

This series of essays explores lessons and observations from fieldwork that might be of interest to the integrative medical community. In this context, the authors discuss "new" or less celebrated botanical medicines and unique healing practices that may contribute to the further development of contemporary integrative medical practices. Perhaps this column can facilitate an appreciation for our own roots and those of other cultures, before such ancient wisdom disappears forever.

SNAKEBITE, SHAMANISM, AND MODERN MEDICINE: EXPLORING THE POWER OF THE MIND-BODY RELATIONSHIP IN HEALING

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The deadly snake, feared by all *Llaneros*—those who inhabit the Colombian savanna region known as the *Llanos*—lay curled under a small shrub, ready to strike at anything that moved. It was late in the evening, in this warm and wet part of the world, and the snake was seeking nocturnal quarry, directing its head toward anything that its heat-sensing nostrils could detect. This snake, locally called the *montonosa*, possesses a particularly deadly form of venom and is aggressive in nature. It was the early part of the rainy season, in May, when humans are commonly bitten by this snake, with deadly consequences.

The young Guahibo hunter was hoping to feed his family by killing a deer that night, or, if he were lucky, a larger animal that might feed his village. He was hunting with a traditional bow and arrow, the former constructed of palm wood, strong, dense but resilient, and the latter of a local reed. A carefully filed and shaped aluminum knife, the gift of a missionary, formed the tip of the arrow. Fixed behind the blade was a small ball of wood, secured with twine woven from the leaves of a palm tree and coated with beeswax. This modification of the arrow would ensure that the blade, once it entered its quarry, would not go through completely. The ball would stop the arrow's tip, once it had entered 6 inches or so into the animal, causing the wound to stay open, thus leaving a trail of blood. The hunter would follow this trail, if necessary, throughout the night and into the next morning, until the animal died or tired and could be captured.

The Guahibo are the traditional inhabitants of this region, a part of Colombia. They move back and forth between it and Venezuela, which shares the *Llanos* habitat on the fringe of the Orinoco Valley. The Guahibo are a nomadic people, until recently moving in bands along trails in the savannas and gallery

forests that form along the small streams and rivers that traverse the region. In the past, they rarely slept in the same place for an extended period of time and made small camps as they walked through their lands. These people are remarkably stoic. I (M.B.) was told that Guahibo women, when ready to give birth, leave the band for a few hours, find a stream, and deliver their babies themselves while squatting, catching up shortly thereafter with their group. Today, however, many of these people are no longer nomadic and have settled into permanent sites.

As the young hunter crossed a hunting trail, following the piercing beam of light from the moon that moved in and out of the clouded sky that night, he stepped near a small bush, under which the *montonosa* lay curled in a small compact circle, ready to strike. In an instant, the hunter became the quarry, as the snake sensed the human's body heat, which stood out against the evening chill. It happened too quickly for the hunter to react in a defensive way; as the snake sank its fangs into the man's right leg again and again, he screamed out, first in surprise, then in fright, and finally in agony. His 3 companions heard the screams and turned toward their friend, knowing immediately what had just happened. Instinctively, one of the men drew his machete from its leather sheath and killed the snake, striking it just behind the head, severing it from the long, thick body. The others immediately attended to the victim. They all knew that the most frequent outcome of this kind of snakebite is a slow and painful death. They bandaged his leg and began to help him walk toward their village. When the pain became so great that he could no longer walk, they hoisted him on their shoulders, as they had hoped to carry their quarry that evening.

The man's condition was deteriorating so rapidly that they decided to take him to a small field hospital in the region that was built to serve the settlers and indigenous people of the area. Twenty-four hours later, they reached the hospital at Las Gaviotas that was directed by a young Colombian physician, Dr Magnus Zethelius. As described by a paper subsequently published by Zethelius and Balick,¹ the patient was in very poor condition—pale, confused, and incoherent. His blood pressure was 90/50, pulse 100, respiratory rate 32 (twice normal), and temperature 36.2°C. He presented with severe edema (generalized

swelling of the body) and excessively low blood pressure causing cyanosis, a state of extremely poor oxygenation. There were numerous blood-filled vesicles, and the liver was enlarged, with edema of the abdominal wall present on the inferior and right side of the abdomen. Petechia (signs of hemorrhage on the skin) were found on the tongue and mouth, and a test of the man's urine revealed marked hemoglobinuria (blood in the urine) and proteinuria (protein in the urine). Both local and systemic effects of massive venom poisoning were present, signaling a poor prognosis for this patient.

Immediately, Dr Zethelius administered, both intravenously and intramuscularly, sufficient antivenom to neutralize 200 mg of toxin. Liquids were also given intravenously, as well as tetracycline and dipyrone.² The patient manifested a state of toxic delirium and had to be immobilized.

As the authors reported in their paper, the patient's prognosis was very poor, and it was not possible to transport him to a larger facility. As his condition worsened, a Guahibo shaman who was a patient in the center walked over to the patient, looked him over carefully, recognized the signs and symptoms of snakebite, and then turned to Dr Zethelius. The shaman explained that he was experienced in treatment of snakebite and that, in fact, the patient did not understand the Western-trained physician's regimen of care. Instead, the shaman suggested that he complement the physician's treatment with a traditional Guahibo therapy, the "smoke-blowing treatment." Because Western medical theory was, at that time (1978) still alien to the Guahibo, and because Dr Zethelius recognized the importance of traditional medicine in his practice, he gave the shaman permission to treat this patient.

"... [H]e [the shaman] asked for three cigarettes (*Nicotiana tabacum*). Upon lighting the first, he began a monotonous chant similar to the song of a nocturnal bird, as follows:

'... Uculi, Uculi, Uculi
'Uruba, Uruba, Uruba
'Chogue, Chogue, Chogue ...'

He began by chanting this song towards the head of the patient and, upon finishing, inhaled the smoke deeply to expel it toward the patient's head. This procedure was repeated with the arms and the legs. Subsequently, the shaman requested a cup of water, in which he extinguished the cigarette and left it to soak. While continuing the same chant, he sprinkled this 'tobacco water' on the patient's

head and extremities. The entire procedure lasted a half hour. During the first few minutes of the ritual, it became very clear that the patient was becoming calmer. This might be explained by the improved hydration and/or previously administered analgesics. However, resultant effects such as these are not usually observed so quickly or so drastically in the many similar cases of snakebite treated with conventional medicine at the 'Las Gaviotas' hospital. We are led to conclude that the smoke-blowing treatment had a strong psychological effect on the patient. Within minutes after completion the patient relaxed and his vital signs returned to normal despite that objectively he was in a toxic state. Subsequently, the patient's general condition improved and

within four days the problem was confined to the leg.... His ultimate survival, in our opinion, reflects the patient's strong belief and trust in traditional shamanistic medicine.... Doubtlessly there are many valuable lessons to be learned from first-hand ethnopharmacological observations by qualified observers. Research such as this appears a virgin but fertile field of scientific investigation in a poorly understood area."¹

This case report, published in 1982, attracted little attention from readers in the United States or Western Europe. However, I (M.B.) received nearly 600 reprint requests from Eastern Europe, South America, and Asia. These were areas where, at that time, practitioners and researchers were fascinated with the potential of the mind-body relationship in healing. For me, the experience of

working with the Guahibo people and observing their shamanic practices was extraordinarily fascinating and intellectually rewarding. It was the birth of my interest in the mind-body relationship, living proof that it existed, and of its strength. Western medicine has come very far in its thinking since that week in May of 1978.

Today, the Guahibo comprise a population of 20000, of which the majority still live in Colombia around the Orinoco River area. The culture is now in an intermediate stage of "modernization"—the people speak their own language, but 50% are now fluent in Spanish. This is often the case with traditional cultures around the world that must succumb to the need to negotiate with the outside world. The Guahibo, originally nomadic hunter-gatherers, have now become fishermen and agriculturists. Originally, traditional dress was made from the cloth of pounded palm fibers—a process rapidly becoming a lost art³ as the majority of the members use cotton or other fibers for their daily clothing needs.



Guahibo hunter in the Elanos of Colombia, ca 1976. Photo courtesy of M. J. Balick.

Within the field of Western medicine, the separation of the mind and the body was established in the 17th century. “[O]riginally this separation provided those interested in the workings of the body (e.g. anatomy and physiology) the freedom to explore while preserving for the church the domain of the mind.”⁴

This case study of Guahibo ethnomedicine demonstrates what most traditional medical systems still appreciate: a healing paradigm that honors the mind, body, spirit, and community. This dramatic episode is a reminder, once again, of the importance of the mind in the healing process.

Today, 2 decades after this case was observed, the power of the mind to influence the trajectory of healing is more understandable. In the 1980s, Candice Pert and her colleagues introduced the concept of a psychoneuroimmunologic network in which neuropeptides (short-chain amino acids) served as messengers extending to every cellular corner of the body.⁵ The approximately 80 neuropeptides known to exist are messengers possessing receptors that saturate the hippocampus and amygdala, centers of the brain associated with emotion. These receptors have also been found in the heart and in the digestive, endocrine, and immune systems. Additionally, receptor-rich areas containing clusters of neuropeptide receptors, or “nodal points,” have been identified where nerve cells are transmitting information from the skin and other organs by synaptic contact to the central nervous system.⁶ Thus it appears that 2 networks—1 “hard wired” and 1 biochemical in nature—exist side by side, bringing information to and from the brain and other organs. This finding denies the preconception that biochemical substrates of thought and emotion require “linear, hard-wired channels of neurotransmission.”⁶ Learning of this neuron-free, biochemical network makes one realize that the complexity of how and when the body communicates within itself is multilayered and perhaps simultaneous. The implications of these findings have provided a way for science to link emotions with the millions of physiological processes within the body.

On a microcellular level, correlations with emotion, immunity, and healing continue to be studied. Due to their very complex nature, these correlations have not been fully elucidated. However, stress in its acute and chronic states has been linked to natural killer (NK) cell activity. NK cells, specialized cells that seek out and destroy foreign invaders in the body, appear to be depressed with long-term exposure to stress.⁷ Shavit and colleagues were able to show that rats receiving repeated, prolonged, and intermittent (but not brief and continuous) foot shocks created suppression in NK cell activity.⁸ Furthermore, this suppression seemed linked to endogenous opioid peptides released during the stress. In later studies,⁹ Shavit was able to create similar suppressions of NK cell activity with injections of morphine and block these effects with naloxone, a morphine antagonist. Findings in humans reveal numerous comorbid effects in those exposed to stress. In 1 study comparing immune markers in Japanese males with a past history of posttraumatic stress disorder (PTSD) but known to be in remission, the subjects had their T cells, NK cell activity, and total amounts of

IFN- and IL-4 measured. All markers were significantly lower than those in the subjects’ matched controls despite subjects’ recovery from PTSD.¹⁰ In the discussion portion of their article, the authors commented that despite their findings, a follow-up study should be done to examine ongoing distress among former PTSD subjects.

Indeed, the effects of stress are modulated by the perceptions of those who are under stress. In many studies, those who feel they have a degree of control over their circumstances seem to fare better. One study done at Yale–New Haven Hospital, involving patients about to receive coronary bypass surgery, divided patients into 3 groups. Subjects in 1 group were given little information on their outcomes but were asked what their expectations were. Subjects in another group were given basic information about the surgery, including the aftereffects. Subjects in the third group were given detailed information on the procedure and instructions on how they could exercise control over their bodies. The results showed that the third group used half as many painkillers and had reduced stays (by several days) in the hospital compared to the other 2 groups.¹¹

Back at the hospital in Colombia, the young Guahibo patient recovered, but his leg began to develop gangrene. The smell was so bad that other patients in the hospital told him he should leave, as the doctor most certainly would have to cut his leg off. In a panic, he disappeared one day, hiding out in the surrounding forest, terrified that without a leg, he would no longer be a person, a hunter, and a man. During the several days that he was in hiding, the condition worsened, such that the prediction by the other patients was realized—a few days later he was found and the leg had to be removed to save his life. Ultimately, however, he was fitted with a prosthetic device and returned to his village, fully able to walk in the forest.¹² This most interesting case raises many issues, some of which are only now beginning to be addressed through pioneering work and medical interest in mind-body healing. Clearly, the ritual of the shaman aided in the patient’s improvement. The quest to understand the mechanisms of such healing—be they biological, physiological, psychological, or a combination of many factors we have yet to describe—will take those who choose this path on a most extraordinary journey, back to the past and into the future. Tragically, as elders pass away, they leave few apprentices, and the nature of shamanism bequeathed today resembles its original form in the same way that the true haute cuisine of France resembles what is served by popular hamburger chains in the United States. Bits and pieces of ritual are incorporated into the mix, and what takes decades to learn, through the most difficult of apprenticeships, is conveyed over a weekend. Does this set the integrative movement back by providing ammunition to its critics, or help propel it forward by introducing new perspectives to its practitioners?

Respect for the values and lessons of traditional cultures includes the obligation to give back to those cultures, in meaningful ways that we have not yet learned. Nettle and Romaine, in their groundbreaking book *Vanishing Voices: The Extinction of the*

World's Languages,¹³ suggest that 90% of the world's languages will disappear in the next 100 years. This massive wave of linguistic extinction will mean the loss of these cultures as well, because when people no longer speak their language, they forget their myths, folklore, traditions, and medical wisdom. Perhaps this cultural extinction, combined with the loss of biodiversity, will be recognized only when it is too late—an avoidable tragedy that will go unforgiven by our descendants.

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