TWISTING ON ITS BACK after thundering halfway out of the water, a humpback is about to splash down in a maneuver known as breaching. Though common among most of the great whales, breaching remains a mystery. Scientists speculate that it may be a form of communication or intimidation, or an attempt to dislodge whale lice or barnacles, the tan clusters on the whale's flippers and underside.

Whatever the cause, breaching seems contagious. If one humpback breaches, others may follow suit,

leaping explosively from the sea. "We've recorded as many as 40 breaches in succession by a single whale," says Gregory Silber, a member of the Maui research team.

This view reveals the humpback's pleated throat, which expands like an accordion as the animal draws in water to strain through its baleen plates for marine organisms. The eye socket appears as a white arc directly behind the bend of the mouth. Knobs protruding from the whale's head, each containing one or two short hairs, are believed to act as sensors.

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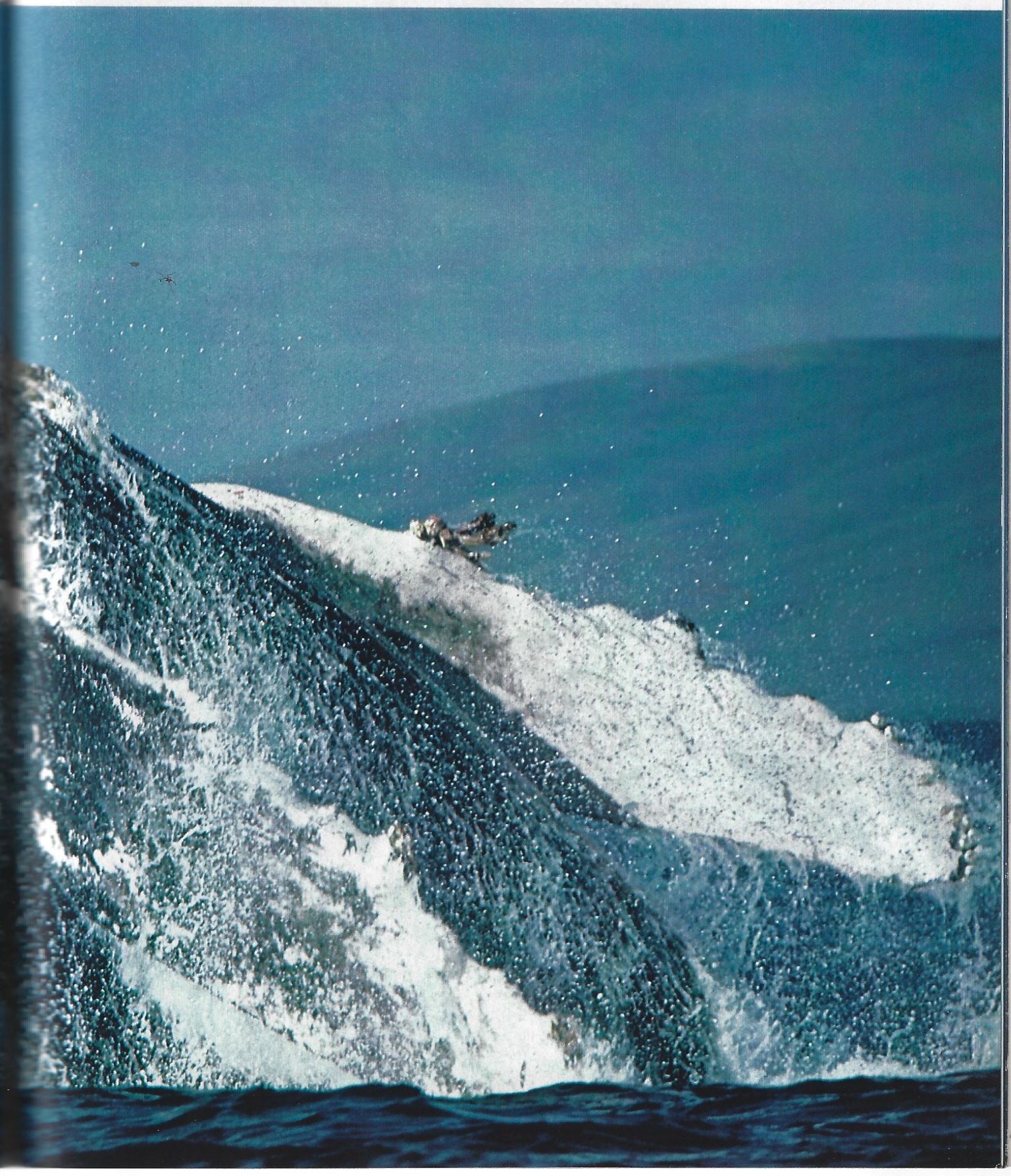
GRAEME ELLIS



CATARACT OF SPRAY streams from the massive tail flukes of a humpback male during combat with a rival. Such clashes, observed for the first time by researchers at Maui, stem from competition for females.

"When it comes to courtship rivalry," says Jim Darling, a team leader, "humpbacks are anything but 'gentle giants.' The males go at it with everything they have—tail lashing and body checking. It's an awesome experience to see a collision involving 80 tons of determined whale."

*Two males (**above**) compete for the right to escort a cow and calf, another association first discovered by the Maui team. "Most cows with calves have escorts," Darling explains. "In the past, scientists assumed that escorts were females, sort of maiden aunts who helped the mothers raise their children. But close observation has proved that escorts are males, and that's what the fighting is all about."*

*An open wound near the base of one humpback's tail (**above right**) testifies to the ferocity of combat. Another male (**right**) employs a gentler tactic, blowing a stream of bubbles. Males occasionally blow bubbles, perhaps as a warning, or as a screen between a rival bull and a cow and calf.*

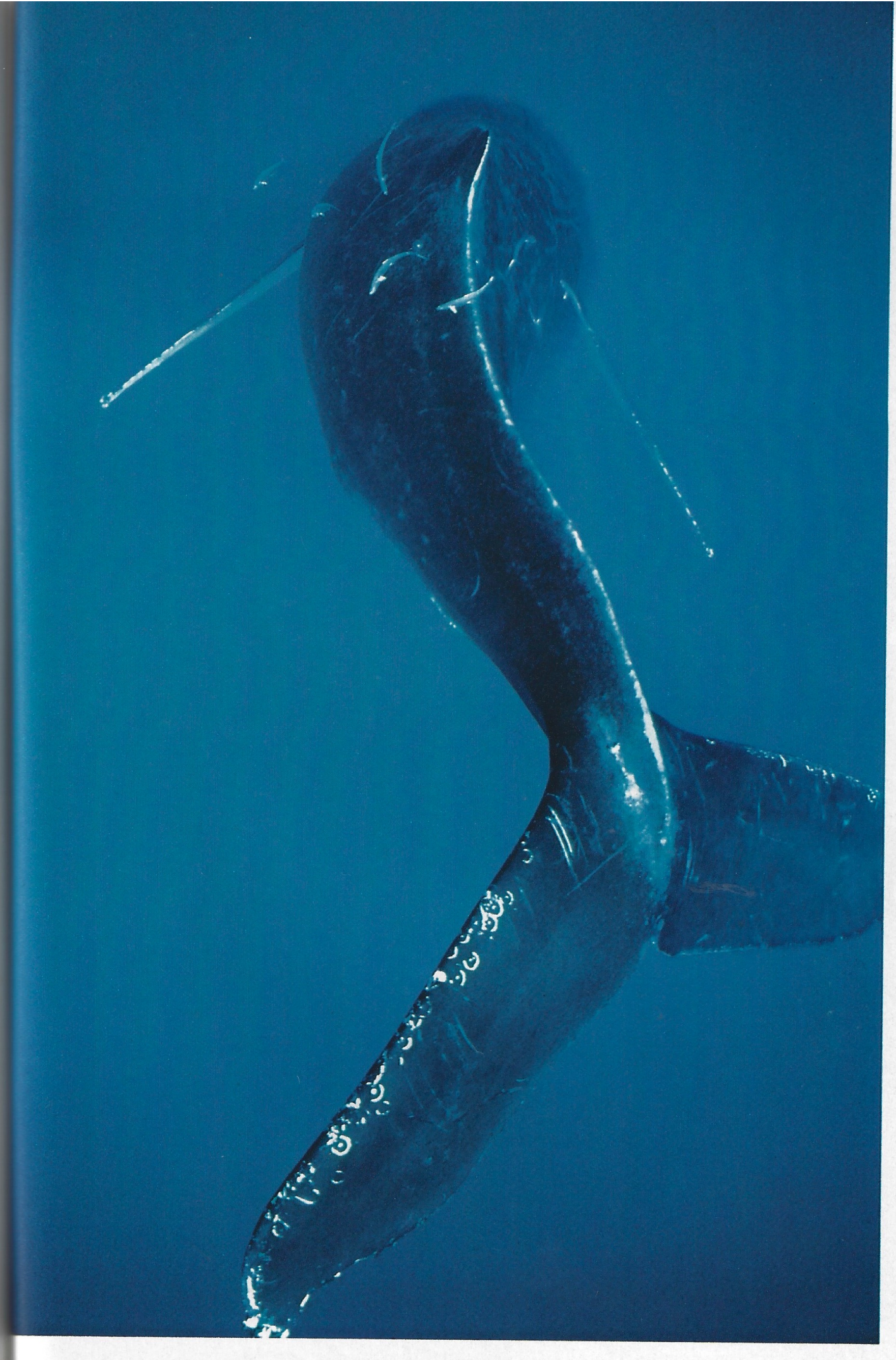
JOHN FORD (BELOW)

SERENADE IN BLUE echoes through the twilight depths as humpbacks sing the haunting song peculiar to their species. Although other whales and dolphins make sounds underwater, none equals the song of the humpback for complexity and precision. In a given area, such as Hawaii or off Baja California, all humpbacks sing the same song, composed of two to eight recognizable themes in the same sequence.

Research at Maui revealed that singers follow the same pattern of behavior, performing alone within 150 feet of the surface, head down, flippers outstretched, and body inclined at a 45-degree angle. To determine the sex of singers, photographer Flip Nicklin trained himself to scuba dive as deep as 130 feet while holding his breath. Approaching a singer from the rear, Nicklin was able to photograph the tail and genital area before exhaling the bubbles that might disturb the whale. The singers proved to be male, and nearly all surfaced for breath during the same theme of the song.

"Singing," observes Peter Tyack, "appears to be related to courtship. Singers often interrupt their song and dash off to join other whales, usually including females."

*A diver (**left**) photographs a singer whose heavily scarred dorsal area suggests countless battles over females. The flukes of another singer (**right**) display circular scars left by barnacles that dropped or have been scraped off. Small fish known as leatherbacks browse along the whale's back.*



SEA'S PRISM lights the glide, in unison, of a cow and calf, which holds its station above its mother. Unlike most females with young, humpback cows occasionally allow divers and surface craft to approach within a few feet of their calves. The trait cost humpbacks dearly at the hands of 19th-century whalers, who harpooned calves and held them as decoys to draw the mothers within range. So great was the slaughter and so perilously close did humpbacks come to extinction that an international treaty in 1966 forbade commercial hunting of the species worldwide.

Research at Maui by Debbie Glockner-Ferrari and her husband, Mark, revealed that some humpback cows calve annually rather than every other year, as some people had believed. Conservationists welcome the discovery as evidence that humpbacks may be increasing faster than had been estimated.

"Like most young creatures the humpback calf is insatiably curious," observes Jim Darling. "It will leave its mother's side to inspect a diver nose to nose, then rejoin the cow in slow motion like a spacecraft docking with the mother ship."

*TRIO OF TAILS (**right**) identifies a calf, cow, and escort, the latter swimming beneath the female. Researchers at Maui believe the escort's motive is neither to defend nor to help care for the calf but to mate with the cow, an event they have yet to witness. Escorts may change partners during the winter season, and sometimes cows have been observed unescorted. The calf (**above**) momentarily parts company with its mother to breathe at the surface, where harpooners no longer lie in wait.* □