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Vertebrate Repellents: Mechanisms, Practical Applications, Possibilities

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Background

Nonlethal approaches to the management of problem wildlife are increasingly popular, despite the absence of reliable tools and strategies needed to fully implement these schemes. Repellents are a case in point. Although aversive substances are frequently discussed as integral components in nonlethal approaches to wildlife damage management, few data are available that pertain to their relative effectiveness. Indeed, the marketing strategies for most commercial formulations emphasize anecdotes and testimonials rather than experiments and field evaluations. This remarkable lack of dependable information probably reflects the fact that the U.S. Environmental Protection Agency (EPA) does not require efficacy data for vertebrate repellents. Instead, the EPA requires the submission of evidence that putative repellents are environmentally benign and non-toxic. An unfortunate (albeit amusing) consequence of this regulatory strategy is that wildlife managers have access to an array of environmentally safe but potentially useless repellents to deploy for animal damage control.

The present discussion attempts to provide selection criteria, or at least a basic understanding, of how effective chemical repellents work. Visual and auditory repellents (e.g., hawk effigies, propane cannons) are not considered because they are expensive and, with few exceptions (e.g., Electronic Guard predator deterrents, flagging as a goose grazing deterrent), they confer little long-term protection. This is because visual and auditory strategies depend on startle responses and neophobia by target animals for their effects (e.g., Conover 1982, Dolbeer et al. 1994). Such behaviors are not effective substrates for avoidance because they diminish rapidly when animals are exposed to the relevant stimuli more than a few times. Also, ordinances frequently ban noise and light pollution in urban and suburban settings where the need for repellents is greatest. Ultrasound is not constrained by ordinances in the way that sonic repellents are, since

humans are unable to detect ultrasonic frequencies. Unfortunately, most animals cannot detect them either (e.g., Summers-Smith 1963). Regardless of the manufacturer or device, to date, no ultrasonic device has demonstrated significant effectiveness against any vertebrate or invertebrate species (Shumake 1997, Woronecki 1988).

Categories of Chemical Repellents

Vertebrate chemical repellents fall into three classes; those that cause **pain**, those that cause **fear**, and those that cause **sickness** (Mason 1997). Repellents are most effective when they are used to prevent the consumption of a treated item such as

foods or electrical wiring. They seldom if ever prevent animals from entering areas containing treated items, i.e., there is little or no evidence for 'area' repellency associated with products available at the

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present time. To illustrate this point, naphthalene (moth balls) is registered with the EPA as a bird repellent (to disperse roosts, Dolbeer et al. 1994). While there is no question that foods treated with naphthalene are avoided by birds, it is equally clear that naphthalene is not always aversive. Moth balls spread in gardens for insect control are routinely picked up by a variety of avian species, who rub them on their feathers in order to kill arthropod ectoparasites (Clark et al. 1990).

Pain (Irritation)

Amongst the three types of chemical repellents, substances that cause sensory pain are most effective. This is because sensory pain elicits immediate avoidance independent of learning, and because repellency does not diminish for as long as the repellent chemical is present. Irritants are not simply 'bad' tastes or smells; they stimulate specialized trigeminal pain receptors (so-called nociceptors; e.g., Silver 1990) present in the exposed mucous membranes of the eyes, mouth, nose, and gut lining. For mammals including humans, strong irritants in-

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CALENDAR OF UPCOMING EVENTS

October 4-8, 1997: 51st Annual Conference, Southeastern Assoc. of Fish & Wildlife Agencies, Oklahoma City, OK. Contact: Kim Erickson, PO Box 53465, Oklahoma City, OK 73152, phone (405) 521-3721.

October 16-19, 1997: 8th Eastern Wildlife Damage Management Conference, Clarion Hotel and Conference Center, Roanoke, Virginia. Single rooms begin at \$67 per night. Registration fee of \$125 (\$95 student) includes 2 lunches, reception, 1 dinner, 1 banquet, field trip, and Proceedings. Pre-registration requested by Oct 2. NADCA Membership Meeting planned. Contact: Jim Parkhurst, Virginia Coop. Ext., Dept. of Fisheries & Wildlife Sciences, Virginia Tech, Blacksburg, VA 24061-0321, (540) 231-5573, FAX (540) 231-7580, e-mail: jparkhur@vt.edu

October 19-24, 1997: Second International Congress of Vector Ecology, Holiday Inn Int'l. Drive Resort, Orlando, Florida. Sponsored by Society for Vector Ecology. For registration information, contact: Gilbert L. Challet, Sec-Treas., P.O. Box 87, Santa Ana, CA 92702, (714) 971-2421 ext. 148, FAX (714) 971-3940.

December 7-10, 1997: 59th Midwest Fish & Wildlife Conference, Milwaukee, Wisconsin. Theme: "Managing Natural Resources: Integrating Ecology and Society." Conference will include sessions on Prevention and Control of Invasive Species, and Managing Overabundant Wildlife. For further information, contact Michael Samuel at (608) 271-4640, or visit website <http://www.dnr.state.wi.us/fh/fish/mwfwc.htm>.

March 2-5, 1998: 18th Vertebrate Pest Conference, Doubletree Hotel, Costa Mesa, California. Contact: Sydni Gillette, DANR-North Region, UC Davis, Davis, CA 95616, (916) 754-8491 or visit website <http://www.davis.com/~vpc/welcome.html>

April 19-24, 1998: 11th International Conference on Bear Research and Management, Park Vista Hotel, Gatlinburg, Tennessee. Contact: Michael R. Pelton, Univ. of TN, Dept. of Forestry, Wildlife & Fisheries, P.O. Box 1071, Knoxville, TN 37901, (423) 974-7126, FAX (423) 974-4714, e-mail: pelton@utkux.utcc.utk.edu

NADCA Officers' Nominations Needed

NADCA needs you! Consider serving a 2-year term as Regional Director or a board member. Also, if you know of a fellow member who would be great in a leadership role, encourage them to consider serving. Feel free to send any nominations for national officers, or nominate yourself, by contacting Eugene LeBoeuf, NADCA president, at (505) 846-5679.

NADCA elections are this fall, with elected members beginning a 2-year term of office in January 1998.

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Your contributions of articles to *The Probe* are welcome and encouraged. The deadline for submitting materials is the 15th of the month prior to publication. Opinions expressed in this publication are not necessarily those of NADCA.

Person-to-Person Hantavirus Reported

A hantavirus outbreak in Argentina last year killed 11 people and sickened nine others in the first known instance of the respiratory illness being spread from person to person. Previously, it has been thought that hantavirus pulmonary syndrome could only be contracted by direct contact with rodent reservoirs and their urine or feces.

The illness first came to light in the U.S. when it killed dozens of people in the Four Corners region in 1993. Since then, hantavirus is known to have infected 162 people in 27 states, and 76 of them have died, according to the Centers for Disease Control and Prevention. The respiratory illness starts out with flu-like symptoms that worsen and can quickly become deadly. There is no known treatment other than supportive treatment for symptoms. There are dozens of different strains of hantaviruses in the world, but none has previously been shown to spread from person to person.

In the Argentina episode, a 41-year-old man was the first to fall ill. In three weeks, his mother and his doctor fell ill. Four weeks after that, the doctor's wife became sick. She traveled to Buenos Aires for medical care, and then her physician contracted the illness. "The Argentina cases are worth taking notice of," said Dr. Fred Koster, who cared for the first hantavirus patients diagnosed in New Mexico. "We have to ask ourselves why is Argentina's virus different from ours. That simply remains a puzzle."

—summarized from Associated Press article in *The Coloradoan*

Vertebrate Repellents: Mechanisms, Practical Applications, Possibilities

clude capsaicin and capsicum oleo resins (i.e., the active ingredients in 'hot sauce' preparations), and volatile chemicals such as mustard oil (allyl isothiocyanate) and ammonia (Budavari et al. 1989). Other effective irritants with potential practical applications include astringent tannins like quebracho and substances like agricultural lime. Quebracho is effective as a deterrent to gnawing by rodents (e.g., voles, Swihart 1990) and lime deters grazing by deer and geese (Belant et al. 1997a,b).

Tastes, per se, are rarely (if ever) effective feeding deterrents. While bitter and acidic substances can reduce the consumption of treated materials slightly, intake typically returns to values close to baseline within a short period of time. Products that claim effectiveness solely because of a 'bad' taste are doing so largely (if not solely) in the absence of reliable evidence. In particular, products that contain denatonium derivatives (e.g., Bitrex, denatonium benzoate, denatonium saccharide) are ineffective repellents, regardless of the method of application (e.g., topical spray, translocated pellet delivered to the roots at planting). Most of these commercial preparations (e.g., Ropel, Tree Guard) are labelled for use against herbivores and carnivores. Both kinds of animals show marked insensitivity to bitter compounds in experimental tests (Nolte et al. 1994b, Mason and McConnell 1997). New products containing denatonium benzoate appear with surprising frequency.

For birds, methyl anthranilate (a flavor compound in grapes and the active ingredient in 'ReJex-It' products [R.J. Advantage, Inc.]) is an effective irritant at concentrations that are inoffensive to most mammals. This differential effectiveness highlights a taxonomic difference between mammals and birds in irritant perception. Mammalian irritants are usually inoffensive to birds, and vice-versa. Capsaicin, for example, is an extremely effective irritant for mammals and it elicits avoidance at concentrations as low as 1-10 parts per million. Birds, on the other hand, tolerate capsaicin concentrations as high as 20,000 parts per million in drinking water. Likewise, mustard oil is a principle ingredient in riot control gases. For mammals, exposure to this substance provokes intense apnea and lacrimation. However, when open vials of mustard oil are placed in starling nest boxes, birds build more nests, lay more eggs, and hatch more nestlings. A plausible explanation is that this chemical acts as an insecticide and fungicide against pathogens and parasites present in the boxes but not as an avian repellent.

The greatest disadvantage to the use of irritants as wildlife repellents is that problem animals usually do not learn to avoid treated foods. For reasons that remain unclear, wildlife will continually 'test' treated materials, and reinfestation rapidly occurs once control measures are relaxed. For example, treating livestock feeds with methyl anthranilate will eliminate feed consumption by pest birds within 24-48 hours. However, if methyl anthranilate treatments are stopped, bird numbers return to pretreatment levels within two to three days (Mason et al. 1985).

Fear

Substances that induce what humans describe as 'fear' include sulfur compounds and volatile ammonium soaps of higher fatty acids (Milunas et al. 1994). Predator urines, and commercial preparations in-

cluding Deer Away Big Game Repellent (IntAgra Corporation), Hinder (Uniroyal Inc.), and bone tar oil (e.g., Magic Circle Repellents) contain these substances. In general, sulfur-containing mixtures are effective against herbivores. Sulfurous compounds are not aversive to animals with other food habits, and they are usually attractive to carnivores. There are no data consistent with the belief that odors from one predator might be aversive to other predators, even though the latter might occasionally be eaten by the former.

Although sulfurous compounds are marketed exclusively as mammalian herbivore repellents, they may be offensive to avian herbivores as well. For example, both white-tailed deer and snow geese tend to avoid grazing in fields previously planted to cabbage (Mason and Clark 1996), and both avoid Big Game Repellent (Milunas et al. 1994, Mason Pers. Obs.). Two plausible explanations can be offered for this effect. First, the digestion of meat proteins produces sulfur compounds. For herbivores that are potential prey for meat-eating species, the presence of sulfur odors may signal that predators are somewhere nearby (Nolte et al. 1994). Second, forage plants that bioaccumulate sulfur also tend to bioaccumulate selenium (Mason et al. Unpubl. Ms.). Accordingly, sulfurous odors could be used as reliable cues for the avoidance of poisonous vegetation.

A disadvantage to the use of fear-inducing substances as repellents is that animals habituate to them. Repellency diminishes unless the presence of the cue is occasionally associated with the presence of a predator. Also, when a protected material is highly attractive, the aversiveness of fear-producing substances disappears. Under some conditions, these substances may even become attractive. For example, there are anecdotal reports that wolf urine applied as a repellent along roadways during winter can become a cue used by moose to identify locations spread with salt.

Sickness (Conditioned Avoidance)

Tastes that are followed by sickness are avoided. This effect is variously called conditioned (or learned) taste avoidance, conditioned food avoidance or conditioned flavor avoidance. Learned avoidance can occur after a single aversive experience, particularly when sickness is great and the taste, food, or flavor is new to the animal. Avoidance is much harder to establish if target wildlife are already familiar with the sensory characteristics of the treated commodity.

Conditioned avoidance has been applied successfully to crop protection (e.g., Reidinger and Mason 1983). It is the mechanism underlying the utility of methiocarb (mesurol) as a bird repellent, and disulfiram (thiram) as a bird or mammal repellent. It also has been applied in attempts to control predation by coyotes and to encourage the avoidance of garbage dumps by bears. Neither of these attempts has been particularly successful. In the former case, conditioning failed to produce the desired result (avoidance of livestock) because learned avoidance applied to the consumption of prey, not to the act of killing it. Predators readily learn to avoid consumption of a prey item after the prey is paired with sickness, but killing continues (i.e., killing and eating are separate motivational systems). Likewise, while it might be relatively easy to train bears to avoid a novel food paired with sickness, it is much more difficult to train animals to avoid a familiar place

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The Uneasy Conscience of the Animal Rights Movement: Part 2

Stephen Vantassel, NWCO Correspondent, Wildlife Removal Service, Springfield, Massachusetts

Editor's Note: This is a continuation of the article begun in the August issue of The Probe.

Here in Massachusetts an organization called Pro-PAW (Protecting Pets and Wildlife) succeeded in banning all foothold traps. Due to the law's language, the bill has banned traps not even invented yet. Conibears can still be used, but one must obtain a special permit before using them and then only after box traps have been tried for 15 days. The ostensible reason behind this attempt is to protect pets and wildlife from these so-called cruel traps. Unfortunately for the AR, the litany of horror stories concerning the cruelty of footholds are largely based on situations resulting from the illegal use of footholds (ix). By conveniently neglecting to mention this fact, the AR can demonize footholds. The same withholding of information holds true for their condemnation of conibears. Legally set conibears rarely caught domestic animals in this state, for prior to Question 1, Massachusetts law required that conibears be completely submerged in water or set in or under a building. This highly restrictive and now defunct law essentially prevented the capture of non-furbearers and also reasonably ensured a timely death for the animal. Again, in light of the law, one must conclude that their desire to restrict conibears stems not from a desire to protect animals from a prolonged agonizing death, but from a real desire to end fur trapping.

Finally, the story of "Big Boy", a cat allegedly caught in a foothold as stated in the spring issue of *Animal Action* published by the MSPCA and AHES, carefully omits any mention of whether or not the trap was set legally. It also fails to note that the cat wandering around outside was probably out marauding the local wildlife. If one really wanted to protect wildlife, Pro-Paw would petition for a leash law on cats in Massachusetts. According to Robert Else in his article in the April 1995 issue of *Fur-Fish & Game*, there are approximately 60 million cats on the prowl in the U.S. If these cats average one kill per week, they will have eliminated 240 million animals by the end of the month. (Even the Humane Society estimates that there are 40 million cat owners in the U.S.) In light of these horrific numbers, AR doesn't work to ban cats. Instead they work on public education, suggesting to people that they keep their cats indoors (see *Shelter Sense* March 1995: Please note the palpable lack of any strident condemnations against people who let their cats roam outside. Compare that to literature published by AR against trapping). If prudence suggests that one work to save the most with the least, then the energy of the AR movement should be spent on leashing cats.

The irony, of course, is that these cats are little more than four-legged hunters. They don't need the bird, the mouse, or the vole. They simply kill for the fun of it and then go home and eat their Fancy Feast. By contrast, hunters tend to eat what they worked so long and hard to hunt and even pay for the privilege. What I find particularly despicable is their neglect of how much foothold design and use has improved in the last 40 years. I am regularly reading about dog proof or dog resistant sets, and how to modify traps to prevent/reduce animal pain and non-target catches. Does the AR movement give any kudos to

this information? No. They don't want to ban bad trapping, they want to ban all trapping. They are like people who want to solve drunk driving by eliminating driving. What the AR people don't want the public to know is how much improved trapping is today. Most states require trapper education and have implemented 24-hour trap check rules. Improvements within the traps themselves have reduced foot damage (i.e. pain) and the resultant chew- or wring-outs. Trapper education through print and classroom instruction have reduced the gross excesses of the past. The irony is that sometimes trap technology has moved faster than state law and this results in more pain and suffering for the trapped animal. For example, Massachusetts didn't permit the use of snares. Too bad, because snares can be designed to prevent non-target catches as well as lethal catches.

We must also recognize that the box trap is not painless for the animal. AR people talk about the box trap as if the animals don't suffer. They don't seem to tell the public that many box trapped animals suffer from nose burn, pelt damage, foot damage and even death from exposure. Of course, I haven't even begun to talk about the alleged psychological distress incurred by a caged animal. To suggest that box-trap-only-trapping will usher in an age of humane trapping is a myth. What is more humane: a 120 conibear over a squirrel hole in a house where it will die relatively quickly, or a box trap on the roof where it might freeze before I check it the next day? I asked that question of a high level official in the Humane Society. You know what his answer was? He said the homeowner should have made sure his house was secure enough to prevent the squirrel's access in the first place. I responded, "Well that didn't happen, so which method is more humane?" He didn't respond (x).

The AR movement often preaches that caring for animals leads to caring for humans. I have serious doubts about the validity of that belief. Hinduism tends to have a high view of animals. Yet, has this high regard for animals translated into compassion for humans? I don't think so. One could argue that the evidence leads in the exact opposite direction. The literally tens of thousands of dollars spent on pets in this country could be much better spent on feeding the hungry and housing the poor. Animal shelters, which expend vast amounts of resources on housing animals, could be used to assist human needs. Also has the animal rights movement with its concern about suffering taken up the cause of the unborn? I would think that an unborn child at the sixth month of gestation would have developed a sufficient nervous system to feel the pain of the abortionist's knife/suction tube. But I guess the unborn child isn't a human or even an animal in their mind. The fetus' status must exist somewhere in that moral twilight zone known as "choice".

A more sinister way that the AR movement mangles the facts stems around its pro-vegetarian stance. Vegetarianism, they claim, will save the world from hunger (xi). Various statistics are used to show that the grain used to feed cattle could feed many more people if it was given to people and not cattle. More could be fed if grazing pasture was converted to crop production. While the statistics don't lie they do hide

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Uneasy Conscience of Animal Rights Movement

some painful truths for the AR position. First, starvation is more complicated than just a supply problem. To suggest that people are starving because cattle are fed expensive grain is simply wrong. For example, the great Ethiopian Famine had more to do with the civil war than it did with lack of available food supplies. Second, cattle can be raised in areas that are too dry for crop production. One need only look at the Middle East, i.e. Israel, to see how cattle can be raised in areas too arid for consistent raising of crops such as the Negev. Sure irrigation would solve the water problem but would only endanger the soil to salination. Animals also eat plants and waste that humans have not found a use for. Thus cattle production can actually increase the total food supply of the planet. Note I have not even talked about harvesting the oceans. Third, animal protein is the most efficient way of providing necessary amino acids to the body. Fourth, meat from game species, such as deer, pheasant, duck etc., is used by humans. These sporting activities not only provide food for the hunter/trapper but preserve the forest from destruction by the plow or the bulldozer. Fifth, aboriginal peoples in the High North also rely on sea mammals to fill an important part of their nutritional need and the needs of their economy. Vegetarianism just won't work well for Eskimos. Finally, vegetarians conveniently forget how many animals farmers must kill to protect their vegetable crops. It seems that the vegetables of the vegan are watered by the blood of the crop-damaging animals.

A final area where AR are loose with the facts is in wild animal management. In Massachusetts, Pro-Paw rejects the contention that banning footholds and conibears will increase the incidence of rabies. They argue that there is no scientific evidence to support the belief that trapping controls the spread of rabies. There are a couple of issues here.

First, how does one define the term "scientific," and second, is there a difference between the notion of the incidence of rabies and the spread of rabies? Let us address the last issue first. If the AR mean that trapping won't necessarily reduce the geographical spread of rabies, I would agree. Rabies first emerged in Massachusetts, not on its Southern border, but in the Northern town of Fitchburg. It turned out that raccoons were hitching rides on dump trucks in Connecticut and getting off at the dump in Fitchburg. I seriously doubt that trapping would have prevented this. However, if we desire to reduce the incidence of rabies in a given locale, I think it is very clear that trapping would assist in this regard. Reducing the numbers of animals by definition must reduce the number of potentially infected animals. Fewer animals mean fewer potential contacts with people. If you doubt this, then why is it that in 1994 we were picking up sick raccoons left and right, and in 1995 it seemed the raccoons disappeared? Rabies so ravaged the population that there were very few raccoons left. Only in 1996-97 am I beginning to see resurgence in the raccoon population.

As for the first issue, it boils down to what one considers scientific and scientifically proven. Unlike physics, biology is a soft science. There are many factors and issues that will affect a particular study. However, that doesn't mean that knowledge isn't gained or that conclusions can't be supported. It means that different people can arrive at different conclusions. Yet I would remind the AR people that biology in regards to animal management can never be an arm-chair science. State biologists must respond to present problems. The farmer, the homeowner, etc. cannot just wait around for years for all

the evidence to come in. He needs to solve an animal damage problem now. These problems need to be handled in a cost-effective way. Traditionally animal damage problems have been solved by using a free labor force that actually pays for the privilege to help—we call them "sportsmen." While the facts may not all be in, I do believe that history has shown that management has worked for game and non-game species as well. The AR should spend more time in the field doing research than in court seeking injunctions. It would even help if they would set aside some of their millions and buy a couple acres of land for conservation purposes. Being the animal killer that I am, it would seem that having open space for the animals to live sounds like a pretty humane thing to do. But I am probably wrong, since the AR groups don't spend their money that way.

My last criticism of the AR movement is over their perpetual argument that hunting deer etc. only increases the problem. They consistently argue that reducing herd numbers in various sanctuaries will only cause the remaining deer to rebound with greater fertility and therefore greater numbers. I guess this is why we shouldn't swat mosquitoes, because we will only reduce the population thereby making them return in greater numbers next year. Aside from the counterintuitive nature of the AR argument, it does have some evidence to support it. If animal populations are not reduced sufficiently enough, then they will rebound back with a vengeance. This fact, however, doesn't prove the AR point. All we need to do is to make sure that the deer population is significantly reduced to prevent this massive rebound. Second, the initial thinning still benefits the land by reducing the pressure on the indigenous plant life. I always find it amazing that AR people never seem to complain about animals starving. It is only when they are hunted or trapped does a moral problem arise. Third, hunting/trapping regulations ensure the propagation of the targeted species. Biologists want the excess removed, not the stock. Seasons are typically set when the animals are not raising young. If significant population reduction was desired, then a simple change in the season dates would easily solve this problem.

My contempt for the animal rights movement flows from a realization that their concern is only to stop any and all use of animals for human consumption (xii). All the talk about pain and suffering is only a smoke screen. If people want to help me capture animals in a way that is effective and causes less injury to the animal, I am more than willing to listen. I don't get up in the morning saying, "How can I make an animal suffer today?!" I make my money solving human conflicts with animals. But the fact is, trapping will never be painless. The issue is whether the suffering is appropriate given our present knowledge and skill, and is it justified for the activity. I believe that humans can morally consume animals. Once that is understood, the issue changes to how can I best use this animal resource? Until the AR movement changes its stance from non-use to wise use, it will continue to have an uneasy conscience.

One final note, it is obvious to any casual observer that I have painted the AR movement with some very broad strokes. The reader should realize that individuals under the umbrella of the AR movement will be followers of differing degrees and stripes. My purpose behind this article is to attack the leadership and the essential philosophical and religious underpinnings of this movement. It is the leadership and their ideas which are the most culpable. It is their ideas that should be resisted at all costs. In closing, I want to make one

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Vertebrate Repellents: Mechanisms, . . .

containing many familiar foods.

Combinations

The available evidence suggests that repellent combinations are more effective than repellents with single modes of action. For example, mixtures of capsaicin, thiram and Big Game Repellent may be considerably more effective deer repellents than any one of these substances used alone. Likewise, mixtures of mesurol and methyl anthranilate are more effective than either mesurol or methyl anthranilate alone. Cinnamamide (e.g., Crocker and Perry 1990) d-pulegone (e.g., Mason 1990) and anthraquinone (Thomson 1989) are all broadly effective vertebrate (bird and small mammal) repellents that exert sensory (irritant) and post-ingestional effects. Intuitively, it is easy to believe that irritation and gastrointestinal malaise would provoke stronger avoidance than irritation or sickness alone.

Summary

Irritation is a more effective repellent principle than conditioned avoidance, and conditioned avoidance is probably a more effective repellent principle than fear. Regardless, the effectiveness of any repellent is affected by (a) the number or density of animals causing problems, (b)

Repellency is always relative and thus, always susceptible to failure. Given sufficiently high numbers of animals and sufficiently few alternative foods, repellents will fail to confer protection.

the number of alternative foods available in relation to the treated material, (c) the palatability of the treated commodity, and (d) weather conditions (Dolbeer et al. 1994). **Repellency is always relative and thus, always susceptible to failure.** Given sufficiently high numbers of animals and sufficiently few alternative foods, repellents will fail to confer protection. The clear implication is that repellents are not a stand-alone technology. Other methods implemented alongside repellents may include harassment, sterilization, or the use of physical barriers. In some situations, it may be necessary to employ lethal methods of population reduction before nonlethal methods can be used. Ultimately, the development of selective, ecologically-sound and effective chemical repellents requires a knowledge of the chemosensory *Umwelt* of the species in question (von Uexkull 1934), and an understanding of the degree to which the species relies on chemical cues in the context of a particular problem.

References

- Belant, J. L., S. K. Ickes, L. A. Tyson and T. W. Seamans. 1997. Comparison of four particulate substances as wildlife feeding repellents. *Crop Protection* 16: in press.
- Belant, J. L., L. A. Tyson, T. W. Seamans, and S. K. Ickes. 1997. Evaluation of lime as an avian feeding repellent. *Journal of Wildlife Management* 61:917-924.
- Budavari, S., M. J. O'Neil, A. Smith, and P. E. Heckelman. The Merck Index. Merck and Co., Rahway, N.J.

- Clark, C. C., L. Clark, and L. Clark. 1990. 'Anting' behavior by Common Grackles and European Starlings. *Wilson Bulletin* 102:167-169.
- Conover, M. R. 1982. Behavioral techniques to reduce bird damage to blueberries: methiocarb and a hawk-kite predator model. *Wildlife Society Bulletin* 10:211-216.
- Crocker, D. R. and S. M. Perry. 1990. Plant chemistry and bird repellents. *Ibis* 132:300-308.
- Dolbeer, R. A., N. R. Holler, and D. W. Hawthorne. 1994. Pages 474-506. In T. A. Bookhout (ed.) *Research and Management Techniques for Wildlife and Habitats*. The Wildlife Society, Bethesda, MD.
- Mason, J. R. 1990. Evaluation of pulegone as an avian repellent. *Journal of Wildlife Management* 54:130-135.
- Mason, J. R. 1997. Avian repellents: options, modes of action, and economic considerations. In J. R. Mason (ed.) *Repellents in Wildlife Management*. Colorado State University Press, Ft. Collins, CO. In press.
- Mason, J. R. and L. Clark. 1996. Avoidance of cabbage fields by free-ranging snow geese (*Chen caerulescens*). *Wilson Bulletin* 108:369-371.
- Mason, J. R., J. F. Glahn, R. F. Reidinger, and R. A. Dolbeer. 1985. Field trial of dimethyl anthranilate as a nontoxic bird repellent in cattle and swine feedlots. *Journal of Wildlife Management* 49:636-642.
- Mason, J. R., J. Hollick, B. A. Kimball, and J. J. Johnston. Repellency of Deer Away Big Game Repellent to Eastern Cottontail Rabbits. Unpubl. Ms.
- Mason, J. R. and J. A. McConnell. 1997. Hedonic responsiveness of coyotes to 15 aqueous taste solutions. submitted to *Journal of Wildlife Research*, in press.
- Milunas, M. C., A. F. Rhoads and J. R. Mason. 1994. Effectiveness of odor repellents for protecting ornamental shrubs from browsing by white-tailed deer. *Crop Protection*, 13:393-397.
- Nolte D. L., J. R. Mason, G. Epple, E. Aronov, and D. L. Campbell. 1994a. Why are predator urines aversive to prey? *Journal of Chemical Ecology*, 20:1505-1516.
- Nolte, D. L., J. R. Mason and L. Lewis. 1994b. Tolerance of bitter compounds by an herbivore, *Cavia porcellus*. *Journal of Chemical Ecology*, 20:303-308.
- Reidinger, R. F. and J. R. Mason. 1983. Evaluation and exploitation of weaknesses in behavioral defenses against dietary poisoning. In: D. E. Kaukiainen (ed.) *Test Methods for Vertebrate Pest Control and Management Materials*. ASTM STP 817, American Society for Testing and Materials, Philadelphia, PA, pp. 20-39.
- Shumake, S. A. 1997. Electronic rodent repellent devices: Efficacy test protocols and regulatory actions. In J. R. Mason (ed.) *Repellents in Wildlife Management*. Colorado State University Press, Ft. Collins, CO. In press.
- Silver, W. L. 1990. Physiological factors in nasal trigeminal chemoreception. Pages 21-42, In B. G. Green, J. R. Mason, and M. R. Kare (eds.) *Chemical Senses, Volume II: Irritation*. Marcel Dekker, New York.
- Summers-Smith, D. 1963. *The House Sparrow*. Collins Publishing, London. 251pp.
- Swihart, R. K. 1990. Quebracho, thiram, and methiocarb reduce consumption of apple twigs by meadow voles. *Wildlife Society Bulletin* 18:162-166.
- Thomson, W. T. 1989. *Agricultural chemicals III: Fumigants, growth regulators, repellents, and rodenticides*. Thomson Publications, Fresno, CA.
- Von Uexkull, J. 1934. A stroll through the worlds of animals and men: a picture book of invisible worlds. Pages 5-76, In C. H. Schiller and K. S. Lashley (eds.) *Instinctive Behavior: The Development of a Modern Concept*. International Universities Press, New York.
- Woronecki, P. P. 1988. Effects of ultrasonic, visual, and sonic devices on pigeon numbers in a vacant building. Pages 266-272 in A. C. Crabb and R. E. Marsh (eds.) *Proceedings of the Vertebrate Pest Conference, XIII*. University of California, Davis. CA

Uneasy Conscience of the Animal Rights Movement

thing perfectly clear: the animal rights movement is first and foremost a movement of faith. Anti's adopt their views because of a religious transformation. They cannot prove with scientific certainty that it is morally wrong to consume animals, any more than I can prove it is correct. Our positions result from prior religious convictions. One can never compromise with these people. I categorically reject the notion that what is needed is more dialogue. AR activists will not dialogue, as demonstrated by their actions in Massachusetts and elsewhere. They had the opportunity to discuss ways to reduce animal suffering with me and other problem animal controllers and trappers. Speaking for myself, I was never contacted. Only after they rammed this law down our throats did one of them say we should talk. The talk is over until the AR movement changes its position to being one of animal welfare that assures the rights of humans to utilize animal resources. This debate is nothing short of a struggle for the hearts and minds of the public. Let us never forget that.

Notes

(ix) Personal conversation with Thomas Decker, Certified Wildlife Biologist for the Massachusetts Div. of Fisheries and Wildlife.

(x) Conversation took place June 6-7, 1995 during the Wild Animal and Handling course held at the HSUS Wildlife Rehabilitation Training Center, West Barnstable, Massachusetts.

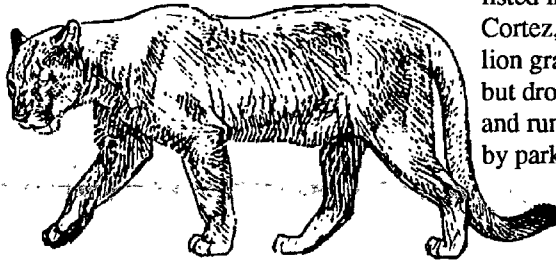
(xi) One need only consult the world wide web. One site in particular should be "must" reading for anyone involved in fighting the animal rights religion, called "herbweb". Its address is:

<http://www.pavilion.co.uk/david-pearce/faqfile.htm>.

This site contains numerous hot links covering a whole host of animal rights propoganda. Be sure to consult the "Meat is Murder" home page.

(xii) I have discussed my theological/religious position on trapping in my article, "A Christian Minister explains Why He Can Morally Trap God's Little Creatures" in The Probe, Issue 160, November 1995.

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ADC News, Tips, Ideas, Publications...

Children Attacked, One Killed by Colorado Lions

On July 17 a mountain lion killed a 10-year-old Lakewood boy who was hiking in Rocky Mountain National Park. The boy had been hiking with his parents and younger sister on the North Inlet Trail in the Summerland Park area, about 2.5 miles northeast of the town of Grand Lake. The sister saw the lion drag the boy off the trail at about 4:30 pm. Other hikers tried unsuccessfully to resuscitate the boy. It was the first known human fatality due to wildlife in the Park.

The lion, an 80-lb female, returned to the scene of the attack about 7 pm and was shot and killed by park rangers.

On July 14, a mountain lion attacked a 4-year-old boy while he and his family walked along a trail in Mesa Verde National Park in southwest Colorado. The boy, a visitor from France, was with his parents and two older brothers. He was listed in fair condition at Southwest Memorial Hospital in Cortez, following treatment for lacerations on his head. The lion grabbed the boy by the head and moved toward the brush, but dropped the boy when family members began screaming and running after the animal. The lion was later shot and killed by park rangers.

—summarized from the *Rocky Mountain News*

Coyotes as Safety Threat Debated

Colorado officials aren't sure whether coyotes in the Tri-County area pose a sufficient human safety threat to warrant use of leg-hold traps. According to Constitutional Amendment 14 passed last November by voters, leghold traps, Conibears, snares, and predacides cannot be used in the state unless there is demonstrable damage to property or when the public health or safety is threatened.

Police in Westminster, Cherry Hills Village, and Greenwood Village have asked Tri-County Health Department officials to declare coyotes as posing a public safety risk, so as to authorize use of leghold traps. During July, there has been rash of coyote incidents in the area involving attacks on pet dogs and cats. Parents of small children in all of the cities have been calling police, fearing an attack on their kids.

"For everyone who tells us the risk is great enough, another says we'd be in violation of the state constitution if we did," said acting health director Chris Wiant. "We met with the state Dept. of Health, attorney general, Division of Wildlife, and state and U.S. Agriculture Departments on this issue, but haven't been able to agree on whether it warrants an exception to Amendment 14." He concluded, "This is all new to us... But I can tell you, I don't want to be the first guy they come back to if some kid gets attacked."

—summarized from the *Rocky Mountain News*



The Editor thanks the following contributors to this issue: Lynwood Fiedler, Russ Mason, Don Stoker, and Stephen Vantassel. Send your contributions to The PROBE, 4070 University Road, Hopland, CA 95449.

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