

APPENDIX

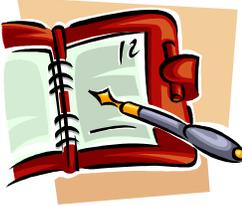
TABLE OF CONTENTS

A DAY ON THE REEF.....	2
FORMERLY BRITISH HONDURAS:	
A PROFILE OF THE NEW NATION OF BELIZE	3
PHYSICAL GEOGRAPHY.....	3
VEGETATION	4
WILDLIFE.....	5
NATURAL HISTORY OVERVIEW	8
THE MANGROVES	10
A TALE OF THREE TURTLES	12
BELIZE TANTALIZES BIRDERS.....	14
TROPICAL RAINFORESTS AROUND THE WORLD	17
TROPICAL FORESTS FOUND MORE VALUABLE FOR MEDICINE THAN OTHER USES.....	18
FACTS ABOUT RAINFORESTS	20
MAYAS HAD A MIDDLE CLASS, TOO.....	22
WRITER’S LIFE.....	24
SUNBURN RAYS.....	27
EXTRA ARTICLES.....	30+

A JOURNEY ALONG THE BARRIER REEF OF BELIZE

A DAY ON THE REEF

*A page from a story by an IEC Traveler
By C.K. Vachon*



At first it seemed that the three palm trees on the horizon rose straight from the sea. They shimmered like the mirage of an oasis in the desert. Light constant breezes propelled us steadily closer and the late afternoon Caribbean sun made the cay of broken shells gleam. We glided smoothly around a gloomy patch of brown coral and then onto the typically luminous blue water of a lagoon about two feet deep. Up to our knees in warm, silken water we eased the kayaks onto the beach, laughing we stretched and shook the languor from our legs, we heard only the ruffle of small waves washing over the reef and a rich quiet. The sun dropped behind the summit of the Maya mountains, in the disconcerting way that it does in the tropics, and darkness was all around us, clear and purple.

Our Belizean guide had introduced himself as Hugh but every one called him "Pappy." He'd been diving these Caribbean waters his entire life--half his day spent darting amongst the distinct shadows of the coral like the jeweled fish he was hunting. Pappy was amused by how little we knew of his country and when we assured that many Canadians hadn't ever heard of Belize he was skeptical. That evening he showed us the sun-worn thatched hut just visible over the low dark green bushes that sheltered it. A fisherman had been banished from the shore and exiled to this cay by his wife, Pappy explained. "What do you mean? Just, told to go?" We asked. "Oh yes, she just told him to get away" Pappy answered serenely. It struck us that the husband had been uncharacteristic docile at the time but we soon learned that Pappy's usual calm acceptance of fate modified the story somewhat. At any rate, it was a sublime spot to be exiled to and we slung our hammocks between the palms and decided to stay awhile too. We crouched down in the bright circle of light cast by our fire and considered dinner. We'd been hoarding a precious tin of butter. Pappy had a two-pound lobster (it is really a very large crayfish with no claws, every bit as delicious) and a small Barracuda that he had lured from the sea with a ragged shred of a Canadian plastic bag. He literally charmed fish out of the water. We argued for the lobster and melted butter with a true Canadian zeal for immediate gratification. Pappy was not moved. "tomorrow we'll have many more lobsters, tonight we'll eat fish." "How do you know we demanded." "You'll see tomorrow" he said. And we did. He was always right about fish.

While we ate Bill, our Canadian guide from Vancouver, tossed a coin with Pappy and was designated bread maker for the evening. We were telling stories until late that evening--everyone coming up with anecdotes about their jobs back there in the "real world. Jobs and lives that seemed very unreal and faintly ridiculous when seen from this idyllic perspective. Rather the same sensation one gets when observing ants from far above- where are they all rushing to? We laughed so long that it grew late and one by one people drifted off to sleep and only three of us were left, gazing at stars and listening to the rhythmic thump of Bill kneading bread. When sleep was on the point of conquering us the bread was ready and we dowsed down for the night with a slice of fresh, hot raisin bread each.

We awoke, as usual, feeling vigorous, and broke the glassy surface of the water for a morning splash. Then we devoured the new bread with a lime custard and hot, sweet coffee. The day was amazingly clear and still. Bill pointed in the distance to the mountains of Honduras, the famous "Mosquito coast" to the south and we unfolded the charts to orient ourselves and plan the route we'd take the next day. Bill's finger traced the trajectory on the chart. Pappy's eyes scanned the chain of cays. He had as little use for charts here as we have on the streets of the town we live in. He was thinking of today's lobsters anyway. "I think it's time to dive now" he offered. We paddled out to a likely spot- the kayaks were more buoyant and light with our gear left back on the cay. Pappy said we'd arrived and we lashed our kayaks into a raft with our paddles as cross beams and slipped on fins and mask. Under the surface the light is prismatic as the sun's shafts glance off the angled waves above. The rippled, clean expanse of sand is almost barren next to the hectic populations of the reef. We moved gingerly around great antlers of staghorn coral. Below a sea urchin was inching it's way back to the stalwart protection of

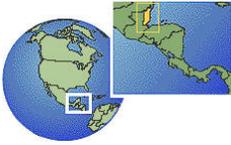
the coral refuge. A Queen Triggerfish, brilliantly coloured in blue, green and gold had spotted him though and advanced swiftly, first nipping at the long, impervious looking spines, it then circumnavigated the hapless urchin and proceeded to blow jets of water until it had blown the urchin over, exposing his vulnerable underbelly for a feast. A barrier reef is a whole food chain in one location. From the algae that pigment the coral, to the grim sentry- the Barracuda, everyone eats and everyone is eaten. There is even a prevailing grating noise as Parrot fish gnaw the stony corals incessantly. A school of Blue Tang moving between the deeper blue water and the reef flats were balletic in their complete unison of movement. The waters around me were obscured by their numbers and then in one co-ordinated movement they had moved on. The Trunkfish is God's idea of a Piscean joke. The lumpy body is held rigid by a firm exoskeleton and tiny, frantically whirling fins propel it fussily over the reef. We stared, fascinated at the fantastic variety of life around us. Pappy and Bill were hunting efficiently while we explored, and they found us resting when they threw their final catch onto the raft of kayaks. I had one nagging question in my mind. I suggested to Pappy that there must be sharks sometime. "Oh Yes" he answered with his usual phlegm. "Well, when I come face to face with a bear at home I know what to do. What would you do if you came face to face with a shark?" I asked. "I would try and kill it" he said.

With the wind in our favor we hoisted our small sails and sailed back to our cay that afternoon, effortlessly skimming right up the beach on arrival. The sun dropped again, like a penny into a slot, behind those mountains and I was staring at the spangled stars that sprang out when it left. Pappy touched my shoulder. "We're eating the butter now" In Belize there is an exquisite pleasure sufficient to each moment.

FORMERLY BRITISH HONDURAS: A PROFILE OF THE NEW NATION OF BELIZE

by William David Stezekorn.
Ohio University Press: Athens, Ohio. Revised Edition, 1981.

PHYSICAL GEOGRAPHY



The northern half of Belize, which contains the Districts of Corozal, Belize, and Orange Walk, is low and undulating, gradually rising from the coast to the Guatemalan border in the west, but rarely exceeding 200 feet in elevation. The area is drained by the New River and the Hondo River which flow into Chetumal Bay in the north, and by the Belize River, which flows easterly and is navigable for at least 120 miles. Although broken by many dangerous rapids at its western extremity, the Belize River still serves for native transportation from the interior to produce markets in Belize City.

This low-lying land is composed of parallel, subdued ridges and depressions, the ridges being noticeable only by reason of the differences of soil and vegetation. The jungle-covered ridges and intervening gullies run north and south, parallel to the seacoast and are, in fact, backbones of former coral reefs. If the present seacoast is considered to lie along one of these reefs, the next reef seaward and approximately ten to fifteen miles offshore is a string of small islands (called Cays) some of which possess palm-covered opulence while others are partially or occasionally submerged and mangrove-covered. These islands string out along the entire Belizean coastline. The next ridge just a few miles seaward of this chain of Cays is the famous Barrier Reef whose coral formations appear above the surface of the water only tentatively from time to time and serve to protect the entire 175 mile coastline of Belize from the rough sea.

Belize City, barely eighteen inches above sea-level, is backed by extensive mangrove swamps extending many miles inland in some areas, and lie like a moss-green algae between the sea and land, wedding the salt water to the verdant tropical forests.

The southern half of the country is a plateau, dissected by the relatively low-rising Maya Mountain Range running north and south, and fringed by a narrow coconut palm-covered coastal plain averaging about fifteen miles wide and some ten feet in elevation. The southern plateau widens and declines toward the west, ending the north by a broken escarpment falling rapidly to the Sibun River Valley. The Cockscomb Range, an isolated group of peaks, rises close to the irregular seaward edge of the plateau at its northern extreme. This long row of uneven, abrupt humps look to all the world like a lower mandible of a gigantic crocodile laid along the otherwise flat skyline. The highest of these quartzite and granite peaks, Victoria Peak, is 3,680 feet in elevation and the highest measured point in Belize. The Maya Mountains are jungle-covered limestone hills, for the most part still unexplored, pierced by caves and ribboned by streams feeding the many short jungle rivers which cut through the coastal plain to the sea. The fabulous Mountain Pine Ridge Area of the Cayo District is on the higher elevation of the rolling southern plateau, ranging in altitude for 1,500 to 2,700 feet. Partially open land, it is crossed by rushing mountain streams with white-water rapids and spectacular falls.

VEGETATION

Seasonal broadleaf forest covers at least ninety percent of the country. On the limestone soils of the north, the forest is deciduous; the sapodilla (*achras sapota*), which when tapped like a rubber tree gives a white resinous latex called chicle, the basis for chewing gum, and the 150-foot towering mahogany (*swietenia macrophylla*) are dominant. Mahogany wood, a principal export of Belize, is of the finest quality known. Ace handles, door posts, and golf club shafts are among the special uses of sapodilla wood. Chicle bleeding is carried out in the wet months, July through February, when the rains induce a good flow of gum from the trees.

From the lime-poor soils of the plateau country, mahogany is rare and Santa Maria (*Calophyllum brasiliense*) is the most important timber tree. Santa Maria wood is extremely hard and is the source for lumber for local home building, as this wood is relatively save from termite attack, a constant hazard in Belize. It was once used for ship masts. Another tree of commercial value is the pink-flowered mayflower tree whose decorative graining is preferred locally for wall paneling to the more universally popular mahogany. The short jungle rivers are largely bordered by dense, swampy jungle growth and tall, fronded banana trees.

The Mountain Pine Ridge area of the Cayo District, at its higher elevations, has coniferous forests, carrying oak and Caribbean pine (*Pinus caribaiea*). Its mountain-fed streams dramatically cascade over rocky falls. The Belizean pine found in this region has the character of the pitch pine and reaches heights of over 100 feet. Cedar (*cedrela mexicana*) and rosewood are also prevalent. The fine-grained, hard, durable, red-hued rosewood is used for fine cabinet work. The local rosewood trees are relatively



large but the percentage of marketable wood from this is small. Cedars are used for making native dug-out canoes, called "pit-pans". The insect-proof, nicely grained cedar wood is used for cigar boxes and drawer and wardrobe linings.

Grass savannahs with scattered oaks, pines and palmetto palms (*paurotis wrightii*) are characteristic of the southern coast and north-central regions. Mangroves fringe the northern coast, river inlets and cover many of the cays.

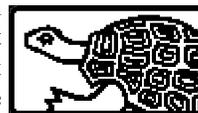
A common tree of potential commercial importance, although hardly exploited, is the royal palm of cohune (*Orbignya cohune*). From its hard stony nuts a valuable oil is extracted and, when burned, leaves a charcoal of great purity. This substance was once used by the British army for gas mask filters. The cohune starts as a one-leaved affair, then grows a fleur-de-lis of beautiful great fronds that sprout from just above the ground. At this stage, it has the appearance and dimensions of a mature oil palm but it has hardly begun to grow. The hard-wooded cohunes don't flower or fructify until their heads reach the sunlight; that is, grow up to the height of the forest canopy. The trunks become smooth and ringless, looking more like hardwood trees. One can only recognize the cohune as a palm by looking up at its wing-leaved head, a titanic distance up in the sky.

The ceiba (*yaxche*) tree, the National tree of Guatemala, is found in Belize. This slender-trunked, uniquely-shaped tree once considered sacred by the Mayas who believed that this tree grew in Paradise and, in its heavenly shade, deserving tribesman would someday rest, forever free from labour. It is still superstitiously protected in Belize as well as Guatemala.

Flaming red blossoms of the slender flamboyant trees (*delonix regia*); thickly flowered hibiscus of every colour; eleanthers; pink, orange and purple bougainvillea; red blooming royal poincianas; and the frangipani (*plumaria*), whose pink-flowered limbs emit a pungent perfume, all give a fragrant and colourful accent to Belize's tree-lined roads and vine-choked jungles. Great purple bunches of orchids grow around the wide-spread roots of "bullet" trees, and lofty "cotton" trees stand singly, their crowns spreading like open parachutes, adding to the character of Belize's "back country". There are some 240 species of wild orchids alone, growing in Belize!

WILDLIFE

If British Honduran politics is a laboratory for the political scientist, as newsmen are prone to term it, then Belize's jungles are certainly a laboratory for the naturalist. This country is; the home of some of the most fascinating creatures in the world, including an opossum only three and a half inches long, turtles that climb trees, ants that practice agriculture, and the "two-snakes-in-one" which is exactly that. But, before venturing into the awesome depths of the tropical jungle with a Belizean guide, to avoid confusion one must first take a course in local terminology. In Belize jaguars are called "tigers", jaguarandis are "tiger cats", howler monkeys are "baboons", deer are "antelope" and moths are called "bats". True bats are "rat-bats" and thought by the natives to be of the same genus as the moth.



One may not leave the confines of Belize City to find exotic specimens. Here mangrove swamps team with wildlife; lizards, frogs and endless varieties of crabs. Sharing the mangrove swamps with the frogs and crabs is the Yucatecan Crocodile (*Crocodylus moreletii*), locally called "alligator", naturally. They grow very large; and ten or twelve-foot one is not a very large specimen, I am told. Some natives make a livelihood selling "alligator" skins.

One rarely sees the base of a mangrove tree, as they grow with roots submerged in the stagnant water of the swamps. Peering into these still, fresh-water pools at the base of the mangroves, one can see thousands of tiny fish called "Billums". Billums are present in nearly all still pools in Belize and come in a great variety of shapes and colours; some with ruby eyes, some with brilliant peacock-blue tails, others with mauve-coloured bands or shining skins not unlike mother-of-pearl. They lose their colour soon after being taken out of the water.



Belize also has the common boa constrictor (*Constrictor constrictor*), here called "wowla", which grow to incredible lengths; but the wildest, most unusual snake in the country must be the "two-snakes-in-one". This rare creature is not a hybrid but a separate species known as *Sibynophis annulata* and has the combined features of two entirely different common snakes; the coral snake and the *Coniophanes fissidens*. The astonishing beast has a black head and for the first several inches of its neck is vividly banded with the red, cream, and black markings of a coral snake. The body then abruptly changes, is larger in girth, rougher, and olive-brown, with vague dark longitudinal lines. On the underside it, too, changes from the smooth pink belly of a coral snake to the yellowish-cream of the brown snake. It is speculated that this snake commonly lies with its head sticking out of a hole to fool its enemies, who mistake it for the poisonous Coral. The "two-snakes-in-one" is not poisonous, but little is known of its habits.

Not to be omitted from any list of Belizean reptilian oddities are some of its many varieties of lizards and iguanas. There are green iguanas (*Ctenosaurus similis*) on tree limbs; ground lizards (*Ameiva undulata*), some with bright blue and others with salmon-pink underside; little maklalas, and countless wide-eyed basilisks (*Basiliscus vittatus*). These are very beautiful lizards of the iguana family, called "cock maklalas" raise themselves to their hind feet and run like birds. They have baleful, large, dark grey-blue eyes and, when handled, show much fight, gaping and biting with fury.

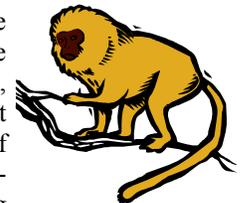
Another local iguana, this one a hissing, frightening-looking huge, leathery-skinned, tree climbing variety, known as the "bamboo chicken", sports a large pouch under his chin and is much sought after in Belize for the dinner table. Their meat tastes very much like chicken, the natives say. Specimens up to four feet long have been found on Half Moon Cay in the Lighthouse Reef.

Belize's very active and scientific Forestry Department has been able to isolate and control the malarial-vector mosquito types, making this disease now nearly extinct, but several insects mar this otherwise natural paradise. The common sandflies (Culicoides); "doctor flies" (*Chrysops costatus*), a yellowish fly that bites hard and long, leaving a large red splotch; and the "bottlas flies", a type of black sandfly of genus *Simulium*, which swarm in clouds and inflict bites that leave a red area on the skin centered by a small blister that turns black, all can make jungle life unpleasant, especially on a hot afternoon when the trade winds subside.

There is a traditional drink in Belize consisting of rum garnished with exactly nine live "wee wee ants". It is supposed to transform anyone who imbibes of it into as energetic a person as this hard-working ant of the genus 'Atta'. Commonly known as parasol ant, cutter ant, or wee wee ant, the Atta destroy thousands of dollars of Central American crops yearly and defy extermination. The wee wee ants live in cities of several thousand, interconnected with subterranean tunnels with many sister cities. Each city is a low dome of about four feet in diameter, about six feet high and sometimes as much as 15 feet deep. They contain a complex of chambers, cross-roads, passages, and deep galleries. Highly organized, this ant civilization has perfected a means of raising its own food, a type of fungus, grown on the decaying leaves of young plants brought to the ant cities for that purpose. Unfortunately the leaves that make the best fertilizer for the wee wee's fungus crop are the Belizean's young, healthy and most valuable citrus trees or, failing this, the fresh shoots of the most valuable timber trees. From the domed city, radiating out in all directions, are eight or more ten-inch-wide hard-packed "roads" used by the wee wees for their nocturnal leaf-gathering activities. They travel these roads many times a night; each time each ant returns with one leaf carried over its head like a giant parasol. The time required to strip a tree of its foliage is phenomenally short. The black and yellow Belizean anteater (*Tamandua*) offers little hope in controlling the proliferate wee wees unless he changes his feeding habits. The anteater is strictly a daytime forager while the wee wees come out only at night.

Of the furry creatures in which Belize's jungles abound, the most common is probably the soft teddy-bear like kinkajous (*Potos flavus*). This little relative of the racoons (racoons are also found in Belize), very rare in other Central American countries, inhabits Belize in such numbers that they are considered pests. Called locally "night walkers", they are found in virtually every type of terrain in the country from the mountain forest, the tall lowland forests, areas of secondary vegetation, and even in the tall growth of the swampy northern plain. Kinkajous can be house trained, are spotlessly clean, are affectionate, and make ideal pets. Also found is the Honduran Coati (*Nasua narica*) and the much rarer Cacomistle (*Bassariscus sumichrasti*), a sharp-faced relative of the "ring-tailed cat" of the southern United States, but so rare in Belize that it doesn't have a local name.

There is no animal that more surely expresses the character of the 'terra incognita', the jungle where man is but a rare and timid intruder, than the "baboons" of Belize. These jet-black regal beasts are really howler monkeys (*Alouatta villosa*), but have many of the characteristics of their namesakes, the African baboon. Lovers of heights, they ascend the tallest trees and from there roar, growl, bellow, and grunt their defiance to the world. There has never been a Hollywood jungle epic yet made that didn't utilize a howler monkey chorus in the soundtrack; a background which gives that rare touch of jungle mysticism. The howlers travel in small groups and are most usually seen in the higher elevations, working their way slowly down to the plains only when certain tree fruits ripen. They are big and black with powerful arms, heavy shoulders, scowling faces, and long prehensile tails which they keep securely anchored to a handy branch. Baboons are often seen in the company of little spider monkeys, whose senseless antics are tolerated so long as they stay well out of reach of their bellicose friends. Having few enemies, the baboon is surely the king of the Belizean jungle and knows it.



Of the few American or European sportsmen that visit Belize each year, some come to fish but a growing number come for big game, and to them that means but one thing: jaguar. This big cat (*Felis onca*) has been all but eliminated from places like Costa Rica, Columbia, and Venezuela, where they were once common, but they still abound in the unspoiled Belizean jungle. This largest of all wild cats in the western hemisphere reaches a length of six to seven feet and weighs as much as 250 pounds. Locally called "tigers", they are tawny or buff-coloured with circular black markings. Pure black ones are sometimes encountered; they are called "panthers" by the natives who highly prize this pelt. Belizeans living in the "back

country" have learned to live with, and respect, the cunning jaguar. They rarely attack men, but dogs and livestock are its fair prey. A Maya guide recounted an incident to the author of a "tiger" entering his thatched roof "pole house" at night and snatching a young dog from its sleeping place at the foot of the guide's bed. He woke in time to see the animal, with the dog, leap through the open door and disappear into the darkness of the night.

Jaguar hunting safaris, under supervision of government-licensed big game guides, may be arranged through several private companies in Belize. They are hunted with dogs, but with the jaguar's superior intelligence and speed, it is not uncommon for a professional hunter to lose half his pack of dogs to the "tiger" on a single expedition. The jaguar does (jaguar hunting is now illegal in Belize) not "tree" as the North American mountain lion does; with increased hunting pressure, they have learned to take to the water, being powerful swimmers and not shunning water, as do most cats. This has made them an even more rare and valued trophy.

Due to the abundance of wildlife, game laws in Belize are little observed but in the case of the jaguar the exporting of pelts, a highly profitable venture, has been restricted. In 1974 it became illegal to export a single wild animal pelt of any species. The United States has also enacted laws banning the importation of jaguar and other wild animal pelts. Legal protection has greatly reduced the annual slaughter, but poachers - spurred by continued demand - still kill many of the animals for sale to tourists.

Other wild cats in Belize are the ocelot (*felis pardalis*) and the mountain lion (*felkis concolor*), which are occasionally encountered, and the small, graceful jaguarondi (*felix eyra*). The jaguarondi, or eyra, was once thought to be at least two different species, as they have a wide range of colour variation. The most common is reddish with metallic, golden-copper tones, but it is also found white and grey spotted, blotched, and solid grey.

Other big game animals in Belize include the prodigiously ugly and pig-like Tapir (*tapirella bairdi*), called "mountain cow". These huge herbivorous, brownish-black animals have short, stout limbs and long flexible snouts with the nostrils near the tip. They reportedly reach 700 pounds!

Belize has about 500 species of birds, many of them rare and beautiful. In size they vary from the minute hummingbirds, seen whirring about every flowering bush in Belize City, to the jabiru stork, now close to extinction, whose eight-foot wingspan make it the largest stork in America.

Driving on the Belize highways at night one encounters nightjars, here called "bullbats", playing in and out of the headlight beams and hears the raucous night cry of the "chachalaca" who Belizeans say can predict a change in the weather. They also claim to be able to tell time in the jungle by the regular whistling habits of the "tinamou" who reportedly sounds off exactly on half-hour intervals.



Fluttering, chattering, vivid green and yellow wild parrots are seen everywhere in the interior, being exceedingly busy doing nothing. Larger parrots, the macaws, come in at least two varieties; the flaming scarlet-coloured and the gorgeous red, blue and yellow ones. There is also another type of parrot which is all green with a blue head. Besides making a colourful addition to the verdant landscape, the parrot is a choice entree on the Belizean dinner table.

Local gamebirds are the Central American wild turkey, whose opalescent colouring seem to change from blue to bronze to a deep rich gold as light plays along their ocellated plumage, and the curassow. The curassow is a black, turkey-like bird with a large yellow fleshy growth about the base of his bill, small beady near-sighted eyes, and an unkept-looking crest which gives it a constant droll appearance. The shanks of its legs are unexpectedly naked and it struts about with a comic dignity. Of the lesser gamebirds there are partridge, quail, curlew, pigeon, snipe, and many varieties of duck.

NATURAL HISTORY OVERVIEW

TROPICAL RAINFOREST (HIGH CANOPY)

The tropical rainforest is found throughout southern Belize and in parts of the northwest. As the name suggests rain forests are generally within a high rainfall and temperature climatic zone. In southern Belize the eastern slopes of the Maya mountains receive the greatest amount of rainfall, while in the drier regions to the northwest the dominant forest type is broadleaf and tropical moist forest. In a broadleaf forest many trees will shed their leaves during an extended dry season often bursting into flower before going into dormancy. An undisturbed wet or moist forest type is characterized by a dense canopy made up of heavily buttressed trees interconnected by vines and lianas. Underneath the forests are often clear and open, with palms and sparse understory growth.



JUNGLE

The jungle is typically a disturbed forest type with a mix of emergent species and thick understory growth. A good example of jungle is found in the Cockscomb basin of southern Belize. In 1963 hurricane Hattie spent her full force on the eastern slopes of the Cockscomb destroying much of the high canopy forest. As the forest canopy is broken up the amount of available light reaching the forest floor increases dramatically, pioneer species thrive producing an often impassable mass of vegetation. This understory growth provides good habitat for small mammals and rodents.

COHUNE RIDGE

"Ridge" denotes a forest type rather than topographic feature. Found within the rain forest, forest communities can be dominated by the Cohune Palm which form a closed canopy limiting understory growth. The Cohune Palm is maintained and cultivated by the Mayans both past and present, the palm fronds are used for thatch roofs and shelters, the nuts for flour, oil and charcoal.

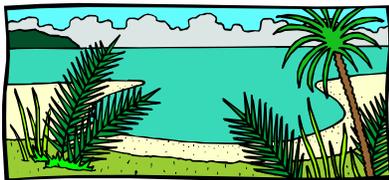
PINE SAVANNAH

This is a fire maintained zone with open grass, clusters of pine, palmetto, oaks and thicket. Interspersed in southeastern, central and northeast Belize.

PINE RIDGE

A climax community on porous non-calcerous soil. Found at higher levels often characterized by swift flowing rivers, deep gorges and areas thickly forested with Caribbean and Honduran Pine.

FRESH WATER MARSH FOREST & SWAMP



Wet lands varying from almost permanently inundated areas to savannah through to marsh forest. It is appropriate to divide the freshwater wetlands into three major types. Bajo swamp forest occurs in clay-filled depressions; during the wet season they are water logged and dry up in the dry season. The result of these conditions is a low dense scrub and thicket 3 to 5 m tall with occasional emergent trees. The flora and fauna of the Bajo swamp is highly specialised and is uncommon in most other vegetation types. The next type of freshwater swamp is termed by Brokaw & Mallory as swamp forest, this subtype does not experience the extremes of wet and dry as a the Bajo swamp and can often be in the most poorly drained soils of a broadleaf forest. The third classification is marsh forest in which bullet tree (*bucida buceros*) is common.

MANGROVE

A salt tolerant community found along much of the sea coast and offshore islands. Characterized by distinct stilt roots with that are often growing right from the sea bed. This community is important as habitat for many juvenile marine species and as offshore rookeries for the frigate birds and boobys. Their arched roots under the water support a rich flora of algae and subtidal organisms. Brittle stars, perwinkle snails, mangrove oyster and a host of other organisms are festooned from the underwater roots. Starfish, crabs, conch and many types of worms occupy the muddy ocean floor.

BARRIER REEF

The barrier reef of Belize extends some 250 km in a north south direction and ranges from 15 to 50 kilometres offshore of the mainland. It is the largest continuous reef in the Caribbean. The shoreward lagoon formed by the barrier reef is 20-25 km wide in the north and close to 40km between the reef and the mainland in southern Belize. The coral reef provides sheltered water that are teeming with tropical marine life.

REEF STRUCTURE

The term "reef" is derived from Dutch for "something from which a ship can run aground" Despite their diverse forms, all reefs share common characteristics in being structures of varying shape rising above the levels of the adjacent sea floor constructed by and consisting of organisms. Reef structures will usually grow to reach the surface of the sea. With specific requirements for life; light, water temperature, salinity these reefs are generally restricted to shallow, warm water areas.



There are four distinct types of reef found within Belize. the barrier reef usually well formed and continuous is separated from the mainland by a lagoon, the fringing reef which grows as a girdle around an island or along the shores of the mainland, a patch reef consisting of clusters of corals found in the lagoon region and the circular atolls found further offshore All these types of reef have a similar makeup, the base structure is formed of calcium carbonate which are the skeletons of dead corals, on this surface will grow new corals, encrusting algae and the branching corals. Reefs are by no means uniform in size and shape presenting many different shapes and sizes, caverns, arches and blocks. These features provide ideal habitat and is an important factor in the diversity and distribution of species.

REEF ZONATION

As you travel from the west or the mainland to the east or the ocean side of the Belizean reef complex there is a distinct zonation of ocean floor, flora and fauna. There are three primary zones: the back reef, the reef crest and the fore reef.

BACK REEF ZONE

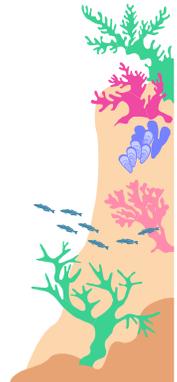
From the shores of the mainland the lagoon may gradually deepen into a channel with sea grass beds before becoming shallow again towards the reef crest. As one approaches the reef crest there are numerous patch reefs in anywhere from two or three feet of water to 30. Patch reefs are often dominated by brain corals. This area of the back reef is very rich in species diversity. It can be thought of as the forest edge bordering on a sea grass savannah.

REEF CREST

As one moves further towards the reef crest the very shallow waters are termed the rubble zone. Much of the debris from surf and storm as it pounds the reef crest is deposited in this area. Because of siltation and high mechanical stresses this area has few living corals. This is the zone that buffers the lagoon side of the reef from the forces of the open sea.

FORE REEF ZONE

The fore reef zone withstands severe environmental stresses near the reef crest until it grades downwards towards the depths of the ocean floor. This area to a depth of approximately 80 ft represents the highest diversity of the reef. The shallow waters adjacent to the reef crest is a region where the branching corals, predominately elkhorn and staghorn corals thrive. As one moves further sea ward the waters deepen and huge masses of boulder corals, massive brain corals, lettuce corals and large cactus corals grow. The transition from shallow water to the ocean depths is broken with ledges and gullies.



THE MANGROVES

By James Beveridge, Reprinted from: Belize Currents

Tourism and development. Eco-tourism and the environment. Not necessarily compatible pairs, but all have made impacts on Belize during the past few years.

Thanks to the Belize government and the country's tourism industry, the rainforests, wetlands, atolls, and the barrier reef are being given priority notice, and rightly so. Most of the world has learned – too late – the benefits of conservation and of the protection of natural wonders. Belize is fortunate that with its small population, few pressures have been put upon its wildlife and its natural beauty.



However, there are two eco-systems within the country that are looked upon as negative by developers and the general tourism industry. These are the mangroves and the accompanying grass flats. Many people see mangroves as a hindrance, an eyesore, and a breeding place of mosquitoes and sand flies. As beachfront property develops, the mangroves are usually the first plant life to be removed.

The turtle grass is a close second in unpopularity. People want beaches. Tourists want to swim over clean white sands. While wading, no one likes the touch of turtle grass on bare skin. Who knows what unpleasant creatures it might hide? Isn't it better to feel the fine coral sand between your toes? So, in come the dredges.

In the natural order of things there is a choice – the beaches or the reef. Beaches are a direct product of open, breaking seas. Were it not for the barrier reef of which we are so proud, Belize might have these beaches. Turtle grass would then be restricted to the sheltered areas, and mangroves would find it difficult to root in the continuous battering waves. Fortunately for these two eco-systems, our barrier reef is a huge breakwater, a seawall, if you will – dissipating the energy of the Caribbean's breakers.

There are, however, those who want more than just our magnificent barrier reef. They want the beach, too.

Nine years ago, the owners of Caye Chapel brought in (at huge cost) a dredge. Over the next few years the waters surrounding the caye were dredged to a depth of twelve feet or more. This provided clean sand for wading and swimming close to the shore. Beach maintenance has continued without a break to this day, but now a new wrinkle appears in this artificial environment. Around the northern point of Caye Chapel are rows of sandbags. Why? Because without the mangroves for protection, the caye is eroding away – as much as fifty feet.

Caye Caulker has a similar situation at its cut, which originally was a shallow ditch dug across the island for easy dory transport. It was much widened in 1961 by Hurricane Hattie, and after Hattie, the cut stabilized until the early 1980s when a small camp resort cut down the protecting mangroves. Since then, the buttonwood trees along the edge have fallen one by one into the fast flowing waters of the channel.

As the mangroves and grasses are uprooted, cayes lose their "anchors", the very things that insure their existence.



Consider the turtle grass. Does it have any redeeming qualities? In the 1988/89 season, the Belize Fishermen Cooperative Associations' production of sales included \$10,352,936.00 in lobster tails, \$2,191,930.00 in conch, and just under \$60,000.00 in stone crab claws. Most of this sea food originated in the grass flats. In addition, large numbers of fin fish are caught commercially in the flats. The grass is also the main food source of Belize's manatees and green turtles. Both are globally endangered species, and both are relatively common in Belize's waters.

The proprietors of tourist resorts catering to the sports fishermen recognize the value of the flats for permit and bone fishing. The turtle grass along with the mangroves are the nurseries of many fish species. Literally billions of fry and sprat inhabit these areas, and in turn are fed upon by larger fish, pelicans, cormorants and other sea birds.

All mangroves are halophytes, which means salt resistant, growing where other trees find it difficult or impossible.

There are four species of mangroves found in Belize. Of these, only two – the red mangrove and the black mangrove – are common, covering much of the entire Belizean coastline and most of two hundred or so cayes. Red mangrove generally grows to a height in excess of 30 feet. It can be found in all tidal areas, some inland

lagoons and river mouths, but never far from sea. It can be identified by its arching prop roots. Black mangroves may grow to double the height of the red. It does not have arching roots, but instead has thin upright roots protruding all around the mother tree. These may be up to twelve inches high and are called pneumatophores. Both the prop roots of the red and the pneumatophores of the black serve the same purpose, which is to provide air to the tree.

White mangrove is usually found more inland along river banks, and buttonwood, the last mangrove, grows on the drier areas of the cayes and mainland.

Mangroves are second only to the barrier reef in providing hurricane protection to the cayes and coasts, and are remarkable in its ability for growth and regrowth. They not only spread by their prop roots, but by seeds which germinate while still on the tree. Upon striking mud, the seeds immediately start to grow. If the seeds hit water and float away, they can survive for up to six months until a suitable condition for growth appears.

In 1965, D.R. Stoddart of Cambridge University conducted a survey concerning the regrowth of the mangroves. Four years before, Hurricane Hattie had caused 100% mortality of mangrove on Turneffe Islands due to her 300 kilometer winds and eighteen foot tidal surge. Results of that study showed no regeneration of growth during those four years. Yet one decade later, there is hardly any sign of damage. The mangroves are back.



The mangrove cayes are home for not only hundreds of species of fish and invertebrates, but also many reptiles, including boa constrictors, iguanas and salt water crocodiles. Loggerhead and Hawksbill turtles feed on encrusting sponges and crustaceans which inhabit the roots; spoonbill, ibis and heron feed in the shallows around the roots, while frigates, pelicans and cormorants roost and nest in the foliage.

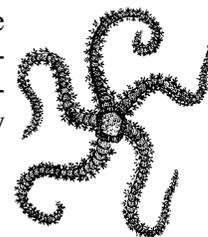
Considering all this animal activity, it is certainly no surprise that your average tourist does not dive among the mangroves. However, if certain unpleasantries are put aside, (inhaling mosquitoes through one's snorkel, and hydroids and firesponges which sting on contact to name a few), this vibrant underwater world will offer major rewards.

The world seen submerged among mangrove roots is straight out of a Tolkein fantasy. Sunlight filtering through overhead foliage and roots, creating eerie moving shadows. The roots, twisted and overgrown, are a kaleidoscope of color – yellow, green and blue of the sponges; orange, purple and red of the tunicates. Large spider crabs cling to the lower root system, while mangrove oysters festoon the upper branches. Giant anemones grow out of the lower nooks and crannies, while scores of upside-down jellyfish pulsate steadily in their fixed positions.

Fish show in numerous shapes, sizes and colors. Barracuda, nurse sharks, tarpon, grunt, cubero, mangrove snapper, grouper and snook to mention a few species. But the undisputed monarch of the mangroves is the American salt water crocodile. Commonly referred to as an “alligator” in Belize, it is the larger of the two native crocodiles. The other, the Morlet crocodile, prefers fresh water and can be found inland in lagoons, creeks and rivers. The salt water crocodile can grow in excess of twelve feet, and was hunted extensively in Belize for its hide which was made into fine leather. Now protected, the rare crocodiles are occasionally caught in nets and fish traps around Caye Caulker and other islands.

All things considered, the mangrove snorkeler should not jump into any mangrove swamp, but first do a little planning. The ideal mangrove snorkeling will be in water from three to eight feet deep, and usually with a slight tidal flow flushing through regularly. The Drowned Cayes close to the city have promise as does Turneffe, but further south close to the Inner and Victoria Channels unique reef formations called faroes are found, rising abruptly from a hundred feet or more to just below the surface. Water is deep and clear, and the root systems have enough invertebrate life forms to keep marine biologists quite busy.

Unique diving paradise or caye protector? The mangroves (along with the turtle grass) are both, and one of Belize's most important eco-systems. A habitat of interdependent living creatures, a major nursery for commercially fished sea foods, and a world so visually unusual beneath the surface, offering erosion and hurricane protection from above. Is providing a sandy beach for our tourists really worth losing this important eco-system? You decide.

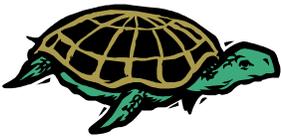


A TALE OF THREE TURTLES

Produced by the Reef Preservation Committee of the Belize Audubon Society with funding support from Dr. C.J. McCoy of the Carnegie Museum of Natural History.

Mankind has always been fascinated by sea turtles and many stories have been told throughout the years of these gentle, harmless reptiles. A West African legend explains why a turtle beats its chest when caught. Long ago the people of the earth were troubled by floods. A wise old turtle swam by and advised them to plant palm trees on the beach to hold the sand in place. This was done and many many lives were saved when the next flood occurred. And what has man done in return? Were sea turtles cherished and protected? To the contrary, turtles are often kept off their nesting areas by fences, walls, buildings, people, pets, bright lights and loud noises. Many are taken and killed for their flesh, their eggs, their shells. This lack of gratitude makes a turtle beat her chest with her flippers when captured by man. Eight species of sea turtles are found throughout the Seven Seas. Three of these –the green, the logger head and the hawksbill-are known to nest in Belize. Let us try to find about a little more about each.

GREEN (CHELONIA MYDAS)



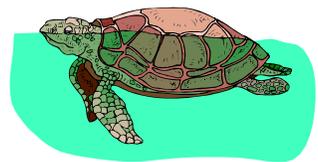
My name is Gertrude. I'm a green turtle. I am so named because of the greenish colour of my fat. Yes, I am eaten; in fact my meat is considered a delicacy and is the main ingredient of turtle soup. My relatives used to grow quite large, some of them measuring 4 feet in length and weighing well over 600 pounds. This is what I've been told for I don't get to see my giant relatives any more. They are all disappearing, one by one. Some are

killed for meat but many become trapped in shrimp trawl nets and other nets and drown. (Humans often seem to forget that we turtles actually breathe and need to regularly surface for fresh air.)

My eggs are stolen from the nest. Hotels, houses and other structures are now popping up on the beaches we have instinctively used for nesting sites. Even our food is growing scarce. Green turtles graze for months in seagrass meadows. Hasn't everyone heard of turtle grass? But dredging and pollution have reduced by food source. Because of these misfortunes I have been classified as "endangered." This means that some humans are working hard to ensure that green turtles do not disappear forever from the oceans of the world.

LOGGERHEAD (CARETTA CARETTA)

Hello! I'm a loggerhead turtle. My name is Lucia. Here in Belize my relatives and I are called "Lagra." We are distinguished from other sea turtles by our large heads, short stout necks and red-brown shells shaped like a giant heart. If the heart is the symbol of love, then I should be quite loveable - all 300 pounds of me. But alas, this is not the case. Over the years the treatment I have received from much of mankind shows a real lack of understanding. But, alas, this is not the case. Over the years the treatment I have received from much of mankind shows a real lack of understanding. Take, for example, my nesting ordeal. Do you realize that female loggerheads return to nest on the very same beach on which they were born? Researchers have tried to unravel this mystery with little success. They can offer no explanation why my relatives will come back to lay eggs on the same beaches from which some of them fled for their lives as many as 50 years earlier. But let us return to my story. After mating, I leave the safety of my home, the sea, in the dead of night to make a next in the soft warm sands on the Caribbean shores. Now although I breathe the same air as you and I can survive out of the water for a long time, on land I am slow, awkward and constantly in anger, from both man and beast. I drag my weight deliberately and painfully across the beach beyond the high -tide line until I have found a suitable nesting spot. I then dig a body pit about two feet deep with my flippers into which I deposit as many as 100 white, leathery eggs, 1 or 2 at a time. Afterwards I carefully cover my eggs, gently packing the sand down and disguising the nest as much as possible. My job completed, I struggle back to the sea. After I leave, poachers will follow my trail and steal the eggs. Hungry animals often find and feast on them, but many of the eggs are left alone. The warmth of the sun develops them and in about 2 months time, tiny baby turtles emerge from their



shells and collectively scrape their way to the surface. These little ones, only a few hours old, wait until nightfall to begin their life or death dash to the sea. Most are caught and eaten by birds, crabs and lizards. Those that reach the sea are attacked by predator fish. Is it any wonder then that less than 5 percent of my offspring will survive to reproduce and keep our species alive?

HAWKSBILL (ERETMOCHELYS IMBRICATA)



I am Horatio and I represent one of the smaller sea turtle species, the Hawksbill. I get my English name from my narrow, pointed face and sharp, hooked beak, just like the bill of a hawk. In case you are wondering, my scientific name refers to the overlapping plates on my upper shell. I don't want to sound boastful but we hawksbills, because of our top shell, are considered to be the most beautiful of all the sea turtles. My top shell consists of scales attractively coloured in tones of orange, gold and dark brown that overlap each other just like roof shingles. But my shell is my downfall and because of it, I am not left in peace. Adult hawksbills are killed only for their shells which are used to make turtle shell combs, hair clips, eyeglass frames, jewelry, etc. Juveniles are plucked from the sea and stuffed, just to be hung on walls as decorations. These young turtles are caught before they are old enough to reproduce. It is not too hard to see why turtles are rapidly disappearing from the warmer waters of the world. Like my cousins, Gertrude and Lucia, I too am classified as "endangered." And I must thank those nice people in Belize for protecting us during the nesting season when we need all the help we can get.

The folklore of ancient coastal communities tells of a race of tiny manlike creatures that dwelt along the shore. Called "sand doobies" they trusted no man but befriended all seaside creatures. It is said that they have helped the baby turtles find the safety of the sea. This may be the reason that an adult turtle will return to the beach of her birth to lay her eggs. Does one ever forget the way to the home of a dear friend? If Belizeans learn to respect and to protect sea turtles, then they will continue to nest on our beaches for generations to come.

Like the imaginary "sand doobies" you can become a friend to the sea turtles of Belize if you observe any of the following steps:

- Learn about our laws that protect sea turtles,
- Respect the turtles nesting season which runs from June 1 to August 31st.
- Do not eat turtle eggs,
- Never disturb a nesting sea turtle
- Do not buy or use turtle shell products,
- Do not throw plastic bags overboard or along the beach,
- Contribute to the Reef Preservation Fund

BELIZE TANTALIZES BIRDERS

By Victoria Irwin

This Central American nation, with a Caribbean twist, beckons many – from birders new to the tropics, thrilling at a Keel-billed Toucan, to macho ‘listers’ attempting to add a few notches on the barrel of their binoculars with an Ornate Hawk-Eagle, Gray-throated Chat, or Ocellated Turkey. That’s the promise of Belize; beauty and abundance.



My goal was simple enough. I had heard the Spotted Wood-Quail once in my life. In the pre-dawn hours at Palenque in Mexico, an explosion of noise outside by cabana made me sit bolt upright. The frantic sounds seemed to be other worldly – and in my groggy state I thought it could be anything, including some discombobulated machine.

By the time I was out the door, there was nothing in sight. I was now awake enough to know the noise was a bird, but which species? As a beginner, I was lost. That outrageous racket stayed in my head, though. And when I listened to a tape of bird songs before I went to Belize last fall (I’m now an advanced beginner), I was startled to hear that same call: a wild, warning cry – the sort of noise you would expect a Rube Goldberg contraption to make if it could jump off the printed page.

“That’s it!” I thought. “That’s what I heard that morning.” Right there I made up my mind to see this bird in Belize.

And I did. It’s part of the magic of Belize, a tiny country with some 550 species of birds, both neo-tropical residents and migrants. It is pretty easy to see the bird-life there. While deforestation and habitat loss is a real problem, the country seems willing to consider a future of balanced development which includes nature tourism, rather than simply following the siren call of clear-cutting lumber companies or cattle ranches.

I found my Spotted Wood-Quail at Chan Chich Lodge near Gallon Jug in the northwestern part of the country, not far from Guatemala. Though I had gone to Belize with an organized birding tour, this afternoon I was with a local nature guide, Gilberto Vasquez, a Mayan who knows the tangled moist tropical forest literally like the back of his hand. He stopped frequently on our walk to explain the medicinal uses of a plant, or to point out a troop of coatimundis under our noses. As a small group rounded a corner and started to climb a hill behind a well-covered Mayan ruin, there was movement in the underbrush along the trail: two birds, gorgeous russet colors with a scruffy, alarmed-looking “hair cut.” We stood very still, and they moved slowly, warily away from the path. But our look was clear. These were Spotted Wood-Quail!

Gilberto didn’t disappoint us as we continued on the wide, well-raked trail through the forest. As we neared another corner, he told us that we might see the coveted Tody Motmot; he often saw a pair in this area as he cleaned the trails in the morning. We looked off into the dense jumble. There, as if on cue, the pair sat, not more than 25 feet off the trail. They eyed us as we eyed them. One bird even turned from facing us to showing us its back, the better to see its entire plumage. Further on we watched the bright beauty of a familiar passerine, the Hooded Warbler, and heard the gentle call of the Slaty-tailed Trogon until we spotted it in the canopy.

My stay in Belize was limited to the Gallon Jug area. But the looks at rarities and more common birds were more than satisfying. Ornate and Black-and-White Hawk-Eagles sat patiently in treetops at different times while we watched in scopes. A Black-faced Ant-thrush wowed us as it calmly walked across and up a jungle trail. Six species of woodpeckers provided some nice comparisons for our group. Euphonias and elaenias entertained us when we wanted to rest our necks. Flycatchers – ranging from birds from home (Eastern Wood-Pee-wee) to the rare White-throated Flycatcher – kept everyone studying guidebooks in the lodge at the end of the day.



Unlike other Mesoamerican countries, the ravages of overpopulation and habitat loss have not yet taken a great toll in Belize. Populated by Mayans during the height of that civilization, the area once had nearly one million inhabitants. Since the Mayan collapse, the territory has been sparsely populated. As a backwater former British colony, large tracts of the country lay undisturbed for centuries. Today conservation organizations like the Belize Audubon Society are working to protect this natural heritage.

“It is unique,” says James Baird, a retired vice-president of Massachusetts Audubon, and former board member of the Program for Belize, a group now run by Belizeans that has helped purchase and conserve habitat, while creating jobs for local people. “There are only 200,000 people in Belize,” Baird explains. “In El Salvador, there are seven million in the same land area. That’s the difference.”

The country has several distinct zones for birding. The coast harbors seabirds such as Red-footed Boobies and Magnificent Frigate-birds. Coastal cays have specialties like Black Catbird, Mangrove Vireo, and Mangrove Warbler.

Outside Belize City there are trips to areas such as the Crooked Tree Wildlife Sanctuary, home to a nesting population of Jabiru Storks. Inland yields a trove of forest birds, from regionally endemic Furnariidae to migrant wood warblers. The Maya Mountains have broadleaf hardwoods, and pine forests at higher elevations provide different habitat, with different birds. For birders looking for a first exposure to New World tropical species, “Belize is the place to start,” says Dale Delaney, noted nature tour leader. The number of species, the ease of finding them, as well as the comfort of travel, put Belize at the top of the list. “It almost spoils you.”

An advantage of birding in Belize for these birders is that the genera of several families are represented by only one species. For example, there is one *Celeus* woodpecker, the Chestnut-colored. There is one toucan (Keel-billed), one toucanet (Emerald), and one aracari (Collared). “It’s not an overwhelming number of species, but a wonderful cross-section,” says Delaney. Birders visiting Venezuela, by contrast, will have far more to sort through.



For advanced birders, Delaney adds, Belize offers species that are rare or uncommon in other parts of their range. One of the most obvious is the Occellated Turkey.

“A seen bird is a dead bird,” in much of the turkey’s range, says Delaney, because it is greatly prized for its meat. But in the 200,000 acres where hunting is forbidden near Gallon Jug, the birds thrive. Tom Harding, who with his wife, Josie, runs the Chan Chich Lodge, said that on his first visit to the area, he found piles of dead turkeys under trees. Hunters came into the area with guides during the night, and with spotlights fixed on roosts, blasted away. They killed more turkeys than they wanted to take.

Today in places where it is protected, like Chan Chich or Tikal in Guatemala, it is difficult to imagine the large birds as wild. They stroll the grounds like barnyard fowl. The list of interesting birds also includes Chestnut-bellied Heron and Bare-throated Tiger-Heron. Bicolored and White hawks are not hard to find. The King Vulture is not a rare bird, but it isn’t easy to see in the northern part of its range. Our group saw it several times, including once from above as we flew back to Belize City.

The Great Curassow can be seen in the trees near Chan Chich, along with Crested Guans; Lesser Swallow-tailed Swifts are active in the skies over the Mayan plaza on which the lodge sits. Last November, a feisty pair of Bat Falcons stood guard over the plaza.

The White-whiskered Puffbird is not rare, but it is uncommonly encountered. It is a very regular sighting at Chan Chich. A regional endemic is the Rufous-breasted Spinetail. It has been seen on the Belize City Christmas Bird Count. Woodcreepers are a specialty in Mesoamerica, and Belize can offer exciting glimpses of these somewhat plain, but captivating singers. The Strong-billed Woodcreeper was seen or heard every day of my visit; a pair was roosting in the cavity of a tree right outside the lodge.

The Gray-throated Chat is a regional specialty. We saw it on two days; once a banded male entertained us for nearly 10 minutes as he bounced through the low canopy above us. The Black-throated Shrike-Tanager, whose range extends to Nicaragua, is easily found in Belize. Its habitat, primarily forest, is disappearing rapidly in other parts of its range. It is often found in mixed blocks foraging through the forest, and its unmistakable call can mean good overhead birding while the flock passes through.



The Jabiru is found along the inland lagoons, particularly at Crooked Tree Reserve. While the South American populations of this stork appear to be healthy, the Mesoamerican Jabirus face the threat of massive habitat loss. The Belize population is one of the largest in the region.

“The Jabiru population is doing very well, indeed,” says Lydia Waight of the Belize Audubon Society, which runs the reserve. “Their population is on the increase.” Also at Crooked Tree are the Black-collared Hawk and, along the road leading to the lagoons, the Aplomado Falcon.

Farther south at Mountain Pine Ridge, the Orange-breasted Falcon can be found. The very rare Keel-billed Motmot has been reported in southern Belize near Caracol.

And, of course, neotropical migrants can be seen all over the country. We saw nearly 30 “birds from home” during our week’s stay in November. It is fascinating to see them in such different habitat, and to study their behavior and plumage in the tropics.

The boom in nature tourism caught some Belizeans by surprise. Tom Harding came to Gallon Jug in 1986 at the invitation of Belizean entrepreneur, Barry Bowen, who owned much of the property in the area. While there was damage from hunters, looters at Mayan ruins, and marijuana farmers, there was also a lot of beauty.

“We were so enchanted,” recalls Harding of his first visit. “We thought that if a hotel or lodge were here – a presence of some kind – it might deter the devastation.”

Harding says he and Bowen didn’t know there was such a “species” as *birder* at that time. But a visit by some North Americans opened their eyes. Harding was astounded at the interest – just as the birders, including Dale Delaney and James Baird, were astounded at the bird-life.

Today 40 percent of Chan Chich visitors are hard-core birders. Another 40 percent are natural history buffs who want to see both nature and the local Mayan ruins. Twenty percent have never seen a tropical forest up close before. Many had visited the Belizean coast, and tacked on a trip to the interior out of curiosity.

Since it became clear that Belize’s nature bounty could yield money, small lodges and tour operators have opened throughout the country. While Belize is considered a model for “eco-tourism”, some local conservationists are reserving judgment.

“The Belize Audubon Society wants to make sure that the influx of visitors does not put too much pressure on these small reserves,” says Lydia Waight. “We have wardens, visitor centers, and education programs. But we need to ask how much is enough, and how much is too much?”

At places such as Chan Chich, for example, night birding has been banned because the numbers of nocturnal animals around the lodge has dropped. And there are other concerns about exploitation of the country’s vast natural resources.

“We recently discovered a group that intended to rustle 600 mahogany trees – 400 in the Program for Belize property and 200 in Guatemala,” says James Baird. “They had cut the trees, but they hadn’t been able to take them. Conservationists must be vigilant.”

It is a fragile treasure, this turquoise and green paradise. Critically important for resident birds and neotropical migrants, whose homes and wintering grounds are being decimated in nearby Mexico and parts of the Peten in Guatemala, Belize is still “whole” enough to preserve a significant area of tropical habitat. And it offers birders the chance to see a fascinating variety of birds – while supporting a country’s efforts to conserve its natural resources for future generations.

TROPICAL RAINFORESTS AROUND THE WORLD

Questions and Answers About Tropical Rainforests

WHERE ARE TROPICAL RAINFORESTS AND HOW MUCH REMAINS?

Rainforests girdle the Earth in a 3,000 mile-wide green band that straddles the equator. Rainforests once covered at least 14% of the Earth's terrestrial surface. Now only 6% - or less than half the original acreage - remains in rainforest. Brazil contains one-third; Indonesia and Zaire each have ten percent of what's left.

WON'T THE RAINFOREST GROW BACK?

Not with its original diversity of plant and animal life. Some rainforest ecosystems have been evolving for 70 to 100 millions years and contain many species that exist nowhere else. These species exist in a complex and delicate balance. When large areas are deforested, many species become extinct.

At the same time, when fragile rainforest soils are exposed to the sun and rain, they erode quickly. When grazed by cattle they become compacted and sterile. When the trees are removed, rainfall patterns change and aridity may set in. All of this adds up to the creation of deserts where formerly the richest communities of life lived.



WHY ARE THE RAINFORESTS SO IMPORTANT?

Rainforests are a vital organ in the planet's life support system and play a central role in regional and global climate control. They maintain and conserve soils and regulate hydrological cycles, thus ensuring fresh water supplies. They provide the sole habitat for over half of the species on Earth, and the ancestral homelands for millions of forest people who rely on them for physical and spiritual sustenance.

Rainforests also provide foods, medicines, and other products for the industrialized world. Since rainforests constitute the Earth's primary gene pool, their destruction will have incalculable economic as well as biological consequences. Their destruction is also contributing to the greenhouse effect (25% of greenhouse gases come from burning rainforest), depletion of the ozone layer, and global climate change.

WHY ARE THE RAINFORESTS BEING DESTROYED?

Misconceived Third-World development schemes are the main cause of tropical deforestation. Many of these projects are financed by the U.S., European, and Japanese taxes and by private banks based in the industrial North. The most destructive projects are road building, logging, agriculture, mining, hydro-electric dams, and cattle ranching. All of these play a role in the destruction of Latin America's rainforests. In Southeast Asia, Oceania, and Africa, logging and agriculture are the primary causes.

HOW LONG HAS THIS BEEN GOING ON?

The destruction began 500 years ago when Europeans began to colonize the tropics. However, indigenous tribes were the main casualties until the industrial revolution brought in bulldozers and chainsaws that were capable of wholesale exploitation of the rainforests. After World War II, the destruction accelerated, and most of the loss has occurred just since 1960.

ISN'T OVERPOPULATION THE REAL CAUSE OF DEFORESTATION?

Not really. Overpopulation is often cited as the cause of agricultural settlement in rainforests, but inequitable distribution of goods and agricultural land in tropical countries is even more responsible.

Many governments use rainforests to defuse movements for land reform. Rather than instituting land reform on prime agricultural lands, which are usually occupied by export crops, they relocate landless peasants to the rainforests where they have no option but to practice slash-and-burn agriculture. Because most rainforest soils are unsuitable for crops, the peasants must move further and further into the rainforests in an endless cycle of burning and depletion.

However, blaming Third-World peasants for rainforest destruction is like blaming foot soldiers for war. In Brazil 4.5 percent of the landowners control 81 percent of its farmland, and 70 percent of the rural households are landless.

WHY DON'T RAINFOREST SOILS MAKE GOOD AGRICULTURAL LAND?

The heat and heavy rainfall in moist tropical regions leach the nutrients out of the ancient soils so that only the top few inches of most rainforest soils contain any fertility. Most of the nutrients are in the biomass – vegetation above the ground.

When leaves and other organic material fall to the ground, they are recycled very quickly through complex interactions among microbes, insects, birds, and plants and animals. However, when the trees and plants are destroyed, most of the nutrients and the complex interactions that have held them go up in smoke.

DOESN'T IT MAKE ECONOMIC SENSE TO CONVERT THESE EMPTY, IDLE LANDS INTO PROFITABLE ENTERPRISES?

That depends on how it is done. First of all, rainforests are not empty. Tribal groups have successfully occupied rainforest territories for hundreds or even thousands of years and nearly all the remaining rainforests are the ancestral homelands of one group or another.

Secondly, intact rainforest is hardly idle. It provides essential environmental services to humans and all other life forms – services such as soil, water, and climatic stability that affect the regions surrounding it and beyond. This is one of the reasons that conversion of rainforest into farmland and cattle pasture has failed almost universally, contributing instead to a downward cycle of ecological degeneration and poverty.

Large-scale “development” of the rainforests has succeeded only in redistributing wealth upward, not outward to the people who need it. The permanent, widely distributed benefits of the intact forest are converted into short-term profits for the very few. The biological and economic loss is incalculable, irretrievable, and tragic.



On the other hand, by leaving the rainforest intact and extracting renewable non-timber products, long-term harvesting would generate two to three times more revenue than commercial logging and cattle ranching.

ISN'T IT UNREALISTIC AND PATRONIZING TO PROTECT INDIGENOUS TRIBES FROM THE 21ST CENTURY?

The question is not whether they can adapt to the 21ST century without losing their cultural identities and skills, but whether they will be allowed to do so. Cultural extinction is not inevitable. If indigenous groups are allowed to retain their traditional lands and are protected from newly introduced diseases, are given time to adapt and allowed to determine their own futures, they can contribute much more to dominant societies than they can after they've become refugees, the dependent victims of disastrous development schemes.

TROPICAL FORESTS FOUND MORE VALUABLE FOR MEDICINE THAN OTHER USES

By Catherine Dold

Reprinted from *The New York Times*, Tuesday, April 28, 1992

A FOREST PHARMACY

In a study of forest plots in Belize, a small plot of 30-year old forest in a low-lying valley yielded five native medicinal species, worth \$564 for a single harvest. A plot of 50-year-old forest in the foothills of the Maya Mountains produced four species worth \$3,054 at local market rates. Clearing the land for other agricultural uses yields far less economic value.

Scientists have developed the first evidence that harvesting locally used medicinal plants from tropical forests could be more lucrative than clearing the land for farming or growing timber.

Such evidence could help convince policy makers that forests should be preserved, as well as show local people who rely on the forest for income, and are tempted to clear it, that they have a stake in its preservation, said the researchers, Dr. Michael Balick, director of the Institute of Economic Botany at the New York Botanical Garden, and Dr. Robert Mendelsohn, associate professor of forest policy at Yale University.

Dr. Balick and Dr. Mendelsohn's findings, based on research in Belize, were published in the current issue of the journal *Conservation Biology*. Preliminary results of the study were reported in January by researchers who attended a symposium on tropical forest resources at Rockefeller University.

With the help of a local herb gatherer, Dr. Balick collected from two plots of mature, secondary growth hardwood forest all the medicinal plants that could be sold to local herb pharmacists and healers. The plants are commonly used in the treatment of ailments like rheumatism, indigestion, colds and diarrhea.

YIELDS FROM PLOTS

The first plot, seven-tenths of an acre of 30-year-old forest in a low-lying valley, yielded 86.4 pounds (about 39 kilograms) of five different species. The second plot, six-tenths of an acre of 50-year-old forest in the foothills of the Maya Mountains, produced 358.4 pounds (about 163 kilograms) of four species. At local market rates, accounting for labor costs, the plant materials from the two plots are worth \$564 and \$3,054, respectively.

Dr. Balic and Dr. Mendelsohn then calculated the value of the plant material in each plot assuming it could be harvested on a sustainable basis. Theoretically, a herb gatherer who owns 30 acres of forest that takes 30 years to mature could harvest one acre each year. Each section would then have 30 years to regenerate before it was re-harvested. The current value of medicinal plants on the two study plots, given such a sustainable harvest, they found, is \$294 and \$1,346 per acre.

When compared to other land uses, medicinal harvesting appears to be one of the most valuable uses of the land. Other scientists have found that clearing rain forest for agriculture is worth \$137 per acre in Brazil and \$117 per acre in Guatemala. Even the most successful pine plantation in the tropics is expected to yield only \$1,289 per acre. Dr. Balick and Dr. Mendelsohn warned that the land value they found in Belize could not be assumed to hold for other areas.

This type of local marketing might work if it is carefully controlled, said Dr. David Ehrenfeld, a professor of biology at Rutgers University who is editor of *Conservation Biology*.

"But any natural system that is coupled to the world market is not likely to fare very well," he said. "Many of the people who are now selling products of the rain forest are not very knowledgeable about the ecology of the forest, and this is a great danger."

Conservationists often argue that tropical forests should be preserved because they may contain undiscovered medicinal plants that would be worth billions of dollars if developed into drugs.

Dr. Balick does not discount such notions. But that abstract argument for preservation, which might not pay off for another decade, is of little interest to the farmer who needs to feed his family, he said.

"We wanted to identify what is valuable to the small farmer today, because he decides whether to cut his piece

of the forest to feed his family or to use it in another way to derive income,” Dr. Balick said. “For the first time we are not talking about medicinal benefits that are years in the future. We are talking about benefits that people are realizing today.”

The World Health Organization estimates that as much as 80 percent of the world’s population relies at least in part on traditional medicine for primary health care.

The next step, Dr. Balick said, is to work with farmers to develop nondestructive harvesting methods that would not require entire parcels of land to be cleared.

Hugh Iltis, a professor of botany at the University of Wisconsin, said he had mixed feelings about the study. “It could be done in the secondary growth forest or the buffer zones around the preserves,” he said. “But it should not be done in the preserve itself. If it is a good business, people will eventually try to plant pure populations of what they are selling, and you would end up with a drug garden.”

FACTS ABOUT RAINFORESTS

- Rainforests cover 2% of the earth’s surface, or 7% of the land mass. They originally covered at least twice that area.
- Tropical rainforests are defined primarily by two factors: location (in the tropics) and level of rainfall. Rainforests receive from 4 to 8 meters of rain a year – 5 meters of rain falls on the rainforests of Borneo each year, five times as much as on New York. The heavy vegetation blocks the rainfall, and water reaches the forest floor by rolling down branches and trunks or as a fine spray. Another distinctive characteristic is that rainforests have no “seasonality” – no dry or cold season of slower growth. (Myers, N. *The Primary Source*).
- Tropical rainforests are the Earth’s oldest continuous ecosystems. Fossil records show that the forests of South East Asia have existed in more or less their present form for 70 to 100 million years (Myers, N. *The Primary Source*).
- Rainforests are being destroyed at a staggering rate. According to the National Academy of Science, at least 50 million acres a year are lost, an area the size of England, Wales and Scotland combined.
- A study by the United Nations Food and Agriculture Organization published in 1981 predicts that one-fifth of the world’s remaining rainforests will be gone by the end of the century.
- According to the 1978 UN *State of Knowledge* report, all accessible rainforests will be lost by the year 2000. Brazil will lose an area two and a half times the size of Portugal.
- All the primary rainforests in India, Bangladesh, Sri Lanka and Haiti have been destroyed already. The Ivory Coast rainforests have been almost completely logged out. The Philippines lost 55% of its forest between 1960 and 1985; Thailand lost 45% between 1961 and 1985.
- Unless current trends change, Malaysian peninsula rainforests will be gone in 1990. Nigeria will be deforested by 2000. Sixty-eight percent of Congo’s rainforest is slated to be logged. Thailand will lose 60% of its 1981 rainforest by 2000. Guatemala, Colombia, Guinea and Madagascar will lose approximately one-third by then, and Ghana one quarter. Honduras, Nicaragua and Ecuador will lose half of their remaining forest by the end of the century. (World Wildlife Fund)
- By the year 2000, rainforests in Central America, Southeast Asia, West Africa, the Himalayan foothills, and Pacific Islands will have largely disappeared, accounting for another 1 million species lost. (Diamond, J.M. & May, R.M. in *Nature*, September 12, 1985)
- Despite the small land area they cover, rainforests are home to about half of the 5 to 10 million plant and

animal species on the globe. Rainforests support 90,000 of the 250,000 identified plant species. Scientists estimate that there are at least 30,000 as yet undiscovered plants, most of which are rainforest species. (Myers, N. *The Primary Source*)

- One fourth of the medicines available today owe their existence to plants. Seventy percent of the plants identified by the National Cancer Institute as useful in cancer treatment are found only in the rainforest. Drugs used to treat childhood leukemia, Hodgkin's disease and other cancers come from rainforest plants, as do medicines for heart ailments, hypertension, arthritis, and birth control. Yet fewer than 1% of tropical forest species have been thoroughly examined for their chemical compounds. (Myers, N. *The Primary Source*)
- Many of the foods we eat today originated in rainforests: Avocado, banana, black pepper, brazil nuts, cayenne pepper, cassava/manioc, cashews, chocolate/cocoa, cinnamon, cloves, coconut, coffee, cola, corn/maize, eggplant, fig, ginger, guava, herbal tea ingredients (hibiscus flowers, orange flowers and peel, lemon grass), jalapeno, lemon, orange, papaya, paprika, peanut, pineapple, potato, rice, squash (winter), sweet pepper, sugar cane, tomato, turmeric, vanilla, yam (Mexican). The wild strains of many of these plants still in the rainforests provide genetic materials essential to fortify our existing agricultural stock. Many other rainforest plants may have great promise to become other staple foods. (Caulfield, C. *In the Rainforest*).
- Rubber, another rainforest product, can only be obtained from healthy, thriving forests. The rubber tappers do not damage the rainforests. (Caulfield, C. *In the Rainforest*)
- It's a common myth that rainforests are "the lungs of the world." While it is true that rainforests produce vast amounts of oxygen through photosynthesis, they consume as much as they produce in the decay of organic matter. Rainforests do affect our atmosphere and climate, but not through supplying the world's oxygen. (Caulfield, C. *In the Rainforest*).
- Rainforests play a critical role in the atmosphere in part because they hold vast reserves of carbon in their vegetation. When rainforest is burned, or the trees are cut and left to decay, the carbon is released into the atmosphere as CO₂, carbon dioxide. This is the second largest factor contributing to the greenhouse effect. (Caulfield, C. *In the Rainforest*)
- Four-fifths of the nutrients in the rainforests are in the vegetation. This means that the soils are nutrient-poor and become eroded and unproductive within a few years after the rainforest is cleared.
- A typical four-square mile patch of rainforest contains as many as 1500 species of flowering plants, 750 species of tree, 125 mammal species, 400 species of birds, 100 of reptiles, 60 of amphibians, and 150 different species of butterflies. In one study, one square meter of leaf litter, when analyzed, turned up 50 species of ants alone (National Academy of Sciences).
- The tropics are the earth's richest natural reserves. One fifth of all the birds and plants on Earth evolved in the Amazon Basin. (Steinhart, Peter. National Wildlife, Dec/Jan. 1984)

MAYAS HAD A MIDDLE CLASS, TOO

By John Noble Wilford;

Reprinted from The Belize Times, Sunday, January 17, 1993

Digging deeper, clearing away thickets of misconception and finally deciphering obscure glyphs, archaeologists are developing striking new images of the ancient Mayas of Central America as a people with a more richly textured society than previously imagined.

No longer are they idolized as an exceptionally peaceful people; their kings made a habit of bloody wars of conquest. Their agriculture was not so primitive; they practiced intensive farming sufficient to feed large urban populations. Their art and technology were not necessarily derived from the powerful cultures of temperate Central Mexico; on their own the Mayas evolved an innovative, vibrant civilization in the tropical lowlands.

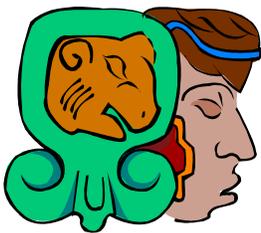


Now evidence is accumulating to support another transformation in thinking. The Mayas, it appears, did not have an invariably simple social structure divided sharply between the rulers and nobles on top and the multitude of poor working peasants. As some kingdoms prospered, new excavations reveal, the gulf between the two disparate groups began to be filled with a growing middle class.

Some of the most persuasive clues for the existence of a Mayan middle class emerged last year from the tombs and ruins of Caracol, which was the capital of one of the major Mayan kingdoms in what is now Belize. Archaeologists said similar evidence is being found at sites in Guatemala and the Yucatan of Mexico.

The new findings not only challenge conventional ideas about a rigid, two-tiered Mayan society, but also undercut a widely held belief that the collapse of the classic Mayan civilization, one of archaeology's enduring mysteries, was brought about, in part, by a widening gulf between the rulers and the ruled that led to revolt.

In an announcement of the most recent studies of Caracol, Dr. Arlen F. Chase and Dr. Diane Z. Chase, anthropologists at the University of Central Florida in Orlando, said yesterday that an examination of burial practices and non-royal workshops and living quarters showed the presence of a large, flourishing middle class in the city throughout the late classic period, from AD 550 to 900. If anything, they concluded, the elite and the commoners of Caracol were growing closer over this time. "There was a large middle group who lived very much in the manner of what we thought was reserved for the nobility," Dr. Diane Chase said. "This is something we have absolutely no doubts about."



The Chases, a husband-and-wife team, and other experts cautioned that the Mayan situation should not be equated with the economic and political status of modern middle classes. Nor is there clear evidence for much social mobility in Caracol. Members of the middle group seem to have been civic administrators, overseers, leading warriors, bone-setters and skilled craftsmen. Dr. Jeremy A. Sabloff, a Mayan specialist at the University of Pittsburgh, described the Caracol discoveries as exciting and important, "part of a whole change in Mayan archaeology, in which people are seeing that the older, simpler models are just not sufficient to explain what we are finding in excavations."

Dr. David Friedel, a Mayan archaeologist at Southern Methodist University in Dallas, said new research elsewhere was producing evidence of "social rankings below the level of kings in all the well-recorded capitals." One of the current challenges for archaeologists and scholars of Mayan hieroglyphics, he said, was to understand the symbols of power used by several different ranks within the elite and to identify those in power and the relation of others to them.

The Chases suspect that the Caracol middle class arose in the wake of military success, beginning in 562 with the conquest of Tikal, another important Mayan city-state in what is today Guatemala. Victory brought wealth and rapid population growth, which scholars now recognize as a motivation for much Mayan warfare in the classic period, from AD 250 to 900. From a detailed survey of a Caracol site, covering 55 square miles, an extensive digging, the Chases estimate the city's population may have reached 180,000 making it one of the largest in Mayan history.

CLINCHER FOR HYPOTHESIS

About 70 formal tombs have been investigated at Caracol over the last eight years, including two intact royal tombs found last year. One tomb, determined to be 1,600 years old, contained the remains of a ruler and another individual, along with a large number of ceramic vessels and jewelry. A painted text dated the construction of the second tomb to 668. It held the remains of four members of a royal family, all resting on a plaster floor covered with jade flakes.

“Those two tombs were the clincher for our hypothesis,” Dr. Diane Chase said. She and her husband had already outlined their ideas on a growing middle class in a book, *Mesoamerica Elites: An Archaeological Assessment*, published last summer by the University of Oklahoma Press. Before these discoveries, the researchers said it was widely believed the Mayas buried their dead rulers and royal families in ways that differed significantly from the rest of the population. Instead, comparison of these tombs with non-elite burials showed a number of shared practices: the interment of more than one person in the same chamber and the use of identical ritual materials.

The Mayas did not bury their dead in secluded places like cemeteries, but in special buildings that were part of their living complexes. “They had the dead ‘live’ with them,” Dr. Arlen Chase explained. “The dead may have even been formal participants in rituals carried out by their living descendants.” The royal tombs at Caracol may have been somewhat larger than those of the middle-class dead, and more elaborately decorated and inscribed with detailed hieroglyphics. But otherwise, the royal dead were treated much like the others. Two things were happening, the Chases concluded. More non-elite people could afford to adopt some of the jewelry and ritual customs of the elite, and the elite seemed to make no great effort to maintain some of the more conspicuous class distinctions.

In other excavations at Caracol, the Chases identified workshops where craftsmen made jade and shell ornamentation, including rings, necklaces, pendants and earflares, apparently for the growing middle class. The artisans’ stone tools were still in some of the shops. “If these artisans were making things only for elite households, the workshop would be near the elite households,” Dr. Diane Chase said. “When we found areas we suspect are workshops, they are not located there, but along the roads leading away from the center. These people were producing things being used by more ordinary people.”

Archaeologists working with Dr. Arthur Demarest of Vanderbilt University in Nashville have sought to delineate social stratification at Dos Pilas, another large Mayan city-state in Guatemala. They examined patterns of variations in the architecture, masonry, pottery, burials and grave goods at more than 400 households.

Dr. Demarest said the findings supported the middle-class hypothesis, showing “a kind of continuum between rich and the poor, without any sharp breaks in the levels of wealth.



EVIDENCE AGAINST REVOLT

Archaeologists said the evidence from earlier sites was too sparse to determine if Mayan societies had a substantial middle class before the sixth century. Mayan prehistory extends back to 1200 BC, but it was the class period from AD 250 to 900 that saw the peak of Mayan civilization, symbolized by the magnificent temples, tombs and pyramids. From the end of the classic period to the arrival of Europeans, the Mayan cities went into a steady decline.

The last recorded date on a monument at Caracol is 859, and the city seemed to be totally abandoned by 1050. From the ruins, archaeologists said, it appears that Caracol met a violent end.

But if the Chases are right, Caracol and other Mayan cities were not doomed by a peasant revolt against the elite. Both the peasants and nobles – as well as a middle class that had known periods of prosperity – were probably victims of the increasingly frequent and widespread warfare that, according to the new thinking, contributed to the collapse of one of the great pre-Columbian civilizations.

WRITER'S LIFE

By Irma McClaurin

I discovered that by writing I could overcome some of the obstacles that faced me as a woman, a Belizean, and later on as someone who was living away from Belize. It helps me to be. If I don't write – I feel unconnected.

The soft voice of Zee Edgell belies the passion, conviction, and determination that fuel her writing and create the people and events of her novels. All her works are set in her native Belize, and in the thirteen intervening years since that country became independent, Edgell has single-handedly become its most widely recognized international literary voice.

Born Zelma Inez Tucker on October 21, 1940, to Veronica and Clive Tucker, both Creole, Edgell documents in her novels the changing history of Belize and the development of a national identity based upon the country's rich ethnic and diverse cultural traditions. In addition to Creoles (African, African-British mixture and West Indian), mestizos, Mopan- and Ketchi-speaking Maya, Garifuna (African and Amerindian), and East Indians, as well as Mennonites and a small group of expatriate Canadians and Americans live side by side in the country today and contribute to the rich mixture that is Belizean culture.

The act of placing pen to paper is often described by writers as a compulsion – a need. For Edgell, it is no different. Writing for her is cathartic, a means of turning pain and difficulties into creative empowerment. Her desire to write grew out of a childhood in Belize that was connected to a supportive family and informed by a strong sense of community.

I think both my mother and father had very hard lives. Neither was formally educated, but they set about educating themselves through night school and whatnot. And then my extended family, they were very much rooted in the community and they were always concerned about Belize. Belize was everything to them and I grew up with the sense that the Belize I used to know would always be there.. I grew up feeling that it was one of my jobs to help other Belizeans in whatever ways I could, and I saw examples of that on both sides of my family.

The longing to do something for her country became even more intense after Edgell returned home to Belize from Jamaica, where she worked as a newspaper reporter, and from London, where she studied journalism. Each return since has been intensified by a recognition that the Belize of her childhood was disappearing. Later, Edgell left Belize again for long stretches to work with her American husband, Al Edgell, in such agencies as CARE, Save the Children USA, and the Peace Corps in Afghanistan, Bangladesh, Nigeria and Somalia. She also has lived off and on in the United States and continues research on her dissertation, "Images of the Caribbean in Nineteenth-Century British Travel Writing", through the Department of English at the University of the West Indies in Kingston, Jamaica. All of this movement gave Edgell a sense of "disconnectedness" from Belize. She says: "My novels are an attempt to reconstruct the fragmented images and myriad memories of Belize."

While living in Afghanistan, Bangladesh, and the United States, Edgell, inspired by her desire to preserve the Belize of the past, wrote *Beka Lamb*, which was published by Heinemann in 1982. Set in 1951, the novel chronicles the birth of the nationalist movement in then British Honduras. Edgell says she wanted to capture the optimism and solidarity of that period, when the citizens of British Honduras rejected their colonial status.

The novel evolved in response to Edgell's memories of the general mood of the country during the late sixties and seventies when many Belizeans studying and living abroad, like herself, returned home at the precise historical moment when Belize was on the verge of negotiating self-government. At the time, Edgell says, there was a general sentiment by some segments of the society that Creoles (blacks) in the country had contributed very little. In her mind, this attitude stemmed from a "colonized" view of the past. In writing *Beka Lamb*, Edgell says she set out to "explore how I had come to be and how others had come to be and to try to understand how I could bridge the gap between the colonial past and the new Belize ... There were no published novels about Belize or about the transition from colonization to independence." Writing about this transformation from colonial subject to independent nation also became a personal odyssey for Edgell.

To become "Belizean" I had to let go of some of the attitudes and values fostered by colonialism... It is not possible to decolonize a mind in five easy lessons. Writing the novel helped me to understand a lot about my past. Not everybody saw it that way; some remained "British Honduran." They saw independence as a mistake. They felt as Belizeans we would not be able to sustain our development.

One other important reason motivated Edgell to write *Beka Lamb*: In response to a void in the literature, she set out to create a record of the Belize she remembered that would include women's contributions to the nationalist and independence movements, as well as to the entire process of decolonization.



I think more women than men were in the streets supporting the early leaders. They contributed money and labor. But apart from very token acknowledgment of their contribution, the women were not part of the dialogue. They weren't part of the discourse. So I think women writers in the Caribbean, including myself, inserted our work into the discourse so that, for example, in any discussion now of Caribbean literature there are a number of women whose work must be taken into account.

Edgell has been remarkably successful at reclaiming women's contributions and voices from the annals of Belize's recent past and lending legitimacy to their experiences from her perspective as a woman writer. These dimensions are what make *Beka Lamb* so rich, timeless, and meaningful to audiences all over the world. The young protagonist and her country come of age at the same time – history and personal life are then interwoven. The novel also shows that the process of maturation is painful for both. In each arena, personal and political, although there are human casualties, there is also triumph.

Edgell's ability to speak simultaneously to such a wide range of issues, like coming of age and decolonization, and in a style accessible to Belizean and international audiences, was recognized when *Beka Lamb* was designated in 1982 the joint winner of the British Fawcett Society Book Prize, awarded to "works of fiction which contribute to an understanding of women's position in society today." Since its initial publication, almost fourteen years ago, *Beka Lamb* has been the subject of numerous literary essays, translated into German, and was selected by the Caribbean Exam Council (CXC) as one of the required books all high school students in the Caribbean must read for the CXC exams. Edgell herself acknowledges that the key to *Beka Lamb*'s popularity is the "idealism, hopefulness, and innocence" of the book. "That's the way most Belizeans were when the National Movement began and we stayed that way for a long time afterwards."

Published by Heinemann in 1991, Edgell's second novel, *In Times Like These*, continues the theme of Belize's transformation from a colony to an independent country. Edgell's concern with historical accuracy is evident in the three-week period she uses as the setting. Relying upon newspapers, archival sources, firsthand accounts from Belizeans, and her own experiences as the head of the Women's Desk and later as the first director of the newly created Department of Women's Affairs, Edgell weaves a story of how women and a nation struggle toward independence.

Set in 1981, *In Times Like These* tells the story of an unmarried Creole mother of twins, Pavana Leslie, who returns to her homeland, Belize, after studying and working abroad. She accepts a controversial position in the government as the Director of the Women's Unit. Pavana struggles publicly to do her job amid the heated political climate and privately with confronting the father of her children. A second story within the novel develops at the historical moment of national protests by Belizeans against an attempt "to resolve a dispute, going back to 1859, between Britain and Guatemala over the latter's alleged claim to the then colony of British Honduras". The event represented the first time Belize was involved in such discussions.

Up to now in my novels, Belize is always a major character. It's not just a backdrop: it's an integral part of the narrative. In this way I create my personal vision of Belize. I also select from the tapeworm of my life several inches that seem to have some bearing on the novel's time frame. I fictionalize those aspects of my experiences so that they do not conflict with the actual events that are a matter of public record.

The imaginary and the real converge in this second novel within which Edgell describes the status of women in the society during the 1980s and the government's response to their issues. Recent studies on women in Belize suggest that regardless of ethnicity, many women occupy a tenuous social position. It is one characterized by the absence of financial autonomy, economic dependency on men, underemployment, low wages, and limited access to job training. The latest census shows that today women comprise less than 30 percent of the employed population, and almost 76 percent of those who work earn BZ\$6,000 (US \$3,000) or much less annually. Edgell's own personal life sometimes mirrored these obstacles as she strained to juggle the often conflicting demands and obligations of being a mother, wife, and writer. Edgell's writing reflects, in a very personal way, her understanding of the enormous pressures Belizean women sometimes face.

In fact, Edgell acknowledges that her fulfillment of the cultural roles of mother and wife has often meant placing what she calls the "primary imperative" of writing at a lower priority. Thus, although she worked in journalism between 1959 and 1969, Edgell did not find the opportunity, or what she calls the "shelter" to begin writing novels until 1975. Finding "shelter" and finding space for the imperative has also meant an awareness that writers must sometimes choose between what they want to say and family, politics or job security. Edgell feels that writers sometimes need to "give themselves permission to write." And this is not always easy because of the difficult personal, economic, cultural, and political choices they have to make.

They usually say that artists give up everything for their art, but I have tried to lead a balanced life; so that has meant keeping the imperative in its place, which I think is to the detriment of the imperative sometimes. But I didn't want my writing to damage my family in any way, because they have been my primary support, my primary shelter. So if it meant having to get up early to do the writing or not do the writing, even though the imperative was screaming at me "get to it", then this overwhelming love [for my family] would help me to keep the imperative at bay until I was able to find the space. And I became very creative at finding space.

Supported by a family that includes two adult children, Randy and Holly, and which still extends to Belize, Edgell has found the necessary "shelter" and "space" at Kent State University, where she is an assistant professor in the Department of English. In between teaching creative writing classes, she works on a third novel. Most recently, she was awarded a research grant for 1994-1995 by the Kent State University Research Council to complete her draft of the novel.

This latest novel is both a cultural and literary challenge to Edgell. Written from the point of view of a mestiza, it represents the continuation of her major objective as a writer, which she says is to write novels “about the various ethnic groups in Belize.” When asked why this is so important, Edgell responds frankly:



In a way it is a hard question to answer, because I really don't know why it is so important to me. Again, maybe it is part of this feeling that cultures in developing countries have always have been so silent ... I mean I come out of a long background of poetry, patriotic songs, short stories, oral stories, and folktales of all kinds, but why Belizeans have not named themselves, why we have not described our culture more fully, that is another question. But one of my concerns today is the demographic shift. According to the data from the 1990 census, ... there has been a large population shift, and the mestizos are now the largest single population block; outnumbering blacks and Creoles for the first time. And if this is true, the mestizos who are there now may also be displaced ... the people who are coming in .. from El Salvador, from Guatemala ... are not necessarily of the same culture as the [Belizean] mestizos ... And we don't really know how their culture will inform Belize. There is a great effort to have them become "Belizean", however that is defined ... I have this great longing to see on the bookshelf a novel from each culture – to preserve them. But I can't do it alone. I will need the help of other Belizean writers.

The festival of San Joaquin not only advances Edgell's desire to create a work of fiction that features each of Belize's ethnic groups and their cultures, but it also continues and expands upon her overall concern with social issues, especially those that pertain to women in Belize. Set within the real context of the recent demographic changes in Belize, that increasingly push the country toward latinization as a result of a flow of political and economic refugees from neighbouring Guatemala and El Salvador. Edgell's third novel is based upon a real incident of a woman arrested for the murder of her common-law husband. The work grapples with issues of domestic violence and crimes of passion, by focusing on the struggles of Luz Marina Figueroa. There are two narrative structures: One tells the story of her new life after prison and the other relates the past through memory. Luz Marina's story challenges Edgell as a writer to stretch beyond what she knows.

It differs from my previous novels in several significant ways: ... I am writing in the first person and I am writing about a subject which is outside of my direct personal experience. And I am also writing from the point of view of a mestiza, although of course I am black.

However, as in her other works of fiction, she is able to draw upon the “tapeworm of her life”. *I grew up among the mestizo in Belize and I think I have an intimate knowledge of their urban and rural life. And in Belize, of course, most mestizo speak English, the country's official language, and many blacks speak some Spanish, and all of us speak Creole, the lingua franca. And to my knowledge no one has ever written a novel from the point of view of mestizos, or from the Mayas, or the Garifuna, or the Mennonites, or any of the other groups who make up the Belizean population ... I think it is significant to my own development as a writer.*

Edgell is not daunted by the possibility of criticism from those who may think she is overstressing her artistic license in trying to assume the voice of someone outside of her culture. In her mind, labels and categories are meaningless. Belizeans don't easily fit them since people of different ethnicities freely borrow, without conflict, from each other's cultures. Edgell then is unconcerned about whether people classify her as a “Caribbean” or a “Latin American” writer, though she does want her works recognized as Belizean. But even recognition as a Belizean writer is secondary to her overarching desire that readers respond to the universal themes she sets within the specific locales of Belize's city, towns, and rural areas.

The most important thing to me is that people enjoy reading the novels. I am a Belizean writer, but that should be less important to the reader than the story I have to tell. Once they begin to read, they would find the book provides them with a companion. I hope they see in what I write, something they recognize, something that can help them get through a difficult day. This is what other writers do for me. It is true that writers are English, Belizean, American, or African, and people are interested in your work because the narratives are local or regional, but in the final analysis, books are about love, hope, joy, death, etc. Like other writers, I try to deal with those themes that affect us all.

Relying upon newspaper stories, her own experiences, history and some of the many cultural differences among the people of Belize, Zee Edgell creates her own literary vision of Belize that is as intricate as the weavings made by older Maya women in the most isolated villages and as distinctive as “boil up” a Belizean dish of boiled fish and some of the “ground foods” of the Belizean diet – plantain, coco, sweet potato, cassava, and yam, and flavored by a rich tomato sauce. In Edgell's fictional worlds, she both preserves the reality of everyday Belizean life and reclaims a history of traditions and change.

Reprinted from “Americas”

SUNBURN RAYS — SOME AVOIDANCE TACTICS

By Craig Hoyt (professor of Ophthalmology and Pediatrics at the University of California at San Francisco).
Reprinted from: *Sea Kayaker* Fall 1986

In the 19th Century, tans were reserved for the swarthy villains of pop literature. All right-thinking individuals went to extremes to protect themselves from bright sunshine with hats, bonnets, and parasols. Since approximately the 1920s, however, tanning has become not only fashionable, but downright stylish. In many circles, to have a good tan throughout the year is seen to be not only healthy but a sign of social achievement, although by now we have all become aware of the mounting medical evidence to suggest that the Victorian attitude toward sunshine may be more appropriate than that held today. As sea kayakers exposed to hours on end of sunshine reflected from the surface of the sea, we should be paying careful attention to sun protection, especially for those of us who are considering a trip to tropical or semitropical areas this winter.

The sun's rays reach the earth with a wide range of energy spectrum. These rays extend from the mid-ultraviolet light range (UV-B) through the visible and finally the infra-red spectra and beyond. From the point of view of public health, the most important rays emitted by the sun are in the UV-B range. That is to say, the rays between 290 and 320 nm, or so-called sunburn rays. Most of us are familiar with the signs and symptoms of an acute sunburn. Clinically, this is characterized by redness, swelling and, at times, blister formation of the skin, beginning in a few hours after exposure. This reaction usually reaches a peak in 12 to 24 hours, and gradually subsides, followed by hyperpigmentation and peeling. It is well known that by and large, people with light complexions, blue eyes and blond or red hair are much more prone to acute sunburn than dark-complexioned individuals. In addition, certain environmental conditions are more conducive to sunburn damage than others; these include high altitude, white reflecting surfaces such as snow and sand, and proximity to the Equator. Water does reflect sunlight, but is not as potent a reflecting surface as snow and ice unless the sun is directly overhead.



The most effective therapy for acute sunburn is prevention. This can generally be accomplished by avoiding exposure between 10 a.m. and 3 p.m., but because this happens to coincide with the hours of the day when sea kayakers are most likely to be at sea, staying out of the sun is not a realistic way for them to avoid sunburn. Covering vulnerable skin is a better alternative. Wearing long-sleeved shirts and wide-brimmed hats or other protective clothing can certainly help.

There are also a number of sun blocks and sunscreens available. Most sunblocks consist of thick layers of zinc oxide and/or titanium dioxide; these are quite effective and have recently become available in bright colored pigments – as well as the familiar white compounds – courtesy of California and Australian companies. However, there are a number of chemical sunscreens which are also acceptably effective in preventing sun damage. A sun protective factor (SPF) index quantifies and assures the efficacy of these agents. The SPF consists of the ratio of the amount of exposure needed to produce a minimum amount of redness of the skin with the sunscreen in place, divided by the amount of exposure required to produce the same amount of reaction without the sunscreen. Thus, if you normally start to burn in 20 minutes or so, a SPF4 sunscreen will give you 80 minutes of protection. Likewise a SPF10 will give you 200 minutes of protection and so on. In general for the paddler who plans to be exposed to bright sun rays throughout the day, sunscreens with a SPF value of 15 should be used to provide effective protection. Among sunscreen ingredients, the three active chemicals in widest use are PABA and its derivatives, Cinnamates and Benzophenones. Each of these chemicals has its own special properties and it may be important to shop around when selecting the appropriate sun screen for your type of skin. PABA, a very effective screen of UV-B rays, can irritate certain types of skin, in particular pale northern Europeans. It also stains clothing and, as a result, a derivative of PABA, called Padimate-O, is much more commonly used. If you use a sunscreen with this as the primary ingredient, and it is also irritating, consider looking for a sunscreen with a Cinnamate as an alternative. If you are looking for a sunscreen that in addition to protecting you from the potential tumors produced by the sun's rays also protects you from the UV-A rays that primarily hurt the collagen and elastin in the deep skin layers, and thus lead to premature aging and wrinkling, look for a sunscreen whose primary ingredient is a Benzophenone.

One of the problems sea kayakers have in connection with the use of any sunscreen is that it might wash off as they launch through the surf, or even be splashed off during normal paddling activities. During a recent kayak vacation in New Zealand my friend Debra and I found we needed to reapply sunscreen as frequently as once every hour in order to obtain adequate protection. Fortunately, there is now a better alternative which is called Bullfrog, a reasonably waterproof sunscreen with an SPF rating of 18. This does not wash or sweat off easily. Developed in California, Bullfrog is a light vegetable oil product combining two different blocking agents and a nice citrus scent. It will, I think, capture the vast majority of the market of active people involved in water sports.

Why are we all of a sudden so concerned about the adverse effects of the sun's rays? It is now clear that a number of benign but cosmetically unacceptable, as well as some life threatening tumors, are directly related to sun exposure. Although the dry leathery wrinkled skin seen in the older person is considered by most to be the result of the normal aging process, this is a gross misconception. These changes are directly due to chronic sun exposure injury that has occurred over a number of years. Damage of this type frequently results in the growth of precancerous change of the skin known as actinic keratoses; these are not in themselves dangerous, but they may lead to a much more damaging and life threatening problem.

Skin cancers are by far the most common of all human malignancies that occur in the United States, and each year they account for 30 – 40% of our total human malignancy treatments. The experience of President Reagan is hardly unique. It has now clearly been shown that basal cell carcinoma, squamous cell carcinoma and the even more life threatening malignant melanomas are all directly related to sun exposure. A study was recently undertaken by the University of Indiana School of Medicine to investigate the prevalence of skin cancer in a group of female professional and amateur golfers. Their results are thought provoking. Four of the 51 female professional golfers had already developed basal cell carcinoma despite the fact that their average age was only 25; eleven of the 142 female amateur golfers who golfed much less frequently and with much less accumulative sun damage also showed basal cell carcinoma, and their average age was 51. This supports the classic animal experiments of Blum and colleagues, who demonstrated that tumor formation could be accelerated by shortening the interval between exposures to bright sunlight and/or increasing the dose of sun exposure. These observations suggest that prolonged daily sun exposure is far more important in causing skin cancer than occasional sunburns that may occur at the beginning of the year.

TREATMENT

All of us at one time or another have been sunburned. Despite the plethora of sunscreens and sunblocks available, we will probably be sunburned again. The burn received from exposure to the sun can be so mild that it simply increases the color of the skin to a very slight pink hue. In contrast, it may be severe second degree burn with blister formation, edema of the surrounding area and severe pruritic reaction (itching). All forms of sunburn will ultimately heal on their own, usually without scarring. However, the appropriate treatment of acute sunburn can greatly enhance one's comfort while waiting for the healing process to occur.



First and foremost for the sea kayakers is to make certain that all areas that are involved with the burn are meticulously cleaned so that there is no potential for secondary infection. Cleaning can be done with a mild soap and lukewarm or even cool water. For most mild forms of sunburn a calamine lotion with 1% phenol can be applied topically to the involved area several times a day with significant relief of the pain and itching. This type of lotion can be obtained without a prescription. For more severe degrees of burn, topical application of a steroid lotion, usually hydrocortisone, may also be recommended. Hydrocortisone lotions and ointments can be obtained in most drug stores without a prescription, at least in weaker concentrations. One should not use fluorinated steroid products (which are usually only obtainable with a prescription) as there is evidence that these may promote thinning of the skin in damaged areas. Topical steroid ointments work primarily by relieving the secondary inflammation that accompanies a burn. Their effectiveness is, therefore, not immediately felt. If one has a significant burn involving a great deal of discomfort, the topical application of an anesthetic ointment may be more appropriate. There are many of these ointments available without prescription and they are of the same type as those used in an injectable form by dentists and other physicians performing minor surgery. Solarcaine

is one of the trade names for this type of product. Note: these products will provide immediate pain relief, but they do not have any anti-inflammatory action to enhance skin recovery from the inflammation of the burn. In severe burns the use of systemic steroids for 4 to 7 days is often advocated by physicians, although steroids used in this fashion - in tablet form – have significant potential side effects: obviously, they can only be obtained with prescription and on the advice of one's personal physician.

For the treatment of most forms of sunburn, I would certainly advise sea kayakers putting together their medicine kit for a prolonged trip to at least carry calamine lotion with 1% phenol and a topical steroid ointment.

It is important to note that sunburn is not the only adverse reaction that the skin may experience as the result of exposure to the sun. Less well known is the fact that many of us may have an adverse reaction that really represents a photosensitivity of toxicity. This produces a different type of reaction of the skin and can occur even in heavily pigmented individuals who have no serious potential for burning. A sun sensitivity reaction is characterized by eczematous areas of exposed skin. The skin does not usually show blistering and edema as is the case for sunburn but rather a dry flakiness and occasional small vesicle formation. There may be very marked itching with this type of reaction, however, and the itching is often greatly out of proportion to the visible damage done to the skin. Sun sensitivity reactions require two elements: 1) The skin must be sensitized either topically or systemically by some chemical product 2) The skin must be exposed to bright sunlight. Products that are known to sensitize the skin toward this type of reaction include plant and plant products (particularly products that include coaltar). One should note that coaltar is part of a number of different types of skin care cosmetics. In addition, some soaps, particularly perfumed soaps, may produce a sun sensitivity reaction. Oil of bergamot is another substance which promotes it; it is found in many forms of eau de cologne, some of which people will unfortunately apply to their skins before sunbathing. Beyond this, a number of systemic medications prescribed by physicians for specific ailments are also well known to promote sun sensitivity reactions; these include phenothiazines (a form of tranquilizers) and the antibiotics, sulfa and tetracyclines.

As I emphasized earlier, the major symptom experienced in a sun sensitivity reaction is a severe form of itching. This is not surprising as it primarily consists of an allergic reaction. The treatment for this type of reaction is to make sure one is not further exposed to bright sunlight until the sensitizing agent has been discontinued. Topical application of steroid ointment for relief of the inflammation and itching is recommended. Severe reactions may also require systemic steroids as is the case of sunburn, but this should definitely be managed by your own physician. Sea kayakers would be well advised not to apply anything to their skin prior to going out on a kayak trip other than a sunblock or sunscreen. This includes all forms of eau de cologne, deodorant, hand lotions and other cosmetic products. Not all of us will experience sun sensitivity reactions if we use products known to sensitize skin to sun; however, this is not an uncommon problem, and one easily prevented in most circumstances.

Recent evidence suggests that beta-carotene tablets may protect the skin from both sunburn and sun sensitivity reactions. This observation has promoted the sale of these capsules and tablets in health food stores. These are not always easily obtainable, however, and for those sea kayakers headed for tropical waters, one should note that the best source of beta-carotene is not carrots, but papaya. A diet rich in papaya may provide you protection from the sun's damage on your next tropical adventure.