BEHAVIOR

Human olfactory communication

Animals communicate sexual availability, individual identification and maternal attraction by smell. The human body has glands capable of producing pheromones or chemical communicators, and now there is evidence that humans can, to some degree, use olfactory cues the way animals do. This was shown in two sets of experiments conducted by Michael J. Russell of the University of California at San Francisco.

In the first experiment, 16 males and 13 females were asked not to use soap, perfume or deodorant for 24 hours. They were then given a clean T shirt to wear as an undergarment for 24 hours. The shirts were collected and each was placed under a wax-coated cardboard ice bucket in which a small hole had been cut through which the shirt could be sniffed. Each subject was then presented with three buckets and asked to identify by smell the shirt he or she had worn. Shirts from another male and another female were under the other two buckets, and subjects were asked to identify these shirts by sex only. In the April 8 NATURE Russell reports that 75 percent of the subjects, 81 percent of the males and 69 percent of the females, made correct responses on both parts of the experiment. This shows, he says, "that at least the rudimentary communications of sexual discrimination and individual identification can be made on the basis of olfactory cues."

In the second experiment Russell tested the ability of infants to respond to the odor of their mother's milk. While the infants were asleep (to avoid visual or auditory cues) breast pads were held near their noses. Each child was presented with a pad that its mother had just worn in her bra for three hours, one that another breast-feeding mother had worn and a clean pad. At six weeks of age, six of the ten infants tested responded to their mother's milk by turning toward the smell and making sucking responses. None responded to the clean pads, and only one responded (with a head jerk and a negative cry) to the strange mother's milk. The identification of a mother by her infant, Russell suggests, may not be a response to her odors but rather to odors placed on her by the infant.

Introversion, extroversion and stress

Performance efficiency has been found to be related to stress. Too much or too little stress is associated with reduced efficiency, while moderate stress is thought to lead to optimum efficiency. But not all people are equally susceptible to stress. One personality theory, for instance, identifies individuals as either introverts or extroverts, depending on whether their behavior shows more interest in inner or personal matters or in external, social matters. The theory suggests that under similar circumstances an extrovert might seek out arousal or stimulation while an introvert might attempt to avoid stimulation. Working within this theory, researchers at Northwestern University have shown that some forms of stress do affect introverts and extroverts differently. William Revelle, Phyllis Amaral and Susan Turriff report their findings in the April 9 SCIENCE.

A personality inventory was used to rate 101 students on a scale of introversion-extroversion. Then the students took three equivalent tests of verbal ability. The tests were given with no time limit, a very short time limit and with either placebos or pills that contained caffeine. As expected, with caffeine providing the stress or arousal, introverts and extroverts scored differently, especially when the test was given under time pressure. When treated with caffeine, introverts correctly answered fewer problems and extroverts more problems. "Caffeine-induced stress," the researchers conclude, "neither raises nor lowers average performance but rather increases the performance for some individuals and decreases it for others."

ENVIRONMENT

Losing ground

In the past, says Erik P. Eckholm of Washington's Worldwatch Institute, concern for environmental quality has focused on pollution of the air and water. A more serious problem, however, is declining productivity of farmlands in poor countries, and he summarizes his view of progress made in this area in the two-word title of his new book: *Losing Ground* (W.W. Norton).

Eckholm's study, supported by the United Nations Environment Program, concludes that such environmental problems as soil erosion, spreading deserts and increased flooding are too often neglected when development experts consider the worsening plight of Third World citizens. As their farms lose fertility, these people are often forced to abandon their land to search for livelihoods in already overcrowded cities. At best, they must rely more on the industrialized countries for more assistance.

Eckholm reiterates the problems of deforestation he developed in an earlier report (SN: 9/27/75, p.198), and he places the familiar Sahel desert-spreading story into the context of a global trend. But he also breaks some interesting new ground—at least in terms of topics that have not fully reached the public consciousness: Though only 10 percent of the world's people live in mountain highlands, nearly 40 percent live in the adjacent lowlands, so that fully half of mankind will be directly affected by changes in the mountain environment where soil erosion is increasing. The resulting silt is just one of the increasing number of threats facing farmers' water supplies—waterlogging and salinity due to improper irrigation are removing some half million acres a year from cultivation.

As tropical jungles are opened to a variety of new land-use schemes, the question of how to save the rather fragile tropical soils naturally arises. Eckholm points to the new science of "agri-silviculture"—rotating crops and trees—as deserving more attention.

What this all means is a continuing deterioration of life for the poorest of mankind: "The trends charted in this book do not point toward a sudden, cataclysmic global famine. What appears most likely, if current patterns prevail, is chronic depression conditions for the share of humankind, perhaps a fourth, that might be termed economically and politically marginal."

Pollution and the poor

Though it should come as no surprise, a study sponsored by the Energy Policy Project of the Ford Foundation has made it official: poor people suffer most from pollution in American cities. Results of the study are summarized in the March ENVIRONMENT magazine.

The urban poor, of course, live closest to the sources of pollution—power plants, industrial installations and the heaviest traffic. To quantify these effects, Washington, D.C., was divided into sections according to race, rent and income and correlations were taken with various pollutants. Taking carbon monoxide levels as an example, it was found that less than one percent of land tracts with families making over $7,000 (in 1969) suffered CO levels above the Federal standard, while 13 percent of tracts holding families below this level were afflicted.

One bright spot in the report: New pollution regulations not only lower the amount of noxious material ingested by all citizens but also seem to narrow the difference in exposure between classes. When Washington passed new regulations on incinerators, for example, the proportion of low-income neighborhoods suffering acute levels of particulate air pollution dropped from 80 percent to zero.