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Wooden Boat

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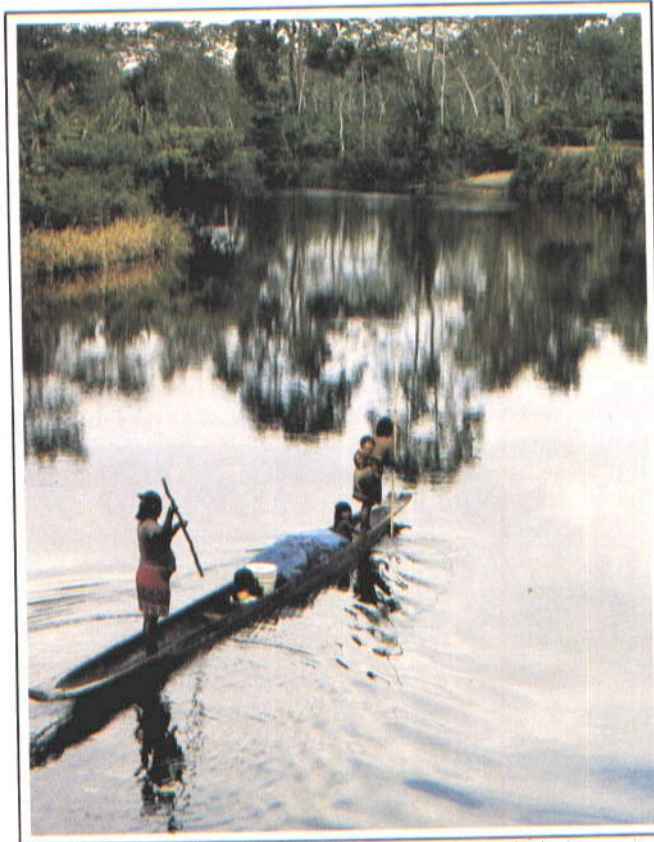
ROWING THE RIVER THAMES
JACK HOLT'S SAILING DINGHIES
NORTH SEA TRAWLER-YACHT
THE CHARM OF THE GUNTER RIG



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THE INDIAN'S APPRENTICE

While in the Panamanian jungle, a young physicist learns to build a most prized possession



Built for transporting plantain fruit, a newly launched piragua is gracefully poled along the Rio Tupisa.

Text and photographs by Lincoln Stoller

*I*t has always been very important. In olden times, when I was raised, my father said: You must know how to make a piragua [the large dugout canoe] and canaleta [the small dugout] and batea [the big clay pot], for without this knowledge you cannot catch a woman. If you are in a big river, what will you cross in? How can you cut plantains, carry corn or rice? If you don't have one, you will have to borrow. But, no! I am a man. I have to do it myself, alone. It has to be me that does it.

Tehamo Gartolda is a stocky man with dark reddish-brown skin that seems impregnable against insects. His face is serious; his dark eyes are often hard to find. Twenty

years ago, Tehamo left Colombia a homeless orphan and came by boat to Panama, where he "traveled from house to house," he says, "like a dog put out." Tehamo is talking to us from his hammock in his thatched hut. He speaks in halting Spanish. He is dressed in the traditional *wayuko*, a red loincloth held by a thin cord around his waist. From over the mountains to the east, the tail of the tradewinds blows through the treetops. It fans the coals of the open fire that sits on a mud hearth built to one side of the elevated wood floor.

We are on the upper reaches of the Rio Tupisa, in the Darien jungle of Panama, in a small village of about 100 Emberá Indians—the pueblo of Chilingó. For most of the



Emberá carpenters are masters with the axe, removing a maximum amount of wood with a minimum amount of work.

year it is the rainy season, when wide plains of soggy clouds hang over the landscape, and rain thunders down in sheets and floods the forest. The dozen wall-less stilt-houses float over a mud sea, their low-eaved, thatched roofs shedding the driving rain. But now it is the dry season, which runs from January to March, and the midday sun beats down fiercely on the hard-packed earth. It has been weeks since the last drop of rain.

I am in Chilingó visiting my friend Stephanie, who is studying the Emberá culture for a dissertation in anthropology. It is the first time I've been to the jungle, and it is the first time I've lived with people whose traditions are this old or whose lives are this isolated. I have few expectations.

Stephanie has spent the past four months doing all the hard work: finding the village, working out living arrangements, and establishing contacts. She has become fluent in the Emberá version of Spanish and is learning their own native language. From listening to the gossip she has learned the local sentiments and politics crucial to knowing how to behave in different situations. Throughout my stay I let Stephanie do most of the talking; I spend my time listening to conversation or making myself useful, helping our neighbors gather food, cut wood, and clear the orchards. I make no secret of my interest in or my ignorance of jungle ways, which would be hard to hide in any event.

In the States, I am finishing a PhD in physics. Declaring myself a physicist is enough of a conversation-stopper at home; to the Emberá, of course, it means nothing at all. So to the frequently asked question of what I do where I come from, I answer that I build airplane engines—that is the best I can think of. Most of the adults here have never gone to school, can neither read nor add. They rarely see pictures or magazines. My modern world remains to them both distant and intimidating. Despite these great differences, I

have developed a bond with these people that is unlike any I have made before. They, too, have found a friendship with me that, I suspect, I may never fully appreciate or understand.

The Emberá relate to us with a refreshing directness. Even the children quickly warm up to us as we follow them on their sugarcane-finding expeditions. Everyone welcomes a helping hand with the chores, whether it be crushing leaves for fish poison or tending a pot on the fire. The Emberá enjoy hearing about distant places, and they respond to our attentive audience with stories of their own. I am impressed by a sense of trust that makes dealing with these people seem like a simple matter of common sense.

Part of the Jungle

As a people, the Emberá are short in stature. Their bodies are amazingly tough, and their facial features are angular. The women are often painted with the traditional patterns—a black basket-like cross-hatching alternating with rings and circles, extending from their calves to their forearms and up their faces as far as the cleft in the lower lip. On rare occasions the men also will get painted black from the tips of their toes to the top of the lower lip. In the old days, their clothes were made from the soft, beaten, inner bark peeled from the rubber tree; these days, most men have gone for western dress. The women still wear *parúmas*, the colorful, square-cut, wraparound cloths that extend from the waist to the knee. Many of the women are quite beautiful, and they are always seen wearing many necklaces of small, colored plastic beads. Gold teeth, from the distant clinic, are also jewelry, and because tooth brushing is not popular, they peek from behind almost every pair of lips, glittering amid the casual conversation and in the smiles and laughter that often greet us.

The Emberá live a rugged and primitive lifestyle, yet their routine of everyday living is much the same as ours—deciding what foods to prepare, feeding and taking care of the kids, cleaning the house and yard, working on long-term projects. Otherwise, the Indians' material world is vastly different from our own—their comforts are few, and they depend greatly on their natural environment. They have neither pesticides nor fertilizers for growing their staple food, plantain—a starchy, banana-like fruit that is eaten cooked. The success of their crops is determined by the natural cycles of the insects, the silt-enriched soil, and the rains. Since food supplies are limited and there is little long-term storage, they cannot easily afford a bad season. They depend on the forest for food, medicine, and building materials. These differences between the Emberá lifestyle and our own contribute to their different sense of place—they do not just live *in* the jungle, they live as part *of* the jungle. The day-by-day imperative is survival, and in this they compete with all the other living things. They are bound to the jungle through their culture and by necessity, for without much money, experience of the outside world, or education, there is nowhere else they can go.

Because of their contact with the outside western world, the Emberá view themselves as a poor people. They have even come to identify themselves with this poverty—it has become part of their oral tradition. In their folktales, they often seem to fall short of God's expectations, and are given a hard fate: "You [the Emberá] will stay poor, you will suffer to eat, to get money! But the *kampunia* [the white man], he will stay rich."

Tradition and Turbulent Change

The traditional measure of social stature is the size of a man's family and the size of his orchards. By these standards, Tehamo is not a poor man—he has been able to divide his large plantain grove into family plots for himself and his sons and daughters, and he holds an important place in the community. Despite the opportunities this might afford him in these changing times, Tehamo remains the village's most ardent traditionalist. He rarely goes downriver. Always wearing a loincloth, Tehamo has not replaced his many lost teeth with gold. Like most of the adults, he cannot read or write, nor is he interested in learning. What Spanish he does know comes from the necessities of the plantain trade.

Tehamo has tuberculosis, and it's been nearly two years since he felt really well. Although it's not often discussed, his condition is known to everyone in the village. Not surprisingly, they are irritated that they and their children must continue to suffer the risk of infection because he is too stubborn to get treated. We have been told that many years ago, when the trip was much harder, Tehamo took his ailing first wife to Panama City. She was dying of consumption. They arrived on a holiday, and the hospital turned them away. Unable to afford staying in the city, they turned back, and his wife died on the way home. Whatever Tehamo felt about doctors before, he does not like them now, and he does not seek their help.

The last decade has brought the greatest changes that have occurred since the Emberá migrated to Panama from the south several hundred years ago. Even 20 years ago, most Emberá lived in a pattern of geographically isolated families—there was no tribal government. Each family

grew only the food it needed to feed itself. Now, with the establishment of government schools and the pressures of encroachment, people have formed loosely organized communities, and an economic market has developed between communities. As new roads are built into the interior, outside trade is growing—these days, everyone sells produce downriver to buyers who supply both local and city markets. With the money thus earned, the Embera buy pots, kerosene and cooking oil, shovels, machetes, and axes. People wish for chainsaws to allow them to join the lumber market. They buy clothes, especially for the children, who must be properly dressed if they are to attend the government school. These are times of turbulent change. One particularly vivid picture sticks in my mind: We were on our way downriver, when we came around a bend and a house came into view. There, atop the undercut riverbank, stood our friend Absolon. He was painted solid black. He stood by his thatched stilt-hut wearing a bright red loincloth that stood out against the green, matted jungle, and beside him, nearly chest high, stood a shining 40-hp Johnson outboard motor.

Needles on the Water

Boats are traditionally among an Indian's most important possessions, being essential to a river-oriented lifestyle. For the Emberá, the river is their link to the commercial market; they fish it and farm on its fertile banks. In the past, most Indians only used the small dugout canoes, called *canaletes*, but now, with the need to ship large quantities of produce, families need larger boats, called *piraguas*. About every two months, a new *piragua* is built in the village.

A *piragua* is measured by the number of plantains it



In the face of turbulent changes affecting his long-isolated tribe and family, Tehamo remains an ardent traditionalist.

holds, from a 2,000-plantain piragua of about 25' length to a 10,000-plantain piragua of 50'. Averaging 35' long by 2' wide, with only a few inches of freeboard, the piragua rides like a needle on the water. Because it has no keel, it is remarkably maneuverable, gliding sideways as gracefully as it slips forward or backward. One afternoon, Tehamo tells us the story of how the piragua came to be:

In olden times, God said to man, "I will make a piragua. I will labor, I will labor. Hombre, son, go to the house, tomorrow, in the morning, I'll let you know when, come and see it." The next day, he went to see it.... Aieee! It was pretty. Nearly done. But it was standing up! The next day, God would fell it, it would be done, finished. But the Son, he didn't think, and so he says, "I am going to fell that!" And so, po...po...po...po...pum! He chopped it down. But it was broken; right away it was ruined.

When God came to see.... Oooh! Son has felled it. God says: "Son, so you want it this way? Well, I will not help you anymore! This is the way it will stay!" And this is how it is today. We have the axe, all the tools. If only the Son hadn't felled it, God would have given us the piragua. But so, for this reason, the people still labor to make the piragua.

Shortly after my arrival in Chilingó, Tehamo is about to start work on a new piragua. It will replace his old one for transporting plantains. As he has taken a liking to me and Stephanie, he invites us to join him in his work. The story that follows chronicles our tutelage under Tehamo in the traditional construction of the piragua.

Paring Down the Trunk

The morning is cool, the sun just over the treetops, as we follow Tehamo, his son-in-law Peru, and their families on the 20-minute walk to the work site. The dry, narrow path weaves through the overgrown plantain groves to a gravel bar at the mouth of the Rio Preciada, where it joins the Tupísa. Here lies the fallen *espavé* (wild cashew) tree

from which Tehamo plans to make the piragua.

Above the work site, thick vines rise from the underbrush. Some, like the strangler fig, grip the tree trunks in a chaos of clenched and flattened fingers. Others, waist-thick, rise leafless a hundred feet to the treetops, where, silhouetted against the sky, hang the long, woven nests of an *Oropendula* colony. All day the birds fill the dense forest with their squeaks and swooping calls.

The women, Betilda and Nelba, leave the infants in care of the youngsters and go to gather lunch from Tehamo's nearby plantain grove. The day warms up, and the axe strokes beat in an even tempo. The stump and treetop have already been severed and the central trunk rolled into position. A piragua's length is limited by the portion of the trunk that is straight-grained; this boat will be 30' long. The men chop deep sections every few feet along the rounded top of the 4'-thick trunk, and then split away the intervening wood to make a level surface for the top of the piragua. There is a tremendous amount of wood to be removed—it will take two men twelve days.

Tehamo's sharp axe whistles over his left shoulder and arcs into the same groove as his last stroke with a solid "thwack!" Dislodged with a twist of his wrist, the axe swings down to the right, its blade pointing outward. He uses the momentum of the axe falling away from the work to power it back up over his head, twirling it behind his right shoulder. This continuous whirlybird motion leaves Tehamo's hands fixed on the axe shaft.

Tehamo gives me an axe and instructs me to pare down the end of the trunk. The boat is to be made only of heartwood, which lies beneath nearly 1' of cambium, so the final form of the piragua is still far below the surface—safe from my impassioned (and inaccurate) strokes. I work to reduce the huge mass of wood through a process of pulverization, chips flying everywhere. I have to stop after an hour because of blisters.

While we work, the boys frolic naked in the shallow rapids beside the work site, yelling and screaming as they ride through on their short, buoyant balsa logs. Betilda and Nelba cook a lunch of plantains and fish. The ripe plantains are boiled down to a sweet, lumpy soup. The armored catfish, or *wacúco*, are roasted whole in the coals. Everyone who has helped is fed.

Transformation of the Tree

It takes two days to level the trunk and begin chopping out the interior. The word used for this is *detripar*, as it resembles the gutting of a fish. Midway along the now-leveled trunk, a sickle-shaped diagonal slice is chopped out of the heartwood to define a section of the piragua's interior. A second cut is made adjacent to the first but along the alternate diagonal, and the wood between the two cuts is then cleaned away. The men work outward from this first, hollowed section, chopping new diagonal slices—always alternating in direction—and splitting away the intervening wood. This is the secret of piragua building: to remove a maximum amount of wood with a minimum amount of axe-work. Large, pillow-sized hunks of wood are defined by making deep, narrow cuts; then the separate blocks are broken free with a few sharp strikes of the blunt side of the axe. In this fashion, large amounts of wood are quickly knocked away.

When, after two days, the "detriping" is nearly finished, work stops as Tehamo goes to the fire and gets a baked

plantain. Standing at the far end of the trunk he bites a piece, chews it up, and spits a spray of pieces over the roughed-out form of the small end-deck. He does the same over the near end. Tehamo then explains that completing the *detripar* is a crucial step which marks the transformation of the tree into a piragua. At this point, when the tree dies and its spirit is freed, the spirit must be fed to ensure that it will not go hungry and thus linger in the piragua. (It is the hungry spirit of the dead tree, we are told, entering and eating inside a person's body, that causes urine to be blood-stained.) Work resumes, and the roughing out of the interior is complete by the end of that, the sixth day.

Now the interior will be worked to its final shape. The removal of wood continues with the axe; the adzes are used only for smoothing. Layer by layer, the interior wood is worked back by creating a cross-hatched pattern of cuts as uniform in spacing and depth as the stitches of a sewing machine. After the shallow cuts have raised a scored surface, glancing side-strokes remove the feathered wood, leaving a faint herringbone pattern.

The Emberá carpenters are masters with the axe. Where most craftsmen would use a chisel, the Emberá still cut with the axe at full swing. "To be a good axeman, one must strike like the woodpecker," Tehamo says. "The woodpecker strikes over and over at the same spot. He does not give up. He returns again and again until the nest hole becomes a cavity in the hard tree trunk." To acquire this skill, the Emberá axeman takes the spirit of the woodpecker—four times in the axeman's life, he will hunt and kill a woodpecker. During the waning moon, he will grind its beak, and mix the powder with *jagua* (hog-wa), the black

pigment used as body paint. Ritually chanting, he will coat his hands.

In shaping the interior, only three kinds of measurements are taken: one for uniformity of width, another for uniformity of depth, and a third to gauge the thickness of the wood. The shape of the piragua is fitted to these measurements by eye and by ear; tapping on the hull produces a hollow sound whose tone varies in proportion to the wood's thickness. To measure the overall depth and width, Tehamo puts a short, lengthwise slit in the center of a long reed and passes a second, shorter reed through it. The width of the piragua's interior is measured by setting the long reed across the gunwales (for this boat, about 29" at the widest). With the long reed resting in this fashion, the short reed can be slipped up and down through it to measure the depth of the interior (about 13" throughout most of its length). This arrangement of spliced reeds is often used to check the work and usually lies in or around the piragua. Much later, in one of our conversations with Tehamo, we learn that it serves a dual purpose.

"They say, in olden times, that when you are taking off the top, the Devil can come there, inside, to defecate. If this happens, one will die, either the woman or you. So you have to put the cross in or near the boat, all the time. When you return to the house, you must leave a cross of sticks," Tehamo says. "I didn't see the cross there," says Stephanie, a bit puzzled. "It was there," he responds. "That thing you used to measure?" she asks. "That's the same."

Bottom Up

For the next few days, Tehamo works alone. One after-

noon, we help him smooth the interior and finish the short fore and aft decks, and Tehamo instructs me in using the scoop adze. This small tool is held in one hand by a short 4" shaft. It has a heavy, hand-wrought, sharpened steel scoop, about 3" wide, which droops over the front of your hand. It's swung from the shoulder; when the blade grabs the wood, you use your wrist to make a sharp downward twisting or scooping motion. I work on the floor of the piragua while Tehamo works away the wood on the sides of the boat to a rough three-fingers' width. These walls are to be finished to one-and-a-half fingers' width, or about 1", at the gunwale tops.

On the weekend, the pace of village life relaxes, and work on the piragua stops. Some men go hunting, others spend the afternoons at home. Two families take a piragua and go fishing. The women of one family spend Saturday morning painting each other's bodies, using sticks as brushes.

Monday is a special day. With the inside finished and the side walls almost roughed to shape, the piragua is ready to be turned over. Throughout the morning and early afternoon, people arrive to help—15 men and women and as many children. Most have been sitting around, waiting and gossiping, as the work has progressed.

Tehamo goes into the woods to find some heavy *bejúco* vine, then shows me how to use a rock to beat the end of it into a pliable state. Meanwhile, Miguel, the village elder, has cut a small tree trunk, and half a dozen people help him hold it in place and lash it perpendicularly across the top of the piragua. It will act as a long handle with which to turn the piragua. Tehamo ties the vine at the top of this lever and runs it over the dugout. The men put bracing inside the boat's walls, and we line up with the women, ready to heave on the *bejúco*. The piragua sits on an intact portion of the tree trunk, weighing probably over half a ton. Signaled by a spreading agitation and a rising chaos of shouting, we begin straining on the line. With the wood creaking and popping and the knot in the *bejúco* slipping, the unfinished boat lands bottom up with a hollow, resounding thud.

Throughout the next few days, the soft cambium wood is cut from the bottom. Wood is removed until the 4"-deep holes, previously drilled from the inside, are uncovered. There are three sets of three holes each, one set at either end and one set in the middle. The three holes are spaced across the width of the bottom, one hole along the centerline and a hole on either side below the walls. Reaching them tells those working on the outside that it is 4" to the hollow cavity inside. Before the boat is launched, the holes will be plugged with dowels. From these guide holes, the gentle curves of the hull are carved by eye. The finished hull thickens from 1" at the gunwales to 2" on the bottom.

One, Two, Three...

On the twelfth day, the piragua will be launched. We meet Tehamo at the work site around noon. He is catching one of his frequent bad colds and doesn't offer any animated storytelling with the usual rumbles, clicks, and wild gesticulations. He really shouldn't be working, but he wants to get the piragua downriver as soon as possible. As before, an assembly has gathered to help in the launching. Isalesio is doing some finishing work on the still upside-down hull, carefully smoothing down the high spots. There are two axes, and all the men take turns expressing their support.

By mid-afternoon, the piragua is ready to be turned right-side up. The boat, now weighing about 300 pounds, has a more-or-less semicircular cross-section and is easily flipped over. There are more than enough people to swing the boat about and head it off down the bank. The pushing and shoving become frantic as the boat, half launched, becomes stuck, its bow submerged while water pours in. Someone counts to three, and a great shove sends the piragua gliding out into open water.

The Boundaries Dissolve

In Chilingó, the day's activities end at sundown. The short evenings are marked by a regular routine of preparing dinner and settling in for the night. Tonight, we have just caught a ride to the village in the new piragua, crowded with a half-dozen adults, another half-dozen kids, three 6' logs, and a dog. As usual, we have gotten home with barely enough time to start the dinner fire before dark.

As the forest is swallowed in shadow, the families begin to assemble beneath their thatched roofs. The children scurry to finish their last daytime chore—herding the chickens into their teepee-like coops. Little kerosene lamps made from baking soda cans with hollow metal stems and rag wicks are lit as darkness closes in. A young woman finishes at the fire, puts out the lamp, and lies down beside her husband and child inside the rectangular fabric enclosure that guards against mosquitoes and vampire bats. Stephanie retires to our tent, erected inside our house, while I go out to watch the night.

The jungle night is a rich and living darkness. There are noises everywhere, and everything that cannot be seen can be imagined. By day, the jungle, with its thorns and snakes and biting insects, is pushed safely back by the clean-swept earth of the village clearing. By night, the boundaries dissolve, and, under the cover of darkness, the jungle comes back.

Starlight glimmers before moonrise in the bottomless night sky. Flying animals whiffle past the houses at ear level. In the trees nearby sings the night bird they call the *do-go-wiru*, or "devil's chicken"; on the riverbank, the frog *bāu-hiá* calls like a lonely old woman. A cacaphony of crickets, toads, and treefrogs cheech, croak or peep their songs, each at its own tempo. From inside the forest comes a muffled, hysterical laugh.

It comes again—a half-tone higher, a little shorter, eerie, human-like. The sound comes seven times, heading toward a crescendo, but breaks off. In a little while it starts again. It is only a bird—the *Madre del Agua*, which, they say, lives in the river and walks about at night. When the *brujos*, the spirit healers, fight, this little black bird delivers their death spells.

The moon bathes the village in a flat, silver light as I stand listening. Late at night the vampire bats come, but the Indians are hidden, safe under their fabric canopies. A rooster crows, setting off a wave of responses. The ruckus trails off into the distance at the other side of the village, only to bounce back once more.

Just before dawn, a dense mist veils the pueblo, caught in the long, fringed leaves of the coco palms. Sounds are muffled in the thick air—the low rumble of talking adults mingles with the calls of the mourning doves; the cries of the children are in chorus with the chattering parakeets; a rooster punctuates the banging of pots and the clacking of sticks.

Calloused Hands

After breakfast, Stephanie and I visit Tehamo. He is lying in his hammock, still sick with his cold. The piragua, beached on a gravel bar nearby, awaits only some finishing work and a coat of sealant. Tehamo thanks us for the aspirin we have brought, setting them aside for use at night to help him get to sleep.

"You should go to the doctor for your tuberculosis," I tell him, knowing full well what his attitude is. He dismisses the suggestion with a wave of his hand. "Too expensive, I don't have the money." He looks away; I drop the subject.

Out of the blue, he says, "Know about the metal machines? You go over here, and here it is—gold!" I guess that he is talking about a metal detector. With some surprise, I look at Stephanie. "Gold?" I reply. "Gold, where?"

"Rio Tuquesa. With the machine—" He rolls his hand in his finished gesture, then says in his rough, low voice, "—we make a business, work together." He firmly taps his fingers twice on the floor, accompanied by a clicking sound made with his tongue. He pulls himself around, and I see his eyes, which is rare. They sparkle. "Well...?" they question me.

I tell him about the story I would like to write about the building of his piragua. Whatever the story sells for, he will get a share of the profits. Tehamo likes the idea—business, pure and simple—and I spend the next few days writing down his lore of the piragua. It is my last week in the village.

When, six months later, Stephanie returns to the States, she brings a paddle made for me by Tehamo. The pointed paddle, leaning quietly in the corner, reminds me of Tehamo's calloused hands and the things I take for granted.

The author has used proceeds from the publication of this article to set up a special fund for the purpose of directing aid to the Emberá Indians. The fund is administered by Cultural Survival, a registered nonprofit, Harvard-based organization. Contributions of any amount are encouraged and will be used to fund health and education projects. If you would like to contribute, please make your check payable to "The Emberá Health and Education Fund," and send it to:

The Emberá Health and Education Fund, Cultural Survival, Inc., 11 Divinity Ave., Cambridge, MA 02138

Lincoln Stoller is a physicist in Texas who is about to move East. His interests include all kinds of theories, mountains, jungles, poor people with rich cultures, and money. He is currently seeking a job on Wall Street.

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