

OUTER LIMITS

Modern science is proving that primitive medical practices may not have been so primitive after all

What the Witch Doctor Knew

BY KATHLEEN MCAULIFFE

Witchcraft, wives' tales, and old medical lore have rarely penetrated the high-tech world of modern medicine, but Robert Root-Bernstein, Ph.D., a physiologist and historian of science at Michigan State University in East Lansing, would like to change that. The thirty-eight-year-old scholar claims that ancient physicians were not as ignorant and misguided as has been widely assumed. According to Root-Bernstein, further study of bloodletting, balms of Gilead, and many other discredited healing techniques and remedies of the past may yield fresh approaches to the treatment of cancer, heart disease, and still-prevalent infectious illnesses.

Root-Bernstein, a recipient of a MacArthur Foundation "genius" grant, is the author of *Discovering* (Harvard Universi-

ty Press, 1989), in which he explored the ways scientific knowledge advances. While researching the book, he encountered a mystery that kindled his fascination with folk cures. Wading through medical archives, Root-Bernstein was struck by how often members of ancient cultures survived devastating injuries despite the absence of any antiseptics or antibiotics to protect against infection. In the Andes the Incas even managed to perform trephination (surgically opening the cranium) without killing the patient, for many Incan skulls show new bone growth over gaping holes. How, over millennia of hunting, warring, and flesh-piercing rituals, Root-Bernstein wondered, had so many of the wounded escaped falling prey to an army of lethal microbes?

A reference to an Egyptian surgical papyrus written in 1700 B.C. yielded a clue. The



Long scorned as an outmoded folk remedy, leeches are now used to hasten healing after microsurgery.

document recommended packing injuries with honey. Further research revealed that such sugar remedies were used by many peoples—from the Aztecs of Central America, who coated wounds with the syrupy sap of the maguey plant, to medieval Europeans, who called their sweet pastes "balms of Gilead."

To Root-Bernstein, it seemed reasonable that the dressings might have an anti-



The medical techniques detailed in old wives' tales may have had a soothing effect—even if the wives didn't.

septic function because bacteria can't live in high concentrations of sugar. But only scientific data could resolve the matter. Scanning contemporary journals, he found reports that confirmed his hunch. The strongest evidence came from Richard A. Knutson, an orthopedic surgeon in Greenville, Miss. In 1975 Knutson had tried sugar packings as a last resort to treat elderly patients with festering bedsores that had resisted every known antibiotic therapy. The strategy had been suggested to him by an old nurse, who recalled that doctors in the deep South had used sugar dressings with great success in the era before penicillin. Knutson himself was skeptical—until he saw the results: Virtually all the bedsores healed. Since then, Knutson has used sugar dressings to treat more than 7,000 patients with wounds that are particularly susceptible to infection, such as severe burns, open fractures, and surgical incisions. The treatment, he reports, reduces the need for skin grafting by 98 percent, cuts healing time by one third, and dramatically diminishes scarring.

That knowledge fueled

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Root-Bernstein's admiration for the healing arts of the ancients, and he became an avid collector of old medical lore. Of course no one, including Root-Bernstein, is advocating that modern physicians—or patients—adopt the medicinal practices of the past indiscriminately. But Root-Bernstein believes "primitive" cures might hold clues to "new" and more effective remedies. "If we dust off and appraise this heritage with the benefit of hindsight," he says, "we will find it full of rich observations and insights."

Consider phlebotomy, or bloodletting, a technique widely practiced from Greece's classical period to the Renaissance. Today's physicians can scarcely conceive of a more barbaric treatment. But if we are to believe Root-Bernstein, bloodletting may eliminate fever—the very application for which it was prescribed by its earliest and most ardent proponents. For example, in an ancient medical text, the Greek physician Galen describes bleeding a young man to relieve his acute fever, achieving such rapid results that onlookers gasped, "Man, you have

slaughtered the fever!"

Now, almost 2,000 years later, the validity of such practices has been bolstered by the research of Norman W. Kasting, a physiologist at the University of British Columbia in Vancouver. For the last few years, Kasting has been investigating the properties of arginine vasopressin, a neurotransmitter that helps control body temperature. He found that when animals hemorrhage, the drop in their blood pressure is detected by their brains, which respond by releasing vasopressin. To study how this chain of events affected temperature regulation, Kasting induced fever in animals and then bled them. The fever vanished as vasopressin levels in the brain climbed.

In addition to lowering body temperature, bloodletting may strengthen resistance to disease—again, it is suspected, through the action of vasopressin, which can also stimulate certain immune functions. "Conceivably," argues Root-Bernstein, "a closer look



Bloodletting may lower body temperature—and boost immunity. at phlebotomy could suggest better ways to treat and prevent illness."

Sometimes science has to advance before the signifi-



Some of the shaman's potions warrant serious study.

cance of old remedies can be appreciated. In the course of physiological research, Root-Bernstein recently began experimenting with adjuvants—harmless microbes or chemicals that are added to vaccines to boost immune response. After seeing how adjuvants work, Root-Bernstein was able to make sense of a folk cure that had previously baffled him. The treatment, practiced in the United States as recently as the last century, consisted of swathing injuries in a poultice soaked in hot

water, charcoal, and yeast. Wrapping a wound in a dirty rag may sound counterproductive, but as Root-Bernstein now surmises, the yeast

probably stimulated the body's defenses in the same way modern adjuvants do, while the hot charcoal sterilized the wound and soaked up toxins produced by infectious organisms.

As a consultant to the pharmaceutical industry, Root-Bernstein is now urging chemists to study lesser-known herbs and other natural compounds whose curative properties have been extolled by witch doctors, shamans, and other traditional healers. There is an urgency to his exhortation, for both indigenous peoples and the plants and animals from which they have harvested a cornucopia of drugs are rapidly vanishing under the juggernaut of advancing civilization. Through contact with Indians of the Amazon basin and Central America, one new company, Shaman Pharmaceuticals, Inc., of San Carlos, Calif., has already identified a weedlike plant that has shown promising antiviral properties against herpes and respiratory infections such as influenza. The drug, made of a chemical called SP-303, has entered human clinical trials and may be marketed as soon as 1994.

Nor is this success story unique. The majority of today's most popular remedies—from aspirin to the heart medication digitalis—originated in old wives' tales and tribal lore. "If we can overcome our prejudice toward primitive people," says Root-Bernstein, "we may find the seeds of many more medical advances buried in the past." ■