



4-1-1987

## Animal Crackers

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## The Cost of Veterinary Education at Penn

Tuition fees have been increasing steadily. At the present time, veterinary students at Pennsylvania pay \$10,890 yearly if they come from Pennsylvania and contract states; all others pay \$12,950. This does not include the cost of living. The average age of the graduating veterinarian is 29.5 years, and he or she has an educational debt (average) of about \$40,000—in some cases considerably more. This usually must be paid off in ten years. Yet the average salary the first years after graduation is around \$22,000.

About as many women as men graduate each year and about half are married, some with children. Applications have been declining, in part because of the potential debt burden. We seem to be facing a situation where only the very wealthy or the very poor can afford a college education. Financial planning must begin early—even before entering high school.

Scholarships are an enormous help to students needing financial help. Endowment funds make it possible to support qualified students and help them avoid the stress and frustration that go with meeting loan payments while trying to learn.



## Cryptorchidism

Cryptorchidism is a condition in which one or both testicles do not descend into the scrotum (unilateral or bilateral cryptorchidism). It often is incor-

rectly referred to as monorchidism, which is an extremely rare condition in which only one testicle is present. The undescended testicle does not produce sperm, but does produce the male hormone, testosterone. Thus, if the undescended testicle is allowed to remain when the scrotal testicle is surgically removed, the animal will retain the physical and behavioral characteristics of a male.

The condition occurs in horses (the affected animal may be called a "ridgeling"), and the affected animal acts like a stud rather than a gelding. In swine, the meat become unpalatable, as it does in boars. The treatment is castration before maturity.

In dogs, the condition is a disqualifying fault at shows. It is fairly common and has been found in many breeds, although it seems to occur more often in the smaller breeds. The overall prevalence is about 10 percent. It is considered an inherited condition. Family studies indicate that inheritance of the trait is best predicted by an autosomal recessive model. Affected males must have two genes for the trait, receiving one from each parent. Males with only one gene are not affected but are carriers of the trait. Females, of course, are not cryptorchid, but carrier females have one or two genes for the trait, in which case 50 percent or 100 percent of their offspring will also be carriers. Unilaterally cryptorchid males have nearly normal fertility, since the scrotal testicle can produce sperm. Elimination of the trait is possible only if the affected animal and its parents are not used for breeding. Siblings of affected males may also be carriers. The retained testicle may develop tumors which sometimes cause feminization. Medical treatment is not recommended since it is of little value in inducing testicular descent and because of the inherited nature of the condition. The owner should be urged not to use the dog for breeding.

In many species, both testicles are descended at birth. In dogs, testes normally are descended at ten days of age, but it is difficult to determine at that age since the testes are small. However, both testicles should be in the scrotum by three months of age. As

a rule of thumb, an undescended testicle can be considered permanently retained at six months of age. There are differences of opinion as to whether castration is indicated in young dogs to prevent the development of testicular tumors. Certainly, castration prevents the reproduction of affected individuals.

## Preventive Measures—Reminders

CONFINEMENT IN A CLOSED CAR ON A HOT DAY can be deadly. This warning is often ignored. When travelling with a dog, a wire crate is recommended.



ANTIFREEZE is highly toxic but animals seem to be attracted to it. A small amount on the garage floor could be fatal if ingested. Keep containers closed and out-of-reach.

RABIES vaccination now is compulsory in Pennsylvania and other states. A killed vaccine is available. The recommended schedule is vaccination of puppies at three months, re-vaccination in one year, and then a "booster" every three years. Any animals under one year of age vaccinated for the first time should receive a "booster" one year later, then at least every three years.

The increasing frequency of rabies in wild animals (raccoons, skunks, etc.) makes it important to pro-

## Project Threshold

The University's Strategic Plan for Computing, published in November, 1983, called for expansion of University support for computing in education, research, and administration. This plan was adopted by the University administration and has provided the guidelines for subsequent developments related to computing in the University.

The President and Provost called upon the International Business Machines Corporation to help us begin implementation of the Plan by providing computer resources to the University. The result of this proposal was THRESHOLD, one of nineteen Advanced Education Projects funded by IBM. Over the past two and a half years, this project has brought nearly six million dollars worth of computing equipment to the University. As indicated by its name, THRESHOLD was intended to bring the University from an environment in which computer use was the exception into one in which computers are widely used for instruction and research.

The following is an overview of how the

THRESHOLD project, now in its third year and nearing completion, has impacted the use of computing, particularly small system computing, in the School of Veterinary Medicine.

Investigators at the School of Veterinary Medicine have been awarded 14 grants through THRESHOLD. Applications in progress include development of a registry of genetic diseases of pedigreed dogs, computerized three-dimensional reconstruction in the teaching of anatomical sciences, development of computerized tutorials of principles of biomechanics to veterinary students, and development of a database on periodontal disease in dogs. Equipment for all of the projects has been received, tested, and set up. There remain some delays due to lack of funding for additional equipment (digitizers, video equipment) and for software development. The thrust of the projects, however, which is to develop innovative microcomputer techniques for teaching veterinary applications and increase student exposure to microcomputers in educational settings, appears to be most successfully met.

At New Bolton Center, the large animal facility in

Kennett Square, several innovative programs are in progress. Dr. David Galligan, lecturer in animal health economics, has developed a nutritional herd monitoring program using spreadsheet software. This program allows a dairy manager to enter milk production parameters and to evaluate the efficiency of milk production. This software is available to students so that they can have experience with the economic and health considerations of herd management. Spreadsheet programs have also been developed by Dr. C. F. Ramberg for nutritional service and teaching applications in dairy and equine nutrition. The programs are currently being used by both students and practicing veterinarians.

In Philadelphia at the Small Animal and Basic Sciences Facility, The Canine Genetic Disease Information System, directed by Dr. Donald Patterson and coordinated by Patricia Green, is intended to provide a comprehensive source of knowledge regarding many aspects of canine genetics. The system will include information on both known and suspected genetic diseases, as well as on the occurrence of these diseases in various dog

fect domestic animals which might come in contact with them.

**HEARTWORM DISEASE** occurs throughout the United States. Infection may be prevented by daily doses of *Diethylcarbamazine* (DEC). Treatment should be started at the beginning of the mosquito season and continue for several weeks after. In warmer climates, it should be given year round. Have a blood sample checked for microfilaria before starting treatment.

The new drug *Ivermectin*, which is effective when given every thirty days, has not yet been approved by the FDA. It is being tested in tablet form, and very small doses are effective against microfilariae. Some dog owners are using products approved for horses and cattle. It cannot be recommended for dogs until it has passed all tests for safety.

## Get It Right!

If Doctor or its abbreviation Dr. is used before a person's name, academic degrees are not given after the surname. Correctly, a name is written as Dr. John Jones or John Jones, V.M.D.

V.M.D. (Veterinariae Medicinac Doctoris) is awarded only by the University of Pennsylvania in the United States. The other schools award a D.V.M. The requirements are much the same for each.

The noun *veterinarian* and the adjective *veterinary* often are used incorrectly. A veterinarian is a graduate of a veterinary school.

To *spay* means to neuter a female animal—the past tense is spayed (not "spaded"). A male is castrated.

## Specialists

The American Veterinary Medical Association recognizes fourteen Specialty Boards. After fulfilling prerequisites (advanced training, experience, etc.) and passing an examination, a veterinarian becomes a Diplomate (Board-certified).

The American Board of Veterinary Practitioners has Diplomates in three categories—Companion Animal, Food Animal, and Equine. Their certificate expires in ten years, when a recertification examination is given.

Other Boards are Veterinary Toxicology (the science of poisons—their source, chemical composition, action, tests and antidotes), Laboratory Animal

Medicine, Theriogenology (the study of reproduction in animals), Anesthesiology, Dermatology, Veterinary Internal Medicine (Internal Medicine, Cardiology, and Neurology), Microbiology, Ophthalmology, Veterinary Pathology, Veterinary Preventive Medicine, Veterinary Radiology, Veterinary Surgery, and Zoological Medicine.

The Annual Directory of the American Veterinary Medical Association lists Specialty Boards and Diplomates as well as the prerequisites for examinations.



## Book Reviews

*The Evans Guide for Houstraining Your Dog* by Job Michael Evans (Howell Book House, 230 Park Ave., New York, NY 10169. \$11.95)

This is an excellent book for anyone getting a puppy for the first time. For the more experienced owner, there are new ideas and something to be learned from the author's progressive approach.

Houstraining requires time and hard work, for a time, and this book can be a guide to success. It shows how to do the job so the dog becomes an accepted member of the household.

Some excerpts:

... Problems arise when an individual dog, either through its genetic makeup or mistreating by its owner, comes to think of itself as the leader of the pack.

... Establish eye contact on your own terms ... if you've been yelling at your dog when dealing with a houstraining accident, resolve to stop today. Try using the human equivalent of a bitch's growl.

... You should discipline your dog ... the most you will need, except in chronic cases, is your growling tone of voice and eye contact. Discipline humanely and on a level that the dog can comprehend, because the discipline mimics that of the bitch.

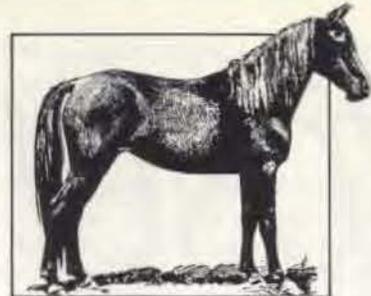
... If you want your puppy or older dog to get houstrained, you simply *must* confine the dog.

... The Umbilical Cord Method: Attach the dog's leash to your belt loop and go about your day. You'll know exactly where your dog is and can more effectively avoid houstraining accidents.

... Schedules are important and it is essential to have one if you want to houstrain effectively.

... What Goes in Comes Out ... Select a good food.

... Houstraining isn't just something that magically happens ... but once it's done, it's done.



*The Arabian: A Guide for Owners* by Sharon Byford (Alpine Publications, 214 19th St. S.E., Loveland, CO 80537. \$35.00)

This book is a primer for the Arabian horse owner, which covers history, bloodlines, care, breeding, and training. There also is basic information on stable management, health care, grooming, genetics, etc. There is something which should be of interest to anyone who would like to read about horses in general, Arabians in particular.

Some excerpts:

... The Arabian horse is the world's oldest breed. All Thoroughbreds eventually trace to Arabian ancestry.

... The Arabian is characterized by a beautiful, delicate head, often with a "dished" or concave profile below large, prominent eyes; a high-set, arched neck; and a naturally high tail carriage.

... Credit for popularizing the Arabian horse throughout the world belongs to the Crabbet Arabian Stud of Sussex, England.

... A few Arabians were imported to the United States in colonial times.

... The Arabian's affection for people often is attributed to close contact between the desert horses and their Bedouin owners. Foals usually were weaned quite early and were usually dependent upon their owners for care and survival. Bedouin women and children usually raised the young horses, feeding them camel's milk.

... It has been said that they respond more like pet dogs than other breeds of horses.

... The loyalty of the Arabian horse to its owners was legendary in the desert; a celebrated war mare would not leave its fallen rider. Throughout history, the Arabian excelled as a war horse.

... Arabian shows feature a variety of performance classes, such as English Pleasure, Western Pleasure, Reining, Stock Horse, Trail, Pleasure Driving, Formal Driving, Cutting, Side Saddle, Hunter, Jumper, Park Horse, Equitation, and Native Costume.

... Arabian horses will continue to be appreciated for their beauty, intelligence, endurance, spirit, and affectionate nature. It is up to the owners and breeders of today to ensure that the Arabian horse of tomorrow retains the qualities for which it has been valued for thousands of years.

breeds. The database will ultimately offer the opportunity for veterinary students, veterinarians, and breeders to have microcomputer access to current knowledge in the field of canine genetics.\*

The goal of Dr. Richard Miselis's project was to implement computerized three-dimensional reconstruction graphics to teach anatomy courses in the Veterinary School. Generally, two-dimensional tissue sections or textbook drawings are used to convey gross structure, microstructure, and ultrastructure in anatomy courses. Dr. Miselis has created a program which inputs this information into the computer and reconstructs an image in three-dimensional perspective, allowing more rapid appreciation and retention of the aspects of the structure being taught. A student database interface is in development. Future goals are to develop this program to aid in interpretation of images obtained from technologies such as CAT, NMR, and PET scans.

The Veterinary Microcomputer Laboratory, directed by Dr. Larry Glickman and coordinated by Linda Domanski, will be used in both teaching and research. The microcomputer laboratory facilitates

the use of programs developed by other THRESHOLD investigators at the Veterinary School. The facility consists of two IBM ATs and four IBM XTs, connected by the IBM PC Network. Currently, the spreadsheet programs developed by Drs. Ramberg and Galligan are available in the microcomputer laboratory and are in use by veterinary students. Other activities include incorporation of clinical decision analysis in the veterinary curriculum, teaching of epidemiologic methods through simulations of epidemics, and providing microcomputer-based statistical software to aid in student research.

THRESHOLD has provided the Veterinary School the capability to develop innovative software focused at a wide variety of veterinary applications and has made microcomputing available to veterinary students.

\*The project is supported by funds from the American Kennel Club. It will require three to five years before it is available for general use.

—Linda Domanski

## General Alumni Society Trip

The General Alumni Society and the College of General Studies will sponsor an exciting Alumni College Weekend in Charleston, South Carolina, during the Spoleto Festival. This comprehensive arts festival was founded by composer Gian Carlo Menotti in 1977. A full program of sightseeing throughout this charming city will be included, as well as a performance of chamber music; "Footprints" by the Jazz/Tapp Ensemble; "A Road to Mecca," starring and directed by the playwright, Athol Fugard; and the opera "Salome" by Richard Strauss. Dr. Eugene Narmour, associate professor in the music department, will lecture throughout the weekend.

The group will stay at the famous Mills House in Charleston. The dates are May 28-31. For more information, please feel free to call Rhea Mandell at 898-6940.