# Sodium bicarb use questioned

When the body is in serious trouble — after a heart attack or during liver failure, for example — the blood becomes acidic. And since acidic blood is life threatening, doctors commonly treat the condition by injecting a base, sodium bicarbonate.

"It seems intuitively reasonable that if you have acidosis, giving a base will make it better," says Allen I. Arieff of the University of California at San Francisco. But the effects of sodium bicarbonate have never been adequately tested in clinical experiments, and animal experiments show it may actually make the situation worse, he says. At the recent meeting of the American Society for Clinical Investigation (ASCI) in Washington, D.C., he described the ill effects of injecting sodium bicarb and suggested a substitute that has proved effective in animal and human trials — another alkaline chemical called dichloroacetate.

The acidity in acidosis comes from lactic acid, a "dead-end waste product," Arieff explains. The body usually can metabolize 10 times more lactic acid than its tissues can produce, except when there's not enough oxygen. Then the process fails and potentially lethal lactic acidosis results.

In previously published work, Arieff and his colleagues compared the effects of sodium bicarbonate, sodium chloride and no treatment in dogs made acidotic by limiting their oxygen intake. The sodium bicarb *increased* lactic acid concentrations, more than did sodium chloride or no treatment. The lactic acid increase led to lowered blood pH and bicarbonate levels — the opposite of what was desired — and hindered heart function. "Doing nothing was much better than giving bicarbonate," Arieff says.

At the ASCI meeting, Arieff described what happened when acidotic dogs were given dichloroacetate, which stimulates an enzyme involved in maintaining the proper acid-base balance. The chemical increased blood pH and bicarbonate levels, held lactic acid levels steady and improved heart function.

Paul Rosen, a clinical research associate at Abbott Laboratories in North Chicago, one of the major producers of sodium bicarbonate for acidosis, says, "There may be validity to what they're saying. Whether you can extrapolate to humans is another question. But I wouldn't want to throw away sodium bicarbonate as a treatment of metabolic acidosis."

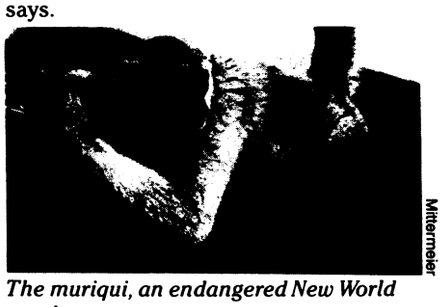
At the University of Florida in Gainesville, Peter W. Stacpoole and his colleagues have begun limited human trials of dichloroacetate. "There's increasing evidence it [sodium bicarbonate] may not [always] be beneficial," says Stacpoole, "though it flies in the face of years of experience. I think it's time to seriously re-evaluate the role of bicarbonate treatment in lactic acidosis."

Initial results with dichloroacetate look promising, he says, but the larger controlled clinical trials that weren't done with sodium bicarbonate are needed for the new drug. "You could make the same kind of criticism about dichloroacetate as with sodium bicarbonate at this time," says Stacpoole. "Dichloroacetate is still an experimental drug." —*J. Silberner*

# Funding for humans' closest relatives

The Washington, D.C.-based World Wildlife Fund-U.S. this week launched an international campaign to raise $1 million to save diminishing wild populations of nonhuman primates.

The fund is focusing on three groups: the lemurs of Madagascar, the great apes of Africa and the New World monkeys, mostly in Brazil. Many species are dwindling so fast that one in seven could be extinct by the end of the century, says Russell Mittermeier, director of the fund's Primate Program. Some species, such as the golden lion tamarin, may survive through captive breeding and later release into the wild (SN: 3/3/84, p. 140). For others, preservation of tropical rain forests, in which more than 90 percent of all nonhuman primates are found, may be the only chance for survival, Mittermeier says.



Mittermeier

*The muriqui, an endangered New World monkey.*

The organization will use the money — which it hopes to get from private sources — to set up or revamp national parks in countries like Brazil and Madagascar, with large primate populations, and to establish educational programs for local people. The educational effort is important, says the fund's president Russell Train, because "conservation that doesn't engage the self-interest of local people is not going to work."

A main reason for saving the world's nonhuman primates is that they are a valuable model for studying the behavior of a close relative — humans. Jane Goodall, whose studies of chimp behavior for the past 25 years at Tanzania's Gombe Stream Game Reserve have helped establish such a model, was named honorary chairperson of the campaign. —*D. D. Bennett*

# Prehistoric diets: Down to the bone

Several scientists have proposed, quite reasonably, that prehistoric hunter-gatherers moved back and forth between coastal and inland camps in order to exploit seasonally abundant food sources. New evidence indicates, however, that some humans living from 2,000 to over 8,000 years ago on the southwestern Cape of South Africa did no such thing.

Measurements of food intake, reflected in stable carbon isotope ratios of human bones from that time period, suggest that there were distinct coastal and inland populations that did not travel great distances during the year. This surprising finding casts doubt on assumptions about the diets of hunter-gatherers elsewhere, say archaeologists Judith C. Sealy and Nikolaas J. van der Merwe of the University of Cape Town in South Africa.

All previous archaeological evidence in the southwestern Cape pointed to summer occupation at inland sites and winter occupation in caves near the ocean. Prehistoric inland deposits are rich in the remains of plants that are best eaten in late summer; also present are the bones of tortoises, which are most active and easiest to collect in summer. Coastal sites contain remains of limpet and mussel shells, which are safer to collect in the winter, when they are less likely to be rendered toxic by outbreaks of a minute type of poisonous algae. Nearly all the jaws of Cape fur seals found in these camps are those of yearlings that died in summer months (the seals are born in November).

The South African researchers took a closer look at these and other foods known to be important to prehistoric humans in the southwestern Cape. By calculating the ratio of stable carbon isotopes in a wide array of coastal and inland foods, they found that a marine-based diet has an isotope "signature" substantially different from a land-based one.

They then measured isotope ratios in the bones of 18 prehistoric human skeletons, 14 of which were uncovered at coastal sites and 4 at inland mountain deposits. A seasonally shifting population would have had similar ratios falling between the marine and terrestrial "signatures," assert the researchers in the May 9 NATURE. Instead, the coastal skeletons reflect a predominantly marine diet and the mountain skeletons an almost entirely land-based diet. Thus, say the investigators, a nonmigratory pattern of life appears to have characterized these people.

The sample is too small to identify subgroups that may have seasonally migrated, they add, but the further use of isotope ratios in South Africa and elsewhere will provide important food for thought about prehistoric diets.

—*B. Bower*