



Creating the Nation's first BioPark

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Letter from the Desk of David Challinor
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In mystery novels a pathologist is often called to the scene of the crime to help the police determine the cause of death. Although pathologists are generally not as visible as the chief detective among the dramatis personae, they are nonetheless often essential in solving crimes. Most people would be surprised to learn that like forensic pathologists, veterinary pathologists are important members of the staffs of all large zoos. At the National Zoo, veterinary pathologist Dr. Richard Montali works hard at disease preventive testing of zoo animals, or in the case of death, at determining the cause.

Contrary to popular conception, pathologists do not act only after a death. When new animals arrive at the National Zoo, they are immediately quarantined for a period of time ranging from several weeks to several months. The new arrivals are monitored and tested for diseases that could be transmitted to the Zoo's permanent inhabitants. This monitoring is tedious and time-consuming because many wild animals do not exhibit symptoms of illness (a life-preserving strategy adopted in the wild to mask frailty from predators). For example, several years ago at the National Zoo a black rhinoceros died unexpectedly. No behavioral change had been observed by her keepers, but when the pathologist completed the autopsy, she was found to be riddled with tuberculosis.

Unfortunately, tests for animal TB have been developed primarily for domestic animals and do not always detect the disease in wild ones. This means that veterinary pathologists have to create new tests to discover TB in such animals as black rhinos and Bactrian (two-humped) camels, two species which are particularly susceptible to TB. Among the hardest TB cases to treat is the strain found in birds, and considerable research is underway to develop preventive measures for avian TB. Last month, Doctors Montali and Bush from the Zoo spent several days at Slimbridge, the Waterfowl Trust's facility in Gloucestershire, UK, where they worked with scientists on the Slimbridge collection's TB problem.

Veterinary pathology is a rewarding profession, particularly when a medical problem is solved. The solution to halting the spread of a disease often results in changing a treatment or diet which was previously considered innocuous. Successful detective work solved the case of tamarin hepatitis, an acute, often fatal disease. In the 1980's an epidemic of hepatitis broke out among tamarins in zoos all over the country. The epidemiology was hard



to determine. The outbreaks only occurred in zoos and wild animal parks, not in research primate colonies. Fortunately, there were no cases at the National Zoo. A major breakthrough in solving the epidemiology occurred at the Ft. Worth, Texas Zoo, where two separate colonies of tamarins were housed about 2-1/2 miles apart. A new vendor of mice (as food) had been contracted and baby mice (dead) were fed to Golden Lion Tamarins about once or twice a week. Within two weeks after eating mice from the new vendor, the tamarins (Golden Lion and Pigmy Marmosets) started dying. The keepers noted that only the individuals that ate mice became ill, and thus the pathologists were able to isolate the causative virus carried "silently" by the mice. Pathologists have not determined that every outbreak of hepatitis in small primates is related to mouse feeding, but some of them are associated with wild mice contact.

A mystery which was more difficult to solve arose last summer at Front Royal when three Eld's deer from Thailand were found dead in their paddocks. All three animals were found lined up, lying on their right sides, about 10 to 15 feet apart, not far from the fence. Their left eyes were missing, and there were lacerations on their bodies. The autopsy showed internal bleeding just under the skin of the legs. Prior to their death, all animals had been behaving normally and had seemed in good health.

Various causes of death were considered, such as ritual killing by a cult, savaging by feral dogs, or poisoning, but there was no evidence to support any of these theories. Finally, the most logical explanation was determined, although it was not possible to prove unequivocally. There had been a severe thunderstorm, and lightning had apparently hit the 10' high chain link fence that encloses the deer's paddock. The fence is buried about three feet underground to prevent dogs from digging under it. The electric charge from the lightning apparently traveled underground and through the soaked soil, shocking the deer as they ran toward the fence. They died instantly. The electric charge they received accounted for the hemorrhaging under the skin. The loss of the left eyes and the lacerations were the result of vultures attempting to feed on the carcasses. All the deer fell on their right side because they were apparently running to the right and up a hill when struck; thus they would have been leaning to the right.

This tale supports the employees' theory that the unexpected is commonplace at the Zoo. The fact that such unanticipated events occur requires perpetual vigilance by the Zoo's staff, especially where the health of the animals and the staff is concerned. Certain pathogens have been known to pass from animals to humans, and this is particularly true for primates which are so closely related to us. This risk of disease being spread is one reason why virtually all indoor primate exhibit areas are separated from

the viewing public by glass. The animals on exhibit are thus less vulnerable to common diseases like influenza and TB from the visitors. Other techniques will undoubtedly be tried to reduce health risks, but vigilance through the practice of preventive medicine is the best protection for both the animals and for their human caretakers and visitors. In this ongoing care of the animals, the zoo pathologist plays a major role.

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