

BIOLOGY

Cooling hot-headed dinosaurs

On the heels of a recent suggestion (SN:10/14/78, p. 259) that the bony head crests of duck-billed dinosaurs, or hadrosaurs, might have been resonant cavities comes another possibility: The crests may have helped cool the creatures' brains.

The central nervous system, topped off by the brain, is quite temperature-sensitive. Mammals reduce the heat as blood, heated by the brain, transfers its warmth to air flowing through the vessel-enriched nasal passages. In reptiles, heat evaporates from the floor of the cranium and into the oral cavity. Dinosaurs had to keep cool heads, too, says P. E. Wheeler of the University of Durham in England, and he suggests how.

The hollow crests of hadrosaurs, for example, were part of the animals' air passages. Air entering the enlarged space may have cooled the brain directly by carrying heat conducted through the cranium and indirectly by evaporating heat from a blood-vessel enriched mucosal lining. The large external nares high on the skull of the *Brontosaurus* also offered a large evaporating surface, says Wheeler, and were well positioned to cool the brain directly. Like those of modern day bison, the horns of ceratopsians such as *Triceratops* seem to have been covered with blood vessels. Blood cooled by convection on the surface of the horns and returned to the head could have contacted and cooled arterial blood entering the brain. Other structures, like the bony plates running down the backs of *Stegosaurus*, may have cooled the spinal cord, he suggests in the Oct. 5 NATURE.

Controlling nematodes naturally

Years ago, Lovell peach was used as rootstock for grafting in California peach orchards. When peach growers found it was easily infested by parasitic worms called root-knot nematodes, they abandoned it in favor of a less susceptible strain.

A survey of old San Joaquin Valley orchards started from Lovell rootstock, however, showed unexpectedly low root-knot nematode populations. Further investigation by researchers at the University of California at Riverside revealed "one of the first documented examples of biological control of a plant-parasitic nematode... by a naturally occurring antagonist." The nematode eggs were parasitized by a newly found species of fungus called *Dactylella oviparasitica*, according to a report in the September CALIFORNIA AGRICULTURE, published by the University.

Researchers Graham R. Stirling, Michael V. McKenry and Ron Mankau found *D. oviparasitica* widespread in the San Joaquin Valley. The fungus attacks the nematode egg masses as they protrude into the soil from galls on the roots and occasionally grow into the female nematode lying within the root. The fungus was not as successful on Thompson seedless grapes where nematode egg production lasts longer and forms larger egg masses. The researchers therefore conclude that the parasite will most effectively reduce nematode population in hosts like the Lovell peach, which support relatively small egg masses.

Some beetles play possum longer

The flour beetle, *Tribolium castaneum*, not only infests grains, it plays dead to avoid its predators. And, depending on where it's from, one strain of beetle will feign death longer than another, according to research at the University of Chicago. Using beetles from Chicago, Arkansas, Japan and Spain, Leslie Prohammer found individual beetles will play possum as long as 35 minutes. Average times for the five strains ranged from three and a half to twenty-two seconds, indicating a geographic difference in behavior and possibly "a more active predator in one locale." Cross-breeding the strains may reveal a genetic basis for the behavior, Prohammer says.

BEHAVIOR

'Do you, Mr. Spock, take . . .

It wouldn't exactly be made in heaven but it would have at least a 50-50 shot at working. That's the major advantage of Matesim, a computerized system that analyzes how a potential marriage might work out. Developed by University of Utah sociologists Gerald Smith and Jerry Debenham, Matesim utilizes a Univac 1108 computer to analyze 108 different question categories, according to the Oct. 9 COMPUTERWORLD.

Each respondent is asked about marital values and expectations, general value systems and what they would like to see in their prospective partners. The program includes questions about physical attractiveness, television viewing habits, job mobility, child discipline, goals, ambitions, attitudes toward life, class association and self-confidence.

The computer system then compares the responses of two potential marriage partners to each other and to marriage standards compiled from the collective opinion of social workers and psychologists who made their own assessments about what is important to a successful marriage.

Taking all three areas into account — the counselors' standards, proximity of the potential husband or wife to the respondent's ideal and closeness of the partner to the respondent's values — the computer then predicts the course of the marriage. If the couple is in conflict in 50 percent or more of the areas, the marriage would not be a predicted success.

Debenham and Smith have already begun to distribute the simulation program to other universities and nonprofit institutions. The program may be modified in certain cases, depending on the users' orientation, they say. For example, Brigham Young University officials changed many of the questions relating to sexual values to questions about spiritual values.

The cocaine high: In the blood

Recent studies have indicated that the psychological high from cocaine does *not* occur when the drug's concentration in the blood plasma is at its peak. However, a new study of 10 volunteers in Illinois sharply disputes the previous findings. Researchers at the Illinois State Psychiatric Institute and the University of Chicago Department of Psychiatry report in the Oct. 13 SCIENCE that the subjects experienced their maximum highs when plasma concentrations were also high. "The suggestions that physiological and subjective changes after cocaine administration are not related to plasma levels are not supported by this experiment," they report.

A.A. survey: More young alcoholics

If Alcoholics Anonymous membership is an indicator, more and more younger persons may be having serious drinking problems. In a recently completed survey of its 17,000 members, AA reports that the percentage of alcoholics in the under-30 age group has risen from 7.6 percent in 1974 to 11.3 percent in 1977. The survey also shows:

- A general increase in alcoholics who are also addicted to drugs. In the under-30 group, 43 percent said they are also addicts; overall, 18 percent said this was the case. Twice as many women as men indicated multiple addiction upon entering AA.
- Females comprise 29 percent of the members, compared to 22 percent in 1968.
- Members still say the influence of present AA members is the most important factor in recruiting new members. However, the role of outside counseling and treatment has increased sharply.
- As in the past, the longer the period of sobriety reported, the better the chances for continued sobriety.