

A remote beach on Costa Rica's Pacific shore is deceptively deserted. For every square foot of sand has been upturned by the massed thousands of ridley turtles that came the previous night to nest. One evening (overleaf), three thousand turtles were on the beach at one time.

ARRIBADA

photography by DAVID A. HUGHES

ON THE PACIFIC COAST, near its northern border, Costa Rica has proclaimed a new national park, Santa Rosa. From the old farmhouse that serves as the park's museum and temporary headquarters, a horse track somehow finds its way to the ocean and a modest beach nestled between rocky promontories. It is an arduous day's journey in the rainy season—through high-canopied forest, open valleys, mangrove swamps, up nearly vertical and rock-strewn trails, across streams and an estuary. Arduous, but exciting, with glimpses of trogons and coatimundis, with the accompaniment of chattering white-faced monkeys and, toward dusk, the howlers.

The beach, however, is the goal. For to this patch of sand, to perpetuate their kind, come the Pacific ridley turtles, *Lepidochelys olivacea*. They come here in the immense nesting aggregations that, in Spanish, are known as *arribadas*. And this one place in Costa Rica, Nancite Beach, could be the salvation of this little sea turtle.

Like most of the world's oceanic turtles, the Pacific ridley is a threatened species. Threatened because it migrates in tremendous flotillas and congregates at its few chosen nesting beaches. This makes the slaughter easy for commercial hunters spurred by a fashionable demand for turtle leather. In one year, more than one million ridleys were legally killed in Mexico. The illegal kill cannot be guessed.

It was not until 1967 that the first ridley nesting beach in the eastern Pacific was discovered. Only seven sites are known—five in Mexico, two in Costa Rica. They host, when the *arribadas* come, perhaps three million turtles. But nowhere are the marine reptiles safe from exploitation—by the hide hunters or by the egg takers—except at Nancite Beach. Strictly by chance, for its importance was then unknown, this isolated cove fell within the guardianship of a national park.

To study and photograph the *arribada*, animal behaviorist David A. Hughes, with his wife and daughter, spent three and a half months in the solitude of Nancite Beach, camped in a shady thicket of hibiscus at the south end. And from the steep hill above, with a telescope, they could see countless thousands of turtles at sea, "floating, basking in glassy smooth patches, shells high above the water, while brown boobies flew about them, alighting and resting on their dry, bobbing backs."

Local folk near other ridley beaches had said that the turtles always come ashore during the moon's last quarter. But the new moon came without any *arribada*. Another report that an onshore wind would "blow" the turtles to

land was repeatedly disproven. For six weeks the Hughes waited until, one day, "the expectancy in the air seemed tangible, as groups of buzzards sat in their favorite trees gazing out to sea. Perhaps, with their incredible vision, they were able to detect some change in the behavior of the turtles."

That night, 212 ridley turtles came ashore to nest. The following night Hughes had tagged the foreflippers of 65 more turtles when, at midnight, "my flashlight revealed a solid line of turtles along the edge of the surf. And each receding wave left a phalanx of new arrivals."

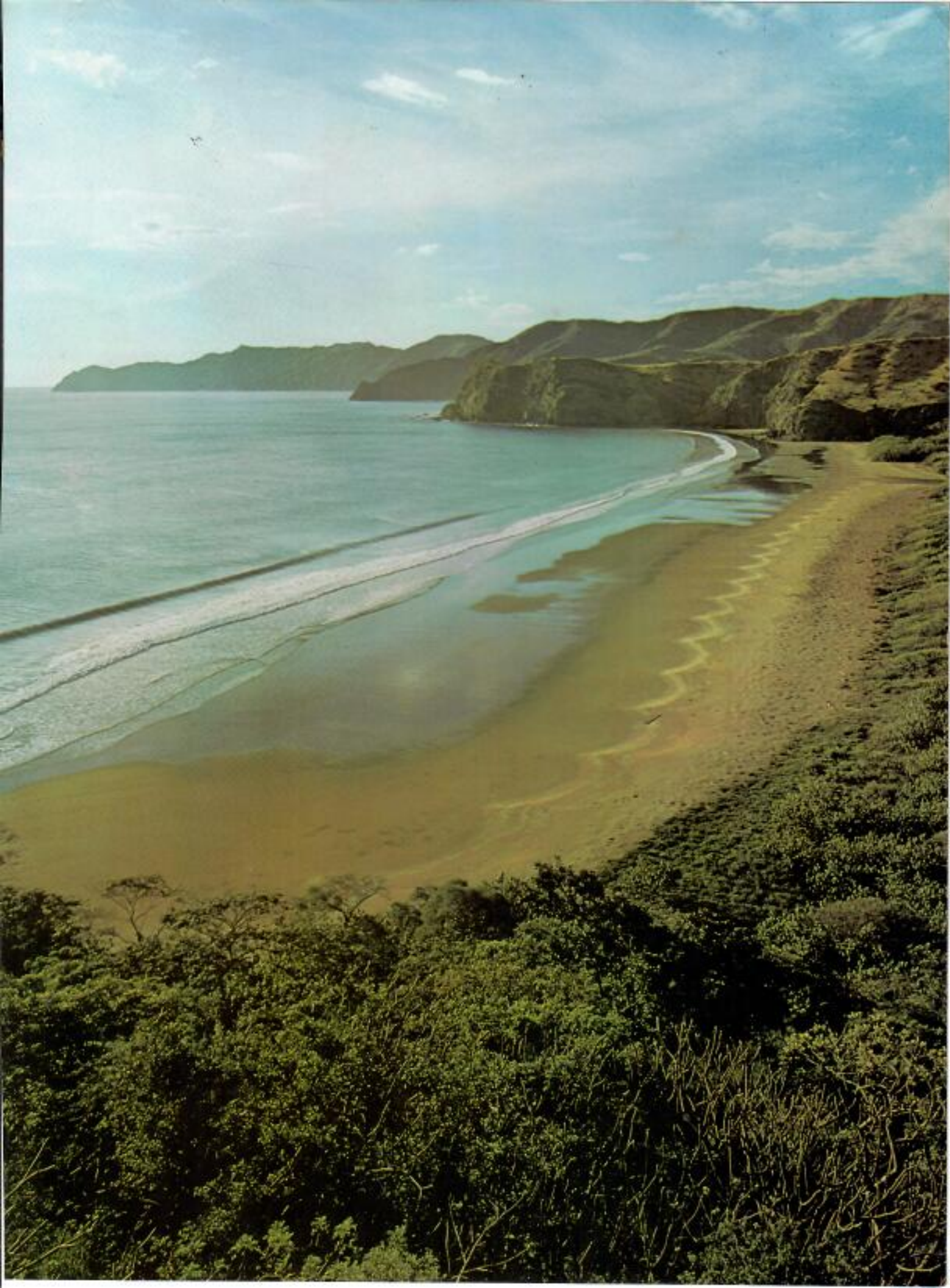
Turtles marching up the beach and turtles returning to the sea had to clamber over each other. As unused nesting places became almost impossible to find, newcomers dug up the eggs of earlier females. All the while, over the roar of the surf, could be heard "the sighs and grunts of labor, the grind and squeak of shell against shell, loud slaps as neighbors struck neighbors with wide sweeps of their foreflippers, and the constant thud of turtles stamping the sand hard above their eggs."

Hughes had heard that Mexican *arribadas* occurred in daylight. But the chaos on Nancite Beach was over by dawn, when hundreds of vultures arrived to pick their way into the protected carcasses of turtles that had been overturned in the melee or become entangled in the thick vegetation above the beach. For four nights the mass nesting continued. On the fifth night, only shark-crippled turtles, many of them missing flippers, came ashore to make a futile try at digging nest chambers.

Two more *arribadas* took place during the Hughes' stay on Nancite Beach. Only twice did the congregated nesting continue through the intense heat of the day. In those three *arribadas*, Hughes estimated, 290,000 nests had been dug and 29,000,000 eggs deposited in the narrow strip of sand above the tide line. He calculated further that if just one square foot of sand were allotted to each turtle, there would be room on Nancite Beach for only 180,000 nests.

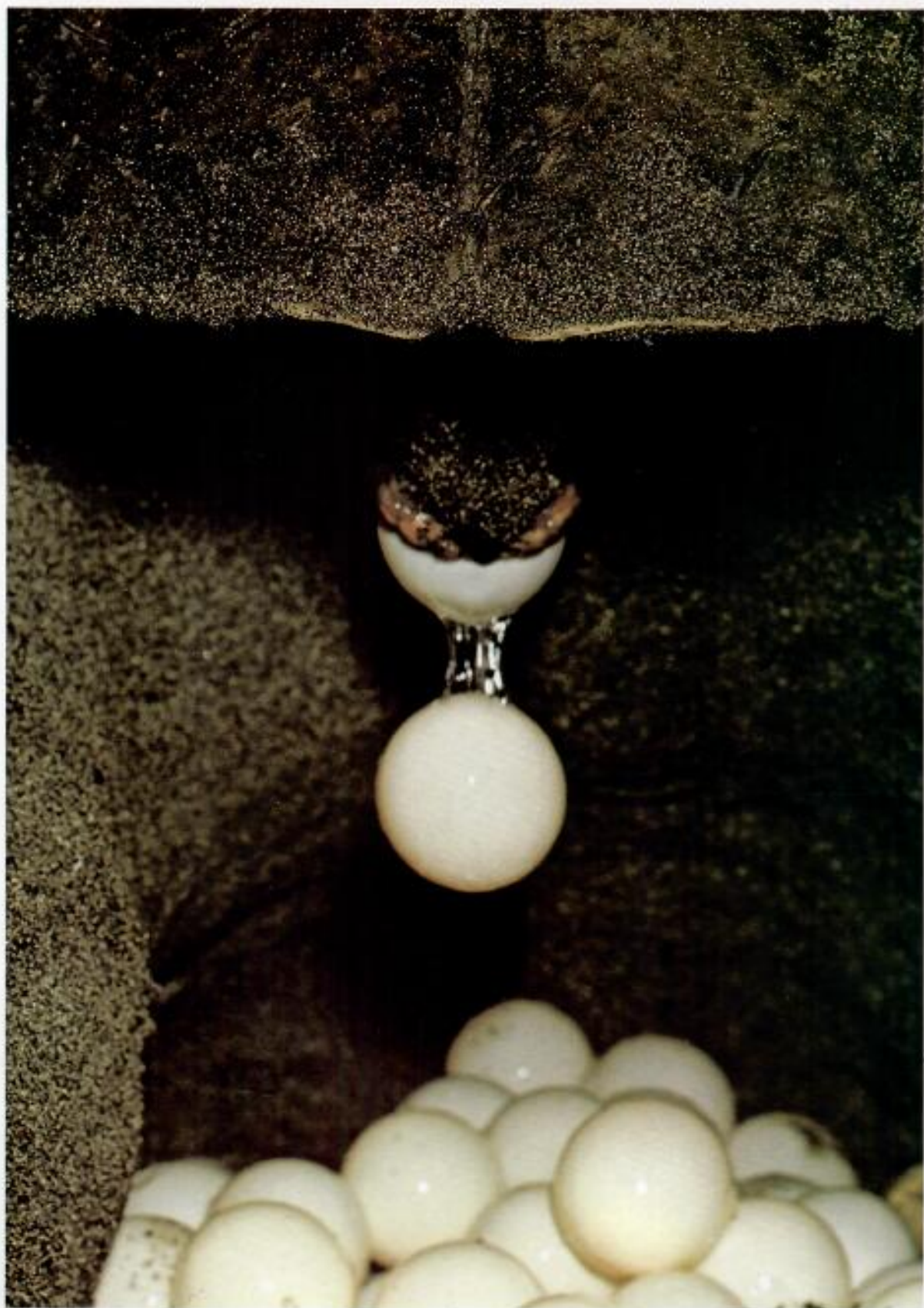
And why *arribadas*? Once, Hughes suggests, ridley turtles came ashore daily throughout the nesting season, and this attracted an enormous number of predators that not only attacked adults and destroyed eggs but eliminated nearly every hatchling that emerged. By confining their nesting to brief and irregular periods, he believes, the turtles gained some measure of relief from predation, though a great destruction of hatchlings still occurs.

Now, regrettably, the worst predator on Earth has discovered the ridley's aggregations.









An egg drops into a Pacific ridley turtle's nearly filled nest cavity, as another emerges from the cloaca. The hatching of eggs from the first arribada at Nancite Beach overlapped with the arrival of nesting turtles of subsequent waves, and a female ridley, perhaps two feet in length, was photographed with a hatchling measuring about an inch and a half.





Hatchling ridley turtles, emerging from the sand 48 days after the first arribada, had to run a devastating gauntlet of predators. Black vultures, 250 strong, congregated at erupting nests. At midbeach, ghost crabs in unprecedented numbers seized tiny turtles by the flippers and carried them into their burrows. Frigatebird gangs patrolled the surf, snatching and swallowing hatchlings with aerobic skill. Numbers of sharks cruised in water inches deep. Of the 11,500,000 eggs deposited by the first wave of female turtles, only 100,000 hatched, an average of only one per nest; no more than 25,000 hatchlings reached the sea.





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- 4 In the dragon islands
field notes by Peter Matthiessen
photography by Les Line

- 28 Tortoiseland of Alcedo
photography by Tui A. De Roy

- 40 Galápagos . . . the sea below
photography by Douglas Faulkner

- 50 The man who rediscovered America
David McCullough

- 64 Panama practices art of the possible
Anne LaBastille

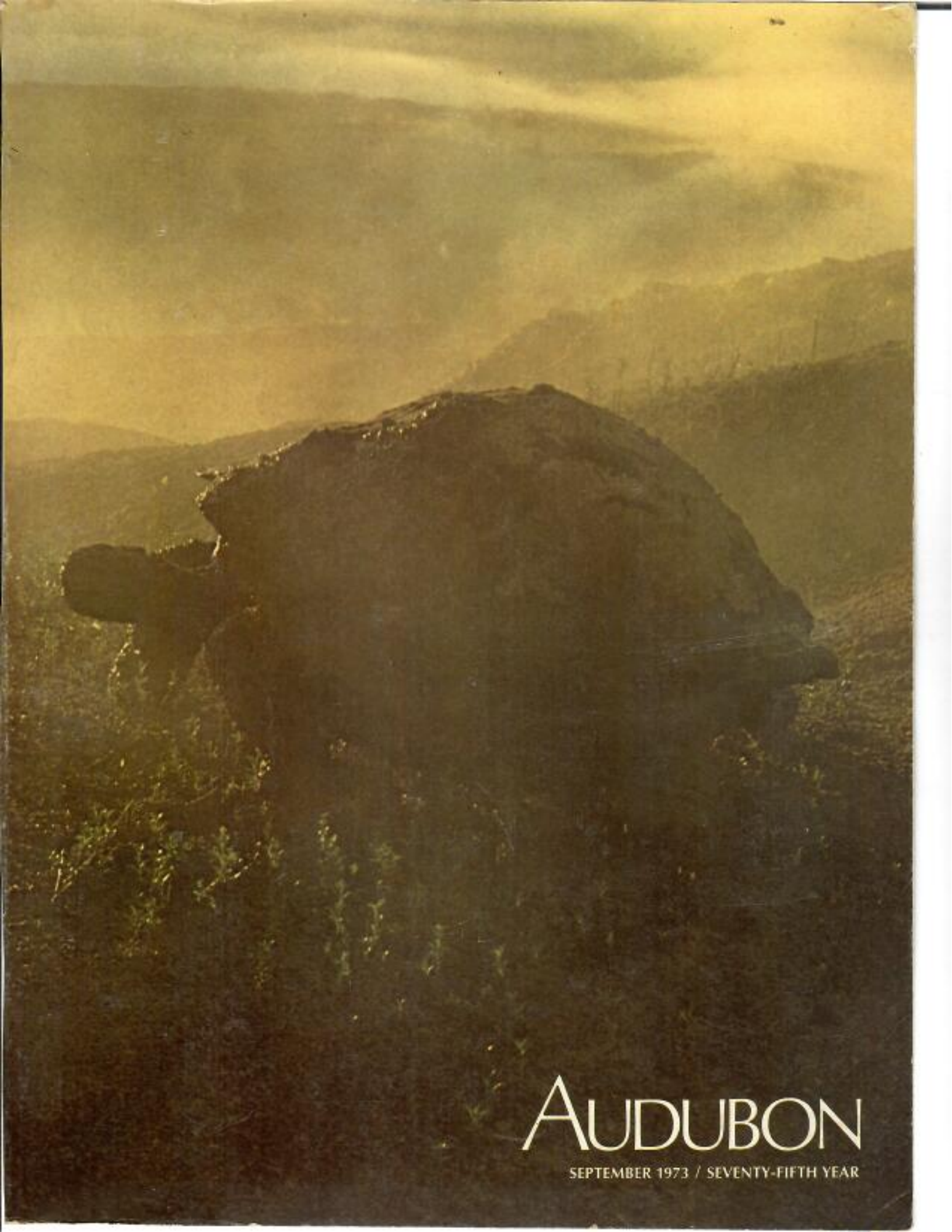
- 78 Arribada
photography by David A. Hughes

- 86 Parrot! Parrot! flickering out
story by Edward R. Ricciuti
painting by Don R. Eckelberry

- 121 The Audubon Cause

- 124 Out of sight, out of mind
Gary Soucie

THE COVER: It is dawn on the rim of the volcano called Alcedo, on the largest of the Galápagos islands, Isabela. A giant tortoise, its carapace caked with mud, has just left the warm puddle where it spent the cool night. Spider webs and dew sparkle in the sparse herbage that grows in the pumice. The thick fog of night is lifting out of the great caldera, and the opposite rim four miles away is dimly visible. Sulfur-scented steam shoots from fumaroles a thousand feet below in the collapsed crater as the tortoise, a female perhaps four feet in length and weighing 400 pounds, shuffles in search of food, her arched forelegs striking the volcanic litter with an audible thump. It is a mystic, awesome scene out of prehistory, captured by a young photographer who grew up in these islands of evolution. Tui De Roy, whose essay on the "Tortoiseland of Alcedo" is a highlight of this issue on tropical America, made the picture with a Pentax single-lens reflex, 35mm wide-angle lens, Kodachrome II film, and an exposure of 1/100th at f:8.



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