C·R·E·S

Center For Reproduction Of Endangered Species

1988/89 Winter Report

Editor: Judy Kinsell

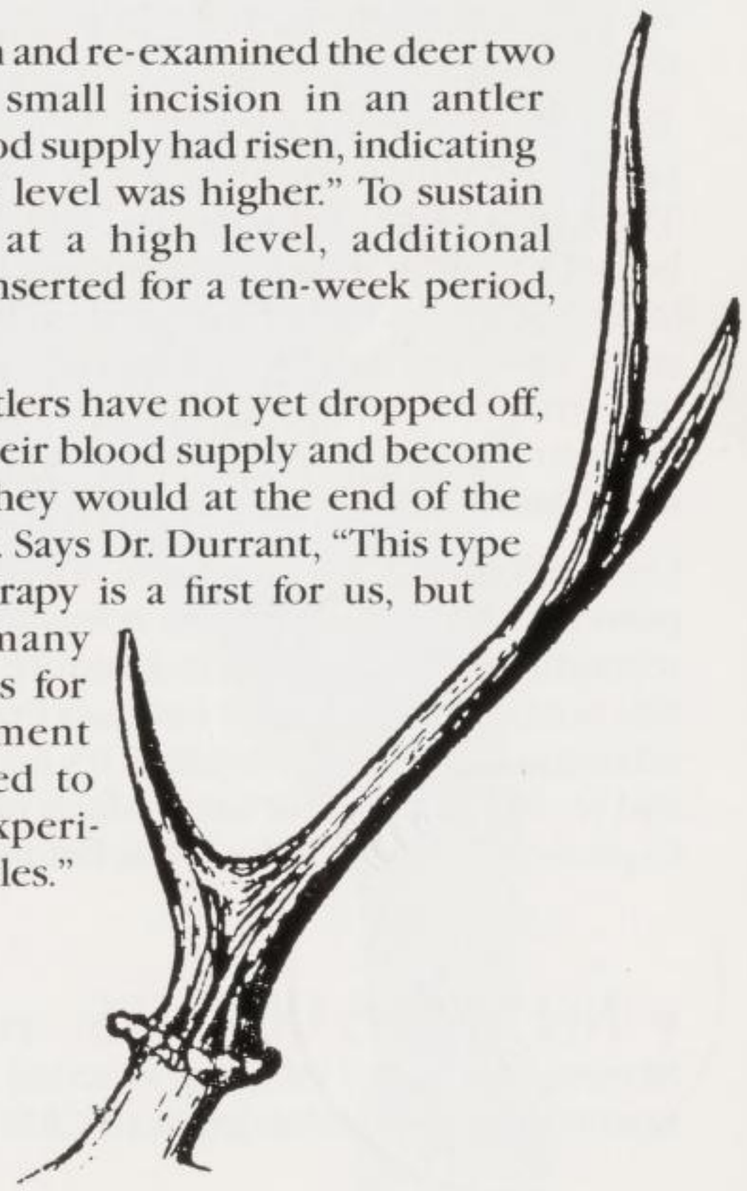
• REPRODUCTIVE PHYSIOLOGY

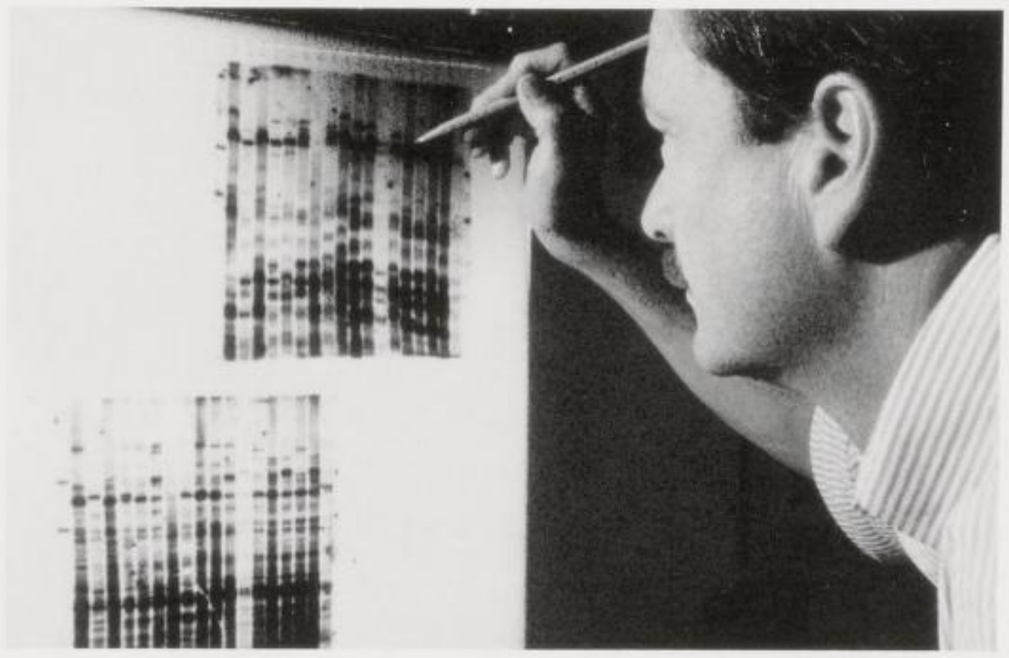
Keepers at the Wild Animal Park became concerned when a male hog deer failed to lose his antlers. The animal had assumed a submissive role as the target of increased aggression by a male whose antlers had long since dropped off. Even more alarming was the possibility that continued bone growth at the base of the antlers could eventually push through the skull, and kill the animal.

CRES reproductive physiologist Dr. Barbara Durrant was called in on the case. After examining the hog deer she suspected it was not producing the male hormone testosterone in amounts sufficient for a normal antler cycle. "Normally, testosterone levels rise before breeding season," she explains. "Antlers grow and support velvet growth. When the hormone level peaks, velvet is shed, the animals clash for dominance, and rut. As the breeding season ends, testosterone levels drop sharply and the antlers fall off."

In an effort to restore the deer's normal cycle, Dr. Durrant simulated the hormonal pattern of the breeding season. "Because the testosterone level was extremely low, we placed hormone implants under the shoulder skin and re-examined the deer two weeks later. A small incision in an antler revealed the blood supply had risen, indicating the testosterone level was higher." To sustain the hormones at a high level, additional implants were inserted for a ten-week period, then removed.

Although the antlers have not yet dropped off, they have lost their blood supply and become hard, much as they would at the end of the breeding season. Says Dr. Durrant, "This type of hormone therapy is a first for us, but we're seeing many new applications for hormone treatment that can be used to help animals experience natural cycles."





• **GENETICS** For the first time, DNA fingerprinting—a technique used with humans to determine parentage or identify crime suspects—is being applied to endangered species research. Led by Dr. Oliver Ryder, CRES geneticists are adapting the technique to gain valuable information about the relationships of the 28 California condors in existence.

Knowing how closely related the condors are to one another is critical to the future of the species. Pairing birds that are too closely related could result in unsuccessful hatchings or offspring that have difficulty reproducing. The California Condor Recovery Team recommended that eight condors at the Wild Animal Park be paired for the 1988–89 breeding season, and that two males be sent to Los Angeles in exchange for a female. These decisions were made after carefully reviewing factors such as the birds' ages, behavioral data, and findings from the DNA fingerprinting analysis.

To make a genetic fingerprint, DNA is extracted from cells and cut with enzymes at certain positions. Through the use of probes, individual patterns become visible. The resulting genetic fingerprint looks somewhat like a bar code found on grocery store items. Because DNA bands are inherited, individuals who have more DNA bands in common are more likely to be related than those who do not. Yet each set of bands is unique, much like a fingerprint.

Says Dr. Ryder, "This technique is purported to be so powerful, some people think it feasible to sort out the relatedness of individuals in an entire population. At this point we can identify condors that are closely related and not closely related. It's uncertain territory, and we have to use our best judgment about the way to proceed. Nobody's done this before."

• **INFECTIOUS DISEASES** The Institute of Museum Services (IMS) has awarded a $25,000 matching conservation grant to CRES virologist Dr. Michael Worley, toward his study of the detection of a hepatitis B-like virus in black rhinoceroses. Dr. Worley launched the investigation when a number of North American zoos began to experience serious losses among black rhino populations. Currently, fewer than 90 of the animals live in captivity worldwide and less than 3,200 remain in the wild.

Dr. Worley's initial studies involved serum samples from 32 black rhinos from North American zoos. "Of those," he explains, "42 percent had antibodies that recognize a virus-protein related to the hepatitis B virus. These antibodies are most readily found in rhinos exposed to animals that have experienced a hemolytic event, resulting in death from hemolytic anemia."

Fatal hemolytic anemia has been documented in black rhinos with frightening persistence in recent years, and the cause remains unknown. But at the CRES virology lab, researchers are finding clues they hope will lead them to understand the cause of this disease syndrome. In the serum of an infected rhino, they recently discovered particles that closely resemble hepatitis B virus particles.

As efforts continue, Dr. Worley and his team plan to establish a link between a hepatitis B-like virus and the hemolytic syndrome in black rhinos. "If this can be accomplished," he says, "we will proceed to develop a means of rapid diagnosis and, hopefully, prevention of the virus infection."

• **ENDOCRINOLOGY** In cooperation with the Burnett Park Zoo in Syracuse, New York, Dr. Arden Bercovitz is working to find a non-invasive way to detect pregnancy in the Hoffman's two-toed tree sloth. Dr. Bercovitz became involved in the study when he learned the species experienced an abnormally high rate of aborted pregnancies.

Officials at the Burnett Park Zoo believed the sloths would have a better chance of reproducing successfully if pregnancy could be determined early on. The sloth's gestation is unknown, but is estimated to be between eight and 14 months. The current method of pregnancy detection involves physically palpating the sloth's abdomen. The stress of normal handling and restraint is an obvious disadvantage of this procedure.

Over a period of two breeding seasons, Dr. Bercovitz measured sex steroid hormones from excretory samples of three pregnant and six non-pregnant females, and—as a basis for comparison—three males. "We measured androgens, estrogens and progesterone. Thus far, progesterone appears to be the best indicator of pregnancy. In most mammals, progesterone lev-