with the 17-member group. "Although the group was quite diverse, it would appear that on the whole they fared well," the researchers report. "Prediction of psychosis and high suicide rates for transsexuals in the earlier literature are certainly not borne out." Meyer of Johns Hopkins declined to comment on the study.

The study found that between 60 and 70 percent of the transsexuals either improved or stayed at a high level of psychological functioning. "While there were gains in the areas of sexual adjustment and family acceptance, there were only modest gains in the ability to be self-sufficient financially and establish closer interpersonal relationships," they report. In addition, Minnesota Multiphasic Personality Inventory scores indicate that "the overall personality styles of these individuals have not changed.... One of the first, and perhaps most remarkable impressions drawn from comparing these testings, separated by more than 8 years, is how similar they are."

Although the transsexuals were "struggling with intimacy and economic problems and exhibited few changes in degree of psychopathology" eight years after their surgery, they "were very satisfied with their decision to have surgery and with their course following surgery," the researchers report. "If one were to judge solely by the patients' own opinions, the overwhelming conclusion would be that surgery is an extremely beneficial procedure. In spite of the considerable pain, expense and delay, they would all choose the same course." Hunt and Hampson reiterate that "in our judgment, one can increase the likelihood of a favorable outcome for the surgically reassigned transsexual by selecting candidates on the basis of their presurgical ego strengths and their adjustment during the presurgery period while living in their new gender/sex role." □

Magnesium and heart deaths

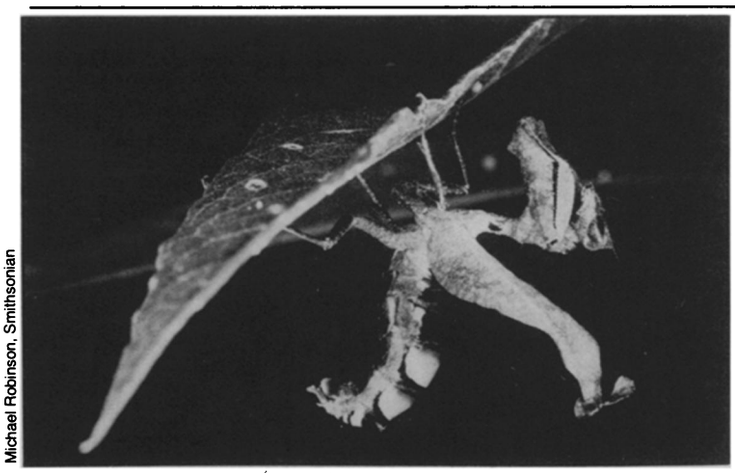
A link between soft drinking water and cardiovascular deaths was made several years ago (SN: 9/11/71, p. 175). And it has become apparent since then that the culprit is not some element in soft water, but rather an element in which soft water is deficient — magnesium. Now the latest piece of evidence linking magnesium deficiency in soft water with heart deaths is reported in the April 11 SCIENCE by Prasad D.M.V. Turlapaty and Burton M. Altura of the State University of New York Downstate Medical Center in Brooklyn.

Several scientists have noted that there are lower than normal levels of magnesium in the heart muscles of sudden heart death victims. This discovery, along with the finding that soft water is deficient in magnesium, made Turlapaty and Altura wonder whether magnesium deficiency might cause spasm of arteries feeding blood and oxygen into the heart and leading to heart failure and sudden death.

They isolated coronary arteries from dogs, incubated the arteries in solution, then exposed them to normal, high or low concentrations of magnesium. They report that low magnesium levels increased artery tone compared with that exerted by normal magnesium levels, and high magnesium concentrations decreased artery tone. What's more, low magnesium concentrations caused the arteries to respond much more to body chemicals that constrict coronary arteries than did normal magnesium concentrations, while high magnesium levels made the arteries respond much less. "Thus our results," Turlapaty and Altura conclude, "which demonstrate that reduced magnesium in the coronary vasculature environment exerts profound influences on coronary vascular tone and reactivity, support the hypothesis that hypomagnesemia could produce progressive vasoconstriction, resulting in coronary arterial spasm and, finally, sudden-death ischemic heart disease."

But exactly how does magnesium deficiency lead to coronary artery spasm at the cellular level? Turlapaty and Altura aren't sure, but research by other scientists suggests that extracellular calcium and intracellular concentrations of the intracellular messenger cyclic AMP may serve as go-betweens. For instance, when the influx of magnesium into artery muscle cells is lowered, it has been found to make calcium flow into the cells in abundance and to cause artery muscle contraction. Also, magnesium has been noted to activate an enzyme involved in cyclic AMP synthesis, and cyclic AMP is known to be involved in coronary artery contraction. □

Narrow window on sex



Michael Robinson, Smithsonian

Only for 20 minutes, between dawn and sunrise, does the female praying mantis assume a mating posture. Here she hangs, abdomen curled enticingly, beneath a leaf.

When an animal's best defense is mimicking a dead leaf, vigorous though necessary activities such as mating are risky. A tropical species of praying mantis sidesteps this danger by mating early enough to beat even the early bird. Michael Robinson and Barbara Robinson of the Smithsonian Tropical Research Institute in Panama report that the mantis *Acanthops falcata* copulates only during a 20-minute period between dawn and sunrise.

Efforts to raise the tropical praying mantises in captivity had been frustrated by the insects' refusal to mate "at civilized hours of the day," Michael Robinson says. The mantises were kept apart at night to prevent cannibalism and were put together at times from 8 a.m. until late at night.

The trick to mantis-mating was found when the Robinsons' young puppy insisted on being taken for a walk early one morning. "All of a sudden, at dawn, we noticed that all the males within the large outdoor cages became unusually active," Michael Robinson says.

When the biologists introduced female mantises into the cage, just before sunrise, the females raised their wings and curled their abdomens, exposing glands that seem to release a sex attractant. The males settled close to the females, then jumped the last few centimeters and grasped a mate with their legs. The mantises do not mate at night, although it might be safer, because the final leap of the male onto the female is mediated by sight, Michael Robinson speculates. The male must jump accurately to avoid being seized and devoured by his intended. The Robinsons, however, observed little of the expected cannibalism during copulation.

Dark-to-light transitions trigger the brief matings, the Robinsons find. When they reversed normal light and dark periods in an environmental control chamber, the insects adjusted their sexual activity within three days.

Daily "narrow time windows" of behavior may turn out to be a rather general principle of animal survival, Michael Robinson suggests. "There well may be a 'diary' of biological activity in the tropics that is largely unconsidered and certainly uninvestigated," he says. □