, canine first aid, and planning for a new dog's arrival at home.

A "Dog Health Record" provides space for recording immunizations, parasite examinations, allergies, special diets, long-term medications, and a veterinarian's address and phone number.

The new booklet is available free by writing to: Ken-L Ration Dog Care Booklet, Dept. T., P.O. Box 6333, Chicago, Ill. 60677.

Carolyn A. Morency
The Quaker Oats Company

I am sure that Today's Animal Health readers are aware that the current problem of dog overpopulation poses numerous problems throughout the United States.

Of the estimated 48,846,000 pet dogs in the United States, 52% are female and 43% of those female dogs are capable of breeding one or two litters annually. It is estimated that dogs in the United States are capable of giving birth to 10,000 puppies per hour.

Pet overpopulation has been a subject of concern and is one of the most frequent complaints mayors of metropolitan and suburban areas hear. According to "**Newsday**", the country's largest suburban paper, letters on the subject of dogs run "fairly high", following letters on abortion, gun control, taxes and local political issues.

Concurrently, there is a high concentration of dog problems in rural areas, resulting in part from dogs being dumped off by owners who couldn't find homes for puppy litters. At times, stray dogs have become hazardous problems, forming potentially dangerous dog packs.

Eight million unwanted dogs were destroyed in the United States in 1977 at a cost of over $200 million, according to the American Society for the Prevention of Cruelty to Animals.

Euthanasia, though, is a drastic, undesirable measure for many pet owners. They would just like to limit their dogs' offspring. Many turn to surgical neutering, but there are large numbers of pet owners who want their dogs to have puppies at a later time.

In a 1976 study conducted by The Upjohn Company, four reasons were given for the high incidence of unspayed female dogs. Of households surveyed, 44% cited possible later desire to breed the dog, 26% thought the cost of surgery too high, 14% objected to the weight gain after spaying and 12% complained of possible personality changes.

Aiming for a method that would allow dog owners to breed their animals later if they so desired, Upjohn began research on canine birth control in 1966. The research resulted in a liquid compound which prevents heat in female dogs.

Called Cheque, the contraceptive is dispensed through veterinarians. Administered at home by the dog owner, it is placed daily either on a small portion of the dog's food or directly into its mouth. Dosage is prescribed by the veterinarian based on breed and weight. Cheque is effective as long as daily treatment is continued.

Cheque contains a synthetic steroid hormone that prevents heat in the mature female dog. It is a non-progestational compound which eliminates many of the problems associated with progesterone.

Field tests of Cheque have found it highly acceptable with an expected efficacy of over 90%.

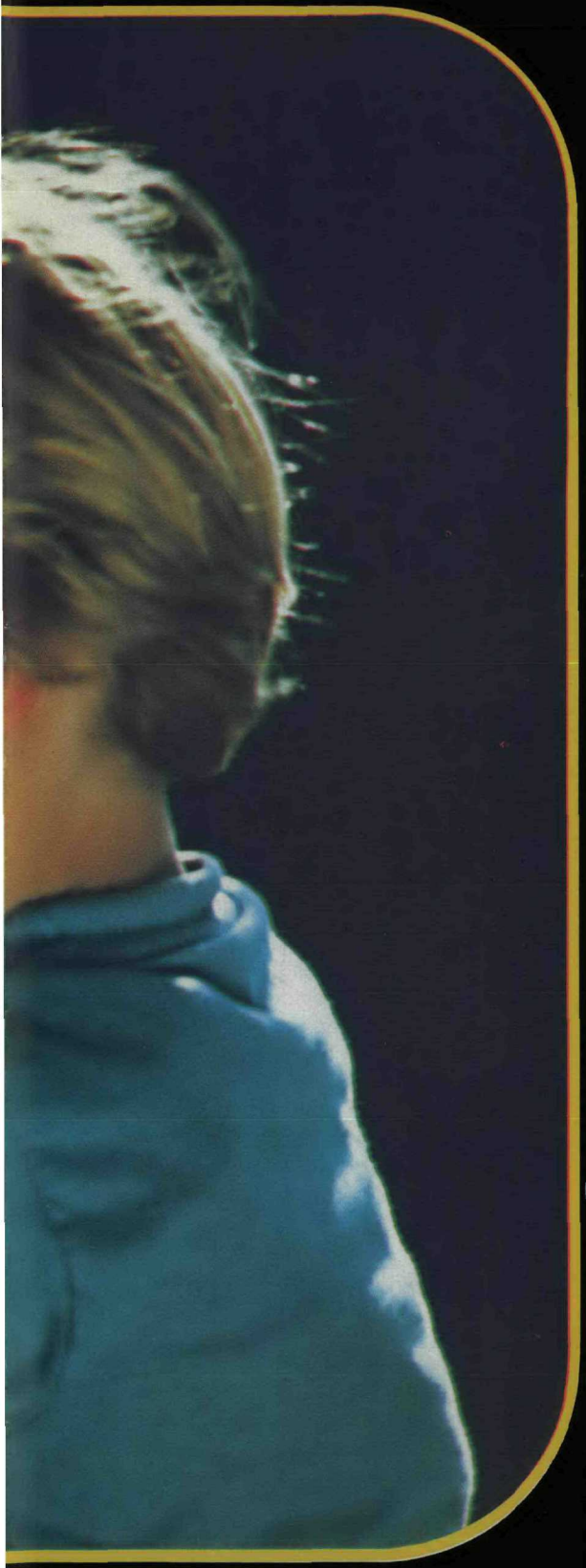
Most dogs have been found to come into heat between 70 and 90 days following last treatment of Cheque. Few adverse side effects have been found in extensive testing of the drug.

For further information, readers may write to me c/o Cheque, The Upjohn Company, 9823-190-1, Kalamazoo, Michigan, 49901.

Loren E. Byers
The Upjohn Company

PETS FOR PEOPLE-TH

ERAPY



by Leo K. Bustad, D.V.M.
College of Veterinary Medicine
Washington State University

The first recorded use of pets in therapy occurred in the 1700's and is described by Boris Levinson in his helpful book *Pet-Oriented Child Psychotherapy* (1969, Charles C. Thomas, Springfield, Illinois). The instance involved some revolutionary approaches in a new mental hospital called the York Retreat in England. Significantly, the care of pets by the patients was the initial planned step. It was reported that the pets helped awaken social and benevolent feelings in the patients. This experience seems to have been ignored until World War II, when the American Red Cross at the American Air Force Convalescent Center in Pawling, New York, utilized dogs in patient care. The experiment met with unusual success.

Dr. Levinson is the modern pioneer in pet therapy with children. As a result of his dog, Jingles, being accidentally introduced to a distraught, withdrawn child, the doctor began using pet therapy. In this serendipitous experiment, Jingles became an instant friend of Johnny and helped remarkably in Johnny's rehabilitation. Dr. Levinson summarizes his great respect for Jingles in the most remarkable dedication I've seen in any book:

This book is dedicated to Jingles, my co-therapist,
To whom I owe more than he owes me;
Who taught me more than I taught him;
Who unveiled a new world of experience for me;
Who doesn't care whether this book is dedicated to him or not;
And who will never learn about it.

Although these are the only events that I have found in the literature, I am certain that pets have been utilized for therapy for a long time and in countless situations which have gone unrecorded. This belief was reinforced last fall when I visited Bethel, in Bielefeld, Germany, one of the most remarkable places I've been privileged to see. Bethel residents have benefited from pets as companions for probably 100 years. Bethel is (at present) a center of healing for severely disabled people and was begun modestly in the late 1860s as a home for epileptics. During my visit, I observed the birds, cats, dogs and horses in the residences and the work sites. I asked my host, Friedhelm Hocke, how long they had utilized pets as companions with their patients. He said that although horses had been introduced only recently, many of the other animals had been kept as pets since the early years of Bethel. Keeping pets is accepted here as an appropriate and reasonable way of life. The therapeutic value of these pets is unquestioned by the people in charge here.

Many years ago, I visited a rehabilitation center for handicapped people at Beitostolen, a ski area in central Norway, which was started by a blind musician named Earling Stordal. There they supplement their intensive physical therapy program with the use of dogs and horses as important components in their therapy regimen. Their use of pets continues because it has been found to be very effective.

Recently I visited a psychiatric hospital in Alaska. The chaplain of the hospital, an old friend, was my host as we toured the facilities. When we came to the pleasant living area, we met a large white dog. "This is Princess," he said, "and she is the most important member of our therapy staff." He went on to say that many of the disturbed people there related initially only to the dog. Princess turned out to be the link with the community of people.

In England, an interesting experiment was reported by Mugford and M'Cominsky in 1975. (In: *Pets, Animals and Society*, R. S. Anderson, ed. Bailliere Tindall, London, and William and Wilkins, Baltimore, pp. 54-65.) They used a small Australian parrot (Budgerigars, usually referred to as Budgies) as therapy for old-age pensioners who lived alone in an urban area in Yorkshire, England. The pensioners with parrots were compared to another group of pensioners who had plants. The control was a population of old-age pensioners without pets or plants. The group with the parrots was judged to have been helped the most. The Budgies exerted a beneficial effect upon the social and psychological condition of these people.

In recent correspondence, Dr. Cicely Saunders, who is the Medical Director for St. Christopher's Hospice in the London area, related to me

PETS FOR PEOPLE-THERAPY

that their patients are allowed to have pets. This hospice concentrates on caring for terminal patients. The presence of pets is beneficial in this particular situation.

One of the great failures of civilization in many parts of the world, and certainly in this country, is that we often separate old people, especially when they become institutionalized, from their pets. Often, the pet is the only thing left in life who gives them unconditional love with few demands. The result is a tragedy. Prohibition of housing of pets in retirement homes is supposedly for safety and health reasons. These rules are very difficult to justify on the basis of what we know. Rules and regulations should be made more realistic and sensitive to people and their pets.

Dr. Levinson correctly observed that much confusion and lack of direction exists in the use of pets in therapy. He made a plea for imaginative and rigorous research to establish boundaries and principles in their use in psychotherapy. He went on to state that we must learn how to select and train dogs for special psychotherapeutic work. (Dr. Levinson's book *Pets and Human Development*, 1972, Charles C. Thomas, Springfield, Illinois, is the most comprehensive book on this subject available.)

Dr. Sam Corson, his wife Elizabeth, and their associates at Ohio State University were among the first to attempt, systematically, to evaluate pet-facilitated therapy. Pet-facilitated psychotherapy in a hospital setting is described in *Current Psychiatric Therapies*, (Vol. 15, Jules H. Masserman, ed. Grune & Stratton, New York, pp. 277-286). Dr. Corson describes a colony of dogs housed on a hospital floor just below the day room of some emotionally disturbed people. One of the patients, a young teenager, heard the dogs barking and wanted to visit them.

After considerable thought, Dr. Corson decided that using pets as therapy for patients who had failed to respond to so-called "standard" therapy (e.g., drugs and electroshock) was worth investigating. He had a mixture of wirehaired terriers, border collies, beagles and cocker spaniels. From this mixture he, his wife and his associates tried to match the personalities of the dogs with the needs of specific patients.

The results of these experiments were exceedingly encouraging. Psychotics who were bedridden and uncommunicative were transformed and eventually discharged. The Corsons reasoned that the pets were so effective in psychotherapy because to a withdrawn individual, the pets are undemanding, uncritical friends who serve as loving links for those who has lost social skills and desires. Furthermore, the pets need help; they need to be fed, bathed and brushed. As the patients assumed these duties, the Corsons noted that the patients began taking better care of themselves and became more independent.

For financial reasons, Dr. Corson's dogs next were moved to an institution for older people, and some remarkable results were obtained. People who were dependent and generally uncommunicative took dogs for walks in the neighborhood and talked to people. One 82-year-old man had been institutionalized for over 20 years due to a fall and a head injury. He spoke audibly and asked to care for the dog. As a result, he became part of the life about him and began drawing pictures of dogs, first by tracing and later free hand.

Related to the pet-facilitated therapy we have been discussing is the specific assistance that can be rendered by a dog to a deaf person. In recent times, interest has grown in the hearing dog programs. The American Humane Association has a nationwide program, and the Berkeley Humane Society is planning such a program. An early "hearing dog" program was initiated by the Minnesota Society for the Prevention of Cruelty to Animals after they were contacted by a deaf woman whose dog, upon whom she depended to notify her of arrivals of visitors, had died. She wished to obtain a trained replacement. This stimulated the Minnesota society to initiate a modest program. Since that time, many others have become interested in this worthwhile program. The need appears to be very great since about 6% of our population has hearing impairment (about 1.8 million people in the United States.)

The American Humane Society has a well-organized program for hearing dogs. At their headquarters in Henderson, Colorado, there is a fine facility for training animals. Training techniques for both dogs and masters have been established. About 40 dogs have been placed for performance evaluation. In the training program, the animals must learn complete obedience and then are checked for sound-keying with their deaf masters. They are trained to detect sounds of various sorts, such as traffic noise, door bells, smoke signals, sirens and other sounds of importance.

Regional programs are being developed to broaden the scope of the endeavor and make it convenient for more of the hearing handicapped. Veterinarians are interested in cooperating with these types of centers. They can contribute in developing behavioral profiles on animals and in helping to determine the effect on the animal itself.

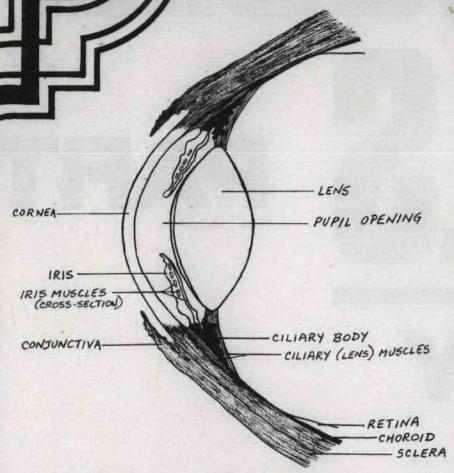
Conclusion

Many people are beginning to recognize the extent to which pets can facilitate therapy for an assortment of human problems. Pets can be utilized for disturbed children and adults, such as those who are autistic. They provide security and comfort for older people, comfort for those who are in prisons, and important help for those who have a serious hearing impairment. Veterinarians should work toward adopting laws that would permit the presence of pets in institutions in each of our states.

On the basis of experiences by many people and institutions in Germany, England, Norway, and the United States, pets must be recognized as vital to the psychological well-being of people and as agents of therapy in a great number of conditions and situations. Our companion animals offer us security, succor, esteem, understanding, forgiveness and, most importantly, abundant and unconditional love. Furthermore, pets make no judgments, need our help, and make us feel important.

ANATOMY OF THE EYE

S. Koch, D.V.M.



Drawing by Kate Cameron, A.H.T.

Dr. Koch is a trustee of The Foundation for Veterinary Ophthalmology, a non-profit, tax-exempt organization. The goals of the foundation are to raise funds to train people in the field of veterinary ophthalmology by making fellowship and residency programs available to them. The training is available at selected centers in the United States. The work of the Foundation is supported completely by donations from people who are interested in the welfare of animals. If you would like to help, your tax deductible contribution can be sent to: The Foundation for Veterinary Ophthalmology, c/o Dr. S. Koch, 6223 Richmond Highway, Alexandria, VA 22303. An annual report will be sent to all contributors when it is available.

All of us, except perhaps the visually handicapped, take our eyes for granted. But how many of us know how the eye works? In order to understand how it works we first must understand its basic structure. Hopefully the end result of this article will be that our readers will have a basic understanding of the domestic animal eye. With this understanding its functions and its disease can be more easily discussed.

The eye is arbitrarily divided into three "coats"; the supportive, the nutritional and the functional. Obviously there is a crossover between the groups because a supportive portion may have some nutritional responsibility and vice versa.

The "white" of the eye and all its associated structures are supportive. This includes the hard "sclera" and the muscles that make the eye move in its socket. The conjunctiva or the pink tissue that often gets red and inflamed is the nutritional coat for the sclera and has other functions as well.

The nutrition for the eye is mostly from the conjunctiva and tears and fluid inside the eye and from lid glands and one other unique structure called the ciliary body and choroid. The ciliary body is what produces the fluid inside the eye that keeps the eye's shape and allows for fluid to circulate in the eye. When something goes wrong with the ciliary body we end up with a hard eye (glaucoma) and sometimes even a soft eye. The choroid is the source for nutrition for the whole back of the eye. When the choroid stops working the eye is in trouble.

Most of the other structures in the eye are for visual use.

The cornea or clear window on the front of the eye lets the light go into the eye. The iris or pupil opening controls how much light goes further back into the eye by opening and closing in response to the light. The lens focuses by means of tiny muscle fibers attached to it so that near and far vision is possible. The retina is the real seeing part. The retina is about ten cell layers thick and contains millions of receptors that work on the light and change it to energy so that the impulses can go into the brain for instant action.

When you think about all these portions of the eye you can well imagine how many things go wrong with it and therefore how many things can affect vision.

In later articles we will try to help our readers understand more about what can happen to the eye.

DENTAL PROBLEMS IN ANIMALS PART IV

ZOO DENTISTRY

by C. P. Ryan, D.V.M.

Photos: Courtesy of San Diego Zoological Society

Zoo veterinarians are presented with a wide variety of patients with various dental problems. If you are an animal dentist at the zoo you may be treating a pigmy chimpanzee for gum infections in the morning and removing an abcessed molar tooth from a 300 pound orangutan in the afternoon, all the while wondering what you are going to do with the newly arrived elephant who has a broken tusk.

TEETH HAVE MANY FUNCTIONS

We tend to think of teeth as useful only for chewing food and biting, but in animals teeth may be used for a variety of purposes. Most of us have seen how a mother dog will pick up and carry her young puppies with her teeth. When you don't have hands, your teeth may be the next best thing. Elephants use their tusks to move objects of considerable weight, and the right-hand tusk is generally worn more because it is used more, making the elephant predominantly "right-handed". The lemur, an animal somewhat like a monkey, but having a foxlike face and woolly fur, uses his lower incisor teeth as a comb to aid in keeping his hair groomed. Domestic cats will also use their teeth to remove thorns and mats from their fur. In addition, cats have barb-like projections on their tongues which can be used somewhat like a fine-toothed comb.

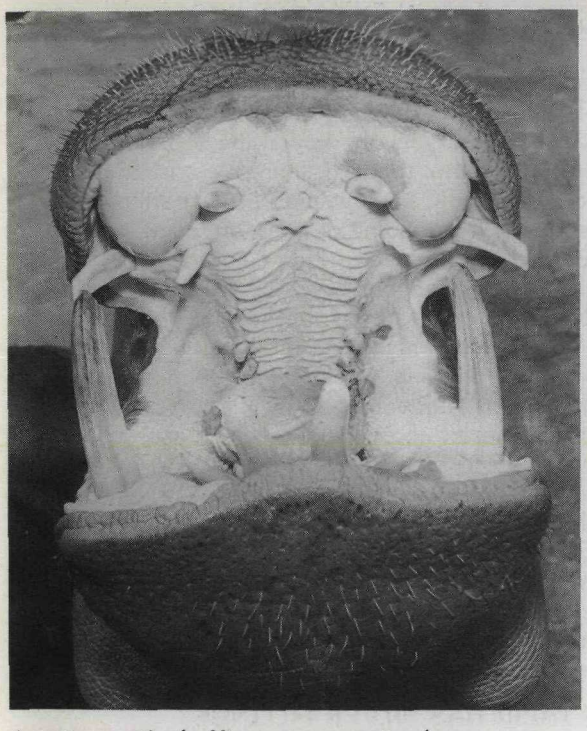
CURIOUS TEETH ARRANGEMENTS

Zoo animals have numerous types of teeth with various arrangements. Birds have no teeth at all. Elephants have a curious tooth arrangement. The single incisor teeth on either side of the upper jaw are elongated and may grow to great lengths. A tusk is an extremely large tooth projecting beyond the lips. Elephant tusks can be long and heavy, one of the largest tusks known is ten feet in length and weighs over 200 pounds. Unfortunately for the elephant the tusks have long been sought as a source of ivory which in some areas has resulted in virtual extermination of the animal.

Besides the tusks, the only teeth elephants have are enormous molars. They have four deciduous or baby molar teeth that are soon shed. There are six permanent molars in each half of both upper and lower jaws, but interestingly, only one is functional at a time. The molars of elephants have broad crushing surfaces for chewing fibrous vegetation such as bushes and small trees, and the wear on them is considerable. As one molar is abraded away, the next tooth behind is moving forward to push out the worn stump and take its place. When all the teeth are worn down, the elephant faces death from starvation. A similar problem is seen in grazing range cattle, and very valuable cattle have had their worn tooth stubs fitted with metal dental caps to prolong their lives. It is hard to bite off grass with just your gums.

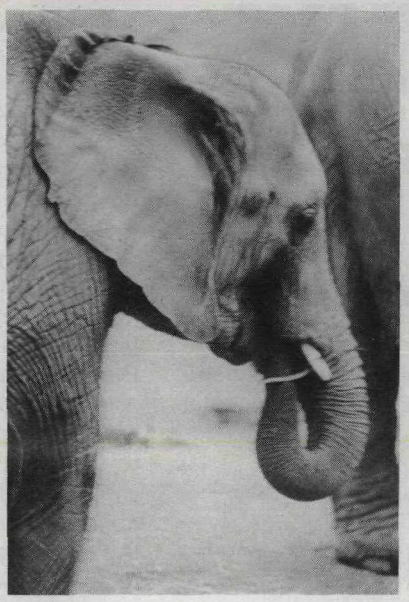
ANESTHESIA RISKY IN WILD ANIMALS

Dr. Gerald N. Esra, veterinarian at the Los Angeles Zoo, reports that most of the routine dental care and cleaning on the wild animals is performed while the animal is immobilized or anesthetized. General anesthesia is much more risky in wild animals because there are so many unknown variables. The choice of tranquilizing agents and anesthetics has changed through

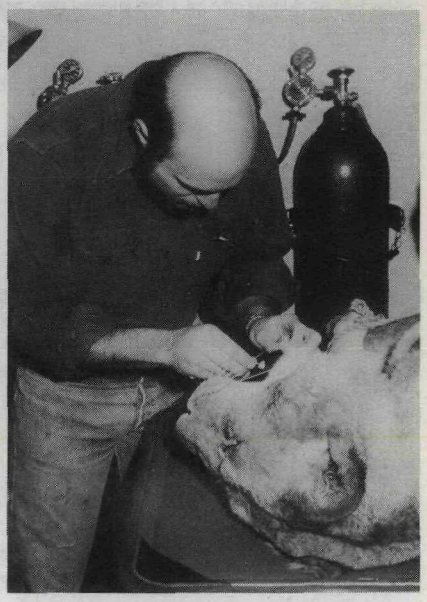


(photo: Los Angeles Zoo)

A gaping mouth of a Hippopotamus or river-horse must seem like a nightmare to an orthodontist. In the wild the characteristic yawning is an aggressive gesture and not related to being tired.



African Elephant who has large ears can be distinguished from the Asiatic Elephant who has small ears. These animals have been preyed on by hunters for their ivory tusks for centuries. The tusks are actually elongated incisor teeth. Some naturalists estimate that in the early 1900s as many as 100,000 elephants were slaughtered each year.



Dr. Reddick working on a lioness who had broken off her lower canine tooth. When radiographs were taken, the medical staff was surprised to find 7 B.B. shot lodged in her tongue. Fortunately the shot was not causing any problems, and it was felt she must have brought the B.B. shot with her from Africa. (photo: Dr. Esra)

the years as better agents become available. Research is being conducted continuously on anesthetic agents in hope of improving their safety. Once immobilized, the teeth are quickly checked and any routine scaling of the teeth is performed rapidly before the animal awakens.

The smaller animals are generally brought to the health center when extensive dental care is required. The hospital is fully equipped with anesthetic machines, oxygen, operating room, incubators, observation cages and an x-ray machine. Because of their size and the difficulty in transporting them, the large animals, like elephants and rhinos, are generally treated in their home pens or habitats. The dental instruments used at the zoo are the same ones used on people, cats, dogs and domestic large animals like horses. Because of the large variety of types and sizes of animals treated by zoo veterinarians, improvisation is often required. The veterinarian and dentist may have to design their own instruments to fit the patient's needs.

ELEPHANT TOO BIG FOR DENTIST'S CHAIR

One hapless male elephant, named Mouse, arrived at the Los Angeles Zoo with a broken tusk. This is not that uncommon in the wild as the tusks can be injured during the daily activities of food gathering and defensive behavior. Examination of the elephant by the medical staff revealed that the tooth was abcessed. The tusk had been fractured close to the lip, and with the root canal exposed, an infection had spread deep inside the tooth. Long term anbtibiotic treatment was ineffective in controlling the infection.

Dr. Norm Reddick, a dentist who works closely with the zoo to help provide needed dental care, was consulted, and it was decided to do root canal therapy to try to save the tooth. Since there were not any ready made dental instruments large enough to do the job, an electric hand drill was obtained and a special bit was made in the machine shop. A general anesthetic was given, and after Mouse went down, Dr. Reddick also injected a local anesthetic around the tooth. Dr. Reddick reports that even when under a general anesthetic, the animal will still flinch and move some when you begin working on the teeth. He always gives a local anesthetic around the tooth just as he does with his human patients. The abcessed tusk was drilled and cleaned out, then the root canal was filled with material to prevent further infection, and the remaining tooth fragment was rounded off. Since the elephant was too large to transport to the health center at the zoo, the whole procedure was performed in the elephant's pen. It was the largest tooth Dr. Reddick has ever worked on. After a year the elephant moved to another zoo which was a disappointment to Dr. Reddick. He had hoped to follow the tooth's progress over several years.

FIRST ZOO PATIENT A POLAR BEAR

Dr. Reddick's first experience in zoo dentistry came when he was consulted by the zoo about Bruno, a polar bear. The animal's keeper noticed that Bruno was irritable all the time and his appetite was poor. By close observation the keeper spotted a small bloody discharge on Bruno's lower jaw. Examination by the zoo veterinarian revealed a broken lower molar tooth which had become infected and had developed a draining

DENTAL PROBLEMS IN ANIMALS PART IV

ZOO DENTISTRY

abcess in the lower jaw. A polar bear's molar teeth are massive, making removal difficult. Dr. Reddick decided to save the tooth by performing a root canal. The dental repair was successful, and the bear is now hungry as ever.

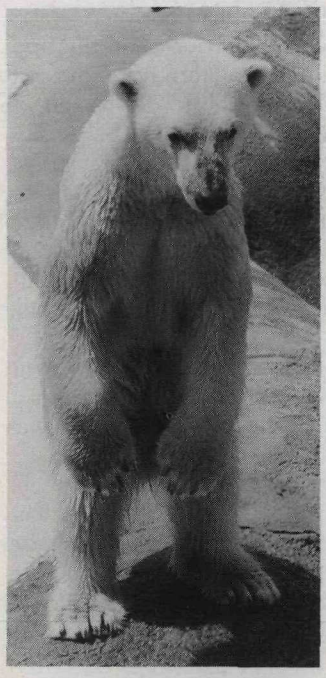
ROOT CANAL THERAPY COMMON

Dr. Reddick reports that root canal therapy is one of the more common procedures he performs on zoo animals. Root canal therapy provides an alternative to extracting teeth that have abcessed. Often the animal's tooth has been broken or worn down. This exposes the root canal which contains the living pulp and allows infection to enter and destroys the viable portion of the tooth. Special instruments are required to remove material from the tooth's root canal. It is then filled with substances such as gutta-percha and amalgam. Gutta-percha is the coagulated milky juice of various tropical trees used as a dental cement, and amalgam is a soft metal alloy of silver, tin and mercury.

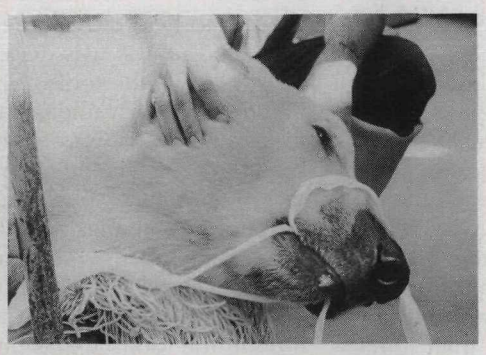
Another need for root canal therapy at the zoo occurs when the teeth on some of the wild animals are trimmed down close to the gums. Occasionally to protect animals that are displayed together, some of the more aggressive individuals in the group must have the tips of their canine teeth shortened. Baboons normally live in discreet family groups called troops. In the wild, the lion and leopard are the main enemies of the baboon. Baboons can be very cunning and ferocious fighters using their brutal teeth to advantage. At times an unruly baboon becomes a hazard to other members of the troop, and the vicious canine teeth have to be shortened. This helps to prevent mauling of the other animals which may become a problem especially during the breeding season. Trimming off the tips of the teeth requires a general anesthetic, and a dental saw is used to shorten the teeth. Afterwards a root canal procedure is done on the teeth. Besides baboons, many of the wild cats (leopards, lions, jaguars) have had this procedure.

MOUNTAIN TAPIR HAS SILVER FILLINGS

Tapirs are nocturnal animals with heavy bodies and stout legs and are related to the horses and



Dr. Reddick's first zoo patient Bruno, a polar bear, seems a little tense about having his teeth examined. Polar bears like the water more than other bears and spend most of their time on the ice or in the sea looking for food. (photo: Los Angeles Zoo)



An anesthetic has made Bruno more accessible to the dentist. The average weight of a polar bear is 900 pounds, and their favorite food in the wild is seals. Bruno was a little on the light side, weighing only 734 pounds. (photo: Dr. Reddick)

Dr. Reddick (left) cleaning out the infection in Bruno's lower jaw is assisted by animal keeper, Jerry Brewer (right). The animal keepers are often the first to notice if the zoo animals are having medical problems. (photo: Dr. Reddick)

Getting this Asiatic elephant back on his feet after dental therapy requires a helping hand. Note the heavy rope tied around the rear foot for restraint. The Asiatic elephant is commonly used as the "beast of burden" in his native land and has been domesticated for centuries. (photo: Dr. Reddick)

Mountain tapir receiving dental care at the Los Angeles Zoo. (photo: Dr. Esra)

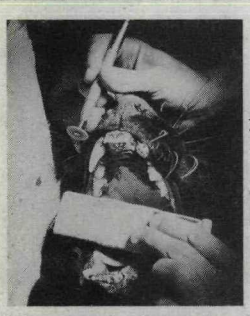
rhinoceroses. The rarest of the tapirs is the woolly or mountain tapir, a rather shaggy-haired species found in the Andes Mountains in Columbia and Ecuador. The Los Angeles Zoo has the only male in captivity in the United States and possibly the world. They were naturally anxious to use him in a breeding program. Unfortunately he was very uncouth in his social behavior towards his mate and kept chewing on her, and she understandably would not accept his advances. To make him more presentable to his mate, the staff decided to have Dr. Reddick file the points off his sharp teeth. After the dental procedure, the tapirs got along better, and the zoo was rewarded with a new baby tapir.

Interestingly, mountain tapirs are easily tamed and appear to enjoy the companionship of man. After getting to know the male — who especially loved to be scratched — Dr. Reddick was able to go into his pen and examine his teeth without any difficulty. A year later while checking the male's teeth, Dr. Reddick noticed several areas of tooth decay. To prevent future problems, the cavities were drilled and filled, making the Los Angeles Zoo one of the first to have a tapir with silver fillings.

SAN DIEGO DENTAL PROJECT

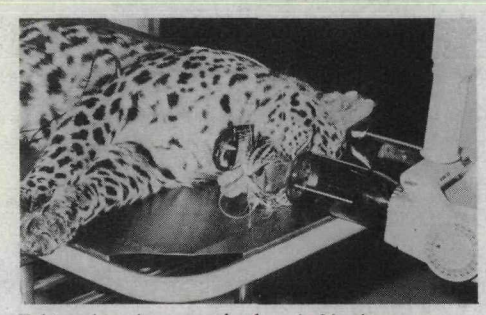
Zoos are continually trying to upgrade their facilities and improve the medical and dental care of their animals. One of the biggest obstacles standing in their way is finances. Recently the Zoological Society of San Diego gave a grant to the San Diego Zoo and Wild Animal Park for the study of dental problems in zoo animals. The long term objective of the program is to evaluate the application of modern dental technology to zoo animal health through in-house education, casework and research. A mobile dental care unit has been developed which enables the dental care equipment to be taken directly to the patient. Dr. Phillip T. Robinson, Director of Veterinary Services, reports that they currently have well over $10,000 invested in equipment and supplies, and always welcome outside sources of funding to support their dental effort.

Dr. David A. Fagan, a dentist, has been active in the field of veterinary dentistry for the past seven years and is helping in the San Diego project. Dr. Fagan has presently limited his clinical practice to comprehensive dental care of exotic animals. He is consultant to the University of California-Davis, California Primate Research Center and the San Diego Zoo. Dr. Fagan's first experience with zoo dentistry came in 1973: "It was after I was asked to treat Buster, the large male Dromedary Camel at the Sacramento Zoo, that I realized just how inadequately prepared I was to cope with the extremes of care, associated with applying human dental procedures to zoo animals."

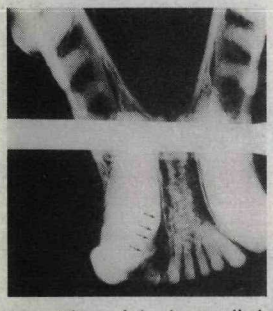


(photo: Dr. Reddick)

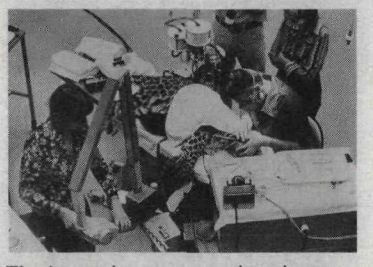
"Disarming" a leopard at the Los Angeles Zoo. The canine teeth are trimmed back with a dental saw. Following this procedure the root canals (arrows) are filled and sealed.



Taking dental x-rays of a female North Chinese leopard. Routine health examination by the San Diego Veterinary staff last year found her suffering from an unusually destructive form of periodontal disease. This year she has undergone extensive endontric, restorative and surgical procedures to control the dental disease. (photo: San Diego Zoo)



Dental film of the leopard's lower jaw. The severe periodontal disease has resulted in resorption of the root of the incisor tooth and multiple dental abcesses. The destruction around the teeth shows up as a blackened area on the dental film (arrows). (photo: San Diego Zoo)



The leopard is receiving dental care from Dr. Fagan with help of assistants at the comprehensive dental care unit in the Jennings Center for Zoological Medicine in San Diego. While under general anesthetic, her heart is being monitored with an electrocardiogram (ECG). (photo: San Diego Zoo)

Linda, mother to seven pigmy chimpanzees and pregnant again, broke off a front tooth. Fearing the broken tooth would abcess and result in miscarriage, the medical staff at the San Diego Zoo decided on a root canal procedure. Here Linda is having corrective gum surgery prior to the repair of her broken tooth by Dr. Fagan, aided by his assistant Anna Nelson. (photo: San Diego Zoo)

Midway through Linda's root canal procedure, radiographs were taken to evaluate the progress. Assisting Dr. Fagan (right) are Sharon Walsh (center) and Zoo Veterinary Intern Dr. Boyce. (photo: San Diego Zoo)

(photo: San Diego Zoo)

Dental film of the pigmy chimpanzee. Note the missing crown (arrow). Radiographs are a valuable diagnostic aid in dentistry and can detect disease in a tooth which appears normal to the unaided eye.

CANINE COUGH: WHAT IT WHAT YOU CAN DO ABOU

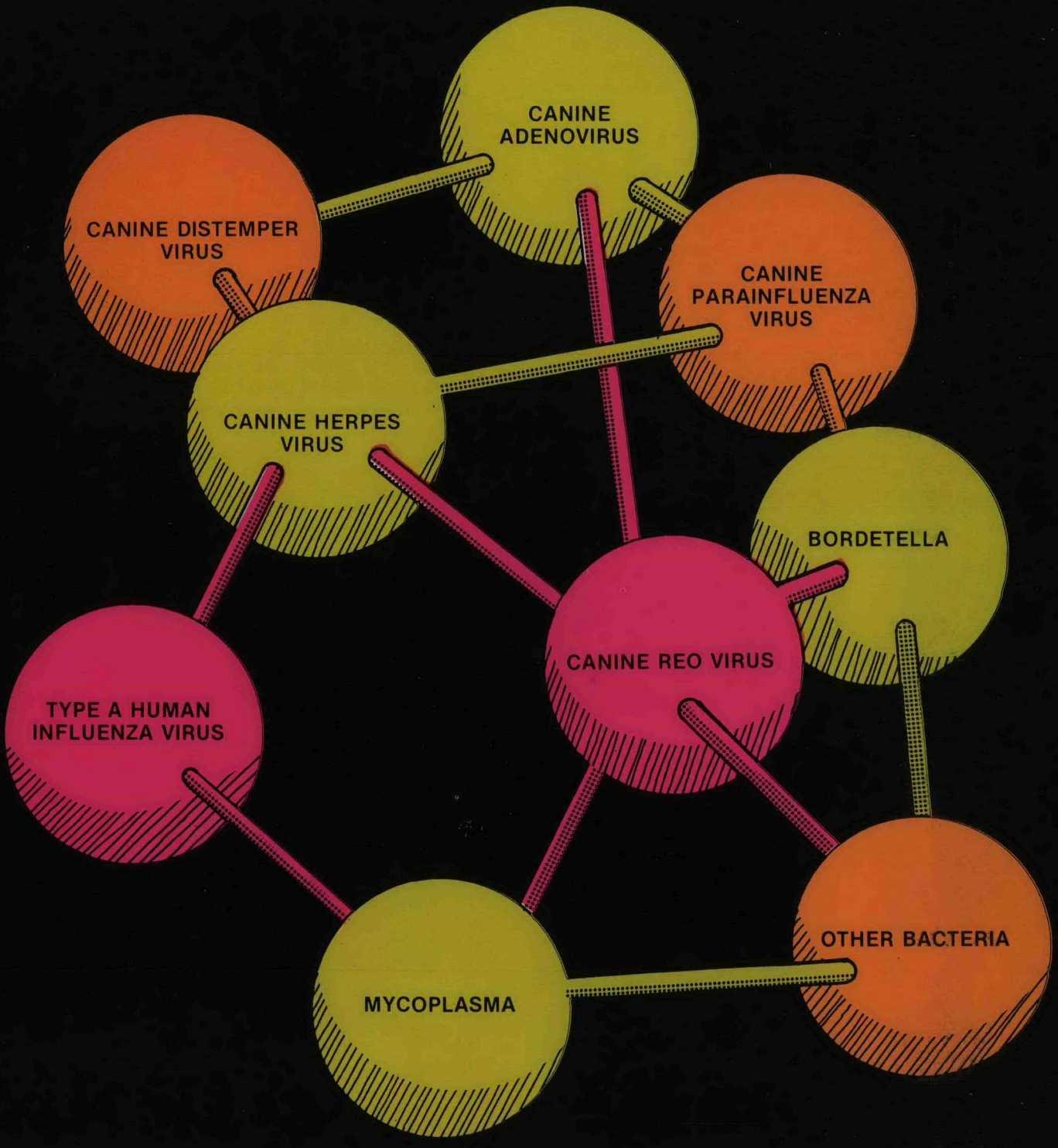


Figure 1. The Kennel Cough Complex. A host of viruses and bacteria as well as mycoplasma (microorganisms that resemble viruses in some respects and bacteria in other respects) have been removed from dogs showing typical signs of kennel cough.

IS, AND T IT

By Robert L. Stear, D.V.M.

Robert L. Stear, D.V.M., is Manager of Veterinary Services at Norden Laboratories, a leading manufacturer of veterinary products. He makes frequent appearances as guest lecturer and radio and television commentator on subjects related to animal health. Dr. Stear also authors a column called "You and Your Pet" which appears in more than 500 daily and weekly newspapers. He is past president of the Nebraska Veterinary Medical Association and has served as a member of the American Veterinary Medical Association Executive Board.

Los Angeles Zoo Photo

Figure 2. Dark brownish spots on these lungs infected with parainfluenza virus are the areas where healthy cells have died. This tissue is highly susceptible to bacterial infections.

It's 3 A.M., and your dog is coughing. You're angry, of course — but worried at the same time. What could be wrong? He seemed perfectly healthy earlier when you picked him up at the boarding kennel. And you know he wasn't sick two weeks ago when you dropped him off before starting on your vacation. But now, in the middle of the night, he coughs continually! Why?

The answer might be canine cough or kennel cough. It is one of the most frequently diagnosed diseases affecting dogs in the United States. Dogs of every age and every breed are susceptible, and, despite its name, kennel cough is not limited to animals housed in kennels. Dogs may start coughing after a routine walk or a session with the groomer.

Signs of canine cough vary, depending upon the extent of damage done to the dog's respiratory tract. Typically, however, veterinarians see one of two conditions:

1. Dogs with the least amount of lung involvement show a forceful, harsh, dry hacking cough.
2. Dogs with a great amount of lung involvement exhibit a soft, moist pulsating or blowing cough.

Either condition is a problem for your dog and a worry for you.

WHAT CAUSES KENNEL COUGH?

Canine kennel cough is a complex disease. As Figure 1 illustrates, at least 8 different microorganisms have been associated with canine cough. Some of these agents are more important than others. This is because several of the agents can only cause problems when unusual circumstances render a dog vulnerable to infection. There is, therefore, little worry that your dog will be affected by these pathogens. Other agents like distemper virus and hepatitis virus can cause canine cough, but seldom do because near universal vaccination against these two viruses has greatly diminished their role in the kennel cough complex. On the other hand, two viruses that are important agents of canine cough are canine parainfluenza virus and canine adenovirus type 2.

Canine parainfluenza is a highly contagious virus. After being inhaled, it causes pinpoint hemorrhages (areas of bleeding) in the lungs (Figure 2) and damages the surface of the bronchial tubes. Strangely, dogs infected with parainfluenza alone may appear normal. Cells and membranes have been damaged, however, and thus they are

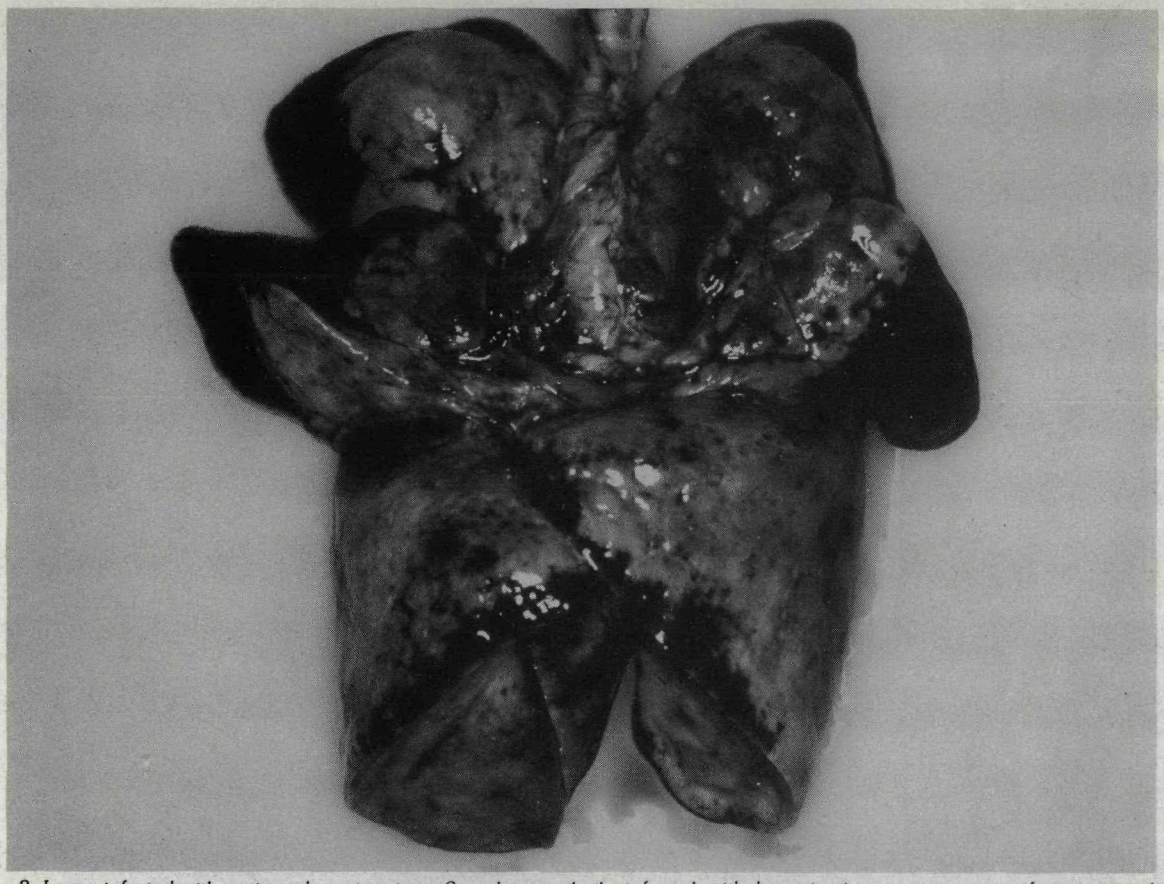


Figure 3. Lungs infected with canine adenovirus type 2 and secondarily infected with bacteria show a severe case of respiratory disease. Note the large dark areas where tissue has been damaged, markedly impairing the lungs' normal function.

weakened and unable to ward off bacteria which can cause serious respiratory infections. Parainfluenza and bacteria together can make your dog cough for periods ranging from a few days to many weeks.

Canine adenovirus type 2 is somewhat similar to parainfluenza in that it also does damage to a dog's respiratory organs which may go unnoticed unless the infection is complicated by secondary bacterial infection. Laboratory tests have shown that a combined adenovirus/bacteria infection can cause extensive lung damage (Figure 3), leading to severe pneumonia.

HOW CAN I PROTECT MY DOG?

It is virtually impossible to isolate your dog from the microorganisms that cause kennel cough. Animals may be exposed at shows, in research areas, at groomers, and in breeding and boarding kennels. Dogs may even contact a disease agent while running loose or being walked near other dogs. Therefore, the safest and most practical means of protecting your dog is to have him immunized against the causes of kennel cough. When your dog is immunized, antibodies present in his system act as a defensive barrier against infection and significantly reduce the chances that your dog will develop a serious cough.

Vaccines are now available for four major agents of kennel cough — distemper virus, hepatitis virus, parainfluenza virus, and adenovirus type 2. Distemper and hepatitis vaccines have been available since the 1950s and have been proven effective in controlling the severity and incidence of disease caused by these two viruses. Acceptance of the vaccines among dog owners and veterinarians is nearly 100%, so it is likely that your dog has already received protective doses against respiratory disease caused by distemper and hepatitis. However, the odds are less favorable that your dog has been vaccinated again parainfluenza and adenovirus type 2. Vaccines against these two viruses are relatively new.

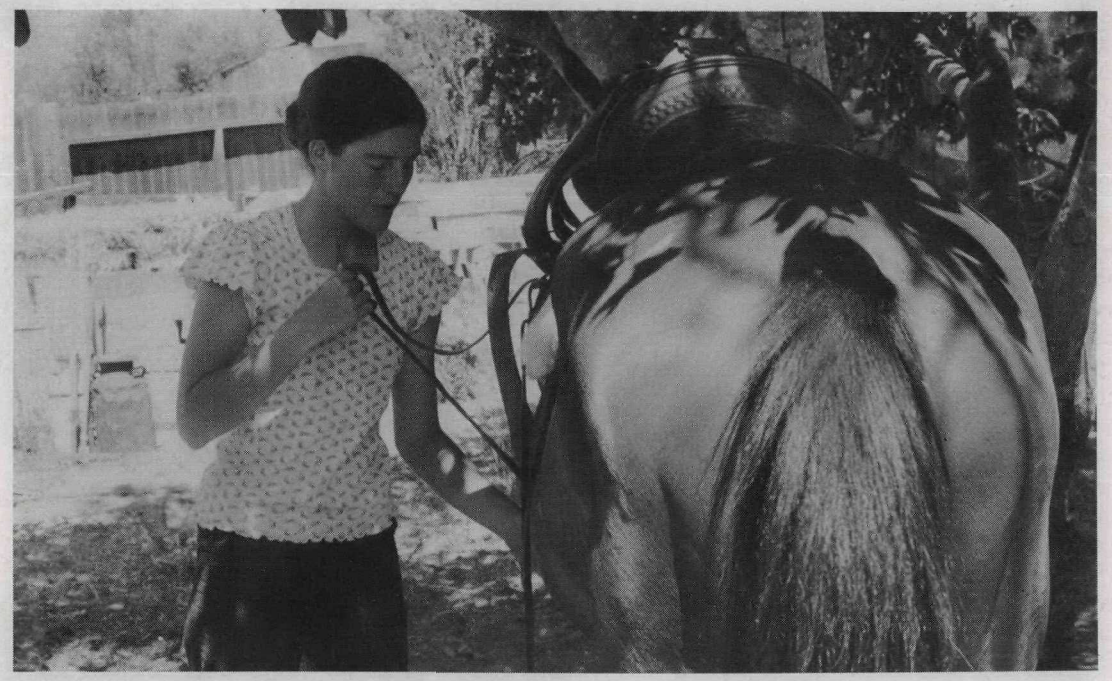
Parainfluenza vaccine was introduced in 1976, and since then has been used successfully in controlling kennel cough caused by canine parainfluenza virus. The development of the various commercial parainfluenza vaccines was a major step forward in controlling the kennel cough complex, but it is not the total answer.

The most recent breakthrough in kennel cough research is a vaccine containing modified live canine adenovirus type 2. Currently, there is only one federally licensed adenovirus type 2 vaccine for use in dogs. A unique feature of the product is that it protects against both adenovirus type 2 infection and hepatitis infection, thus broadening a dog's defenses against kennel cough. A single dose of the vaccine protects for a full year.

Canine cough is a serious disease that can spread rapidly among non-immunized dogs. As many as 8 disease-producing agents have been recovered from dogs with kennel cough. Currently, methods for protecting against all the agents are not available. Vaccines do exist, however, for four principle causes of the disease: distemper, hepatitis, parainfluenza, and adenovirus type 2. Whenever the possibility exists that your dog will come into contact with these infectious agents, he should be vaccinated. Your veterinarian is best qualified to establish a vaccination program specially suited for dogs in your area. Consultation with him should go a long way in eliminating the threat of kennel cough for your dog and assuring restful nights for you.

ADOPTING A WILD HORSE

By Nancee Tavares



Angela invested a lot of time, patience and skill to get to this point.

Horses first came to the New World with the Spanish Conquistadors in the 16th Century. Surviving the torturous months-long sea crossing with little food and less fresh water, these remarkable little steeds were able to walk off the ships and carry the explorers through vast wilderness lands.

They readily adapted to their new country. Some found their way to freedom, forming wild bands that were later joined by ranch and cavalry runaways and retired work horses.

The number of settlers also grew rapidly during this period, pushing the original inhabitants — the Indians — continually on. Most tribes quickly learned the benefits of riding and became excellent horsemen. Stray horses, rustled by the Indians in retaliation for cruel treatment by the white man were dubbed by the Spanish as "mestenos", or belonging to the mesta, a Spanish word referring to ranchers. In time this word became mustang.

Wild mustang herds flourished as more animals slipped through ranch corrals and Indians bands — by 1900 over two million wild horses roamed the West. These were the best descendants of the original stock because only the strongest could survive the harsh mountain and desert environments. The mustang also had to outmanuever the increasing attacks by cattle and sheep growers who viewed them as "worthless animals" robbing their own domestic stock of precious grazing lands. World War I took its toll on the herds, too —

ADOPTING A WILD HORSE

over 500,000 American horses went to Allied troops in Europe. Decades later the airplane made horse hunting easy for commercial hunters who saw the mustangs only in terms of profit for the booming pet food industry. By 1958 the wild horse population had been reduced to 33,000.

At last a small group of people became concerned that America's wild horse was well on its way to extinction. These citizens organized, wrote letters, protested and lobbied against some heavy odds. Who really cared about those rugged little mustangs, anyway? They're only fit for a dog food can, the argument went.

But the mustang supporters grew in number and their efforts eventually paid off in the passing of a Federal law giving the wild horses full protection from unscrupulous horse traders and commercial hunters. Once again the herds are flourishing: about 50,000 wild horses and burros roam the West's rangelands and deserts. Now the mustangs face a new problem — overpopulation. Cattlemen are worried that their own stock won't have any feed left on the already arid grazing lands and the wild horses, themselves, are threatened with undernourishment.

The Bureau of Land Management's new Adopt-a-Horse program may be a partial solution. The program provides a selected mustang free of charge to any person who can provide adequate food, shelter and care. The adopted horses may never be sold or used for commercial purposes and owners must notify the Bureau before giving an animal away. Eighteen-year-old Angela Carpadus thinks it's a great idea. She is the adopted mother of Desert Moon, a three-year old mare, and Eclipse, a yearling filly.

Like all applicants, Angela was required to write an essay on why she wanted the mustangs. She explained that she has always been interested in the special breed and believes that they would make fantastic mounts for competitive trail riding. "Two months passed and I had just about given up hearing from the Bureau," she recalls. "At last I was notified that my application was okayed and two mares would soon be ready."

Angela and her father quickly constructed a super-sturdy, six-foot high, round corral to hold her two wild charges. Based on the old California cowboy style, the fence leans out at the top so that the horse cannot crush the rider's leg against the sides. The fence also has extra wide-spaced boards — in the event that Angela should ever have to make a quick escape.

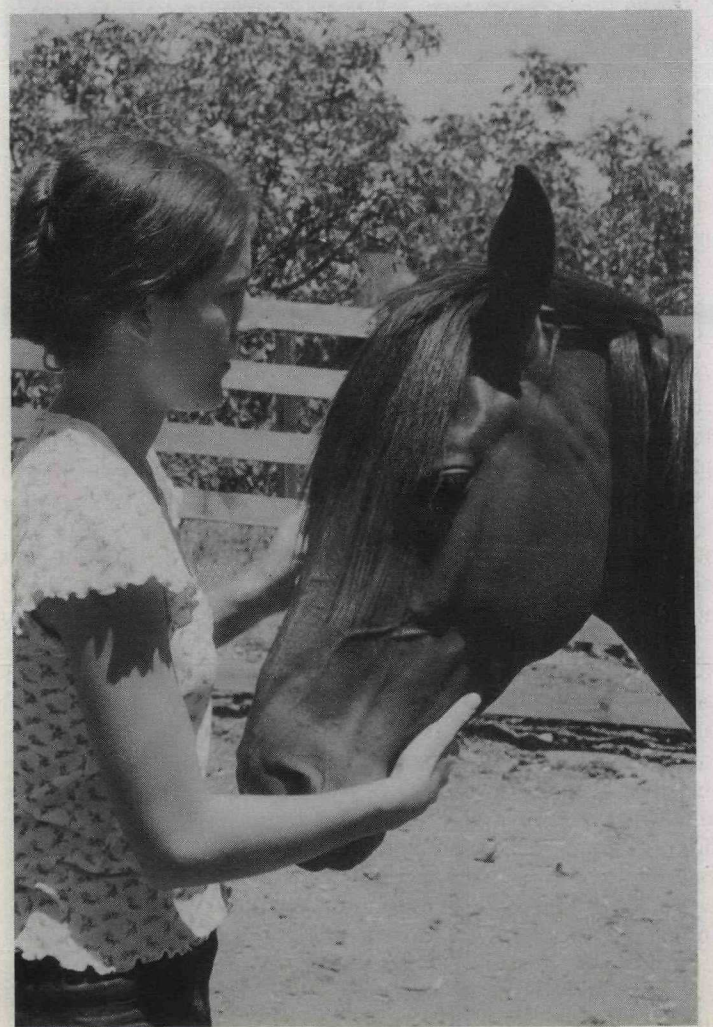
Angela spent a lot of time in that pen during those first few weeks after Desert Moon and Eclipse arrived. In all probability the two mares had never been touched by human hands. "I'd put the hay down and then just

The riding ring is designed according to old California cowboy standards. The fence slants out at the top to prevent the rider's legs from being crushed during the early stages of training.

It took three months of constant attention before Angela attempted to put a halter on Desert Moon.

Unlike domestic breeds, most mustangs have such tough, hard hooves that they never require shoeing.

Angela prefers her antique Mexican bucking saddle when riding a green horse because the deep seat and high cantle (back) offer a little more security.



"Once they trust you, they're fine," Angela says of the Mustang breed.

stand there watching and talking softly to them," she explains. Gradually, she gained their trust. But it wasn't until the arrival of Desert's premature foal three months later that Angela first attempted to put a halter on the little mare. The newborn seemed too weak to nurse and Desert, still a colt herself, was having trouble assisting her baby. The foal died one week later. But in that time a bond of trust developed between Desert Moon and Angela.

"She never pulled back on her halter or tried to fight as just about all domestic horses will," Angela says. "I imagine she wasn't too afraid of people because she had never had any contact or bad treatment by them before. Still, the training has been easier than I thought it would be. Movies add to the fantasy that wild horses are impossible to tame — always rearing up and striking out. I found that once they trust you, they're fine."

Angela does not recommend a wild horse or colt as a project for a beginning horsewoman. She has been riding since she was a little girl, has taken many riding lessons, and has even assisted a nearby trainer in breaking colts.

"Everyone gave me advice on breaking Desert to ride because they never thought I could control her," Angela says. "I listened and then just tried to use my own common sense."

Angela recalls one recent experience: "The wind was really blowing and although Desert has never bucked or bolted, I just had the feeling I shouldn't ride. Well, I got right off and she took off bucking across the corral."

A sixth sense? No, Angela says that kind of intuition develops simply from spending every bit of free time with horses. Sometimes that isn't easy for Angela — she puts in a 30-hour work week at a nursing home to support her animals and plans to start her freshman year in junior college with a major in animal nutrition.

Future plans for Desert Moon include competition in trail rides where Angela believes the mustang breed's inherent stamina and endurance will give the mare a good edge. Eclipse will be old enough to start training in another year. With girls like Angela interested in the mustang's preservation, the rugged breed's future in America seems secure.

For details on adopting a mustang, contact:

"Adopt-a-Horse"
Department of the Interior
Director, Bureau of Land Management
18th and C Streets, N.W.
Washington, D.C. 20240

CANCER IN THE DOG

A Survey of Current Knowledge

by
Claudia L. Barton, D.V.M
College of Veterinary Medicine
University of Missouri-rColumbia

One cannot read James Herriot's series of books about veterinary medicine in the years before World War II without reflecting gratefully on how far veterinary medicine has come in the diagnosis, treatment and prevention of disease in the dog. Before the war, a veterinarian had to watch helplessly as an animal died of distemper, hepatitis or even a bacterial infection. Now, we seldom see a case of canine distemper, and those we see usually contracted the disease due to the owner's neglect. We have conquered the canine distemper epidemic as surely as polio was conquered at about the same time in humans. We now know a great deal about the control and elimination of genetic defects through selective breeding, and bacterial diseases are usually arrested comparatively easily with the wide spectrum of antibiotics available to us.

Because of an educated public and readily available vaccines, the incidence of viral and bacterial diseases has decreased. Therefore, a good part of the veterinarian's canine and feline practice is the care of the geriatric animal. It is not at all unusual to be presented with an animal that is ten to twenty years old, and whose health has been preserved relatively well through frequent veterinary care. Many of these older animals, however, are presented with a disease that we still know little about — cancer.

Often, the veterinarian is forced to sit by helplessly and watch the demise of an animal with cancer, just as Herriot had to watch an animal die of a simple bacterial infection. Of course, veterinarians know a great deal more about the diagnosis and therapy of malignant disease in the small animal than they did thirty years ago; even five years ago no cancer therapy was being taught in veterinary schools. But we still lag far behind human medicine in our ability to control or prevent malignancies. The purpose of this paper is to present briefly our current level of knowledge about the incidence and therapy of cancer in the dog.

Radiation therapy may cure or control some types of tumors which are diagnosed at an early stage. This dog is receiving therapy for a nasal tumor.

A tumor is an abnormal growth of tissue which grows more rapidly than the tissue from which it came. Its cells are not subject to the same control mechanisms which keep normal cells in check. Normal cells grown in a tissue culture medium will cease growing when they have touched each other and filled their container; this is called "contact inhibition" and explains why our liver grows to a certain size and doesn't keep growing until we burst. Malignant cells, however, don't display the same respect for boundaries; instead, they grow relentlessly, tumbling over each other and spilling over the edges of their container. There is a difference between benign tumor cells and malignant tumor cells. Benign tumors are slow growing, usually easy to remove, and do not spread throughout the body. Unless allowed to grow to a huge size, they are not a threat to life.

Malignant tumors, on the other hand, grow rapidly. The cells send spreading fingers into the normal tissue nearby, making it difficult to remove the tumor entirely. Thus, they frequently regrow even after radical surgery. The major danger of a malignant tumor is its ability to metastasize, or spread throughout the body. Vital organs are invaded, and death will soon occur. Some tumors spread throughout the body in the blood, and others travel in the lymph channels. Organs that are frequently invaded by

Extremely enlarged lymph nodes, as seen in this dog, are typical of lymphosarcoma. The life of this animal may be prolonged with chemotherapy.

malignant disease include the liver and lungs, both of which can be rapidly compromised by tumor nodules.

We have all seen people who are seriously debilitated by cancer, and animals are affected similarly. A tumor may cause what we call "the cachexia of cancer;" the animal gradually starves to death as his tumor grows. Hemorrhage, pain, fever and infection are frequent secondary effects of cancer.

What do we know about the occurrence of cancer in the dog? Most people are very surprised to learn that dogs have a higher incidence of many tumors than do humans. Dogs have 35 times as much skin cancer as do humans, 4 times as many breast tumors, 8 times as much bone cancer and twice as high an incidence of leukemia. The only types of cancer that are more frequently seen in humans than in the canine are not surprising: lung cancer is 7 times higher in humans, and stomach or intestinal malignancies are 13 times more frequent in man than in the dog. This would suggest that the pollutants we take into our bodies **do** have significant adverse effects.

Through careful statistical evaluation by veterinary epidemiologists, some breed predilections for cancer have been noted. If a veterinarian was to be asked the breed with the highest incidence of cancer, he or she would undoubtedly reply "the boxer". When a sick, aged boxer presents at the University of Missouri Veterinary Teaching Hospital, we suspect a tumor almost immediately. Other breeds with an extremely high incidence of cancer are the Boston terrier, cocker spaniel and wire-haired fox terrier. Breeds with a very low incidence of cancer are the beagle, poodle, collie and dachshund. Why do some breeds have a high incidence of cancer while some are rarely affected with it? If we knew the answer to that question, we would undoubtedly be closer to preventing cancer than we are. Probably, the answer will be found through studying the immune system of these animals. The boxer's immune system is obviously less able to mobilize resistance to cancer than are the immune systems of many other breeds. It is hypothesized that the high incidence of cancer in the cocker spaniel and boxer is related to their great popularity and heavy breeding in the 1940s and 1950s. If this is true, we should be seeing a rise in the incidence of cancer in the now-popular poodle over the next decade or so, and the "mutt" should have one of the lowest incidences of cancer. Yet, ironically, the dog of mixed ancestry has only an "average" incidence, along with the Irish setter, schnauzer, Labrador retriever and many other breeds.

Some types of tumors are more prone to develop in one type of dog than in others. For example, the giant breed dogs like the St. Bernard and the Great Dane have a much higher

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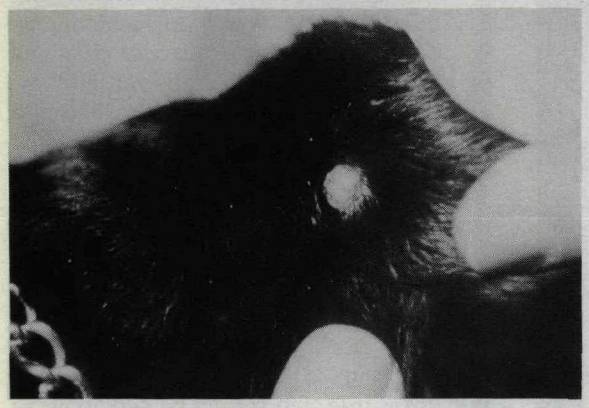
This dog has an extensive bone tumor of the lower jaw which has involved so much normal tissue that therapy is impossible.

CANCER IN THE DOG



A small tumor like this, even though malignant, is very likely to be cured by surgery.

incidence of osteosarcomas (very malignant bone tumors) than does the general canine population. Collies with lightly pigmented noses are prone to develop carcinomas in that area, probably due to long-term exposure to the ultraviolet rays of the sun. Black dogs have a comparatively high incidence of melanomas, or pigmented malignant tumors. The female dog who is not spayed has seven times the chance of developing mammary tumors than the dog who is ovariohysterectomized early in life. This would seem to indicate the the hormone estrogen is a potent stimulator of breast cancer in the dog.

What is the etiology of cancer in the dog? Unfortunately, human tumor research is little more advanced than is canine research in this area. The etiologies of a few tumors of the dog are known. The transmissible venereal tumor in the dog is spread by implantation during breeding, and the canine oral papilloma of young dogs is caused by a virus. In cats, cattle, mice and poultry, lymphosarcoma has been proved to be caused by a virus, but no virus has as yet been recovered from the lymphosarcoma of canines or humans. Undoubtedly, all types of tumors have an etiological cause or causes which are as yet to be elucidated. This is an area in which research in both human and canine cancer is desperately needed. Until we know the cause of a disease, our attempts at "shotgun" treatment will be symptomatic at best, and will seldom effect a cure.

What is the risk to an owner from an animal's malignant disease? At this time we can only give a very guarded answer: there **seems** to be no risk to humans from canine cancer. Several approaches have been used to evaluate the possibility of transmission. First, animal and human cancers which occurred in the same household were studied to determine whether this simultaneous phenomenon occurred more often than would be expected due to mere chance. However, there was no increased incidence of cancer in humans who had lived closely with an animal with tumors. Secondly, no viruses which are known to cause cancer in animals infect humans, at least as far as we know. The virus which causes feline leukemia can be made to grow in human tissue culture in the laboratory, but no evidence of any infection in man has ever been found. Thus, although our knowledge is limited, we currently know of no transmission of cancer from animals to humans — or from humans to animals, for that matter.

Treatment of cancer in the dog has been extremely limited until the last few years. An animal with a small tumor received surgery; if that tumor grew back or spread to other organs, the animal was probably put to sleep. However, other options are now available. A combination of therapies including surgery, radiation, and chemotherapy is now the optimum protocol to achieve control of a malignancy, whether in animal or man. If the tumor is small, of course, surgery is still the best method to effect a cure. Hopefully, all malignant cells can be removed by this method before any spread occurs to regional lymph nodes. With some tumors, however, regrowth either occurs rapidly or surgical resection is impossible due to the location or the extensiveness of the cancer. In these instances, radiation therapy is the best option.

Many tumors of the dog have been shown to be controllable, if not curable, by the use of radiation. This may be administered with a radioactive implant (brachytherapy) or externally using a radiation beam (teletherapy). With either method, radiation will destroy the DNA of cells so that they can no longer reproduce. At the University of Missouri we are using brachytherapy more extensively than any other veterinary institution. The advantages of brachytherapy over teletherapy are many. First, the length of hospitalization for brachytherapy is usually about a week compared to a month or even longer with teletherapy. Only two anesthetic procedures are required with brachytherapy compared to ten or twelve for teletherapy. In an aged dog with cancer, these two benefits alone make brachytherapy superior to teletherapy. Furthermore, the cost of treatment to the owner is generally less with brachytherapy simply due to less hospitalization and anesthesia. At this time, we are accumulating statistical results to determine whether brachytherapy is equal to or better than results obtained with teletherapy. Preliminary data obtained with mast cell tumors, squamous cell carcinomas, adenocarcinomas and perianal tumors is encouraging.

The expense of chemotherapy has prohibited its use in veterinary medicine until recently. Many of the commonly used anticancer drugs are now readily available, however, and are cheap enough to make their use a feasible part of treatment. The effect of these drugs is to kill the tumor cells by several mechanisms; some drugs fragment DNA strands, while others stop the dividing of cells. Of course, these effects against tumor cells also cause changes in normal cells, with resultant deleterious side effects in the animal (or human) being treated. These side effects include severe bone marrow depression, nausea, vomiting, hair loss and hemorrhage. The objective of the oncologist is to achieve a drug dosage that is enough to control (or cure) the tumor without causing any severe side effects. This is often very difficult to do and some nausea is to be expected with chemotherapy. Some

Continued on Page 30

HEARING AND EAR PROBLEMS OF DOGS

VETERINARIAN - PART VI

by W. R. Rose, D.V.M.

On an average, a veterinarian spends four years in basic science training in college and four years in a veterinary medical school. He is therefore more knowledgeable about the health care, diagnosis and treatment of ear diseases than any layman (pet store owner, kennel personnel, dog breeder). When your animal needs health care, see a veterinarian.

Many pet owners do not understand what is involved in a professional veterinary examination of the ears of dogs and cats. To get the most out of a visit to a veterinarian, take the time to make out a background information form (included in Part 3 of **Today's Animal Health**, March-April 1978). This will aid the veterinarian in assessing the case more accurately.

Even though procedures vary from case to case, there are many tests and procedures at the disposal of a veterinarian to use in the diagnosis of ear problems. These can be grouped under the following broad categories:

I. Examination procedures
II. Ear cleaning procedures
III. X-Ray examinations
IV. Laboratory tests
V. Hearing tests
VI. Neurology tests
VII. Surgerical procedures
VIII. Treatment.

I. Examination Procedures:

A specialized instrument, the otoscope, has been developed for the visual inspection of the external ear and eardrum. The otoscope is a very intense light source coupled with a magnifying lens and a funnel shaped cone (speculum). The light illuminates the long ear canal, while the speculum holds the ear canal open for examination. This is especially important due to the shape of the dog and cat ear canal. Fig. 1 shows two types of otoscopes, the diagnostic and the operating otoscope. The diagnostic otoscope is used for examination of the ear while the operating otoscope can be used for ear surgery.

Your veterinarian looks for redness, exudate, ulceration, parasites, foreign bodies, hemorrhage, tumors and other signs of ear disease. Some ear diseases may be unilateral (in one ear) or bilateral (in both ears). So both ears need to be examined carefully.

The eardrum (tympanic membrane) that divides the external ear from the middle ear is also closely examined. This membrane is a good indicator of the condition of the middle ear. This is because this membrane is translucent.

Following are a few of the many signs that your veterinarian looks for with the otoscope to determine the

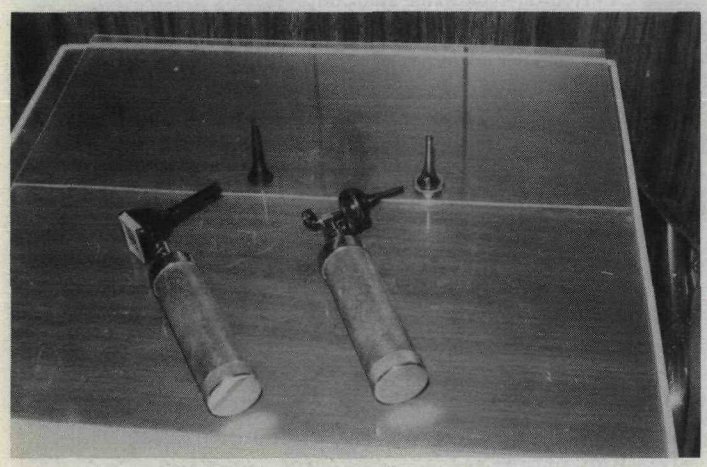


Figure 1. The otoscope used for the examination of the external ear canal and eardrum. Left - a diagnostic otoscope for examination of the ear. Right - a surgical otoscope for examination and surgery.

Figure 2. An otology set used by veterinarians to clean and examine dog and cat ears. The use of many of these instruments is best left in professional hands.

condition of the middle ear.

If there is blood in the middle ear, the drum will appear blue.

If there is pus in the middle ear, the drum will appear white.

If there is serum in the middle ear, the drum will appear light yellow.

If the drum has dark spots on it, this indicates holes (perforations).

If the drum is swollen or sac-like, this indicates fluid pressure (blood, pus or serum).

If the drum is retracted, it indicates an obstructed eustachian tube.

II. Ear Cleaning Procedures

Figure 2 shows some of the instruments used by the veterinarian to clean ears. Most of these instruments are designed for specific purposes and should be used by experienced hands only. Some ears are relatively easy to clean while others may require general anaesthesia to complete the task. The cleaning procedure is determined by the degree of inflammation, type of disease and characteristic of the exudate in the canal. Wax and other materials can become impacted and hard enough to require special chemical softening agents before they can be removed. Part 3 of **Today's Animal Health**, March-April 1978, discusses the various types of discharge. The type of discharge can also tell the veterinarian something of the nature of the ear disease process.

It is essential when possible to clean ears (see Part 5 of **Today's Animal Health**, July-Aug. 1978) to aid in surveying and assessing the extent of the ear disease. Discharge may also interfere with treatment by keeping the drug from getting to the cause of the disease, whether bacteria, fungus or mites.

III. X-Ray Examinations

If middle ear disease is suspected, a series of x-rays (radiographs) may be required. Because the middle and inner ear are enclosed in a bone, the x-ray is needed to see this area. X-rays help to determine if there is middle ear damage, the extent of the damage and the nature of the damage.

X-rays may seem costly, but much expensive equipment is needed to make a picture. Figures 3 and 4 show some of this equipment which includes the machine, special lead aprons, lead gloves, lead screens, special film holders (cassettes), special film, a darkroom with specialized developing chemicals, and viewers for the examination of the x-ray itself.

Interpretation of a developed x-ray requires extensive training and expertise. See Figures 5 and 6. In order to obtain a good (diagnostic) x-ray, general anaesthesia may have to be used.

& CATS

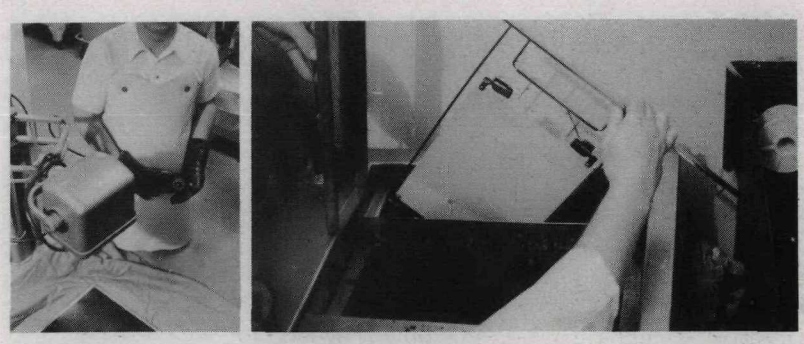


Figure 4.
Left - the x-ray technician with lead apron and gloves; the x-ray machine and loaded cassette ready for an exposure.
Right - the exposed x-ray film being developed in the darkroom.

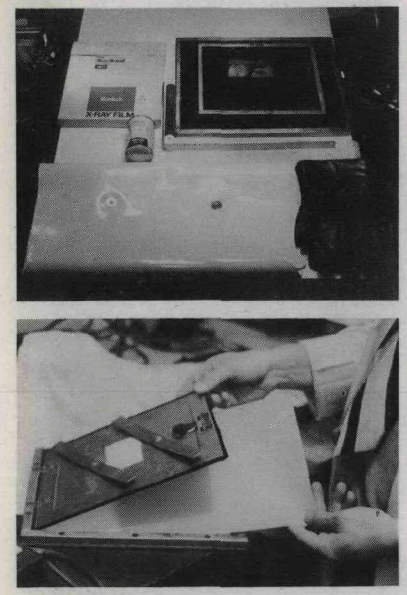


Figure 3. X-ray examination requires much specialized equipment.
Top - shows x-ray film, film cassettes, lead apron and gloves.
Bottom - shows a technician loading a film holder (cassette) before a film can be taken.

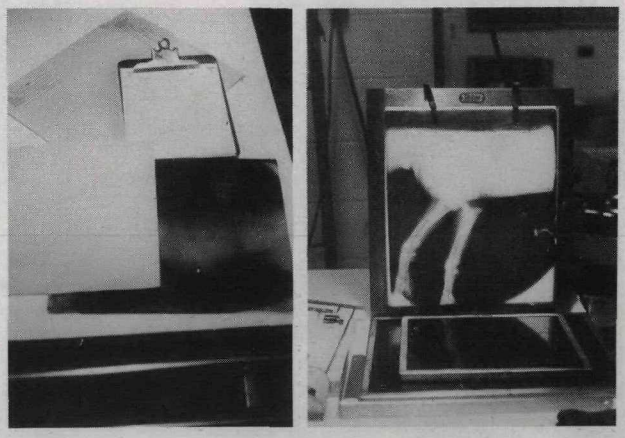


Figure 5.
Left - record keeping is an important part of an x-ray examination of the ear. Good records bring together the results of x-ray, laboratory and other procedures in making a diagnosis.
Right - an x-ray viewer used for examining x-rays.

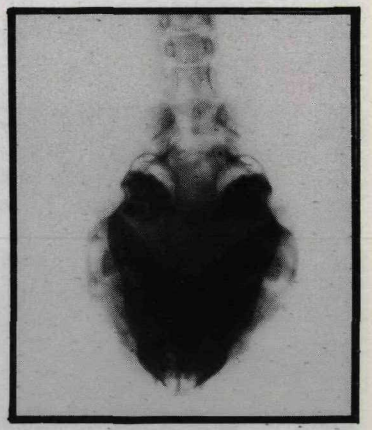


Figure 6. An x-ray of a normal cat; note the tympanic bulla are clear and smooth edged.

X-rays tell veterinarians many things and greatly aid in making a diagnosis based on facts. Early accurate diagnosis and treatment may save the dog's or cat's life. X-rays can help the veterinary practitioner determine if middle ear surgery is required and the type of drugs to be used. Subsequent (follow up) x-ray examinations may be necessary to determine if the treatment is working or not.

Therefore, do not tie your veterinarian's hands, but allow him to use the technology at his disposal. This will help to properly diagnose an ear disease.

IV. Laboratory Tests:

As indicated in Part 3 (**Today's Animal Health,** March-April, 1978), there are many types of ear disease. Most of these diseases require specific treatments. It is therefore essential to isolate the cause of disease by a laboratory test. There are many laboratory tests available to your veterinarian.

Sterile cotton swabs are usually used to obtain samples of wax and exudate from the ears. These swabs can then be used in several ways:

1. Microscopy — smears are made on glass microscope slides and examined under the microscope. Once again, specialized training is necessary to "read" these slides. The veterinary practitioner or medical technician looks for cell types, bacteria, mites, fungus spores and other material to aid in diagnosis. Some special stains may be necessary in this procedure.

2. Bacterial Cultures — swabs can be used to inoculate specialized media (food for the growth of bacteria) to isolate and identify specific germs growing in the ear. This isolation process may take several weeks before the results are known. Many steps are required for the growth and identification of bacteria:

Collection of swabs

Inoculation of growth media

Incubation (37° C)

Subculture on special media

Incubation of special media

Preparation of smears for microscopic exam

Special staining of smears

Examination of prepared smears under a powerful microscope for shape, arrangement and stain

Testing the isolated organisms for sensitivity to drugs (antibiotics).

The processes outlined above are time-consuming and require specialized equipment. Figure 7 shows some of the laboratory equipment needed for such tests.

The results of the isolation and drug sensitivity may alter the type of treatment that your pet is getting. A better drug for the bacteria isolated may be available.

3. Fungus Cultures — are made in a manner similar to bacteria cultures with the exception that it takes longer for a fungus to grow out. Usually 4 or 5 weeks is required.

4. Blood and chemical tests are also available when needed.

5. Biospy — if a malignant growth, a cancer or a tumor, is suspected, a small bit of tissue can be cut or pinched from the ear for examination. The tissue is processed, stained and cut into extremely thin sections. These sections are then examined under the microscope for a final diagnosis.

These are just a few of the many tests that have been developed in the many specialized areas of laboratory medicine. Some of the specialized areas are:

Cytology — the study of the cell

Parasitology — the study of parasites (mites, ticks, etc.)

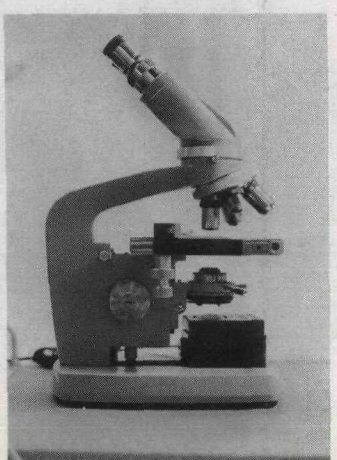
Mycology — the study of bacterial disease

Immunology — the study of allergy

Hematology — the study of blood

Histopathology — the study of diseased tissues.

Figure 7. Laboratory tests are an indispensable tool in diagnosing ear diseases. Much specialized equipment is needed to carry out the various culture and microscopic examinations.



A compound microscope used to examine ear swabs and isolated organisms from cultures.

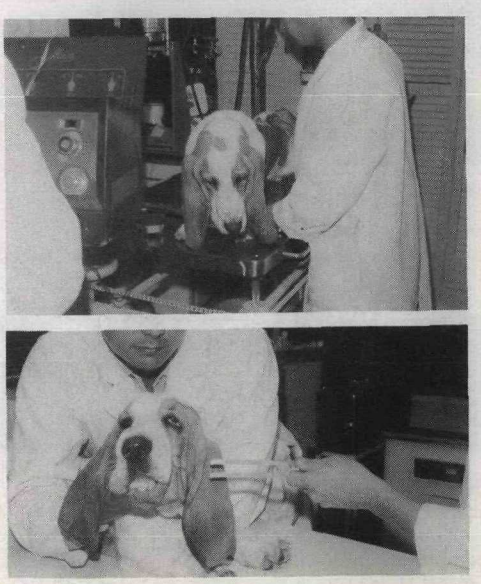


Figure 8. Top - hearing testing of a dog with an audiometer.
Bottom - hearing testing using tuning forks.

All of these fields and many more have advanced the art of clinical medicine in making an accurate diagnosis based on fact.

Your veterinarian has had courses in most of these areas that enable him to choose the test that he needs for each specific case.

V. Hearing Tests:

The importance of hearing to the dog and cat has been discussed in Part I (**Today's Animal Health**, Nov.-Dec. 1977). Determination of the type of hearing loss can also aid in diagnosing inner and middle ear diseases. Hearing testing (audiology) may be required in a veterinary examination if the practitioner feels it is necessary. This testing may require several sessions or return visits to a veterinary clinic.

Once again many types of tests are available to the practitioner. These tests vary from a simple noise test (startle reactions), to a tuning fork test, to an audiometric test. See Figure 8.

Some diseases localize in specific parts of the ear and the only way to find them is through the testing for the functioning of the hearing mechanism. The process of a disease can at times be reflected in hearing loss.

VI. Neurology Tests:

Middle and inner ear disease, as discussed in Part 3 (**Today's Animal Health**, March-April 1978) can cause a wide variety of symptoms. The type of symptoms seen can help the veterinarian to pinpoint the location of the damage (lesion).

As mentioned in Part 2 (**Today's Animal Health**, Jan-Feb. 1978), the inner ear is composed of the cochlea and semicircular canals. The semicircular canals and associated structures (saccule and utricle) are responsible for coordination and balance. Also, the brain (cerebellum) and VIII nerve (auditory nerve) are in close proximity. There are a series of tests to evaluate the function of these structures. The writing reflex, caloric test, centrifugal test and others all help to determine if one of these structures has been damaged.

There are many causes of inner ear damage:

Infection

Injury

Hemorrhage

Inheritance

Poisons

Drug reactions

Tumors

Findings from neurology (nerve) tests may help to determine the type of treatment that should be employed for best results.

VII. Surgical Procedures:

Surgery of the ear may be cosmetic as with ear cropping or therapeutic in treating disease. Veterinary surgery requires the same training and precautions found in human surgery. The same procedures — sterilizing instruments; utilization of sterile caps, masksand gowns; and gaseous asaesthesia — are all routinely used. See Figure 10.

The types of ear surgery commonly carried out on dogs and cats fall into several categories:

1. Cosmetic surgery — ear trim
2. Emergency surgery — ear injuries, blood bruises
3. External ear surgery — ear implants for defective cartilage

   ear drainage for chronic infections

   amputation due to cancer
4. Middle ear surgery — opening of the eardrum for drainage of the middle ear

   opening of the tympanic bulla for drainage and treatment of the middle ear

   removal of abnormal growths

The main point to mention here is that you should follow your veterinarian's advice after surgery. Give the prescribed medicines on time and keep postsurgical appointments. If you do not understand why a surgical procedure is required, ask. If you do not understand the aftercare required, ask your veterinarian. Get written instructions if necessary. Good nursing care can often determine the success or failure of surgery in the dog and cat.

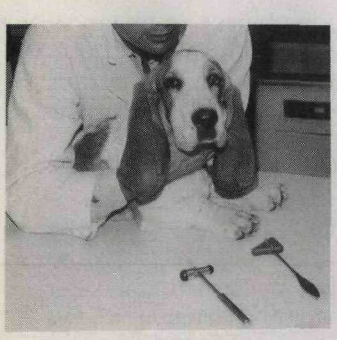


Figure 9. Neurology (nerve) testing of a dog suspected of having nerve or semicircular canal damage.

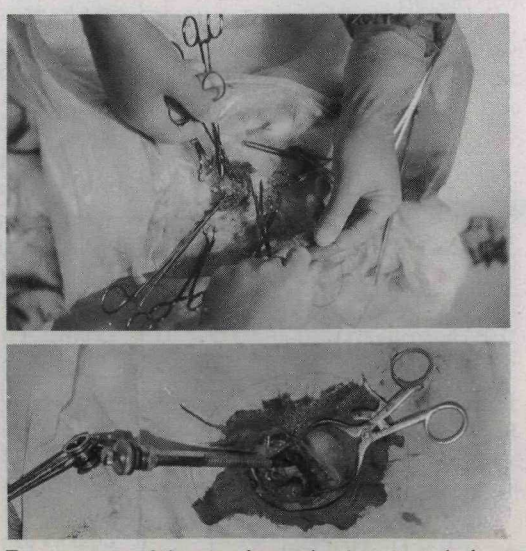


Figure 10. Top - surgery of the ear of a cat for the removal of a tumor. Note the use of surgical drapes, gloves, gowns and instruments. Bottom - opening the middle ear for drainage of a middle ear infection.

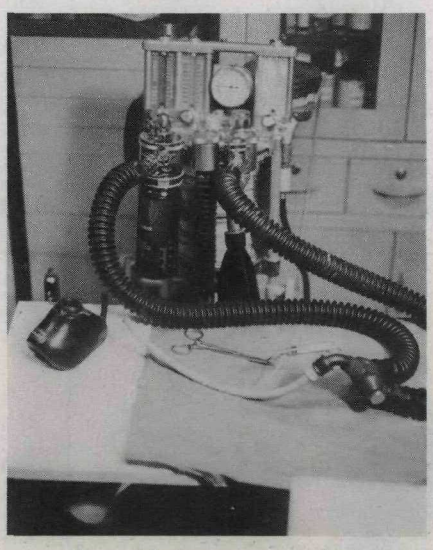


Figure 11. A gaseous anaethesia apparatus used in veterinary surgery.

worth reading

How's and Why's of Psychological Dog Training
By: C. W. Meisterfeld, S.O.E.
Petaluma: M-R-K Publishing
1977: $4.95

A very practical, easy-to-follow guide to training your dog. Excellent line drawings punctuate the chapters. A literary masterpiece this is not. It is written in a conversational folksy manner, but the know-how is there. A valuable informative book for the pet-owner who wants to train his dog himself.

A Fancy for Pigeons
By: Jack Kligerman
New York: Hawthorn Books, Inc.
1978: $12.00

A thoroughly lovely book, illustrated with photographs by the author and packed with fascinating information. Who would normally pick up a book on pigeons, unless he were a fancier, and find it interesting? Even the author is quoted as saying that he found pigeons a much richer subject than he had ever anticipated. Don't let the subject matter deter you. This is really a rewarding reading experience.

I Care About Animals
By: Belton P. Mouras
Cranbury, N.J.: A. S. Barnes & Co., Inc.
1978: $9.95

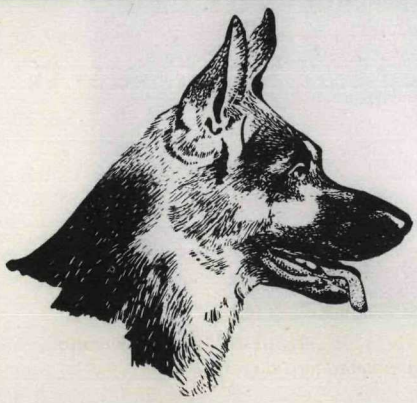
If the title means you, or even if not, read this horrifying account of man's cruelty to the animal world. The author is the founder of the Animal Protection Institute and his book is a call to arms to all of those who care. As an added bonus, there is an appendix on animal care and first aid, with line drawings by the author.

On the Fifth Day: Animal Rights and Human Ethics
Edited By: Richard K. Morris and Michael W. Fox
Washington, D.C.: Acropolis Books, Ltd.
1978: $12.50

Anthropologists, naturalists, theologians and philosophers have all contributed to this fascinating anthology which examines our attitudes and relationships to the animal world. The title of course refers to the Biblical time table of creation which has in part determined the attitudes of the Western World toward wild and domestic animals. The contributors to this anthology all agree that we must reexamine our assumptions if we intend to survive. Very provocative reading.

Naming Your Pet
By: Mary H. Detrick and Nancy B. White
New York: Arco
1978: Paperback, $1.95; Hardcover, $4.95

Now we have seen everything! A compendium of names and meanings for you to peruse before naming your pet. The illustrations in black and white are fun.



CORRECTION

Photo credits for "A Seven Dollar Horse" were inadvertantly omitted in the last issue; photos were taken by TAH Staff Photographer D. M. Diem

CANCER IN THE DOG

Continued from page 24

types of tumors are very responsive to chemotherapy; the average expected lifespan after diagnosis of a lymphosarcoma in a dog is 56 days. With chemotherapy, the life expectancy can be increased to about a year. On the other hand, tumors such as fibrosarcomas and osteosarcomas are notoriously resistant. Human oncology is obtaining some control of these highly malignant tumors with expensive drugs that cost hundreds of dollars per treatment, but these agents have understandably had very limited use in the dog. One disadvantage of chemotherapy is the fact that it is relatively ineffective against large tumors. The number of neoplastic cells must be reduced first by either surgery or radiation therapy in order that chemotherapy may be effective. This stresses again the point that tumors may be curable at an early stage; when they have already metastasized, the prognosis is very poor.

Immunotherapy of cancer is a form of therapy that is still in its very early stages. The assumption is made that the growth of a cancer involved some defect in the animal's immune system. Had immunity been normal, the tumor growth should have been suppressed very early. For this reason, stimulation of the animal's immune system is being attempted as a part of cancer therapy through the use of drugs and vaccines. It is too early to make even a preliminary evaluation of the efficacy of this mode of therapy, but we are hopeful that it may prove valuable.

Obviously, the means of treatment discussed above are not the answers to the control of cancer. Those answers will only be forthcoming when the reasons for the transformation of a cell from normal to neoplastic are determined. This objective will take extensive reasearch and a great deal more money than has been devoted to cancer study in any human or veterinary medical institution to this point. Human and veterinary oncologists are both striving to reach the same goal — a knowledge of cancer so complete that we are able simply to administer a vaccine against neoplastic disease. Let us hope that thirty years from now young veterinarians will be able to took with amazement (and a little disdain) on the primitive methods we now use to control cancer in the dog.

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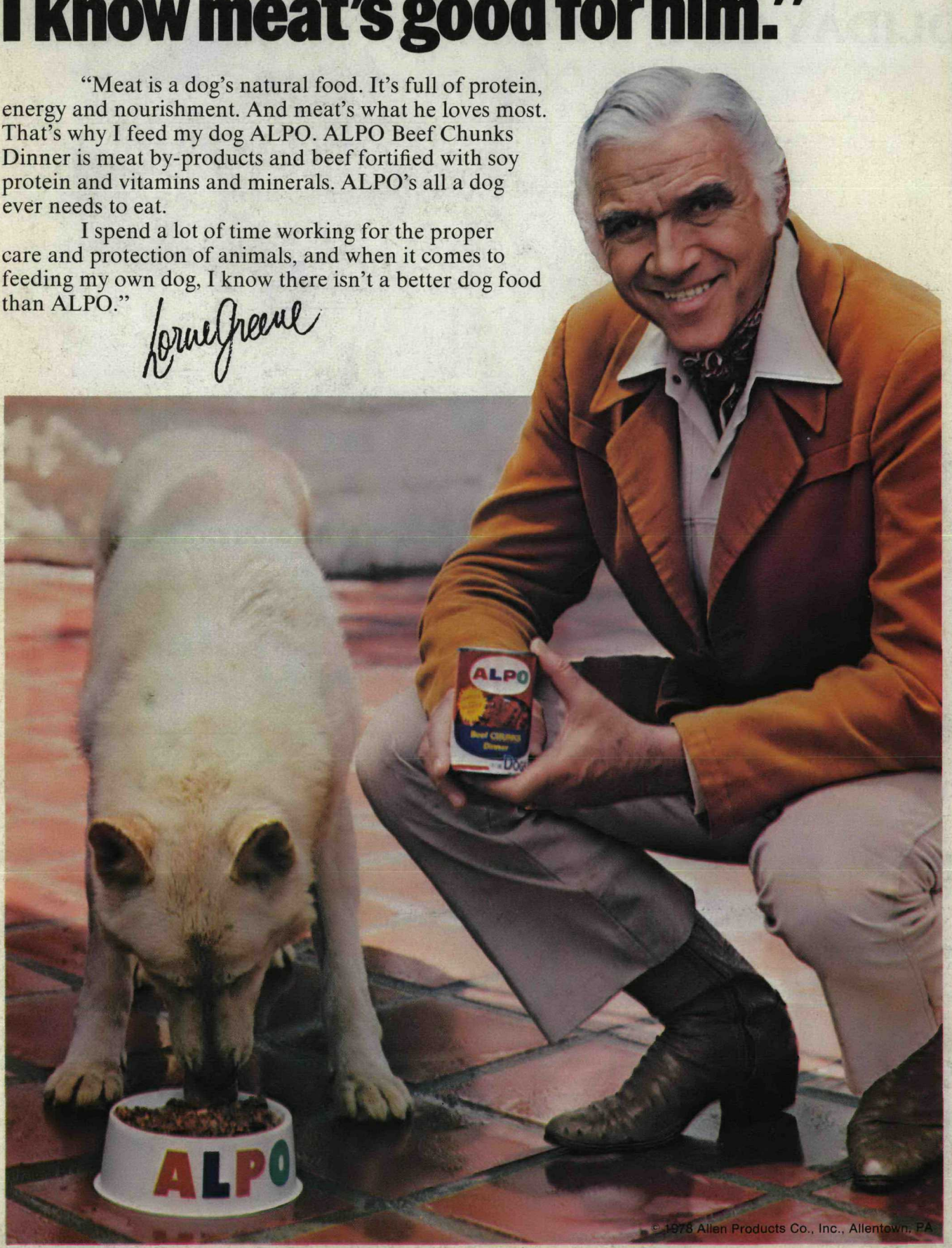

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