

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.

THE POWER OF COMMUNITY

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It was my (M.B.) first experience in this verdant wilderness, an emerald ocean of trees, vines, rivers, and wildlife known as the Amazon Valley. My colleague and I had boarded a bus from Bogota, Colombia, then negotiated with a bush pilot who owned a pre-World War II cargo plane, flying it on an irregular basis to a mud air strip in the heart of the northwest Amazon Valley. His job was to bring in cargo—fuel, tinned food, cloth, and other supplies carried by the small stores that dotted the villages along the river. In exchange for a few dollars, we were offered a "seat" on top of the supplies for the several-hour ride. We checked the old ropes that held the 55-gallon drums of gasoline along one side of the plane, and were glad that the door of this particular flying machine was removed many years ago, replaced by a few pieces of short rope—easier for the gasoline fumes to escape the cramped aluminum tube where we sat.

This flight was nearly 30 years ago, when my (M.B.) graduate school professor, Richard Evans Schultes, placed me as an apprentice to a senior graduate student, Jim Zarucchi, who had previous experience exploring the Amazon. On this particular trip Jim and I landed without incident at a small town on the Rio Vaupés and made our way upriver to a Cubeo Indian village that we had heard about from Schultes, a most intrepid scientist who was to spend 60 years of his life working with the indigenous cultures of the region.

Jim owned a hollowed-out log canoe, perhaps 20 feet in length, that floated with about 3 inches of freeboard above the water. He had recently sold an old truck to a botanical colleague and used the funds to buy a small outboard motor. Knowing that we were headed far upriver and could not carry both the fuel needed for the trip as well as the plants we would collect along

the way, he had deposited fuel cans at houses located in strategic spots along the river; the plan was to work our way up to the village. We hired a local young man, nicknamed "Tuti," who was experienced with the ways of the river and would serve as motor-man and guide. Tuti was quiet with an intense stare, and his uniform was an old straw hat, short-sleeved blue shirt minus its buttons, shorts, and plastic sandals. He knew the beauty and power of the river, when to run the engine quickly to avoid the deadly whirlpools, how to navigate, fish, and hunt at night. The left side of his face bore the scar of several shotgun pellets that had gone through his cheek, tearing his jawbone, and exiting out the other side, the result of an unintentional, self-inflicted wound while hunting. He was to prove an invaluable companion as we traveled on this remote river. It seemed very far from Cambridge, Mass, that summer. Professor Schultes' antidote to homesickness and field anxiety had always been several tins of Boston baked beans, taken along when he went into this wilderness for comfort, anchor, and an occasional familiar meal. However, on this particular trip, we were minus our beans.

We reached the Cubeo village, several palm-thatched log houses placed in a semicircle in a clearing alongside the river. The people in this region traditionally have lived in communal houses, with 3 generations or more sharing the same space. These particular houses had log crossbeams; tied along these were dozens of hammocks, large and small. In the center of the dwelling was a cooking fire. In the course of my ethnobotanical studies, I was to spend many years living in communal settings such as this, learning not only about plants and their use, but about the lifestyle and philosophy that underpinned traditional Amazonian culture. The most striking aspect to me, as a westerner, an outsider, and a guest, was the sense of community that is present in such settings. Life, work, and every aspect of existence involves the community. When fields are to be worked, elders organize the effort, and the task is communal. This work is also a vehicle for communication and strengthening of culture. Stories are exchanged, youngsters trained in traditional ways, and food produced. When a new long house needs to be built, one part of the community goes off to gather the palm leaf thatch, another group cuts stout trees for house

posts and beams, while a third collects vines and slender branches for crossbars. Together, as a community, holes are dug for the house posts, the frame is constructed, and walls and thatch are put in place.

Hunting is also a group experience, with the best hunters of the village striking out as a group, searching for game that will provide protein to the community. Animals are carefully tracked, killed, and carried home, where they are given to each member of the group, ensuring that even the youngest receive their fair share.

As noted in previous columns, we also have spent much time in another part of the world, Micronesia. While in this region land is sparse, and reef and ocean are plentiful, the sense of community is the same. Each person on the island belongs to a clan that helps to guide how the members will live, cultivate their lands, fish, and celebrate their festivals. We recently returned from a stay on Pingelap Atoll and were deeply impressed with the sense of community among the several hundred people who inhabit this golf course-sized speck of land placed in the center of millions of square miles of Pacific Ocean. A typhoon had dumped a foot and a half of sand and coral on the small airstrip that connects the atoll with the outside world. The people on the island came together as a group and spent nearly 2 days clearing debris from the strip. While there are solitary activities, such as cultivating the family's land, the feeling of community is very powerful in this place. The field ship that thrice yearly brings supplies to this island arrived during our summer stay, and it was only by group effort that boxes were offloaded from the ship, brought through a small and dangerous channel in the reef in small boats, and goods distributed.

Spending so much of our lives in 2 diverse cultures—one where community is the focus of life versus another where the individual is at the center—has raised some interesting philosophical issues. At the same time, it is particularly appropriate to think about family, friends and community, as we begin the new year together.

In our Western community it is easier to live more independently because subsistence is independent of the collective action of oneself and the community. In this society, one's ability to generate income is the energetic currency that can buy all the "help" you need. The tradeoff for this change is diminished opportunities for meaningful conversations—unless one seeks less socially isolating experiences. Attention to friends and family becomes crucial in breaking this cycle. There are other ways to prevent social isolation. Some of us may choose varying degrees of networking by joining cooperatives, forming work groups, or developing social networks to share activities one could otherwise

do alone, thus reversing the trend toward a more isolated existence. Isolation may be a choice, but with the increasing demands on our time for all sorts of tasks, it is not hard to see how being alone has become easier than ever.

In primary healthcare, the medical effects of isolation and loneliness on one's individual health are present and often buried in the history of the patient's visit. The reasons for a doctor visit may concern an ailment that seems far removed from the issues surrounding emotional isolation. The practitioner must then take responsibility for reading between the lines of the patient's visit to tease out this piece of history. Are there physical signs beyond direct conversation that can offer clues? Two studies published this year in the *Journal of Psychosomatic Medicine* explored 4 possible mechanisms by which loneliness may have deleterious effects on health.¹² In the first part of the study, a cross-section of 89 undergraduate students were selected, based on pretest scores, to be among the top or bottom quintile in feelings of loneliness. They had their blood pressure, heart rate, salivary cortisol levels, sleep quality, and health behaviors measured. In the second part of the study, 25 older adults whose loneliness was assessed at the time of the testing also had their blood pressure, heart rate, salivary cortisol levels, and health behaviors measured. The results revealed that total peripheral resistance was higher in lonely than in nonlonely participants. Lonelier participants also reported poorer sleep quality. Mean salivary cortisol levels and health behaviors did not differ between groups in either study. The conclusion pointed to "2 orthogonal pre-disease mechanisms that warrant special attention—cardiovascular activation and sleep dysfunction."¹¹

Berkman and Syme³ reported that socially isolated adults suffered higher rates of mortality over a 9-year period even after accounting for self-reports of physical health, socioeconomic status, smoking, obesity, life satisfaction, physical activity, alcohol consumption, and use of preventive services. This study involved 6,928 adults in Alameda County, Calif, with a subsequent 9-year mortality follow-up. The findings showed that people who lacked social and community ties were more likely to die in the follow-up period than those with extensive contacts. The age-adjusted relative risks for those more isolated was 2.3 for men and 2.8 for women.³ Somewhat similar findings were obtained by House, Robbins, and Metner.⁴ Physical examinations were used to assess health status in 2,754 adults. Men reporting higher levels of social relationships and activities were significantly less likely to die during the follow-up period. For women, a similar trend was noted but generally was considered nonsignificant once age and other risk factors were controlled.



Communal house of the Guahibo people, Colombia
Photo courtesy of M. J. Balick.

No association was observed between mortality and satisfaction with social relationships and activities. The authors concluded that how and why these relationships predict mortality were important issues for future research.⁴ Later House et al⁵ confirmed that social isolation was a major risk factor for morbidity and mortality from widely varying causes—a risk factor comparable in significance to obesity and sedentary lifestyles. Furthermore, these effects were evident even after controlling for biological risk factors, social status, baseline measurements of health, and health behaviors.

Another study evaluated the significance of social relationships on health and illness in older adults. In the MacArthur studies of successful aging, a cohort of 1,189 initially high-functioning adults were followed over a 7.5-year period. The results revealed that participants who received more emotional support had better cognitive baseline performance than those who had less emotional support. Greater baseline emotional support was also a significant predictor of better cognitive function at the 7.5-year follow-up, controlling for baseline cognitive function, sociodemographic factors, behavioral, psychological, and health status predictors of cognitive aging.⁶

Recently, Seeman and colleagues evaluated biological pathways through which social support could affect morbidity and mortality from the perspective of allostatic load.² Allostatic load (AL) is a concept first introduced by McEwen and Stellar in 1993 that reflects a more cumulative view of physiological risk.⁷ In contrast to homeostatic mechanisms that strive to maintain equilibrium, allostatic systems enable us to respond to physical states like standing, waking, exercising, running, and so forth. The core of the body's response to a challenge (via this system) creates a cascade of neurochemical responses along the hypothalamic pituitary axis (HPA). This system, designed for relatively short-term challenges, becomes inactivated fairly quickly. It is the adaptive function that readies us for fight or flight. Prolonged stress, however, results in overexposure to stress hormones. The pathophysiologic consequences of prolonged activation can result in cognitive impairment, enhanced inflammatory responses, and impaired immunity to name a few. Much of the neurochemical changes occur as a direct result of prolonged adrenal stimulation to multiple target organs.⁸ Thus, allostatic load reflects the more cumulative risk associated with prolonged activation of a multitude of physiological regulatory systems (eg, heart, adrenal, neural) across time. Returning to the study published by Seeman in *Psychosomatic Medicine*, 2 cohorts were evaluated for measures of social experience, including social integration, support, and social relationships.² One cohort included older adults, aged 70 to 79 years (N=765); the other included younger adults, aged 58 to 59 years (N=106). This study was able to demonstrate cumulative physiological risk or AL in both cohorts. Furthermore, the physiological risk seemed to be higher at older ages, consistent with the idea that physiological damage can be cumulative. A gender difference also was noted in response to biological dysregulation. "In both cohorts, men tended to exhibit dysregulation in cardiovascular parameters (eg,

[blood pressure], cholesterol) whereas women were more likely to exhibit high levels of the neuroendocrine parameters (eg, urinary cortisol, catecholamines)."⁷

When there were positive cumulative relationship profiles, particularly emotional ties with significant others or parents, both men and women were less likely to show cumulative physiological dysregulation or AL. In the older cohort, marital status was not associated with higher or lower AL scores. This finding is consistent with results indicating that marital status may not be associated with significant mortality risk at older ages.⁹ However, more negative demands, specifically more frequent criticism or demands from a spouse or child, was associated with AL. This would suggest that negative types of social experiences have a cumulative effect on increased AL.

Testosterone has been implicated as a hormone largely responsible for fighting, competing, and mating. Some studies indicate that testosterone declines shortly after marriage but surges upward with a marital separation or divorce. The hypothesis is that the drop in testosterone facilitates more community-oriented behavior in men.

Looking more specifically at marriage and hormone levels, a team of Harvard University anthropologists measured testosterone via saliva in 58 men aged 21 to 41 years. Forty-eight of the men were affiliated with Harvard University and all were from Boston. The results revealed small differences (not statistically significant) in testosterone levels between married men with or without children. However, married men with and without children had significantly lower testosterone levels than unmarried men.¹⁰

In another study, testosterone levels were measured in 88 Kenyan Muslim men, including some who had 2 wives. The hypothesis was that the testosterone levels would be lower, but preliminary results indicate the opposite, according to the investigator, Peter Gray.¹⁰

A soon-to-be released study looked at testosterone in diverse locations (eg, Boston versus Nepal versus Paraguay) and revealed that testosterone levels may vary greatly in men in their twenties. However, testosterone seems to consistently drop off at the age of 60 years in all men.¹¹

The rise and fall of hormones is complicated and subject to many factors, including environment and diet. In studies looking at ovarian hormones in women of reproductive ages, Ellison, a noted researcher in the field from Harvard University, stated that "women of reproductive ages in Western industrial nations have higher levels of ovarian hormones than those in rural areas of underdeveloped countries. These differences mean that social and ecological differences exert a strong influence on how high reproductive hormones rise in young adults."¹² Likewise, for men, it is clear that environment also affects testosterone production.¹³

Looking at the data both scientifically and ethnobotanically, it seems that nurturing our relationships both in quality and quantity is beneficial to our psychological and physical well-being. As we begin the new year, let us remember the power of our communities and relationships.

To quote Antoine de Saint-Exupery's fox as he shares his secret with the little prince who is learning about life on earth: "Here is my secret. It's quite simple: One sees clearly only with the heart. Anything essential is invisible to the eyes."¹⁴

Happy New Year to all.

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