

components involved in muscle contraction and relaxation. A small piece of muscle is cultured so that new cells develop and the cell line can be maintained for a prolonged period, allowing long term studies and evaluation of ion (electrolyte especially potassium and sodium) currents into and out of individual cells. As we believe the cause of muscle dysfunction resides in the membrane (in CIR, HPP and myotonia) much of our work focuses on this. A section of muscle is evaluated microscopically for its structure and fibre type. The biochemical analysis is performed by chromatographic methods. A small section of muscle is analyzed for potassium content using spectrophotometry following special preparation methods.

To date we have found that a certain proportion of horses with CIR have prolonged muscle twitches that can be normalized by phenytoin (Dilantin, a drug that affects sodium and potassium movement across membranes and is most commonly known because of its use in epilepsy). Phenytoin is also effective clinically in stopping these horses from having CIR. Phenytoin also shortens the prolonged twitch of horses with myotonia and we are presently studying its effect in HPP. Horses with CIR also show other alterations in their muscle mechanics. Studies on calcium release and uptake and effects of various drugs are ongoing. Our initial studies showed a lower threshold for calcium release in horses with CIR. The muscle culture work and investigation of ion channels is unique to our studies. Most of the data on cultured muscle cells must still be analyzed. However, initial studies on the HPP muscle cells has shown an abnormal membrane current.

Biochemical studies have shown altered phospholipids in horses with CIR: these are major components of muscle membranes and this again supports altered membrane function. Histochemistry and histology have shown no altered fiber typing and often minimal light microscopic degenerative changes in horses with CIR, but horses with a MD-like syndrome had marked changes. Obviously, if a biopsy is taken when the horse is "tyed up" changes may be marked but these are probably secondary, not primary. This again supports the hypothesis of altered membrane dysfunction in CIR (and some of the changes in MD may be due to abnormal calcium leak and subsequent muscle necrosis).

Our studies on potassium are ongoing and will continue both in normal horses on diets with varying potassium, horses with CIR and those with HPP. We are expanding our in vitro studies to look at various other mediators. There are no reports on muscle cell culture and ion channels in any equine myopathies, and we're especially interested in pursuing these studies. Various other biochemical analyses are being performed. At Scott Ritchey, studies on red blood cell fluidity are being conducted on our horses as altered red blood cell membrane character has been associated with some myopathies in other species and if an association is found with certain equine myopathies, this could be a good noninvasive screening diagnostic tool. We are also studying the clinical aspects and various muscle characteristics of an offspring of 2 horses with the myotonic dystrophy-like syndrome. Our research has already generated substantial original information for presentation at various scientific meetings and I think our collaborative approach offers a very unique opportunity for studying muscle disorders.

Jill Beuch, V.M.D.
Associate Professor of Medicine

Farm Show



The School's booth was bigger this year and in a new location. Faculty, staff and alumni manned it during the week-long event.

Student Equine Symposium

The University of Pennsylvania's student chapter of the American Association of Equine Practitioners held its fourth annual Equine Symposium on November 18, 1989. More than one hundred students attended including 19 visiting students from Cornell, Tufts, Ohio State, North Carolina State, and Virginia Polytech Institute.

The yearly symposium gives students the opportunity to learn more about specific areas of equine medicine and practice procedures to which they normally would not be exposed until their senior year. In addition, Penn's students can meet and become better acquainted with the clinicians at New Bolton Center.

For the morning session of the program, students attended three wet labs of their choice, which were taught by clinicians who volunteered their time. The labs provided hands-on experience in a variety of topics including the use of the YAG laser, techniques of arthroscopic surgery and internal fixation, neonatal intensive care, reproductive exams of the mare and stallion, neurologic and ophthalmologic exams, echocardiology, field anesthesia, the use of nerve blocks in lameness diagnosis, the use of cytology in diagnosing respiratory, joint and abdominal disease, radiology, surgical approaches to colic, and the anatomy and surgical approaches to the limbs and upper respiratory tract.

Penn Veterinary School's alumni society sponsored the lunch for all participating students and clinicians which was followed by a talk by Dr. Sue McDonnell, Ph.D. Dr. McDonnell spoke on her work in stallion behavior.

The date for Equine Symposium V will be announced by the end of the school year. More information on this event can be obtained from Amy Hartman, the 1990 president of Penn's chapter of the SCAEP.

Wildlife Report

1989 was another busy year for the Wildlife Service, receiving a record 395 cases. Our release/placement rate for the year was 45%. There are at present approximately 50 first and second year student volunteers who put in a great deal of their limited free time to help provide the best care possible to our patients.

We have been very lucky to have an increased interest in Wildlife by several people in Veterinary School community, especially Dr. David Thomson, who have donated their time to provide the utmost care for our injured animals. Subsequent to Dr. William Medway's resignation, Dr. Charles Newton has taken on the role of Wildlife advisor.

Some of our most interesting cases include:

- A fledgling Peregrine falcon, found under the Walt Whitman bridge, was brought to the Wildlife Service, was treated and placed into another nest in Philadelphia by the State Game Commission and the Peregrine Fund.
- A red tail hawk was referred from Tri-State Bird Rescue in Delaware with a fractured ulna and

tibiotarsus due to gunshot injuries. After several surgeries to repair the tibiotarsal fracture and surgical treatment of a severe case of bumblefoot, the bird was rehabilitated and after 14 months in captivity was released at New Bolton Center.

- A mallard duck that was hit by a car was admitted with a fractured radius and ulna, cranial skin loss and 9 ducklings. All of the ducklings and the mother duck were eventually released.
- An immature bald eagle needing orthopedic surgery was admitted. The bird, which had been shot, was found outside the Blackwater Animal Refuge in Maryland. The legs of the eagle were broken and a bullet was lodged in the right leg. Dr. Gail Smith, associate professor of surgery, removed the bullet and stabilized the fracture with external fixation devices. The surgery lasted almost five hours. The bird was transported to Tri-State for long-term care and a more suitable environment to accommodate its seven-foot wingspan.
- This winter, Wildlife members assisted Dr. Olney Pierce in necropsy of several of the birds that died in the oil spill on the Arthur Kill in New Jersey.

The Wildlife Service is currently lobbying for renovations of the wildlife ward and outdoor facilities.

ies. We are also in the process of improving our selection of reference materials and obtaining more equipment to provide the best possible care for our patients.

