

# News & Review

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## Sea Turtle Excluder Device

The world's seven species of sea turtle have been in trouble the last few decades for a number of reasons and from a number of causes. Turtles are slaughtered for their meat, skin, shells, and other "products"; their eggs are poached and their habitat threatened. Conservation of the sea turtle has to be a global effort, not only because the turtles distribute themselves across thousands of miles, but also because their economic value has thrust them onto the international wildlife market. However, local problems also exist, such as the one affecting three species of sea turtle and the shrimping industry along the South Atlantic and Gulf coasts of the United States. Trawls designed to catch shrimp have also been netting and drowning loggerhead sea turtles, as well as some Kemp's (Atlantic) Ridleys and greens (the most endangered species of sea turtle).

In November 1979, experts gathered at the State Department in Washington, DC to discuss strategies for conserving the sea turtle. One workshop, led by Milt Kaufmann, President of Monitor International (a consortium of environmental and animal welfare groups), concentrated on the problem of incidental catch of sea turtles by shrimp fishermen. According to Kaufmann, the shrimping industry had been denying for years any relationship between the drowning deaths of otherwise uninjured sea turtles and trawling operations in the vicinity. The workshop ultimately produced an official recommendation to establish an observation and salvaging network for the turtles so that hard data on mortality could be collected to clarify anecdotal information and the resultant accusations and denials. By August 1980, at a meeting of conservationists, fishermen and state and federal officials in Charleston, South Carolina, a spokesman for the shrimping industry was ready to agree to the existence of a correlation between

trawling activity and sea turtle mortality. (Data taken in 1980 revealed that 2,085 sea turtle carcasses washed ashore along the Gulf and South Atlantic coasts 2-4 days after the completion of shrimping operations in the area.)

At this same meeting, participants reached a consensus on the best methods for reviving netted sea turtles, and highly specific emergency regulations for fishermen on resuscitation were later published. However, attempting to resuscitate captured turtles before putting them back into the sea is at best a last-ditch measure to counteract rather than solve the problem, *i.e.*, the unintentional capture of the turtles by the trawl nets.

The National Marine Fisheries Service (U.S. Department of Interior) has been working on several approaches to conserving, protecting and restoring sea turtle populations for the past six years. In addition to its efforts to acquire basic information on the life history of the sea turtle, designate critical habitats and establish restricted fishing areas, the NMFS has also directed research into and development of "excluder gear," structural modifications which can be added to shrimp trawls to make them turtle-proof. With one failure behind it (an "excluder panel" that excluded shrimp as well as turtles), the NMFS has gone on to develop and perfect the Turtle Excluder Device (TED), in essence a trap door set in a frame constructed of galvanized pipe which is placed inside the trawl at the intersection of the trawl body and bag. When a turtle or other large object enters the bag, it strikes slanted bars that are joined to the frame, and is forced toward the hinged trap door, which opens when a pre-set tension is exceeded. Turtles are thus released into the sea, while shrimp, being small enough, pass through the bars and remain in the bag.

Field tests of the TED in the South Atlantic during 1980 produced impressive results. Cooperating vessels

reported an 89% reduction in sea turtle capture, with shrimp catch virtually equal to that of vessels operating with standard trawls. Milt Kaufmann, who is also the Fund for Animals' Director of the International Program for Marine Mammals and Endangered Species, is "very optimistic" about the TED, particularly since the device has been further refined, with the trap door at the top rather than at the bottom. This arrangement takes advantage of the fact that the air-breathing sea turtles naturally make for the surface, and the force of the water re-closes the door, eliminating the need for the elastic cords that had been used to pull the door back into position.

Enthusiasm for the TED does not run as high among members of the shrimping industry, however. Although the development of the TED was a joint effort of the industry and the NMFS (Eddie Toomer, the captain of one shrimping vessel, has been singled out for appreciation by the NMFS for his "innovative ideas and enthusiastic support."), the prospect of government regulations requiring the use of the TED is most unwelcome. Jim Sternberg, of the Council on Environmental Education's Sea Turtle Rescue Fund, noted "limited receptivity" among shrimp fishermen in the southeastern coastal states to government-sponsored workshops set up to promote the TED. Those who remain less than enamored of the TED argue that it is too awkward, costs too much (\$200 per trawl, according to Kaufmann) and harms the shrimp catch, contrary to the statements of the NMFS on the TED's performance during field trials. The industry has also pointed out that although it is the target of regulation, shrimping is not the only type of fishing operation that may be adversely affecting sea turtles: Bottom trawls are used to catch flounder as well as shrimp, and the standing nets used in sturgeon fishing can also ensnare larger sea-dwelling animals.

At one stage, the proposed regulations included a choice of using the turtle excluder or limiting trawling time to 90 minutes instead of the usual several

hours. However, this latter option was judged unenforceable owing to the tremendous impracticality of trying to monitor tens of thousands of shrimping vessels. Thus the regulations will most likely require adoption of the TED. After pouring \$1 million into research and development of the TED, the NMFS must now contend with an industry that is hostile to the changes its use would entail. Jim Sternberg suspects that the current reluctance of the NMFS to admit any more than a "correlation" between trawling activity and sea turtle mortality stems from the fear that if the industry should decide to sue for over-regulation, the government would be unable to provide enough hard evidence to meet the charge. Indeed, certain basic questions about the animal at the center of this controversy remain unanswered. For example, no one yet knows enough about the reproductive behavior of sea turtles to define the biological and ecological impact of the deaths of loggerheads (most of them immature) in trawling nets. As spokesman for Monitor International and the Fund for Animals, Kaufmann is urging the shrimping industry to adopt the use of the TED voluntarily during the period in which regulations are being ironed out. Given the problems caused by the industry's attitude and by the current lack of hard scientific data on the population dynamics of the sea turtle, the TED may have a long wait between its field trial and widespread use.

### More Action on Draize

The Food and Drug Administration (FDA) is committing funds to a project allowing one of its senior scientists to study a new *in vitro* testing technique. This statement, made by Robert Wetherall, FDA's Associate Commissioner for Legislative Affairs, appeared in a letter to Congressman Bill Green (R-NY), who subsequently entered it into the Congressional Record (15 June, 1981, E2953). Wetherall also provided an assurance to

industry that the FDA would accept results from properly validated alternatives to the Draize test as sufficient evidence of product safety.

The FDA's initiatives follow those of a number of cosmetic companies, including Avon, Estée Lauder, Max Factor, Chanel and Mary Kay, that have contributed various amounts of money to the Cosmetic, Toiletry and Fragrance Association's Ad Hoc Fund on Alternatives. (Avon and Estée Lauder are known to have contributed \$750,000 and \$250,000, respectively.) The CTFA is now soliciting proposals from organizations interested in managing this fund.

The FDA is a member of the Inter-agency Regulatory Liaison Group (IRLG), along with the Consumer Product Safety Commission (CPSC), the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA) and the Food Safety and Quality Service (FSQS). In the introduction to its recently issued *Recommended Guidelines for Acute Eye Irritation Testing*, the IRLG states: "For humane reasons, substances known to be corrosive may be assumed to be eye irritants and should not be tested in the eye. Furthermore, substances shown to be severe irritants in dermal toxicity tests may be assumed to be eye irritants and need not be tested in the eye." The guideline also suggests that a trial test be done on three rabbits rather than the usual six. If the substance produces severe irritation or no irritation, then no further testing is required. Only if the results are equivocal should another three animals be used.

### **Farm Adverts Lay An Egg**

It is not unusual to see advertisements for meat and other livestock products that feature idyllic barnyard scenes, often with "happy" animals either strolling in the background or actively promoting the products themselves. However, this type of advertising is now being protested in the U.K. following the successful prosecution in France of

three poultry keepers for fraudulent advertising. According to the 13 December 1980 edition of the newspaper *L'A/sace*, the Fraud Squad and the Consumer Bureau of Alsace filed the suit, and the Strasbourg tribunal found the defendants guilty on the basis of the fact that the egg boxes carried a picture of a "natural" country scene, while the eggs actually came from a standard battery cage operation.

In the U.K., however, the controversy has not reached the courts. According to *Ag* (No. 63, May 1981), a number of individuals protested against television spots used by the company of Goldenlay in which its eggs were proclaimed to have "the taste of the country." So far, neither the Independent Broadcasting Authority (IBA) nor the Home Office has been willing to take any action to pull the advertisements. Responding to letters of protest, the IBA stated, "...this is a political matter in which a neutral body such as ourselves cannot participate." The Home Office also invoked the specter of politics, arguing that intervention by the Home Secretary or his representatives would set a dangerous precedent for political interference in program content in general, and tossed the ball back to the IBA, which it called the appointed "guardian of the public interest in relation to their broadcasts."

*Ag* has called on its readers to resist the apparent official runaround by stepping up their protests.

### **British Unions Back Conservation Efforts**

PCAP International (Protection and Conservation of Animals and Plantlife) has secured the support of the British trade union movement in its opposition to the import and export of endangered species of animals and plants, according to recent information from Daniel Lindsay, PCAP's European Secretary. In particular, Dennis Kelly, Secretary of the Liverpool Dockers' Shop Steward Joint Committee, has assured Lindsay that

dockers in Liverpool and Glasgow will refuse to handle all shipments of oil from endangered sperm whales which enter their docks. Dock workers in England have mentioned the possibility of having their counterparts on the Continent cooperate in "blacking" shipments of sperm whale oil, thus (PCAP hopes) upsetting trade to the point where firms would be forced to substitute jojoba oil, an adequate and presently available plant product.

In another action, PCAP is campaigning to enlist the trade unions in its efforts to prevent the dumping of nuclear waste into the sea. Whereas the United States, Norway, Sweden and other countries have ceased this practice, Britain continues to dump on a large scale, raising concern about the concentrations of radioactive material in fish and the long-term effects on marine ecosystems as a whole. PCAP reports that eight major unions and many public figures have expressed their support.

### **Alternative for Rabies Diagnosis**

An alternative to mouse inoculation to confirm a diagnosis of rabies may be available in the form of a tissue culture test, recently evaluated by the New York State Department of Health. According to a report in *Vet Med/SAC* (76:145, 1981), the test, which yields final results in 48 hours, was found to be reliable and comparable in sensitivity to the standard technique of mouse inoculation. (For more information, see the research report in *J Clin Microbiol* 12:590-593, 1980.)

### **NC State Principles for Animal Use**

The following principles for the use of animals were approved by the Cabinet of the new School of Veterinary Medicine at the North Carolina State University (Raleigh) on 5 February 1981. They are reproduced below in full for the information of our readers.

### **Preamble**

The use of animals is essential to teaching programs and biomedical research in a School of Veterinary Medicine. Many significant benefits to the health and welfare of both animals and mankind have resulted from animal use in research and are a matter of historical record. Instruction of students in the professional curriculum of the School of Veterinary Medicine in the arts and sciences of modern diagnostics and therapeutics would also be impossible without the use of some animal models.

At the same time, the use of animals carries with it significant legal obligations for proper care and humane use. More importantly, there is a high moral obligation for the appropriate use of another living animal. This is especially important within a School of Veterinary Medicine because the public looks to, supports, and expects the veterinary medical profession to protect the health and welfare of animals. Therefore, each staff member, student, faculty member, or research investigator of the School of Veterinary Medicine is directly responsible to promote and protect animal welfare within the instructional and research program of the School. This responsibility should be conveyed by example and extends to the education of the future members of our profession.

The purpose of these following principles is to provide guidance for the proper care and humane use of animals within the teaching and research programs of the School.

### **Principles**

1. Animals should be used in teaching and research projects only if their use is required to achieve results which will ultimately benefit society. Statistical analysis, mathematical models, *in vitro* systems, demonstrations, and audiovisual aids should be used whenever feasible to replace or complement animal use and reduce the number of animals needed to achieve significant results.

2. The procurement, care and use of animals in the School of Veterinary Medicine shall be in accordance with

regulations established under the terms of the Animal Welfare Act; all applicable state and local laws; and the National Academy of Science's *Guide for the Care of Laboratory Animals*. The housing, care, feeding, and daily observations of all animals must be supervised by individuals knowledgeable in such matters. At the School of Veterinary Medicine, North Carolina State University these activities are structured under the *Director of Laboratory Animal Resources*.

3. The use of animals should be planned and conducted so as to avoid unnecessary suffering and injury to any animal. Procedures involving live animals must be performed by, or under the immediate supervision of, a faculty or staff member *who is knowledgeable about the procedure*. Students must be instructed in and appropriately supervised for procedures performed by them.

If any experimental or demonstrative procedure, or their consequences, have the potential to produce significant pain, distress or suffering, anesthesia or other appropriate analgesia must be administered. If for any reason pain or distress cannot be obviated, *the procedure in question must be reviewed by the Faculty Committee on Laboratory Animal Resources before it is undertaken*. The requested procedure should be described in writing to the Committee and the Committee will recommend to the *Department Head* whether the procedure should be undertaken. If the matter cannot be resolved in this manner the recommendation will go to the *Dean*.

4. If major surgical, or other invasive procedures, are performed on any animal it should be euthanatized before it recovers from anesthesia unless such recovery is necessary to the research or instructional value of the procedure. Instructional use of animals in surgical procedures should be planned so that if an animal is used for a second major surgical procedure it will be euthanatized prior to recovery from the second anesthesia.

5. When an animal is no longer needed for programs of the School of Veteri-

nary Medicine, it should be euthanatized. An exception is made for animals that have a market value and where transfer to a new owner represents no threat to public or animal health or welfare, or the integrity of the School. Such animals may be sold at fair market value according to the administrative procedures established by the School and the University.

6. When an animal is euthanatized, it must be done in a manner consistent with the recommendations of the AVMA panel on *Euthanasia* (*Journal American Veterinary Medical Association* 173:59-77, July 1, 1978).

7. Any faculty member, staff member, or student of the School of Veterinary Medicine who believes that these principles are being violated may submit a written request to the Faculty Committee on Laboratory Animal Resources for the review of the procedure or situation which results in the alleged violation. The committee will review all pertinent facts regarding the alleged violation and if a violation has occurred, will recommend corrective action to the responsible individuals including the appropriate Department Head. If the matter is not resolved in this manner, the recommendation of the Committee will be forwarded to the Dean of the School of Veterinary Medicine for resolution.

## **Need to Control Stress Stressed**

The study of the relationship between stress and the competence of the immune system has produced the new discipline of psychoneuroimmunology. As the deliberate, quantitative induction of stress in laboratory animals is an integral part of experimentation in this discipline, it is vital to the accuracy and validity of the data that animals are protected from the unintentional induction of stress through handling and inappropriate environmental conditions. According to researcher Vernon Riley (*Science* 212(4499):1100-1109, 1981),

studies from different labs of the influence of stress (as expressed by increased concentrations of adrenal corticoids in plasma) on neoplastic processes have been plagued by inconsistent results, not only because of the difficulties involved in objectively measuring the physiological manifestations of stress, but also because of the confounding effects of generally unrecognized, and therefore uncontrolled, environmentally-induced stress.

Although it is probably impossible to eliminate physiological changes in laboratory animals associated with handling and environmental factors, one can recognize and attempt to control additional stress by keeping animals under low-stress conditions, which Riley outlines as follows:

(i) No recirculation of noxious air that has been in previous contact with animals; (ii) partial soundproofing of the animal storage shelves; (iii) elimination of animal room vibrations and high-pitched sounds of centrifuges, vacuum cleaners, ventilation fans, and other noisy laboratory or building equipment; (iv) elimination of drafts, air turbulence, and wind-tunnel effects; (v) precise light control to stabilize circadian rhythms and to regulate light intensity exposure; (vi) segregation of males and females with respect to transmissible odors, pheromones, and other stress-inducing signals; (vii) segregation of experimental animals that are experiencing stress from normal or control animals; (viii) introduction of special minimum-stress animal handling techniques and cage-cleaning procedures; and (ix) avoidance of drafty, uncomfortable, and stressful wire-bottom cages. Data also indicate that the isolation of animals, with only one animal per cage, is undesirable.

Mice kept under such low-stress conditions showed baseline values of 0-35 nanograms of corticosterone per ml of plasma, while mice maintained in conventional facilities have values ranging from 150-500 ng/ml. Close proximity

to mice of the opposite sex caused a four- to sevenfold increase in plasma corticosterone, which remained elevated for more than 80 days; male mice were less severely affected than females. In C3H/He female mice, the ability to reject a tumor challenge was depressed when they were housed singly, and in males when housed either singly or in pairs. In contrast, the psychosocial "eustress" of being housed in groups of 3-20 per cage was found to enhance the immunological response to implanted lymphosarcoma. In another experiment, mice carrying the mammary tumor virus (MTV) were housed in 3 groups: two in a conventional and one in a low-stress facility. The former two groups, exposed to considerable environmental stress, showed 92% and 68% tumor incidence respectively, compared to less than 10% incidence in the low-stress group. Riley concludes:

*The influences of uncontrolled stress in animal studies, particularly in studies with rodents, call for (i) a more universal consideration of these factors in the design of experiments; (ii) establishment of a low-stress environment for animal housing; (iii) special considerations in the manipulation and handling of experimental animals; and (iv) attention to time factors in terms of minutes, when blood samples are being removed for the establishment of meaningful corticosterone and related values. Because of these largely unappreciated and uncontrolled elements, the question arises as to how much of the present and past work with small animals may be severely flawed. In any event, the information now available calls for a reassessment of the current standards for laboratory animal housing and for techniques related to animal experimentation.*

*I found, somewhat to my amusement... that animals always behave in a manner showing the rightness of the philosophy entertained by the man who observes them. —Bertrand Russell*