

Action for Wildlife: Less Than Meets the Eye

There has been, on the surface at least, some recent forward movement in the U.S. Fish and Wildlife Service's efforts to protect endangered animals and plants. Ten U.S. and Mexican animal species were proposed for addition to the official endangered and threatened species lists last week, and proposed regulations were published in the *FEDERAL REGISTER* for protecting 216 more animals and plants from around the world. Observers, however, in both the Government's endangered species office and the wildlife conservation movement, are taking the actions for less than surface value.

The final proposed listing of eight animals to the endangered list and two to the threatened list (those not believed in danger of imminent extinction) is a culmination of several years effort on their behalf by the Government and conservation groups. Listed as endangered were the American crocodile, the Cedros Island mule deer, the Peninsular pronghorn antelope, the Hawaii creeper, the Scioto madtom (a small Ohio fish), the Po'o uli (a Hawaiian bird), the gray bat and the Mexican wolf. Listed as threatened were the bayou darter and Newell's Manx shearwater.

After a required waiting period of 60 days, the species will be officially added to the 112 endangered and nine threatened species already listed by the U.S. Department of Interior. (There will be procedural delays, however, in listing the gray bat and Mexican wolf.) The new status will proffer to them the extensive protective machinery of the Endangered Species Act of 1973.

Conservationist Lewis Regenstein, head of the Washington-based Fund for Animals, is ambivalent over the listing. "Listing these animals is so long overdue that I just can't get too excited about it, even though they will be protected now. There are, for example, only 12 Cedros island mule deer left, and about a dozen breeding female crocodiles. The Department of Interior has had information on their imperiled status for years, and to me, it is just incredible that they could have waited so long. The Government," he says, "has obviously adopted a policy of waiting until a species is just about to perish and there are only a handful left before it will act."

In its other major action, the U.S. Fish and Wildlife Service, with its *FEDERAL REGISTER* publication, began the process for adding 74 plants and 171 more animals (most of them from outside the United States), to the endangered species list. These include several bread palm, aloe, mussel and orchid species, and among



Timber wolf: Appendix I to endangered.

many other animals, the Asian elephant, the grizzly bear, the peregrine falcon, several parrots and parakeets, the leopard, the jaguar, the lemur and the proboscis monkey. The 216 plants and animals are now listed in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. This international agreement was written by the United States and 80 other nations in March 1973. It protects endangered wildlife from commercial international trade with some outright trade bans, and with the requirement that licenses be issued by both importing and exporting nations for most listed animals.

The United States, however, has yet to establish the specific rules and regulations

to be used at ports of entry and, in effect, does not enforce the international agreement, Interior Department sources say.

The new action is apparently a step toward protecting the endangered Appendix I plants and animals, proposing to add them directly to the U.S. endangered species list and protect them from commercial exploitation in that way, rather than through the international agreement. But a government official in the endangered species office who refuses to be named told *SCIENCE NEWS*, "This action is just plain window dressing." Listing the 216 plants and animals in the usual manner would take "literally years," he says, "and this action is designed to obfuscate the fact that no action has been taken to write rules and regulations to implement the international agreement at our borders, even though it has been over two years since the conference, and we were the leaders in setting it up. The responsibility for this delay, he says, is "benign bureaucratic neglect," beginning with program chief Keith Schreiner.

Schreiner does not see things this way. "This window dressing idea," he told *SCIENCE NEWS*, "is dead wrong." Rule-making progress is being held up by the Office of Management and Budget and President Ford's signature. "Once an executive order is signed to start the rule-making, we could move ahead on it full speed. We could even begin to protect the animals and plants at our borders before the rules and regulations are laid down in writing. I hope that this all happens," he says, "within this calendar year." □

Propellants: New actors in troposphere?

Aerosol propellants have thus far been billed as the dramatic heavies on a stratospheric stage. According to theory, they absorb ultraviolet light energy through a "window" in the stratosphere, and release reactive chlorine molecules which catalyze ozone destruction.

Fluorocarbon propellants 11 and 12 are now being introduced for the first time as antagonists on a tropospheric (lower atmosphere) stage. A new theory, based on a very simplified model of the atmosphere, casts propellants as absorbers of infrared radiation through a second atmospheric window. The denouement, set in the year 2000 and acknowledged to be speculative, pictures an earth warmed by a fluorocarbon-induced greenhouse effect as a result of this infrared absorption. Thus, there are now two potential concerns over propellants—their possible reactions in the upper atmosphere leading to ozone destruction

and their possible reactions in the troposphere leading to a greenhouse effect.

It is not too surprising, however, that there are already objections to the greenhouse theory, calling it "premature" and "dangerous."

The new theory is presented in the Oct. 3 *SCIENCE* by atmospheric physicist Veerebhadran Ramanathan of the NASA Langley Research Center in Hampton, Va. He bases his theory on experimental evidence that fluorocarbon propellants absorb infrared radiation (heat) in the 8 to 13 micrometer region, but not in other solar radiation wavelengths.

He postulates that infrared radiating from the earth's surface in the 8 to 13 micrometer region will be absorbed by propellants that build up in the lower atmosphere as they drift up toward the stratosphere. Estimates place the current tropospheric levels at about .1 or .2 parts

per billion. Assuming a continuous input of propellants at current consumption levels, that concentration will have risen 20 or 30 times, to 2 or 3 parts per billion by the year 2000. At 2 or 3 ppb, Ramanathan theorizes, the propellants will absorb enough radiant heat to cause an average global surface temperature increase of about 1.6 degrees F.

Linwood B. Callis, the head of the Langley Math Fluid Physics section and chief of the current project, says such a temperature increase, if it occurred, would be sufficient to cause some melting of the polar icecaps. But Langley's atmospheric model is a fairly simple, static one, that does not include several atmospheric feedback cycles. Ramanathan is not, therefore, making predictions of such effects, Callis says, but rather indicating that the physical effects of fluorocarbons on the troposphere must be considered as well as the chemical effects on the strato-

sphere. The group plans to use more complicated, dynamic atmospheric models in future studies, Callis says.

The Langley theory, Princeton atmospheric physicist Jerry Mallman cautions, is "very, very premature," and it is "perhaps a bit dangerous to talk at this point about greenhouse effects and polar icecap melting." Mallman says the Langley team is using the simplest one-dimensional model of atmospheric heat balance and projecting the effects—as accurate as these appear to be—onto the climate as a whole. "There are so many mitigating circumstances when it comes to climate," Mallman says, "the complicated interaction of the oceans, ice, clouds and atmospheric motion, that we just don't have any models that even come close to simulating the climate." There is just not enough known about atmospheric physics, he says, to really predict how the climate would respond to this infrared absorption. □

When should life be prolonged?

In this age of medical technology, physicians can sustain a patient's vital functions almost indefinitely with the use of machines. Thus profound legal, ethical and financial questions arise. Who has the right to decide when the plugs can be pulled? When should they be pulled? And who should pay for artificially extending life?

A highly publicized case before the Superior Court in New Jersey—the Karen Anne Quinlan case—may help decide the legal question. Whether the case will resolve the ethical and financial questions is more doubtful.

On April 14, 1975, 21-year-old Karen Quinlan went to bed and never awakened. The county prosecutor's office investigating the circumstances surrounding her illness thought that it possibly stemmed from an accidental overdose or the inadvertent interaction of a tranquilizer and alcohol. During the past five-and-a-half months, physicians at St. Clare's Hospital in Denville, N.J., have kept Karen alive on a respirator. The physicians have told Karen's parents, Joseph T. and Julia Ann Quinlan, that she has suffered irreversible brain damage and has no hope of recovering. But the physicians refuse to take her off the respirator because they fear a malpractice suit. Consequently the Quinlans have filed a civil court action seeking a court decision so that the respirator can legally be turned off.

This is the first time, with one possible exception, in which a court has been asked to decide whether guardians have the right to terminate artificial means of maintaining life. (It has been established legally that a conscious patient has the right to refuse treatment.) The case, scheduled to come to trial Oct. 20, promises to be lengthy and complex, involving lawyers for the state, county, hospital, physicians

and Karen Quinlan. The Quinlan's attorney, Paul W. Armstrong, argues that the Quinlans want to let their daughter die naturally with grace and dignity. New Jersey State Attorney General William F. Hyland argues that if the Quinlans are given the right to terminate life support, the decision opens the door to euthanasia.

In the view of Robert Veatch, staff director of the Research Group on Death and Dying of the Institute of Society, Ethics and the Life Sciences in Hastings-on-Hudson, N.Y., "this will be a very important case for setting public policy regarding guardian decision-making. If they decide that treatment cannot be stopped, that will, at least in New Jersey, set precedent. I suspect it will have an effect throughout the country. If they decide that parents can go ahead and refuse the treatment, that will be the first clear-cut case of guardian treatment refusal, with the possible exception of one case in Miami."

Whether the case will resolve the ethical question about when life should be terminated is more tenuous. The question is incredibly complex, and even physicians who are closely involved with it differ in their views. For example, Andre Hellegers, director of the Kennedy Institute for the Study of Human Reproduction and Bioethics, takes this stance on the Quinlan case: "Here is a woman who for 160 days and some is allegedly receiving therapy when it isn't doing her any good. The problem, I understand, is that she still has some brain waves so that she cannot be pronounced dead. I hope that nobody confuses the difficulty of defining death with the difficulty of whether one may let die, or whether one may kill, which is another notion altogether. But I don't see any ethical problem in this case. She is just being maintained by a machine which

is no good for her or for anybody else. I think we should let her go."

Jonathan H. Pincus, professor of neurology at Yale Medical School, isn't so sure: "In general we [at Yale] do not feel compelled to use respirators or any extraordinary means of keeping somebody alive if we feel it is hopeless. However, if Karen Quinlan has some sort of neurological brain function, it's hard to tell what's going to happen. There is every now and then a case reported of somebody who has survived in relatively good shape from something like that. So if there were any chance of that happening at all, it seems to me that you wouldn't want to throw in the towel. On the other hand, if there isn't any chance of this occurring, keeping somebody on a respirator for several months doesn't seem to be a very effective way of handling it, either."

Aside from the knotty legal and ethical questions surrounding the Quinlan case, there is also the tough financial question. Who should pay for extending patients' lives indefinitely? Lawyers have estimated that the bill for maintaining Karen Quinlan on artificial life support will cost between \$70,000 and \$130,000, and they say it is unclear how the bills will be paid. □

Novas: Swan song, catching a unicorn

As Nova Cygni 1975 continues to fade, further reports of variations in its light superimposed on the gradual decline continue to come in. T.E. Margrave and J.H. Doolittle of the University of Montana's Blue Mountain Observatory find a variation in blue and violet light consistent with that reported earlier by P. Tempesti, but no evidence of variation in ultraviolet. R.H. Koch and C.W. Armbruster of the Flower and Cook Observatory find variations of yellow and blue light with a period of about an hour.

Gerard de Vaucouleurs of the University of Texas has extrapolated the declining light curve of Nova Cygni 1975 and predicts the following magnitudes: Sept. 30, magnitude 8.0; Oct. 30, magnitude 9.0; Dec. 15, magnitude 10.0. Latest observed magnitude estimate, by P. Maley of Houston, was 7.2 on Sept. 24 (I.A.U. Circular 2839).

It's now official. The strange X-ray object in Orion, AO620-00 is being called a nova. It is Nova Monocerotis 1975, because, although people kept referring to Orion, its location (R.A. 6h 20.2 m, Dec. -0°21.2') is actually slightly over the border in Monoceros (I.A.U. Circular 2840). J.B. Oke and Jesse L. Greenstein of the Hale Observatories report an essentially flat spectrum that could come from a very hot source. Radio, optical and X-ray fluxes are all about the same, they say. K. Locher of Grüt-Wetzikon, Switzerland, reports the latest visual magnitude estimate, 11.6 on Sept. 14. □