

Genetics of wolf communication

Key patterns of communication among wolves and dogs are apparently inherited and governed by simple genetic rules, researchers at the University of Connecticut have concluded. They say their discovery has important implications for understanding certain learning disabilities in humans.

With funds provided by the U.S. Public Health Service, Benson E. Ginsburg and his students in the Department of Biobehavioral Sciences are studying inheritance of behavior by crossbreeding different canid strains. Coyotes and red wolves, for example, threaten by lowering their heads and gaping with their mouths. Dogs, on the other hand, threaten by snarling. By crossing a "gaper" with a "snarler," the scientists were able to determine how these characteristics were inherited.

Pups raised in isolation developed typical threatening postures without having to be taught. By the second generation it was clear that the patterns of threat were inherited according to the same genetic rules that govern such physical characteristics as eye color.

Since the dog behavior is typical of young wolves, Ginsburg speculates that human intervention in their breeding had the effect of locking this canid strain into an immature stage of behavior. He also concludes that humans probably have some inherited component of their behavior, although it is not yet clear exactly which ones might be included.

A likely possibility, he says, is the way people perceive visual and oral patterns. Some reading difficulties, for example, seem to originate in a child's inability to recognize spatial patterns in the same way as most other children. This perception difference may be inherited, and one of Ginsburg's doctoral students is pursuing the possible connection in follow-up research.

Electrified bees

Static electricity picked up by honey bees as they fly to and from flowers may play an important role in pollination of the flowers and communication among the bees. Electricity may also be involved in other aspects of the behavior of bees, which pollinate more than 100 agricultural crops.

Eric H. Erickson, an entomologist with the Department of Agriculture's Research Service, in Madison, Wis., found that worker bees leaving a hive carry a slightly negative charge, while returning bees are charged positively. The electric field potential built up between a bee and a flower may be as great as 1.5 volts.

This electric field may cause the bee to attract pollen grains, Erickson says, increasing the efficiency of pollination. The strength of the field may also be involved in communication among the bees to locate flowers, since it varies with the distance to the flowers and with the amount of solar radiation. Approaching storms also affect the buildup of charge, and the bees respond by becoming more irritable.

New deep-sea bacteria?

One of the most urgent questions of ecology is what happens to petroleum waste that disperses and sinks to the bottom of the ocean. The hope has been that deep-sea microorganisms exist that can decompose it, but little is known.

A new instrument for sampling and incubating such organisms has now been developed by the National Bureau of Standards and the University of Maryland. Preliminary results indicate that the ocean depths are indeed inhabited by previously unrecognized species of microorganisms and that these do decompose petroleum—but only very slowly.

Arthritis: A viral cause?

From October 1975 to June 1976, 51 persons in Lyme, Conn., came down with what appeared to be rheumatoid arthritis. Because of the clustering of these cases and because the symptoms were preceded by an expanding skin lesion, it looked as if they may have been caused by a virus transmitted by an insect bite (SN: 6/19/76, p. 389).

Although trapping of insects in the Lyme area and follow-up lab tests have not yet uncovered a viral cause, two more outbreaks of possibly viral-induced arthritis were reported last month at the annual meeting of the Arthritis Foundation. Peter D. Utsinger of the University of North Carolina described three unrelated cases of respiratory illness caused by an adenovirus and followed by arthritis. Blood and joint fluid tests indicated a viral infection which disappeared when the arthritis subsided. Arthur D. Brawer and Edgar S. Cathcart of Boston University described a new arthritis syndrome in five patients in the Boston area. Analysis of joint fluids in these patients suggested that the syndrome was most likely caused by one or more viruses.

Emmanuel Rudd, consulting medical director of the Arthritis Foundation, believes that these reports should not be underestimated. He suspects that a virus might well play a key role in rheumatoid and other major forms of arthritis.

Computer diagnosis of birth defects

There are some 1,400 known kinds of birth defects, many so rare that a physician may not see even one case in his entire career. A worldwide computer system to provide physicians with rapid diagnostic information about birth defects has now been developed by the National Foundation-March of Dimes, Tufts-New England Medical Center and MIT.

A team of physicians and computer scientists are now conducting clinical trials of the system, which will help doctors everywhere to identify rare birth defect syndromes and alert them to unusual patterns in the occurrence of congenital disorders. The system is expected to be fully operational after a six-month test period.

The computer will enable a physician to submit his patient's symptoms to the information system. In seconds, the computer can request additional information, display diagnostic possibilities and supply other useful information on request, such as the probability of recurrence in future offspring. Available 24 hours a day, the computer will be hooked into the public telephone system, enabling physicians to dial the central processing unit from almost any computer terminal in any local hospital or other facility, transmit pertinent information about a patient with a birth defect and read responses displayed on the local terminal.

Nationalities prone to certain bacteria

Different types of bacteria were responsible for diarrhea among students of different nationalities at a Mexican university. Herbert L. Dupont and colleagues at the University of Texas Medical School and Hospital Infantil de Mexico found disease-causing *Escherichia coli* particularly important in recently arrived U.S. students, less important in U.S. students who had lived in Mexico for a year and not an important cause of diarrhea among Mexican and Venezuelan students. Several strains of shigella were also associated with illness primarily among U.S. students. A higher proportion of Latin American students, however, were infected with the bacterium *Giardia lamblia*. The authors conclude in the Dec. 30 NEW ENGLAND JOURNAL OF MEDICINE that intestinal immune mechanisms are likely to be responsible for the differences.