# Today's September/October 1977 \$1.00 Animal Health

# Animal Health

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the Snow Leopard, endangered species, compliments of Norden

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FOR YOUNG PEOPLE



Your magazine is fantastic. It answered several questions I had about by pets. My shepherd was bitten by a rattlesnake a week before I got your magazine. Today's Animal Health told me everything I needed to know!

Many times I have tried to save baby birds - unsuccessfully. I'm keeping your article for reference in the future. Keep up the wonderful work!

#### Donna

Your article about Synanon was really wonderful. I think it is great that your magazine and Foundation give such tremendous support and publicity to other worthwhile causes.

L. Wurlitz New York, New York

The article on leukemia in cats came out just in time. I just found out that my cat has leukemia. The article gives me some hope! My veterinarian is starting treatments this week and I hope she responds. I'm sure glad I didn't have to have her put to sleep.

#### Mary Gomez Rancho Santa Fe, California

Being an animal lover, I was very impressed with your magazine when I saw it in my podiatrist's office.

Please enroll me for 2 years.

#### Esther Rossum Los Angeles, California

Great Cats! I have a masters in English Literature and I didn't even come close!...really now!

#### Claudia Hoffmann Lansing, Michigan

Congratulations on continuing to produce a fine journal. The public and the veterinary profession are indebted to you and your staff for making your information public.

William J. Kay, D.V.M. Chief of Staff The Animal Medical Center New York, New York

# editor's by Richard Glassberg, D.V.M. Viewpoint

United Press International recently publicized the "research" of Dr. Seymore Jotkowitz of Hackensack, New Jersey. They report that Dr. Jotkowitz in a "study" of 50 multiple sclerosis patients found that 46 of them -- or 92 percent -- had been in close contact with a household pet prior to the onset of the illness. They report that Dr. Jotkowitz says "the incidence of the contact with sick dogs in the multiple sclerosis series was impressive" and that "several patients reported that a diagnosis of distemper was actually made for their dog within several years of the onset of their illness." Dr. Jotkowitz goes on to say that "it may very well be that their discovery is of monumental importance, analogous to the discovery of the link between cigarette smoking and cancer, and may lead to effective (preventive measures)."!!

A good "scare story" must sell newspapers and get ratings up for newscasters. I am new to the field of journalism. I am shocked and saddened by the recent irresponsible and sensational job of reporting done by United Press International which will undoubtedly result in the death of many pets.

You probably remember the big scare over Feline Leukemia being transmissible to man . . . turned out it wasn't . . . but how many cats got killed before the facts were presented? Lots of them, I'm sure. I know in my practice I was talking clients out of killing cats.

Then there was the big scare about Toxoplasmosis. One of the magazines was first and then everyone jumped on the bandwagon. People can get Toxoplasmosis from cats but it isn't very common and it is easily prevented . . . but again many cats got bumped off or dropped off in the boondocks to starve to death.

Then there was the scare about Choriomeningitis in small pet rodents and the danger of transmission to humans. Turns out it's a pretty rare disease and again the chance of it being transmitted to people isn't very great. Lots of pets bit the dust to sell those papers.

Well friends, now they are after your dog!

I am not critical of Dr. Jotkowitz for making an observation and reporting it to his colleagues in the American Medical Association. I am critical of the media for reporting the material to the lay public in such a manner that many people were led to believe that the statistics presented were significant and that there was a good possiblity that Dr. Jotkowitz' observation was in fact a fact.

I am sure that if Dr. Jotkowitz queried these same 50 patients he would find that OVER 92 percent drank soft drinks, were exposed to automobile emissions, had trees within 50 feet of their home, and drank milk within seven years of the onset of their illness, etc.

What is the significance of these statistics?

I'm glad to see you are finally getting more good articles about horses! I like the articles about small animals since I have several of them but I have horses, too and I need good information about equine health. Don't forget us "horse people."

Wendy Jordan Clayton, Missouri Your advice about flying pets on airplanes was a good ad for American Airlines, but I wouldn't fly my dog on a plane anywhere. I lost my cat once at the airport because they insisted on opening the container and the cat got out and got lost. My advice is not to fly pets. Stay home if you have to.

R. Riley Berkeley, California

# 

Ellen B. Wells, Dept. of Rare Books Cornell University Library

In 1975 the Humane Society of America sponsored an election to name the Bicentennial Animal in our public school system. It was not the bald eagle, or the turkey, or the buffalo who won, but the horse. There are an estimated  $8^{1}/_{2}$  million horses in the United States today, with a large, moneymaking industry supporting them.

The use of the horse in scientific inquiry changed as knowledge accumulated and investigative techniques developed from observation and gross anatomical investigation to physiological, genetic and behavioral work.

#### Early Observations in Greece

In the 4th century B.C., Aristotle provided some of the earliest scientific observations (there are, of course, earlier textual survivals mentioning the horse from at least 2300 B.C. Figur

Figure 1

waning the brillion

som and they

Net-HILA Pricito Aridolin



primarily veterinary, military and folklore fragments). Aristotle made good observations on the breeding, birth, growth and age of horses, their feeding and care.

#### **Renaissance Findings**

Most of the equine studies of Leonardo da Vinci in the 15th century seem to have been done to clarify in his mind the artistic anatomy of the horse. A sketch from a French collection shows the comparative anatomy of the human and equine leg, with the muscles shown as tubes of force connecting the bones (Figure

Many of the surviving drawings of horses by Leonardo seem to relate to his design of a projected equestrian monument to Ludovico Sforza, Duke of Milan. The monument was not completed, although the final stages were planned.

In 1573, Volcher Coiter, physician to the City of Nuremberg, published a collection of observations from the dissection of various animals. In one paragraph, he compared the digestive tract of the horse with other ungulates. Coiter is said to have been the first to raise comparative anatomy to an independent status in biology.





# ADAGTA DAGTA DA THE HORSE IN SCIENCE AND MEDICINE: A HISTORICAL REVIEW



Ruini, the author of DELL'ANA-TOMIA DEL CAVALLO (On the Anatomy of the Horse), although a lawyer, seems to have been a latter-day Renaissance man, and of especial interest as an equine anatomist. He apparently dissected horses, and like Vesalius dissecting humans, reported what he found and saw, not necessarily what was traditionally supposed to be there (Figure 2). The ANATOMIA, published posthumously by his son in 1598, was recognized a classic, and was plagiarized for centuries.

Ruini's description of the pulmonary circulation is of great interest because it, like that of Servetus', represents a pre-Harveian groping on the threshold of discovery of the total picture of the circulation of the blood.

Fabricius ab Aquapendente, Falloppio's pupil, and teacher of Harvey, made extensive investigations in embryology, almost invariably on a comparative basis. Thus, in his DE FORMATO FETU of 1600 we find fetal growth of man, horse, dog, sheep, rat and fish, among others, discussed.

The fine engravings show a nearly term foal, with sack, and one with sack removed. These illustrations indicate the increasing attention to accurately observed detail and sophistication of physiological knowledge at this still gross anatomical level (Figure 3)

Otto von Guericke was an engineer and politician. As a follower of Copernicus, he was keenly interested in the nature of space, and vacuums.

One of his experiments was the

removal of air from a sphere by a pump. Some of his spheres imploded before he mastered the methodology, but by the late 1650's he was able to construct copper hemispheres, put them together and remove the air. They did not collapse; in fact when teams of horses were hitched to them, they could not pull the spheres apart, a demonstration of air pressure. At least the power of 8 teams was not enough to overcome it (Figure 4).

Biovanni Alfonso Borelli, a scientist (primarily a mathematician) established an anatomical laboratory at the University of Pisa. He had a lifetime interest in anatomical and physiological research.

#### **Explaining Physical Principles** through Horses' Gaits

Volume 1 (of 2) deals with external motions from a mechanical point of view, and in fact the entire text is an attempt to find physical principles in life forms. The horse's gaits are described in terms of the number of feet on the ground at a given point in the sequence of the gait (Figure 5). Motion and the maintenance of equilibrium are seen as the goals of the gaits -- rather good terms for someone interested in celestial mechanics among other things!

#### **Measuring Blood Pressure** & Cardiac Output

In 1709, at his parsonage at Teddington, the Reverend Stephen Hales used horses, among other animals, for experiments relating to the measurement of blood pressure and to measure cardiac output. His many observations and ingenious work place him in a linking position between Malpighi and Poiseuille (the latter studied viscosity of the blood



#### Figure 6

and rate of flow, and introduced the mercury manometer for the measurement of blood pressure).

Hales had the animals cast, and the crural (femoral) and carotid arteries and jugular vein were used in the experiments, by the insertion of tall vertical glass tubes, in which the blood rose. Heat rates were measured and blood volume estimates made.

In Hales' writings, we have perhaps the first clear descriptions of the experimental subjects. Thus, we know he used two mares and one gelding, all unfit for service; one with a fistulous withers, and another with a "canker on the hoof." All three were small, 13-14 hands, and 10-14 years old.

#### "Curare" Proves Fatal

In 1744, La Condamine brought back to France from Peru, specimens of the plant from which curare is produced. These samples were given to Francois David Herissant, anatomist and public servant, member of the Faculte de Medecine and the Academie des Sciences.

Even though warned by La Condamine of the great danger involved when handling the drug, Herissant performed experiments with small animals, some of which died when wounded and exposed to the substance.

While working with horses, he opened wounds in the off hind legs of six horses and put in an unrecorded amount of the extract. Two lived but died when re-exposed two days later. The others died quickly. He also noted using a condemned mare belonging to fellow scientist Reaumer with the same quick, fatal result.

Herissant clearly described the sequence of intoxication, the restless-



ness and ensuing paralysis, the lack of pain and the speed of action of the extract. The horses who died on the first exposure went in 5 minutes.

#### Origins of "Horsepower"

In the 1780's, James Watt was developing and selling rotative steam engines, and he needed a means of charging for them. Since the engines were often wanted to replace the labor of animals, the number of norses that the engine could replace became a measure of its performance. It soon became routine practice for the firm of Boulton and Watt to rate their engines at so many horses, such as "a 20 horse engine."

In his calculations, Watt assumed that a mill horse exerted a pull of 180 pounds, and determined it exerted 32,400 pounds per minute. By 1783 he had rounded it off to 33,000, and was stating "Each horse equals 33,000 pounds, 1 foot high per minute."

#### Heart Movement & Sound

In 1838, following in the footsteps of Hales, Caspar Wistar Pennock of Philadelphia used a horse in one of his experiments in analyzing heart movements and sounds. Most of his experimental subjects were sheep and calves. But the size of the horse, and the slow, clear resting heartbeat induced him and six colleagues to try one.

After fatally stunning the horse, artificial respiration was established (this is not described) and the thorax opened. They had an excellent twenty minutes' observation of the heart's movements, but less luck with the sounds. No graphic record was attempted.

In 1862, Jean Baptiste Auguste



Figure 7

Chauveau, with Etienne Jules Marey achieved what had been attempted since the 1850's, a visual record of heart action. Their apparatus was designed to sense, amplify and record the movements of the right auricle, ventricle, and extra-cordial movement.

In the experimenters' words, "We chose as an experimental subject a large animal, in order to have the double advantage of finding the strongest and slowest beats, and also to have as large an avenue for the introduction of the sound; it is the horse who has served us."

The authors reported that it was entirely undisturbing to the subjects used at the veterinary school at Lyons. They didn't seem affected by the sounds, which enabled Chauveau and Marey to obtain a nearly normal reading of the heart's action.

According to Carl Wiggers, "their records, while not devoid of artifacts, approximated intra-cardiac pressure fully as accurately as many tracings from human subjects published in this present era."

#### **Darwin & Breeding**

In his THE VARIATION OF ANIMALS AND PLANTS UNDER DOMESTICATION, first published in 1868, Charles Darwin included a discussion of the horse. He noted particularly the value of the careful, extensive and long breeding records of the thoroughbred horse. To Darwin, thoroughbreds showed strong evidence for the idea of inheritance. The strong links between **success**, i.e., race track wins, and **pedigree**, i.e., breeding the best to the best, forged in the 17th century, are maintained to this day. which he offered as evidence of the horse to tend to become striped and to revert to what he called the "colouring of the aboriginal horse." These stripes he found reminiscent of quagga and zebra markings. He thought that feral horses might, if studied, indicate that there is a possibility that all domesticated horses are descended from a single stock, dun-colored and more or less striped.

#### Diphtheria Anti-toxin

Emil Roux demonstrated the use of horses for large-scale production of diphtheria anti-toxin in 1894. Working with his colleague Edmond Nocard at the Alfort veterinary school, Roux developed the serum and ran hospital trials in early 1894 (Figure 6).

Following a discussion of other animals that might be used for production of the serum, Roux and Martin stated, "Of all the animals capable of furnishing large quantities of antidiphtheria serum, the horse is the easiest to immunize. It tolerates the toxin better than all species we have discussed. It is not rare to find horses in which 2-5cc. of strong toxin, injected directly under the skin, are provoked to a temporary fever and a passing local edema. Thus, since 1892, with Monsieur Nocard, we have undertaken to immunize horses against diphtheria, because of the work of Monsieurs Roux and Vaillard on tetanus showing that horse serum, similarly in considerable doses, is innocuous to laboratory animals and to man."

#### Telegony

Picking up on Darwin's suggestions about the coloring of the Continued on page 38

Darwin also reported a pony

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Figure 8

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Photograph and color separations of the Snow Leopard, endangered species, compliments of Norden Laboratories

#### by GEORGE UETZ AND DONALD LEE JOHNSON

Reprinted in part, Courtesy Environment, 12/14

In the course of geologic time, the world's animal populations are constantly changing. We know from cave drawings, and other ancient finds, that many animals seen by humans in prehistoric times do not exist today. We know from Indian writings and ancient scrolls that the abundance and distribution of much of the world's fauna (animals) has changed considerably. We know from recorded history that numerous animals have disappeared from the face of the earth in the past few centuries.

The disappearance of some animal species, and the appearance of new ones, is part of the process of evolution — a process in which plant and animal species constantly adapt themselves to changing environmental stresses. Most of the organisms that have ever lived on this planet are now extinct, and it has been learned from the fossil record that extinction is the eventual fate of all species. Changes in the physical environment (climate, soil, and so on) or the biological environment (food sources, competitors, predators) usually initiate the process in nature. Extinction occurs when a species is not able to adapt to such changes and maintain its numbers. As these species disappear, they are gradually replaced by others.

Before the appearance of humans in the biosphere, extinction occurred entirely as a result of natural changes in the environment. With the advent of humans, however, came new stresses on the physical environment and its inhabitants. Some data suggest that the rate of extinction has increased as a result of human activities. Human stress on the environment takes a variety of forms — agricultural and forestry practices, for instance, change, and sometimes destroy, entire ecosystems; hunting, and predator and pest control, directly eliminate some animal species; and pollution by chemical contamination can cause a decline in others. Often, it is the interaction of a number of stresses which finally determines whether or not a species will become extinct.

In a time when problems of all sorts besiege our collective consciousness, however, it is difficult to mobilize concern for the passing of seemingly remote species of animals. Most people have never seen, and may never see, a whooping crane, a blue whale, a California condor, or any of the species on the endangered list. Many people question the value of these species to mankind and wonder whether we would be any worse off if any or all of them should become extinct.

Much of the concern for endangered species is based on aesthetic reasons or is part of an emotional commitment to the integrity of natural heritage. Although these reasons are legitimate in themselves, it is necessary to understand the importance of endangered species and their fate in light of the ecological consequences — and in terms of the interrelatedness of organisms in the biosphere. If animal species become extinct, it is possible that the ecological communities in which they live may be functionally damaged, and may even collapse at some future time. Our biosphere is incredibly complicated and has taken more than four billion years to develop as it is today. The extinction of species we are presently witnessing is the erosion of this system in a very short period of time — much too short for any evolutionary adjustments to occur.

#### **Endangered Species**

Since 1600, when accurate record-keeping began, approximately 225 to 250 species of animals have ceased to exist. The causes of these extinctions are numerous, yet nearly all are at least partially attributable to people and their increasing impact on the biosphere. The number of animal extinctions increased rapidly from 1600 to 1900, and there is the potential for an even greater increase in the future. By the 1920s, the number of animal extinctions in this century was close to that of the previous 100 years. Conservation efforts begun in the 1920s and 1930s may have halted the increase in extinct species for the present, but numerous species today are quite literally on the verge of extinction. As man's impact on the globe continues to grow, it is probable that many more extinctions will occur, as projected in Figure 1.

To make our projections, we have used information from the *Red Data Books* of the International Union for the Conservation of Nature and Natural Resources (IUCN). The IUCN maintains an international list of endangered, rare, and threatened species or subspecies

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of vertebrate animals (see table 1). The IUCN pools information from areas all over the world, monitoring the status of wildlife populations. Animals on the lists are placed in categories relative to their extinction status. TABLE 1

Figure 1

#### NUMBER OF SPECIES AND SUBSPECIES OF VERTEBRATE ANIMALS (WORLDWIDE) ALREADY **EXTINCT OR ENDANGERED AS OF 1974**

Animal Group	Already Extinct*	Critically Endangered**	Endangered and/or Rare
Reptiles	28	34	152
Amphibians	-	6	34
Birds	130	66	346
Mammals	68	73	292
Fishes	_	6	79
TOTALS	226	185	903

\*Data provided by J.A. Davis, New York Zoological Society, the Zoological Park, Bronx Park, New York, Jan. 1972.

\*\* Data from the International Union for the Conservation of Nature and Natural Resources, Red Data Books, Lausanne, Switzerland.

# Photos courtesy San Diego Zoo





Galapagos Tortoise Geochelone elephantopus

Peregrine Falcon Falco perregrinus

Florida Sandhill Crane Grus canadensis pratensis

These classifications include:

Endangered. Species in immediate danger of extinction, for example, the blue whale, peregrine falcon, black-footed ferret.

Critically Endangered. Survival of the species unlikely without immediate intervention by man, for example, the California condor, whooping crane, and oryx.

Vulnerable or Threatened. Species still abundant in some parts of their range, but under threat due to depletion of numbers, for example, the mountain lion, sandhill crane, and green turtle.

Rare. Species with a population that is neither endangered nor vulnerable, but is subject to risk because of its small size, for example, the Galapagos tortoise and Komodo dragon.

In making our projections for the future, we consulted only the endangered, critically endangered, and rare lists. We found that in cases where counts were available, animal numbers were extremely low. Species listed as critically endangered had world populations from as few as 3 to 5 individuals, to no more than a few hundred. Others on the endangered species list ranged from about 300 to 5,000 in worldwide numbers.

when the western world became conscious of its impact on animals. During this period, the number of worldwide animal extinctions increases considerably. This pattern is likely to continue unless an effort is made to halt the process.

Using data from several sources, we have examined extinction rates and the reasons for extinction during the past four centuries. The spread of cities, towns, and farms accompanied the increase in human population during this time. Human beings spread over the globe, exploring and colonizing many previously uninhabited areas. resulting in the demise of many animal species. Just as man's early migrations may have precipitated a wave of extinction on each new continent that was settled, the arrival of explorers and colonists from western societies decimated animal populations in Africa, the Americas, Australia, and on islands everywhere. Island faunas are particularly sensitive to human disturbance because they are often adapted to live only in an ecologically unique environment. With resources limited by the area of the island or archipelago they occupy, the animals are likely candidates for extinction. Few areas of the world, then, have escaped the direct and indirect effects of modern man. continued on next page



Understandably, the number necessary to maintain a viable population varies between species. However, the

great reduction in numbers, rapid shrinkage of habitat,

The facts speak for themselves. We stand an

excellent chance of losing a substantial portion of the

world's animal species, and with them innumerable strands of the interconnected web of life that supports our existence on this planet. In order to understand how this situation has arisen, and to comprehend its full impact on our future, we must examine extinction in greater detail,

and severity of threats documented in the Red Data Books show these animals to be likely candidates for

extinction unless there is human intervention.

both past and present.

## Global Animal Extinction

The geography of animal extinction documents the expansion of modern civilization and provides mute testimony to the development of technology. The sharp rise in bird extinction in the late 1700s and early 1800s, for instance, can in part be correlated with the development of the musket. The causes of extinction, however, are more complex than this. Research in this area has been interesting, revealing distinct patterns and trends in the ways people affect animals.

Figure 2 illustrates trends in the primary. civilization-related causes of extinction in the past. The most obvious trends are the decrease in the role of hunting for commercial products and sport. These are likely due to more sophisticated pursuit and hunting operations, as well as an increased demand for luxuries. Ecosystem alteration has increased, along with a general increase in other indirect means of extinction, such as the effect of introduction and feral (domestic animals that have reverted to a wild state) animals. Overall, there has been an increase in the diversity of ways species are threatened, creating a complex web of extermination closely related to the technological development of civilized man. In the seventeenth century, 86 percent of extinctions were caused directly by human activities (hunting), while 14 percent were indirect (habitat destruction). By the nineteenth century, the pattern was almost reversed - 24 percent direct and 76 percent indirect. Introduced animals accounted for 28 percent of the extinctions during the last century, but during the first 70 years of this century they accounted for nearly 50 percent.

#### Implication for Mankind

When endangered species become extinct, the world loses an animal, surely, but an ecosystem somewhere loses a functioning part. It is obvious, however, that not all ecosystems or natural communities are the same, nor will the elimination of a single species, or several species, affect all natural communities in the

Puma or Mountain Lion Felis concolor

same way. Some communities are far more diverse than others (they have a greater variety of plant and animal species), and relationships among community members can be extremely complex. Eliminating a species from any natural community changes the relationships among community members, and the system no longer works in the same way. The seriousness of the change depends on the role of the eliminated species in the functioning of the community and the degree of the dependence of the community on its biological complexity. In some cases it is likely that little change would be evident, but in others the loss of several species, or a single key species could have serious consequences. As the impoverishment of communities in terms of species composition continues, the web of interrelationships may be weakened, perhaps to the point of unraveling.

Numerous examples illustrate how this may happen. at least on a small scale. In agriculture, replacement of natural vegetation by single crop species lowers community diversity. The monoculture is ecologically simple, and requires huge energy subsidies from man to maintain it. When insecticides are applied to control pest insects, beneficial insect predators and parasites are sometimes killed off, leaving an unchecked pest population to rebound in greater numbers than before. When crops have been grown experimentally within diverse vegetation, no such pest outbreaks occur. When stream environments are modified by sewage pollution, or channelization, a few species, capable of withstanding the disturbance or exploiting extreme environments (such as mosquitoes, for instance), may occur in great numbers and become a pest problem. In research on intertidal marine invertebrates, Robert T. Paine found that removal of a key predatory species from the rocky intertidal community resulted in one of its prey species monopolizing most of the space. With no check on its numbers, it crowded out several other species, destroying the diversity of the system. Paine and others have suggested that predators act to increase species diversity by directing most of their predatory attention to the most abundant species in a community thus preventing any one species from monopolizing the community resources.

Although these examples are somewhat simplistic, they point to the potentially critical situation that could arise in many of the world's remaining ecosystems if more



Green Sea Turtle Chelonia mydas



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#### EXTINCTION DUE TO CIVILIZATION-RELATED CAUSES

Values given are the percentages of extinct or endangered animals in each time period whose extinction was or is due to ecosystem alteration, hunting, and so on. The lower four pie graphs concern animals already extinct, while the uppermost graph concerns animals presently on the endangered species list. Size of pie graphs is proportionate to the number of species and subspecies that became extinct or endangered in each time period.



Data Books, Lausanne, Switzerland; in lower four graphs from Davis, J.A., New York Zoological Society, the Zoological Park, Bronx species become extinct. Some ecosystems depend on "key" species; for example, predators, which may play a major role in the maintenance of species diversity or in the control of prey populations, and decomposer organisms, which help to recycle nutrients. The salt marsh ribbed mussel, for example, is a seemingly insignificant member of the muddy bottom community, yet is responsible to a large extent for the availability of phosphorus, a critical nutrient.

The capacity of ecosystems to rebound from human disturbance is limited by the amount of time between disturbances, the size of the area, and the distance from populations that could recolonize a disturbed area. As forests, prairies, marshes, and other natural ecosystems become fragmented and smaller in size, chances for extinction of animals become greater. The possibility that an ecosystem might be irreparably damaged by the removal of a single species may then increase as well.

If there is a lesson we should have learned from our past and present ecological crises, it is that living things and their environments are interrelated. The ecological consequences of pollution, ecosystem alteration, or extinction of animals may not be immediate or obvious. Damage to biological systems, however, may be irreparable, and may not be discovered until it is too late. Reducing the diversity of animal species by extinction means permanently removing the components from complex processes in many ecosystems. Unless stopped, it can only result in an ecologically simple world whose future would be unstable at best. Even efforts to preserve rare species in parks, zoos, and preserves, while commendable, may prove futile. Such species may no longer reproduce successfully when removed from their natural habitat. Small, captive populations may lack the genetic diversity necessary for survival when reintroduced to natural conditions.

There appears to be an increasing concern for endangered animals as a result of the environmental movement and the outstanding work of wildlife conservation organizations all over the world. These national and international groups have made some progress in international protection for whales, great cats, birds of prey and other animals. In the U.S., the Endangered Species Act was signed into law in 1973, and provides at least partial protection for domestic, endangered species. The U.S. Department of the Interior and many state conservation departments sponsor research on endangered species and attempt to manage and restore their populations in wildlife refuges and national parks. The magnitude of the extinction problems, however, may well dwarf these, and other efforts, to save endangered animals on an individual basis.

We suggest that the ultimate survival of our world's fauna depends on the conservation of wilderness and natural areas all over the globe. The struggle for the Alaskan tundra, the Amazon rainforest, and other smaller patches of natural ecosystems is a struggle to preserve habitats that are essential to animals and to the smooth functioning of the biosphere — and to mankind's well-being. Should we fail to save them, we cannot decelerate the world-wide extinction process, and human survival itself may be at stake. Mankind probably cannot survive in a biosphere devoid of diversity for very long.

Editor's Note: Today's Animal Health will be glad to furnish a copy of references used for this article upon request.



This cat named Aloysius has leukemia. He has been on therapy four months and has had ten transfusions.

Photos by Dr. Alice Villalobos

PARTI

This is the second in a series of three articles which will discuss the problem of cats and leukemia.

The following facts were stated and discussed in the last article and are listed below for background information:

- 1) A C-type virus was isolated from cats in 1964 which seems to be associated with the mysterious anemias and leukemias of cats.
- 2) The virus is commonly called the Feline Leukemia Virus (FeLV).
- A blood test was developed which can identify those cats which are infected with the virus.
- There is strong argument across the U.S. about whether or not to keep cats alive which are infected with FeLV.
- 5) There is absolutely no evidence that FeLV can cause cancer in people.



The next paragraph will discuss the reliability of the different blood tests across the country and dynamics of FeLV infection and the maintenance of a healthy, yet viruspositive cat.

One of the most disconcerting problem in the last three to four years facing the cat and the cat owner has been the unreliable testing for FeLV. Euthanasia is a rather alarming sentence for an FeLV infected cat when one considers that the blood tests which have been duplicated across the U.S. were not well standardized. This problem has recently been worked out.

Some cats were found to be negative to the test even when they had positive biopsy reports which proved they had malignant leukemia cells in their tissues. Some cats showed false positive and others showed false negative results. Furthermore, some tests have had conflicting results on the same samples. Veterinarians were forced to send samples to two and three laboratories across the nation at two and three times the expense to the cat owner. The false positive and negative tests are the result of poor antisera, poor technique, or poor slide preparation. But the test itself is reliable when properly prepared. More laboratories are providing excellent and reliable service and results.



The dynamics of FeLV infection are predictable so there is little reason to push the panic button. FeLV has been around for a long time so nothing is really different than before except there is more misinformation available about it than information. The virus is passed from cat to cat on a horizontal basis rather than a hereditary basis. The virus is found in blood, urine, saliva, and milk of infected cats. Therefore, it is passed most commonly in food and water bowls, litter boxes, cats grooming each other (and kittens nursing from infected queens). (The virus is easily killed with household disinfectants and cannot survive more than 3-4 days in a dry environment.) It is not an airborne virus, and more than casual exposure is needed to infect another cat. Older cats and antisocial cats are less likely to become infected. Young cats have less resistance to the virus. The factors which determine how the cat responds to FeLV infection would apply to exposure to any other disease. These factors include: age, health status, individual variations in the immune system of the cat, the amount of virus, and the degree and duration of exposure.

The chances of **any** cat being infected with FeLV or "positive" is 0.01% (one out of ten thousand). The risk of infection for cats who live with other infected cats in the same household is greatly increased (up to eight hundred times greater). About one third of exposed cats will become infected after two years of exposure. Many of those infected cats will die of cancer or related diseases due to a depressed immune system. It is very difficult to define which cat is able to protect itself from infection with the virus. It has been found that there are about six different catagories of immunity to the virus starting from very immune to no defense at all. Tests to define an individual cat's ability to fight the virus (with neutralizing antibodies) are not commercially available at this point, however they are being run in research facilities.

Signs for a breeder to look for in the cattery are obvious, sudden, overwhelming infections, death, anemias, poor-doing cats, abortions, and the "fading kitten syndrome". It is important to start testing as soon as the problem is suspected so that it can be properly dealt with.

A "positive" test does not mean the cat is sick. It only indicates the presence of the virus in the blood stream at the time of testing. A "negative" test indicates the cat was not infected at the time of testing, not that it is immune. It is important to retest cats at three and six months to properly identify its status. During that time the positives can be isolated or placed in single cat households.

There may be no alternative other than destruction of infected cats for the breeder. However, in the household pet situation, when the cat is loved by family members, there should be some optimistic alternatives provided toward maintaining a "positive" cat. Very often the positive cat is just as healthy and active as negative cats.

Only if a cat is sick, anemic, has a tumor or fluid in its chest or abdomen and is also found to be FeLV positive can leukemia be suggested as a probable diagnosis. More often the cat's illness is not actually leukemia, but the loss of ability to fight everyday infections due to the presence of the virus. To be absolutely sure that a cat has leukemia, a biopsy, or identification of malignant cells must be made by a pathologist or hematologist. Often, a bone marrow biopsy can help determine the type of anemia the cat is sick with.

A program of long term vitamin and antibiotic therapy with periodic checkups and blood tests by a veterinarian can be established for healthy, infected cats. It has been found that if infected cats are helped to fight their daily infections (especially during periods of stress), they can remain healthy. Even the poor-doing cat will benefit by a program of vitamins, antibiotics, and steroids on an alternating extended basis up to six months.

Currently the Veterinary Medical Teaching Hospital (VMTH) at University of California at Davis is conducting a clinical trial to cure infected cats. This may possibly be accomplished by stimulating the immune system of infected cats. FeLV vaccines are now in the experimental trial stage in the U.S. and in Scotland. Soon they may be available for usage. So optimism is definitely in place. The pet owner who has an infected cat need not feel as if he is harboring a public menace. A preventative or cure may be around the corner.

The next article will present programs, data, and discuss clinical trials which are designed to preserve and cure infected cats.

# ask Dr. Smithcors

#### What exactly is flounder in a horse--or is it founder?

It's founder, the more technical term for which is laminitis. It is usually caused by a toxic substance (histamine) in the blood stream, in most cases as a result of engorgement on grain or, in mares, as a sequel to uterine infection. The toxin is carried to the foot (most often both front feet) where the blood supply is very large. This results in inflammation in the region of the sensitive laminae on the coffin bone (third phalanx), a series of platelike structures that interlock with insensitive

laminae of the hoof wall. Because the wall is rigid, great pressure is exerted by the inflamed tissue, and the pain is such that the horse walks gingerly if at all. The swelling may cause the sensitive and insensitive laminae to separate, in which case the horse may lose its hoof. A horse can also become foundered by concussion to the feet from hard or fast work on a hard surface.

What is the proper word for neutering a female dog or cat: "spaying" or "spading" and what is its derivation? The proper term is spaving,

although "spading" is common in areas where Elizabethan English is still spoke (!) and until the late 18th century it was the accepted term. In ancient Greece it also was applied to males--eunuchs were called spadons, although the Greek root is spathe (Latin spatha), which denoted a small broadsword (used in "spading"?). By way of Anglo-French, espier became "to spay." The Spanish espada (sword) was used to designate the suit of playing cards we call spades, and the Latin spatha gave rise to spatula, an early term for the shoulder blade (now scapula). Some years ago a newspaper TV listing for the series "I Spy" was given as "I Spay" -- which to the star may have been "the most unkindest cut of all."

#### Can I bring a parrot back from Mexico when I go for a vacation?

You would have to check on the regulations current at that time. Your county veterinarian's office should be able to give you the proper information. Because of recent outbreaks of Newcastle disease among imported birds, importation of many species has been stopped or severely restricted. In any event the bird would probably have to be placed in quarantine for some time.

A

What causes colic in horses? Do you have to walk horses with colic, and should you keep them from rolling over if they lie down?

Colic is not a specific disease but a complex in which abdominal pain may be caused by a wide variety of disorders. The pain is caused by distention of the stomach or intestines by gas or fluid or by blockage of the intestinal tract, the normal motions (peristalsis) of which are diminished. About 90% of colics result from parasitism by large strongyles, the larvae of which damage the intestinal arteries, in turn reducing the ability of the

intestinal wall to contract. Accumulation of gas from fermenting bowel contents distends the intestinal wall, stretching of which causes pain. Toxic substances which cannot be passed along the tract are absorbed into the blood and can cause shock. Overeating of heavy feeds or ingestion of sand can cause colic. Excitable horses are predisposed to spasmodic colic (nervous stomach). Also allowing a hot horse to drink large amounts of cold water can sometimes result in colic.

Walking a horse may help it expel gas, if that is the

reason for colic, but not if the cause is impaction or parasitism. If improvement does not occur within an hour at most it would be advisable to call a veterinarian. Rolling is an attempt by the horse to relieve the abdominal pain, but this may allow already distended intestinal loops to become tangled and worsen the obstruction. Aside from being the humane thing to do, relief of pain is essential to prevent the horse from injuring himself by thrashing about, and the sooner professional help is obtained the better the chances for recovery.

Are there really crocodiles or alligators (caymans?) living in the sewers in New York? This story surfaces now and then, but mainly in the repertoire of comedians. The rationale appears to be that many of the persons who acquire them by mail order tire of them, or perhaps lessthan-enchanted parents issue "marching orders," and the toilet offers the most convenient means of disposal. That some grown-ups might develop a "Jaws" syndrome is understandable, since some of these beasts will grow to four feet in length at five years of age. The bottom line is that they require a temperature of about 80° and will die in Continued on page 39



# **WHAT DOES THE ELEC MEAN IN THE DOG?**

#### by Marvin Frace, D.V.M.

Almost everyone is familiar with the instrument used by the medical profession called the electrocardiograph. It is used to make tracings of the electrical activity of the heart. These tracings are sometimes referred to as ECG or EKG tracings.

A veterinarian can use a human electrocardiograph to make EKG tracings of the electrical activity of the dog's heart. All the normal values for the wave deflections of the dog's EKG have been established by our profession.

To take a tracing of the dog's EKG, a technician lays the dog on his right side with all four legs extended gently until the legs make a 90° angle with the body, and the front and rear

legs are parallel. Electrical EKG leads are attached to the skin over the elbow areas and the knees for the first six leads, and another lead is attached to various parts of the body as an exploring lead. For example it may be attached to the skin over various ribs, the shoulder or the back.

As in man, there are six main leads that are used to evaluate the heart. They are called lead I, lead II, lead III, lead aVR, lead aVL, and lead aVF. In addition, 1 often use other leads which are attached to three areas on the chest wall and back.

Electrocardiograph tracings and what they mean can be very complicated. Whole books are full of nothing but EKG tracings of different types. The subject is much too broad to cover in this article, so I am going to cut some corners and make some broad generalities.

The EKG can be used to determine many things: heart rate, heart rhythm (regularity of each beat), size of the right atrium, size of the left atrium, size of the right ventricle, size of the left ventricle, or arrhythmias. Arrhythmias are alterations in the rhythm of the heartbeat either in regularity or in the force of the beat.

To show you variations in the EKG I am only going to talk about lead II and show how it can vary. Remember, this is only one of nine or more leads your veterinarian may be considering when he does an EKG on your dog.

The normal lead II complex looks like Figure 1. The P wave is the electrical depolarization (discharge) of the



# TRO-CARDIOGRAM

atria (the two upper chambers of the heart). The QRS wave is depolarization of the ventricles (the two lower chambers of the heart). The T wave is repolarization (recharging) of the ventricles. The repolarization of the atria is hidden in the QRS complex.

To demonstrate how the EKG can show changes in cardiac size we will look at several figures of EKG complexes. I have drawn them to approximate proportion so you can compare them to each other. Remember that Figure 1 is normal for lead II in the dog, and all the other figures are also lead II of the same dog if he were to have the abnormalities labeled under the figures.

You can see the variation of the complexes that show enlargement of the various chambers of the heart.

These changes would always be confirmed by x-rays of the heart and lungs. You can also use these first six leads to determine how the heart is positioned in the chest (electrical axis). It is too complicated to explain here, but this also helps your veterinarian to recognize enlargements of the different heart chambers or malpositioning of the heart. This electrical axis would also be confirmed with x-rays of the heart and lungs.

There are a large number of arrhythhmias that are observed in the dog. The changes in the complexes are very bizarre in some cases and indicate a severe cardiac muscle disorder is present. Figures 8 through 11 show some arrhythmias.

Unlike people, dogs have three arrhythmias that are normal and ac-

ceptable in healthy dogs, (sinus arrhythmia, wandering pacemaker, and sinus arrest). These arrhythmias cause no harm to the dog and are commonly seen by veterinarians in daily practice when monitoring a surgery with an EKG monitorscope.

The electrocardiograph and electrocardioscope are used frequently in veterinary medicine today. You must remember that it is only one tool used to evaluate cardiac function and alone may not give you a firm diagnosis or tell you what is the cause of the abnormality. The EKG must be considered along with tests on the blood, urine and x-rays of the heart and lungs to make a diagnosis. A proper diagnosis is the basis from which a veterinarian prescribes the appropriate drug therapy or surgical correction.





The shark-scare hysteria that gripped surf bathers last summer produced a reaction that may bring harm to some of the gentlest of sea creatures, the small whales and dolphins. This was clearly demonstrated at a Florida beach in June 1975 when "a large finbacked fish with a blunt nose" stranded at the water's edge. According to the National Wildlife Federation, the incident evoked a grotesque response. With visions of man-eating sharks fresh in their minds, bathers stabbed and hacked the helpless animal to death. The mutilated carcass later was towed to sea for disposal. When marine scientists finally were told about it and the animal was described to them, they reported it may have been a kogia, a rare pygmy sperm whale which, unfortunately, resembles a shark. Not much is known about the kogia and marine scientists would have learned a lot by examining the stranded animal. But the mob's action destroyed this possibility and suggests that stranded porpoises and dolphins might suffer the same fate.

Of all the whale relatives, most people know dolphins best from the "Flipper" movies and TV series. People in and around New York's marine district often see the graceful animals sporting off our South Shore beaches and in Long Island Sound. And for some reason, dolphins have even swum well up into the Hudson River. In 1936, a daring pod of 30 to 40 common dolphins ventured into the river, perhaps chasing a school of fish. One swam 145 miles up the Hudson but unfortunately stranded. Nothing is known about what happened to the others.

At this point you may be asking yourself: Were they porpoises or dolphins? Or, are they the same animal? The answer is yes and no. Porpoises and dolphins belong to the marine mammal order, Cetacea, that includes the great whales. They are in a family called Delphinidae that comprises some 50 species or different kinds. Like the whales, porpoises and dolphins — from here on I'll simply call them dolphins — are warm blooded, bear their young alive, and suckle the young.

As usual, the Greeks had a word for it. In this case, it was Aristotle, the ancient Greek best known for his philosophical writings, who, in a lesser-known role as a student of natural history, coined the term, "dolphin." He used the term for both the common dolphin (Delphinus delphis) and the bottle-nosed dolphin (Tursiops truncatus). Incidentally, Flipper was a bottle-

nosed dolphin. The word porpoise, on the other hand, is more "modern" and is based on a Middle English word which is derived from a medieval Latin word meaning "pig fish." It's not known if the word was applied to the marine mammal because of the noises it makes in feeding on fishes or because it makes a pig of itself in gorging on fish when they are available. Many cetologists, specialists in the study of whales and dolphins, prefer to reserve the word porpoise for certain species such as the common or harbor porpoise (Phocoena phocoena) which is found on both sides of the North Atlantic, and call the rest dolphins. To add to the confusion, there is a game fish called the dolphin (the dorado, Corphaena spp.) that is eagerly sought by anglers and gourmets alike. It often enters New York's marine waters during the warm summer days but usually is found in tropical and sub-tropical regions. Restaurant patrons are sometimes startled to see dolphin listed among the seafood entrees. There is a story about the proprietor of a fish market who was loudly denounced by a would-be customer who proclaimed with righteous (although mistaken) indignation that she "would never eat Flipper!" even if she were starving.

The mammalian dolphins are a cosmopolitan lot and are found throughout the world ocean; some even live in fresh water. They range in size from the relatively small (51/2 feet long) common porpoise to the fearsome killer whale (Orcinus orca) that is 31 feet long. Other dolphins are the pilot whale (Globicephala) whose schools are a common sight far off the Long Island coast, Risso's dolphin (Grampus griseus), and the spotted dolphin (Stenella dubia). The common dolphin and the bottle-nosed dolphin have been seen in Long Island Sound, probably attracted by the abundance of fishes there. The harbor porpoise and the pilot whale have been reported from time to time in the sound but there are no details about their activities in that landgirded arm of the sea. To my knowledge, no one has reported a killer whale in the sound although one stranded near Narragansett, Rhode Island, in 1956, and a dead killer washed ashore on the Rhode Island coast about 15 years ago. Since killer whales fed mostly on seals, other dolphins, sea birds, squid, and some of the large whales, it is likely that the Rhode Island records are of animals that had come in from the ocean rather than from the sound. Nevertheless, since a white whale

or beluga was seen in Long Island Sound a few years ago, it is possible that other large cetaceans, including the killer whale, could blunder into the sound. But it is doubtful if they would stay long because there simply aren't enough large food items — other than fishes — to satisfy their huge appetites.

The temperament of most dolphins is quite the opposite of the killer whale. Aristotle and other early Greeks told how dolphins would approach bathers and allow them to rub their hides and play with them. Some dolphins, so the stories go, were particularly attracted to young boys and would let them ride on their backs. The figure of a boy riding a dolphin is common on old Greek coins, vases, and statuary. There is a modern counterpart to the ancient story in the form of Opo, a dolphin that, in 1955, began to swim among bathers near the small New Zealand seaside town, Opononi. Opo allowed bathers to stroke it and even allowed a 13-year-old girl to ride on its back.

Dolphin riding — but not by a human — was mentioned by that master story teller, Aesop, in about 600 BC, in a fable entitled, "The Monkey and the Dolphin." In the story, the monkey, a sailor's pet, is lost at sea but is rescued by a dolphin, believing the furry bundle to be a man. The monkey encourages the deception but is soon found out during a conversation with the dolphin. Angered at the deceitful creature, the dolphin submerges and leaves the monkey to fend for itself in the sea.

Over the centuries, tales have been told and retold about dolphins rescuing humans in trouble at sea by pushing them ashore. Aristotle, in his monumental work, "History of Animals," about 330 BC, set down the stories as part of dolphin lore. Modern students of delphinology have doubted the tales but they were given some foundation by an event that took place in Florida in 1943. A woman bathing in waist-deep water began to be dragged out to sea by a strong undertow. Fighting to get back to shore, she started to black out. Suddenly, she said later, "Someone gave me a tremendous shove." She quickly regained her footing in shallow water but there was no one there. However, two dolphins were swimming not far off the beach and a man who had been farther down the shore, came running up to tell her that a dolphin had pushed her ashore.

And how has man responded to the friendly overtures made by his cousins? Not too well, it seems. Man has eaten dolphins, boiled them down for oil, ground them up for chum in shark fishing, treated them like clowns in public displays, and trained them for military purposes. A few people, however, have recognized dolphins as intelligent animals and attempted to understand their language and even to "converse" with them.

Dolphins have been in the human diet for a long, long time. They were eaten by primitive tribes around the North Sea who tossed the bones into kitchen middens for present-day archaeologists to pore over. The Greeks also were not hesitant about dining on their marine cousin despite the dolphin's association with Poseidon, god of the sea. Henry VIII of England often joined his countrymen in a dish of "porpesse pudding" and in some Catholic countries, dolphins were declared to be fish so that they could be eaten on Friday.

Whalers looked for dolphins, too, although they

have thinner layers of blubber than the great whales. Watchmakers were said to be particularly eager to get the fine oil rendered from the jawbones.

Closer to home, a few years ago, a Montauk charter boat captain shocked a lot of people when, in his book, he told how he harpooned dolphins and ground them up for chum to attract sharks for his clients to fish. His rationale, was that the dolphins destroyed many sport fish that really should be caught by anglers. (The character "Quint" in the book and movie, "Jaws," seems to be modeled after the Montauk captain. In the book, an unborn bottle-nosed dolphin was the special bait reserved to guarantee catching the maneater shark.)

The U.S. Navy took advantage of the dolphin's intelligence and apparent eagerness to associate with man and trained some of the animals for deepwater tasks. In his book, "Marine Mammals and Man: the Navy's Porpoises and Sea Lions," Dr. Forrest G. Wood of the Navy's Undersea Surveillance and Ocean Sciences Department, describes how the animals were trained to retrieve torpedoes and mines from the ocean floor. Dr. Wood is careful to point out that the Navy was not trying to train "kamikaze porpoises" that would carry explosives to blow up enemy ships (and themselves).

There is no doubt that the greatest harm to dolphins comes from the slaughter of the marine mammals in the Pacific Ocean fishery for tuna. Two types of dolphins — the spotted dolphin and the spinner dolphin — are associated with schools of tuna, especially the yellowfin (*Thunnus albacares*). Tuna fishermen look for dolphins to show where the schools of tuna are. In the seining operation, many dolphins are trapped in the net and drown. The National Wildlife Federation, quoting from data released by the National Marine Fisheries Service (NMFS, U.S. Department of Commerce), reports that in 1974, 113,000 dolphins were killed in the yellowfin tuna fishery, with 98,000 of them taken by U.S. vessels. The estimate for the 1975 fishing season was 93,000 to 214,000 dolphins.

The tuna industry, with help from NMFS, has designed special panels in the nets and techniques to help dolphins escape from the encircling seine. As a result, the *rate* of dolphin mortality in tuna fishing has declined. However, the total *number* of dolphins killed has increased because there has been increased fishing for tuna.

Robert Schoning, Director of NMFS, issued an ultimatum to the tuna industry. Lower the dolphin kill rate by 30 percent or stop fishing on all yellowfin tuna schools that travel with the mammals! The tuna industry doubts that it can meet the goal set by NMFS. To insure that every effort is being made, the federal government plans to place observers aboard tuna clippers. The 1976 tuna season will tell the story of the success or failure of the program to reduce the incidence of dolphin mortality in tuna seines.

Dolphins, and their kin, the great whales, are protected by the Marine Mammal Protection Act of 1972. This important piece of federal legislation greatly reduced the traffic in cetacean products in the United States. It also requires permits for the taking of dolphins and other marine mammals for exhibition or for scientific purposes. In addition, it directs the tuna industry to reduce the incidental killing of dolphins "... to insignificant levels approaching a zero mortality."

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C. P Ryan, D.V.M.

SUMMER HAZARDS

#### WOUNDS

Wounds are common in pets and involve a break or laceration of the skin or mucous membrane. Minor scratches often occur during the rough and tumble play of young pets, and if kept clean, usually heal without incident. Deep wounds require prompt professional medical care.

first aid

Fight wounds are every day events in pets who roam and can vary from small tears in the skin to large lacerations. With puncture wounds often nothing can be seen except a tender spot and some dried blood or serum. The fur may feel damp and clipping the hair may reveal several puncture wounds. Evidence of infection doesn't appear immediately after an injury, because the germs need some time to grow and multiply. Often puncture wounds right after they occur appear harmless to the owner, but in two to seven days the wound becomes tender, red, warm and swollen. Remember the tiniest wound can allow thousands of germs to enter the body ..

Cats are notorious for developing infected fight wounds which often go unnoticed until a fluid-filled swelling develops. The swelling usually ruptures discharging a foul smelling pus and leaving an ugly open draining wound which requires medical care.

Dogs running about may cut their feet on pieces of glass, old tin cans and other objects and foot wounds can bleed profusely. Excited dogs have been known to jump through closed windows and cut themselves badly. Be careful when cutting mats out of your pets' fur -don't take a piece of the skin with the mat.

Excited horses often run into barbed wire or other types of fencing causing multiple wounds. To prevent needless injury to your horse keep his corral or pen free of such objects as: old tin cans, broken glass, pieces of wire, sticks and stones. Check the corral fencing for old nails, pieces of pipe, wire or other sharp objects that protrude and could cause trouble. It is always more humane and often costs less to think prevention. The horse is one domestic animal in which minor wounds can lead to a fatal outcome because horses are very susceptible to tetanus or lockjaw. Tetanus infections in horses occur most often as a result of nail wounds in the foot. The tetanus bacteria is common in horse manure. Clean wounds rarely result in tetanus. Horses and people are routinely vaccinated against tetanus. Once the horse has lockjaw it is too late for vaccination - so keep your horse up to date on tetanus vaccination.

Tetanus in people is a major problem in many of the developing countries where routine vaccination programs are still being developed. According to the World Health Organization, tetanus is one of the most common causes of death in the first months of life and can occur in babies whose umbical cord has not been cut under sterile conditions. At least three-quarters of the tetanus infected babies die.

#### **BROKEN BONES**

Broken bones may be encountered with wounds. If you suspect a fracture take your pet directly to your veterinarian. Generally the animal with a broken bone will protect the injury. Trying to immobilize a fracture temporarily with a make-shift splint can be exasperating and dangerous to both you and your pet. Broken bones hurt and the physical restraint required to immobilize a fracture temporarily with the struggling of the patient may cause more harm than good. Unless you are several hours from medical help, let the animal doctor handle the broken bone.

#### **ANIMAL BITES & RABIES**

Besides carrying infection into their bite wounds, animals can transmit rabies (a disease that can be fatal to both man and animals). In the United States rabies is steadily declining, yet the main source of infection for humans and domestic animals is wild animals (foxes, skunks, raccoons, bats, etc.). Worldwide, dogs transmit



Does your dog have an identification tag? If your pet is injured or lost, could you be contacted? Be a responsible owner for your pet's sake.



This nasty wound was the result of a rubber band around the neck of a dog. Do not allow children to place rubber bands around pets even in play. A similar problem is seen from collars placed on growing puppies. A collar that fits just right now may cut through your puppy's neck when he grows.



A dog's paw makes a nice hiding place for thorns and stickers. Here a plant awn often called a "foxtail" is seen in the paw. Remove it before a problem develops.



Routine hoof care is vital for horses. A horse's hoof is similar to our fingernails growing daily. Periodically the excess hoof is trimmed off. Tetanus in horses most often is the result of a dirty foot wound.

more rabies to humans than any other animal. Cats range second to dogs in transmitting rabies to humans in the United States. Keep your pet current on his or her rabies vaccination.

#### WHAT TO DO

- 1. Use caution in approaching cats and dogs showing odd behavior. Avoid foxes, skunks, raccoons and other wild animals. Rabies can alter an animal's behavior, and wild animals that would normally avoid humans may seek them out.
- 2. If you are bitten by an animal suspected of having rabies, contact your **physician** at once concerning what to do about your wound. Your physician can report the animal bite to the local health authorities, as required by law.
- Do not destroy the biting animal. He should be captured and confined for purposes of observation by the proper authorities.
- Your veterinarian can advise you on your animal's wounds. The best protection you can give your pet against rabies is a vaccination.



Animals of all kinds with broken bones are presented to veterinarians. Here is a young sparrow with a broken leg. Cars are the number one cause of broken legs in cats and dogs. Keep your pet off the street.



The development of safe rabies vaccines for animals especially dogs and their wellorganized application on a mass scale throughout the United States has been the single most effective tool in the control of rabies in this country.

#### WHAT TO DO FOR WOUNDS

Animals with severe wounds or broken bones should be taken directly to a veterinarian.

- 1. Remember restrain properly and control bleeding with direct pressure (see First Aid Part I).
- 2. Remove hair and dirt from the wound. In heavily contaminated wounds, running water can be used to flush the wound area. It may be necessary to clip the hair around the wound to determine the extent of the injury.

Cleanse the wound with warm soapy water or 3% hydrogen peroxide. Moist cotton balls work well for cleaning. Be gentle with the tissues and remember it hurts.

- A clean fresh cut may be covered with a light sterile dressing to prevent contamination. Puncture wounds should not be bandaged but left open to allow for drainage.
- 4. Further medical care may be required. If in doubt phone your veterinarian and ask for advice.

# can you depend on it?

#### "A Lost Dog Can Find His Own Way Home"

Do dogs have a homing in-sight that enables them to find their way home if they become lost? Most persons you would ask would probably say yes. In days gone by this belief was commonly held. Thus in 1801 the Reverend W. B. Daniel observed, in his work on Rural Sports, "Of the Dog's instinct in returning home from places to which they have been carried, in such a manner that no trace of the road can be supposed to exist in the animal's recollection, few but have heard recitals which have astonished them." One of the astounding stories the Reverend relates concerns a British colonel who took his favorite spaniel on a carriage trip to Bath, where she was to remain while he returned home to Springfield. But "upon the third day after his return, the bitch was at Springfield, though the distance between that place and Bath is 140 miles, and she had to pass through London, where she had never been but in her passage through it, shut up in a carriage.

Countless such tales told since then comprise a body of evidence most everyone would accept as reasonable proof that dogs do in fact have a homing instinct. Well, not quite everyone. R. H. Smythe, a British veterinarian who has studied the habits of animals for many years, says: "It is exceedingly likely that the majority of dogs which find themselves deserted in strange country, fifty or a hundred miles away from home, never get back at all. Advertisements for lost dogs in newspapers are numerous enough to make this seem probable."

Along the same lines, Dr. L. F. Whitney in his **Dog Psychology** admits, "Many dogs shipped long distances have gotten to their old homes," adding, "but how? Three dogs of which I knew, were sold and shipped long distances but all came home. Upon tracing them it was found that they had been resold to persons in their old neighborhoods and naturally went to their first owners, who gave the dogs credit for having returned on foot."

Consider the many thousands of dogs surrendered to humane societies and adopted by someone in the same geographic area every year. Although statistics are lacking, some of these probably find their way back to their former owners. But if all or even a substantial number of dogs had a strong homing instinct, adoption would be virtually impossible except for puppies. And as Dr. Smythe suggests, "Quite a number of dogs stray away, possibly on a courting expedition, and seem unable to find their way home again after all the excitement is over." He concedes, however, "that a far greater number of lost and stolen dogs would return to their homes if they could be left alone. unhindered in their attempt."

It seems likely that for various reasons some dogs never form a strong attachment to their owners, or perhaps they develop an aversion to a particular person or circumstance and find a happier home when the opportunity comes along. Cats tend to be less dependent upon "their" people than dogs. While some cats have been known to travel long distances in returning home after being lost, Dr. Smythe says that only a very small precentage of lost cats do return.

Dr. Whitney tends to doubt that dogs have a true homing instinct and knows of no authentic study that demonstrates it credibly. Dogs "lost" only a few miles from home, he says, come home by ear, "recognizing familiar whistles and other sounds, or by smells which they identify. But this is not homing instinct." Dogs have the ability to place the origin of a sound within five degrees, which at one mile would be within 450 feet! But what about dogs taken farther from home and released into totally unfamiliar surroundings? "If 100 dogs were all kept in a kennel for a year and then all were taken 10 miles away and liberated at 100 different points, some of them in wandering would get back home....But many of the others might be picked up 10 miles in the opposite direction." That some do make it back, Dr. Whitney attributes to what he terms random scatter and suggests that the dog merely "wanders until by a happy coincidence he finds himself in a neighborhood with which he is familiar and is soon back at his old home." Homing, Dr. Whitney concludes, is mostly a matter of luck.

Luck certainly plays some part, even for a dog determined to return home no matter what. A dog with good road sense may run out of luck in crossing a busy freeway, or in an encounter with a capable animal control officer. However given the indisputable fact that some lost dogs and cats do return, sometimes from considerable distances, must we settle for this being only the pure, blind, unreasoning chance afforded by random scatter? Probably not.

Each dog has his own territory, the boundaries of which he marks with urine. His own particular area may overlap that of several neighboring dogs, but he recognizes it as unmistakably his once it is established. A recently acquired dog or cat may become lost by straying too far from the few signposts he has had time to mark, and in any event it is a good idea to keep a new animal within sight for some time. Once a dog becomes oriented to his new surroundings it may be difficult to lose him, even deliberately.

According to Dr. Michael W. Fox, a leading authority on the subject, a dog removed some miles from his own marked-out territory is likely to follow a spiral pattern in everincreasing circles. Eventually he is almost certain to come across a neighboring dog's mark, which permits practically instant orientation, and getting home from there is all downhill.

What if he is taken a considerable distance from home? The farther--up to a point--the easier it should be, Dr. Fox says. Dogs have an internal "clock" that enables them to sense time as it is related to the position of the sun. A dog 200 miles from home would recognize the difference between his internal time and suntime and would soon strike off in a direction that would reduce this difference. As

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It happens an average of four times a day in this country — 365 days a year — every year. Maybe, while you're reading this article, it's happening to your horse.

When you turned your horse loose last night, you might have made a little mistake. You might have left his halter on him. Right now, the dried sweat under the halter is starting to itch, and he's scratching against a fence post. Or, maybe he's nibbling grass through the fence. Why he's that close to the fence doesn't matter somehow, his halter strap hooks over the post!

He pulls back, straining to free himself, but the post is sturdy and the halter is much too well-made to break. Suddenly, he's scared. In his panic he lunges against the fence twists the halter tighter. It digs into his flesh, cutting off his air. He thrashes his head wildly, battering his face into the post again and again. His eyes start to bulge — he must have air! With teeth clenched and the great muscles in his neck standing out, he makes one last violent attempt to escape.

Later today, when you go out fo feed your horse, you'll find him there next to the fence. If he did manage to break the halter or the post, his tremendous effort and sudden release will have thrown him back to crash heavily on the ground, fracturing his skull, or breaking his neck. If not, he'll still be hanging from the post, strangled.

You're right! A halter accident is not a very pleasant topic to read or think about. But then, it's not a very pleasant thing to have happen to your horse, either. It's brutal, gory, tragic and senseless! It can happen anytime — repeat anytime — your horse is wearing a conventional halter. It can happen when your horse is left unattended, or with you standing nearby; tied to a hitching post, or grazing freely in a pasture; in his stall, or in a trailer. Whenever your horse is wearing a conventional halter, you MUST remember he's in potential danger.

Nylon halters are extremely strong. A halter accident involving a regular nylon halter most generally results in a bad injury, or in the horse strangling himself because the halter refuses to break.

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Rope and leather halters, on the other hand, tend to break under the stress of a mature horse's efforts to escape. Under these circumstances, the horse is thrown backwards and hits the ground in a sort of whiplash effect with his head striking the turf last. The momentum, the snap, and the resulting fall can easily crack the skull or break the neck.

The injuries your horse can sustain in a halter accident are determined by the object his halter becomes hooked on. If he's turned loose in a pasture surrounded by a barbed wire fence, fragile as it may be, if his halter hangs up, in the ensuing struggle he can cut himself severely before escaping. If the wire is held by steel posts, in his panic the horse can impale himself on one. I have personal knowledge of such an accident after removing the body of a yearling colt from a steel fence post in Kansas three years ago.

Sometimes farming equipment is left in the pasture. After a short time, lush grass grows up high around the implement, enticing horses to graze close to it. If the horse is wearing a conventional halter, there are any number of levers, rods, or other pieces of metal sticking out that can hook into a halter strap. A halter accident involving parked farm equipment practically always results in death — either killing the horse outright, or causing extensive injuries so that the animal must ultimately be destroyed.

As we pointed out earlier, when the halter breaks during an accident, the momentum caused by the sudden release adds to the impact of the fall and increases the extent of the injury. However, this is not always the case. In a halter accident in California earlier this year, a valuable horse was killed when his halter broke after a violent struggle. The momentum carried the horse through a wooden fence, and over a 50 foot embankment. The fact the owner was present to witness the tragedy simply adds to the horror of such a freak occurrence.

Experts claim horses spook because their vision is so much different than ours. Their eyes are set on the sides of their heads, which sometimes makes familiar objects look unfamiliar. A report from the midwest illustrates how this anatomical difference can cause a serious halter accident.

A well-broke five year old mare was being hauled in the back of a pickup. There were stock-racks along the sides, but the top was open. Although the mare had been transported this way several times, for some reason she spooked, knocked one of the sides loose and fell out of the pickup. Her halter was nylon, and she was tied with a nylon lead. Neither broke. The truck was moving at less than 20 m.p.h., so the horse might have had a chance to live through the mishap with only cuts and abrasions for her foolishness — if the halter and lead rope hadn't been so strong. Instead, she broke her neck.

Your horse is a lot bigger than you are. If you've owned, or been around horses for a while, you've seen them go through some pretty tough experiences and, seemingly, never feel a thing. They get kicked, they run into things, they fall, even when they play with each other you wonder how they can possibly come out alive. After all that you could start thinking of your horse as being indestructible. But he's not. In fact, because of the way he's built, some parts of his body are almost fragile. In contrast to his heavy body, his legs are thin and stick out away from the bulk of his mass. His neck is long, and although muscular, its distant end is an all too vulnerable place for his head to be. The length of his appendages does offer some advantages in that many horses find it quite easy to scratch a hind leg with their teeth. But this capability also offers another way for a halter accident to happen.

In Washington, a mare had somehow hooked her left hind leg through the cheek strap on her halter while standing in her stall. Again, the panic of being so unnaturally trapped caused a violent struggle. Afterwards, her owner found her lying in the corner with her head pulled to one side, her neck broken. The halter was not loose fitting, and the shoe hadn't come loose to serve as the fatal hook. She had managed to get hoof and all through a tight fitting halter strap! Within a five day period, a veterinarian in California was called to aid three horses that had been caught by their halters on fence posts. All three were dead. In Rhode Island, an Arabian mare died while caught on a gate post by her halter.

And so it goes. One authority claims that over 1000 fatal halter ac-

cidents occur each year, and tens of thousands of other horses are injured in halter accidents annually. In other words, conventional rope, leather and nylon halters cripple a horse on the average of every 26 minutes, and kill a horse every 6 hours, around the clock, every day of the year! If these figures are accurate, halter accidents rank number two on the list of potential dangers to your horse, with internal parasites ranking number one. That little old \$10.00 halter you (and millions of horsemen like you) buy and use, robs us all of millions of dollars in lost animals and unnecessary veterinary bills each year!

What can be done to prevent it?

Many magazine articles and newspaper stories have been written warning horsemen that leaving conventional halters on unattended horses can cause halter accidents! From this information, we are to assume that if you're nearby, your horse cannot have a halter accident but that's not true!

Look at the facts! Read the reports! Hundreds of fatal halter accidents have happened when the owner, or someone else, was on the scene — right there, and witnessed the entire event! It just happened too fast for anyone to do anything about it!

The answer to halter accident prevention is not whether or not you stay close to your horse while he's wearing his halter — it's the type of halter he's wearing! Halter manufacturers have perfected their art to the state that today's halters are virtually "indestructible." If they should break, it's only after your horse has exerted tremendous pressure, and is probably already injured. You've read what happens when a halter breaks during a halter accident.

Recently, a new type of halter was introduced by one of the large equine manufacturing companies. It's different from any halter ever manufactured before, because. designed into one of its two buckles is a patented device that can prevent halter accidents. The halter works like this: For leading your horse, or working him on a long-line, you fasten both top and bottom buckles on the Safety Halter. The bottom one is a lockbuckle, and won't allow the halter to come off - just like your old, conventional halter. But when you turn your horse loose with the halter on, you unfasten the lock-buckle and leave the top, "safety-buckle" fastened. It has a Continued on page 33



spring coupling inside that takes about 150 lbs. of pressure to uncouple. Therefore, if your horse hooks the halter on any potentially dangerous object, he can pull back, causing the spring to uncouple, and the Safety Halter falls away. it's the first halter to ever offer the capability of allowing your horse a chance to get out of a halter accident without injury.

Instead of finding your horse hanging from a fence post, lying dead in the middle of a corral, or gashed and bleeding after a conventional halter has forced him to wrestle with a piece of farm equipment, you'll probably find your horse alive, and uninjured, with his Safety Halter hanging harmlessly from a fence post! All you do is slip the coupling spring back into position and put the Safety Halter back on your horse. No need to call the vet — no need to bury your horse.

The Safety Halter sells for about \$20.00, or about twice as much as conventional halters. Who wouldn't pay \$20.00 to give their horse a chance to survive a halter accident?

Okay. You've read how dangerous conventional halters are. Now you know that a halter accident claims the life of a horse every 6 hours, and will brutally cripple others at an average of about 2 horses an hour. You know that halter accidents can happen anywhere, anytime. Now don't you think you should go check on your horse, and see if he's all right?

### can you depend on it?

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with most other learned or instinctive faculties, however, not all dogs are equal in this regard, and the difficulty increases as the distance decreases because the difference between suntime and internal time is less. The same is true of homing pigeons. Some do much better than others when they are released only a short distance from home. However on a cloudy day most of them may have trouble.

A lot of dogs do get irretrievably lost every year, and if you love yours, the proverbial ounce of prevention is good medicine.





Photos by Susan Childs

This 9-year-old FeLV positive Persian cat has been on chemotherapy for a lymphoma tumor in his chest since March of 1977. He feels great and is clinically normal.



8338 Rosemead Blvd., Pico Rivera, CA 90660

Today's Animal Health/Animal Cavalcade 33

of course, as a class pet. We enjoyed watching the turtle grow, when someone mentioned that salmonella was common to turtles and that we should have it tested.

Much to our sorrow, we found that it did have salmonella, and we would have to get rid of it because the disease is dangerous to humans. Because of our attachment to Myrtle, we wanted her to live, rather than be put to sleep, and we made inquiries as to how we could preserve her life.

The class was told by the Animal Medical Center and other authorities that the turtle would have to be restored to her natural habitat, the swamps, so that she would not endanger any human lives. This is where a complicated chain of events took place.

Our teacher, Sam Brian, has a mother who lives in Florida, who agreed to take Myrtle and put her in the swamps down there.

We borrowed money from the 7th Grade, so we could afford to send our pet turtle down to Sam's mother. After we packed the turtle well in a wooden box so that she would not be injured by the journey, two of the girls in the class were driven out to the airport with Myrtle, where she was put on an Eastern Airlines freight plane to Fort Lauderdale.

We learned later that Sam's mother was not able to pick up Myrtle for a few days because she was sick --she had called the airport to explain the situation and the airlines personnel reassured her that they would take care of the turtle until she was able to pick it up, and they did.

ALC:

In the meantime, we had to pay off our debt to the 7th Grade, so we had a cake sale, and every child in our class was supposed to bake cakes or cookies to be brought in the next day to be sold to the rest of the school. The sale was a success and we were able to repay our debt.

Sam's mother reported that she had picked up Myrtle at the airport and put her into the swamps in Fort Lauderdale, where now she will live out her normal life.





aetrile" is an acronym from Laevo-mandelonitrilebeta-diglucoside; the chemical name for amygdalin, one of a group of chemicals containing one molecule of benzaldehyde, one molecule of hydrogen cyanide and two molecules of sugar. These can be arranged in fourteen combinations and are called "nitrilosides". They are found naturally occurring in a great number of plants. Seeds and sprouts are especially rich in these substances. Amygdalin in commercially extracted from apricot kernels largely because of their availability. The natural diets of all animals contain significant amounts of nitrilosides. Dogs will seek grasses that are rich in them and will even climb apricot trees to obtain the fruit which they break with their teeth to extract the kernel. (We were amazed to make this observation but have since had this confirmed by several other dog owners.) Agronomy, food processing and cultural changes of the past century have reduced drastically the intake of nitrilosides by man and his confined animals. A marked increase in the incidence of cancer, arthritis and other metabolic disorders has paralleled this reduction in the intake of these substances.

Although nitrilosides contain cyanide, this is locked into the compound in much the same manner as it is in many other non-toxic substances such as Vitamin B<sub>12</sub>. It can only be released upon digestion in the presence of a betaglucosidic enzyme. In the original state these substances are remarkably non-toxic and non-irritating. The LD50 for experimental animals, parenterally, is 20,000 mg/K. It is somewhat more toxic orally due to digestion in the small intestine but not in levels commonly used in the treatment and prevention of cancer.

A very significant article entitled "Cancer Immunology" by Lloyd J. Olds was published in the May, 1977 issue of *Scientific American*. In my opinion there is no longer reason to doubt that cancer is a result of failure of the normal mechanisms controlling cell proliferation. One hypothesis suggested for this failure is "deficiencies and other abnormalities in general and specific immunological reactivity on the part of the host".

A plausible explanation for the dramatic increase in cancer in recent times is that changes have occurred in the cell environment that have affected the complex biochemistry of the nucleoproteins. These changes might either be due to additions or deletions from the normal environment. Undoubtedly the cells have been exposed to numerous chemicals that have never existed in the past. However if this were the main factor we might expect to see a similar increase in cancer in animals in the wild and no such increase seems to have been reported. This makes it more likely that the significant change has been in the deletion of some essential substances. A great many such deletions can be suggested. Excessive food processing destroys many of the natural enzymes and vitamins, and the evidence would suggest that some of these might play a role. However the one most obvious deletion and the one that seems most likely is that of the nitrilosides.

In the face of such evidence plus such a plausible theory, it seems incredible that there is any opposition to the study of the possible value of nitrilosides in the prevention and cure of cancer. Yet the medical establishment has taken an unshakable position that they are completely without value and that the American public must be protected from them. Not even the most outspoken opponent of laetrile seriously contends that it is toxic or denies that it relieves pain and improves the appetites and general condition of cancer sufferers.

We, in the veterinary profession, have a very important stake in this controversy. Not only do we and our loved ones face the dread possibility of developing cancer but we are seeing more and more of it in our practices. While laetrile might not prove to be the "magic bullet" against cancer that we all hope for, at least it gives us something to use based on some rationale that will be within the comprehension of many of our clients. I personally do not feel justified in employing chemotherapy and radiation on many of my cancer patients when there is so little evidence that either has great or lasting value, but I do feel justified in using nontoxic substances, such as laetrile, if the limitations have been explained to the client and he requests it for his animal.

Only by using it clinically can we find out whatever value it might have. If the medical establishment is able to continue to prevent its use clinically on humans, it will be up to us in the veterinary profession to make clinical studies on animals. I urge my veterinary colleagues to use laetrile, not only in the treatment of cancer but in other metabolic disorders. This recommendation is based on the rationale that, if the deletion of nitrilosides is the factor causing changes in the biochemistry of the cells, there can be no way of predicting what course these changes might take. My own studies indicate that nitrilosides might be valuable in aplastic anemias, aspermia and seborrheic dermatitis.



#### LAETRILE AND THE TREATMENT OF PET ANIMAL CANCER

espite the tremendous advances made in cancer research in recent years, three out of four people who get cancer are still dying of it. When traditional remedies for cancer fail even though they may be the most modern available to medical science, unorthodox forms often take their place. Among the large number of unorthodox and unproven methods of cancer treatment is laetrile. Laetrile is a substance extracted from apricot pits and is known by a number of names including Amygdalin, Vitamin B17, and Aprikern. It is not a new drug and has been around for over 20 years. Unfortunately, laetrile has enjoyed popularity longer than most quack cancer remedies. Efforts by the Food and Drug Administration to control the sale of laetrile by enforcing law against its importation and interstate shipment seems only to have stimulated more interest in the drug. The promoters of laetrile reap huge financial returns, a fact which appears primarily responsible for the continuance of the drug's availability. Promoters are unable or unwilling to accept the rules of evidence and scientific and ethical approach in evaluating the effectiveness of laetrile. Promoters tend to assume the role of the underdog and claim prejudicial, unfair and discriminatory treatment by the orthodox medical community and have even claimed that bans on laetrile infringe on their rights as private individuals.

If we remove the political and emotional components from the laetrile issue, we are left with the fact that it is the humane responsibility of any drug producer to show drug efficacy (effectiveness) and safety before making the drug available for human or animal use.

Promoters have claimed laetrile has been responsible for cancer cures, remissions, increased survival and relief of pain. Recently some of these claims have been applied to its use in pet animals. The evidence supplied by laetrile promoters to support their claims is in the main anecdotal. Reports on its use which have appeared in the veterinary literature often lack proper scientific documentation and in some instances claims have been made about its efficacy without a definitive diagnosis of the condition treated. The effectiveness of laetrile as a treatment for cancer has been refuted by: Cancer Commission of the California Medical Association, California Cancer Advisory Council, American Medical Association, National Cancer Institute, American Cancer Society and Food and Drug Administration. In September 1971, an ad hoc committee of 5 oncology consultants independently reviewed and evaluated laetrile and found "no acceptable evidence to justify clinical trials in humans." In the early 1970s, laetrile was evaluated as treatment for naturally occurring tumors in dogs and cats in a large medical center (Animal Medical Center, N.Y.) and was continued on next page

### REBUTTAL

#### John E. Craige, D.V.M.

Tow does one rebut old clichés? One cliché that demands an answer is the charge of "huge financial returns". As a matter of fact the original promoters of laetrile are a dedicated, brave, pitifully small group of heroes who faced harassment, vilification, calumniation, persecution, prosecution and even imprisonment while they were getting their message to the American people. Most of them have risked their fortunes as well as their liberty with very little hope of even recouping their losses. Although I didn't get into the battle until it had already been won, my reasons for taking such a strong position have nothing to do with profit. I believe, from my own experiences and from everything I could learn about laetrile that the efficacy of it is based on sound theory, that it has promise in the prevention and management of cancer, and that its suppression by the medical establishment constitutes one of the most shameful episodes in the history of man. With this belief I could retain no self-respect if I didn't speak out as vigorously as possible.

The courts and many state legislatures are examining this question. By overwhelming majorities they are concluding that laetrile is harmless and that the

continued on next page

#### Dennis Macy, D.V.M.

Would like to make several comments in reply to Dr. Craige's remarks about laetrile.

First, regarding toxicity, I would agree that parenteral administration (injection) of amygdalin is considered non-toxic by most (but not all) investigators. When laetrile is taken by mouth, however, it is more than slightly more toxic than the parenteral form and in fact has been found to be 400 times as toxic. As few as five capsules of Aprikern (one of the two commercial names for laetrile) contains enough cyanide to be fatal to a child (American Cancer Society).

Second, Dr. Craige's claim that few opponents deny laetrile's pain relief properties is false. Absolutely no scientific evidence has been produced which indicates that laetrile controls the pain associated with cancer (FDA Consumer, January 1977). The "evidence" for the effectiveness of laetrile in the treatment of cancer which is repeatedly presented by its supporters has consisted of testimonials from people who believe that laetrile has cured them of cancer, prolonged their lives, or reduced their pain. How is it possible to have such testimonials and still no scientific proof that laetrile is effective? Part of the answer lies in the nature of the disease. Cancer is not a single disease, but produces a combination of about 100 different clinical entities, each following its own natural and sometimes erratic course. Skin cancer, for example, is obviously different in its development, effects, and treatment than lung cancer. Animal and human patients sometimes have remissionsperiods when certain symptoms disappear. If laetrile administration coincides with a period of remission, it will appear that laetrile was responsible. In other cases, patients have taken laetrile while receiving proven continued on next page

## LAETRILE

found to be ineffectual and in fact was found to be toxic under certain situations. Nonetheless, because of public pressure, laetrile has recently undergone extensive experimental study by Sloan Kettering Institute of Cancer Research, Catholic Medical Center in New York, National Cancer Institute in Bethesda, and Arthur D. Little, Inc. a research laboratory in Boston. In no case was laetrile shown to be effective in experimental studies by any of these agencies.

In view of the complete lack of scientific evidence to support the effectiveness of laetrile, there seems to be no justification for use of the drug, especially when there are 20 chemotherapeutic agents legally available to veterinarians which *have* been proven to be effective in treatment of cancer in man as well as in animals.

#### John E. Craige, D.V.M.

government has no right to keep it from the American people. Although many tend to accept the rhetoric of the medical establishment, they are basing their decisions on the basic right of the individual to chose his own course, provided it is not harmful to anyone else.

Clearly, Dr. Macy has a right to treat his cancer patients with orthodox "cutting, burning and poisoning" and to recommend this treatment but he doesn't have a right to tell you or me that we have to do this.

We should be allowed to use laetrile, or any other non-toxic therapy, faith-healing, or even no treatment at all if we choose, after being informed of all the possibilities. The medical establishment has forced us to "bet our lives" that laetrile is worthless. They don't have that right and I will continue to speak out until their power to do it has been removed.

#### Dennis Macy, D.V.M.

effective forms of cancer treatment and may believe that laetrile was at least partially responsible for relief of cancer related symptoms or cure if it occurs.

Dr. Craige's charge that the orthodox medical establishment has hindered adequate study of laetrile is absolutely without foundation. Laetrile has received more extensive laboratory screening than any other anti--cancer drug in modern medical history. This screening has been performed independently by prestigious medical investigators previously cited (Eyerly, 1976). In no case, was laetrile found effective. Further, the single controlled study carried out in dogs and cats suffering from spontaneous tumors failed to demonstrate any anti -tumor activity. One doctor, Ernesto Controras of Tijuana, Mexico, was asked by the FDA to provide the case reports illustrating the most dramatic examples of success with laetrile in the treatment of human cancer patients. Of the 12 case histories he submitted, the FDA and the National Cancer Institute were able to obtain and review nine; they found that six of the patients had subsequently died of cancer, one still had cancer that had spread after laetrile treatment, one who had received approved chemotherapeutic agents and radiation therapy remained alive, and one had died of another disease after having the cancer removed surgically.

Dr. Craige has stated that the progressive reduction or loss of nitrilosides (laetrile) in our diets as a result of food processing has paralleled the national increase in



cancer and implies a cause/effect relationship. It should be pointed out that increase in environmental pollutants (many proven to cause cancer) also has paralleled the increased incidence of the disease. Nutritional researchers have used synthetic diets which are free of nitrilosides (laetrile) in laboratory studies for over forty years and have failed to note any increase in the incidence of cancer or other metabolic disorders related to deficiency of this group of compounds.

Furthermore, I would like to take sharp exception to Dr. Craige's statement indicating there is little evidence that chemotherapy and radiotherapy have any great or lasting value in the treatment of cancer. The value of radiation therapy in controlling cancer in man is so well established, it is hard to find a large human hospital not utilizing this modality in the treatment of the cancer patient. Reports of the successful use of radiation therapy in the treatment of cancer in animals has appeared in numerous veterinary journals and text books in the last ten years. Most authors report cure rates of 27% to 100% depending on the type of cancer and state of the disease when treated. Chemotherapy also is a proven effective means of controlling some cancers, although it is primarily used to prolong survival in cases in which the growth is disseminated or multicentric and inoperable. No one can deny the effectiveness of chemotherapeutic agents such as dactinomycin which has been shown to produce cures of (Wilms tumor) in man or of vincristine/methotroxate, which is effective in producing of cures (transmissible veneral sarcoma) in the dog.

Recently, because of pressure from an uninformed public and an effective promotion campaign by laetrile promoters, several states have taken away criminal liability associated with the administration of quack cancer remedies such as laetrile. This is both ironic and unfortunate. It is ironic in that the only country (Mexico) where laetrile has been legally available is considering banning its manufacture.

It is unfortunate in that it means the consumer must more than ever protect himself from frauds. As consumers, you are urged to read the product label whether it be motor oil or medicines. Manufacturers in this country are still required by law to have proof for any statements or claims which appear on the label. You won't find the statement, "for the treatment of cancer", on the laetrile bottle for obvious reasons.

CON



Many boys and girls keep little chameleons. Pet stores sell these lizards for about a dollar and while they do change their body color, they are **not** a true chameleon. This little lizard is an American lizard from south-eastern United States named the Carolina Anole.

The true chameleon lives principally in Madagascar and Africa. He is a strange, prehistoric-looking lizard with bulging eyes and a long grasping tail. When he is not using his tail to wind around twigs and vines he coils it into a spiral. A chameleon's toes are fused together, three on one side and two on the other, so that he can clamp his feet onto branches as he climbs about. He is a very slow moving creature but he has a long, swift tongue. To catch food he shoots out his tongue, which is as long as his body and traps an insect on its sticky tip. The true chameleon can change his body color rapidly among greens, browns, reds, yellows, black and white.

The little American anole, on the other hand, is really quite different from the true chameleon. There are three species of anoles in the United States and they are all small in size. While the true chameleon can range in size from 11/2" to 2'. the Carolina Anole usually grows no longer than 2-3/8". His tail is about twice as long

Photos by Doris A. Woodliff

as the combined length of his head and body and it stays stiffly straight. American anoles also spend most of their time in and on shrubs, trees and vines. Their toes are separate and peculiar pads on the bottom of their toes allow them to scamper about on trees or hang onto smooth or vertical surfaces. Unlike the true chameleon, the anole is very quick and agile and catches food by his speed. Carolina Anoles can change their body color too but only between the colors of green and brown.

Carolina Anoles are gentle, harmless creatures. They are most active during the day after the morning temperature has risen. Their diet consists of flies, moths, mosquitos and caterpillars, so they are useful in the control of these insects. In turn they are preyed upon by snakes and birds.

In June or July the female anole lays two eggs which she buries in decaying wood or trash piles. In about 6 to 7 weeks the baby anoles will hatch out of their eggs. Not only will they be able to climb trees, they will spring and leap from branch to branch, scurrying across the groung and even swimming, if necessary. Several times a year, like snakes and other reptiles, they will shed their thin outer skin as they grow too big for it.

Contrary to popular belief, anoles do not change color to blend in with their surroundings. Color change is controlled by the anole's optic and skin receptors. Any number of factors like air temperature, the amount of light or excitement will cause the anole to change color. Generally, anoles are green colored in the dark, during excitement or fights, and at death.

The life expectancy of an anole is not exactly known but in captivity they usually don't live a year. Many die prematurely because their owners don't know how to properly care for these little lizard pets.

In summer, an anole can have the run of a screened porch where he will be useful in destroying flies and other insect pests. (If you do this, tell your company so they won't be surprised by a green lizard leaping about!). When the weather turns cool, bring the anole indoors and keep him in a large cage in a sunny spot. Some people let their anoles live in a large plant, uncaged, near a sunny window, but this might not be a good idea for most families. In nature, anoles drink the dew and rain drops off leaves, so in captivity, water should be sprayed on plant leaves for your lizard each day. He will not drink from a pan of water and may die of thirst even with a full container of water in his cage.

He prefers to eat live, soft-bodied insects. Meal worms, which are beetle larva, can be bought at pet stores and kept in the refrigerator at about 45 degrees to keep them dormant. A small piece of decaying fruit can also be placed in the anole's cage to attract fruit flies which he will also eat.

A fine, airy cage can be made for an anole from two large cans and wire screening material. Remove the tops from two large cans like the kind prepared stew or coffee comes in. Fill one can half full with cement or plaster of paris. Insert a small branch upright in the wet cement for the anole to use as a climbing surface. Now make a cylinder from wire screen material (hardware cloth) to fit inside the bottom can. Embed the bottom of the wire screen cylinder in the cement and allow the cement to set. The other can will fit over the cylinder on top to make a lid. Add a small plant for your anole to climb on and to drink off.

The Carolina Anole is only one of about 350 species of anoles found from the southeastern United States to South America. Each of these species differ from one another. The Carolina Anole is an interesting lizard to observe and can make a fine pet **if given good care**.

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### THE HORIE IN ICIENCE AND MEDICINE

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aboriginal horse, James Cossar Ewart, a comparative anatomist in Scotland, took up the questions of coloring and of telegony. In a series of breeding experiments, he used a Burchell's zebra, "Matopo," on five mares of various breeds. These included "Mulatto," a 13 hand West Highland mare, who produced a colt, "Romulus" (Figure 7).

On the basis of these hybrid crossings, Ewart concluded that the ancestral horse was striped and patterned as the Burchell's zebra. He saw as added evidence the stripes on mules, dorsal stripes on many dun horses and temporary striping on many foals. He felt that reversion was a possible explanation.

Although many horse breeders were sure it occured, Ewart did not believe that telegony existed (the idea that the first sire infected the "germplasm" of a mare and influenced all further progeny). Ewart worked on the eve of the Mendelian revelation, and we can only wonder what work he would have done had he the benefit of Mendel's ideas. His work was collected in THE PENICUIK EXPERIMENTS, published about a year before Mendel's paper came to light again.

#### **Smart Horses**

Elberfeld, Germany, is in the district of Dusseldorf. In the decade preceding World War I, it was the scene of considerable excitement, generated by three horses, Hans, Muhammed and Zarif. These horses were said to have learned to read, communicate and calculate.

Hans was an Orloff trotting horse, bred and purchased in Russia. His teacher was Willem von Osten, a retired instructor of mathematics, and a keen horseman. He believed sincerely that he had really taught Hans to work at a human level of understanding. By 1905, Hans and von Osten were working with Karl Krall, an Elberfeld jeweler, who purchased and trained Muhammed and Zarif, two Arabian stallions. This was probably a deliberate choice of breed, since it is commonly believed that Arabians, formerly raised as members of the family, are more receptive to human training, and more intelligent than other breeds of horses.

Training was mostly by reward. The horses, though trained by von Osten and Krall, responded to strangers, sometimes in languages or disciplines in which they had not had lessons. The responses were shaking or nodding the head, and tapping the right foreleg (Figure 8). Numbers corresponded to real numbers and also were used to symbolize letters in the alphabet. In problems of higher mathematics, it was observed by some that the horses did not seem to require much time for their calculations.

The horses attracted much attention and generated controversy because of the possibility of fraud or deception. Newspapers were keenly interested and eventually, by public demand, a competent investigator undertook to look into the situation, with the initial full cooperation of von Osten and Krall.

Oscar Pfungst was an assistant of Carl Stumpf, an outstanding German psychologist, founder of the psychological institute and laboratory in Berlin. Pfungst's laboratory investigation still stands as the most probable and documented indication of the truth, among a bulky literature (there were 162 references by 1814), on the so-called thinking horses of Elberfeld.

Pfungst, after much observation and "querying" the horses, theorized that they learned to discover, by purely visual and other sense aids, when they were expected to tap with the hoof and when to come to rest. The horses seem to have used such clues as heartbeat and respiratory movements of the testers as well as vision. Maurice Hontang, writing on the psychology of the horse in the 1950's, believed that these horses showed what extraordinary levels of perception horses could achieve.

Pfungst sought to prove these theories in the laboratory by setting himself as the horse, and volunteers as the teachers or questioners. He jury-rigged what may be an unrecognized predecessor of the modern lie detector apparatus, recording on a Hering kymograph the breathing, head and body movements and respiratory rhythms of the questioners.

Pfungst, as the horse, observed what he called "closing signals," consistent changes in head and body position of the questioners, and the apparatus picked up other less humanly perceptible changes. He could then, in the role of the horse, start tapping and stop when he observed the unconscious "closing signals" in the questioners, and he could show from the paper records the timing correlated with his tapping.

#### Was Mendel Right?

Back to genetics, and a consideration of how the British thoroughbred stud book was used in a way that Darwin would have relished. Since 1900, when Mendel's paper was rediscovered, a controversy simmered between the biometricians, and those newly converted to Mendel's ideas, especially in England. An early proponent of Mendel was Charles Chamberlain Hurst, who was active in genetics until the 1930's. Although an orchid specialist, he was to use THE GENERAL STUD BOOK to devastating effect in the fight for acceptance of "Mendelian law."

After a study of THE GENERAL STUD BOOK (a record that goes back to 1795), Hurst concluded that chestnut coat color was a Mendelian recessive to bay and brown. He used the 1896 volume, published in 1897. His paper was submitted to the Royal Society, where Frank Weldon, chairman of the Zoological Committee, saw it before it was presented.

When Hurst read his paper at a Society meeting in December, 1905, Weldon, who had worked nine hours a day for a month on Hurst's topic, took the offensive. Weldon claimed that Hurst's figures were wrong, and gave what seemed to be contradictory examples from THE STUD BOOK.

Hurst replied that Weldon was mistaken, and that "the alleged exceptions were mere errors of entry." By the time the paper was published, Hurst reinforced this with proofs.

#### "Substance P"

It has recently been reported that Ulf Svante von Euler-Chelpin's discovery of "substance P" is now believed to be a pain messenger to the brain, and is being worked on at the Karolinska by Thomas Kokfelt and others. In the 1930's, von Euler found what he called "an unidentified depressor substance" in the partially purified extracts of horse intestinal tissue and brain, which caused longitudinal muscle of rabbit intestine to contract at a slower rate than when stimulated by acetylcholine.

Continuing investigation of equine antibodies and other immunoglobulin studies taking place indicate that **Equus caballus** is still contributing to the growth of scientific knowledge.



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### **COUSIN TO MAN**

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As I write this, I am reminded of a summer day some years ago aboard a research vessel steaming along many miles at sea off New York City. The warmth of the sun and the glassy smooth sea had brought many of us to the ship's rail to gaze at the calm surface of the water. Suddenly, someone shouted "Dolphins!" and we watched a trio of the animals riding the bow wave. Scarcely moving a muscle (or so it seemed to us), they darted and glided just below the surface, easily keeping pace with our speed of 12 knots. I've read that dolphins may be able to swim in bursts up to 25 knots, but there was no swimming effort involved in these bow riders. Somehow, dolphins had learned to take advantage of the hydrodynamics that operate as the bow of a ship underway cleaves the sea. (Sailors of the Mediterranean told of bow-riding dolphins nearly 3000 years ago.) But our dolphins were not alone. As if on some signal, the

### ask Dr. Smithcors

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water at 70°--and sewer temperatures are much lower than this.

The trainer told me my horse is "ticklish" because he flinches when you push on his back. Do you think this could be something else?

Any condition causing chronic pain, such as lowgrade inflammation of the back muscles, would cause a horse to flinch if the pain were increased by external pressure. But assuming your horse is normal, this is most likely explained by the individual differences in skin sensitivity common to all species. Some animals (and persons) are so sensitive that they will recoil from the slightest touch, while others don't seem to mind at all and may even enjoy being pummelled. Some horses will show little response if touched by a friend but may shy away from a stranger. Horses do have personality, don't they?

Q

#### Do cats need rabies shots?

YES! Now that rabies is uncommon in dogs, largely because immunization is required for licensing in many areas, cats are less likely to contract the disease from dogs, but the relative risk to cats has increased. Thus in 1953 there were 5,688 confirmed cases in dogs and 538 in cats (9% of cases in these two species) while in 1974 there were 248 in dogs and 124 in cats (33%). Meanwhile rabies in skunks and bats increased from 327 to 1,923 cases, and cats which are allowed to roam at night are more likely than dogs to come in contact with these animals. A rabid cat may not show clear-cut signs of the disease so that it may be difficult to diagnose. If your cat is a stay-at-home he is probably safe, but even one rabid cat is one too many-especially if he should be yours.

sea literally erupted with the graceful animals. From horizon to horizon, dolphins were all around us. Some took turns riding the bow wave. Some merely swam along in the arcing movement we call "porpoising." But some performed a ballet that most of us had never imagined was possible. Here and there, individual dolphins leaped 10 or more feet into the air sometimes twisting as they rose, sometimes simply arcing in the air. Some returned smoothly to the water, others fell back on their sides causing a great splash. As we humans watched, our judgment as marine scientists told us that the dolphins probably were trying to dislodge parasites from their skins. But our memories of childhood suggested that the leaping and splashing was just great fun for the dolphins who had an ocean-size puddle to play in.

The ancients believed that twice in mankind's history, dolphins have approached to establish a bond with humans but the dolphins were rebuffed. Perhaps the time is here for man to approach the dolphin — and all of its kind — to establish a bond with the cousin to man.

# "Before ALPO, Lady could hardly stand...now she dances for her dinner."



**BEFORE ALPO:** Lady on April 29,1976. Suffering from insufficient protein, malnutrition and neglect.

"We've always loved boxers; matter of fact we've owned several in the past but never, never had we seen one in the deplorable condition that Lady was in." That's what Mr. and Mrs. George Hill of Center Valley, Pa., had to say when they first saw Lady at the pound. "We fell in love with this neglected dog, and we were determined to bring her back to her former self."

The first thing the Hills did was to take Lady to their local veterinarian. No diseases. That was encouraging. But Lady was badly in need of a proper diet. "From our previous experiences in raising dogs, we knew how much they like meat. They all thrived on it. So it was only natural that we turned to ALPO. You should





Lady on December 1, 1976. Enjoying good health after a steady diet of ALPO's meat protein and loving care.

**AFTER ALPO:** 

have seen Lady dig into her first bowlful of ALPO Beef Chunks Dinner!"

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"Believe us when we say that, before ALPO, Lady could hardly stand—now, a few months later, she plays tug-owar with the kids and literally dances on her hind legs for her dinner. Her dinner is still ALPO. And, as far as we're concerned, it always will be."

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