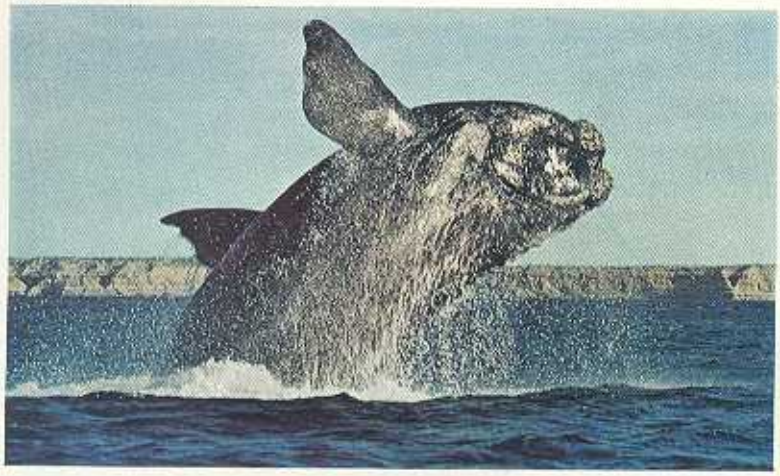


"And God created great whales...."

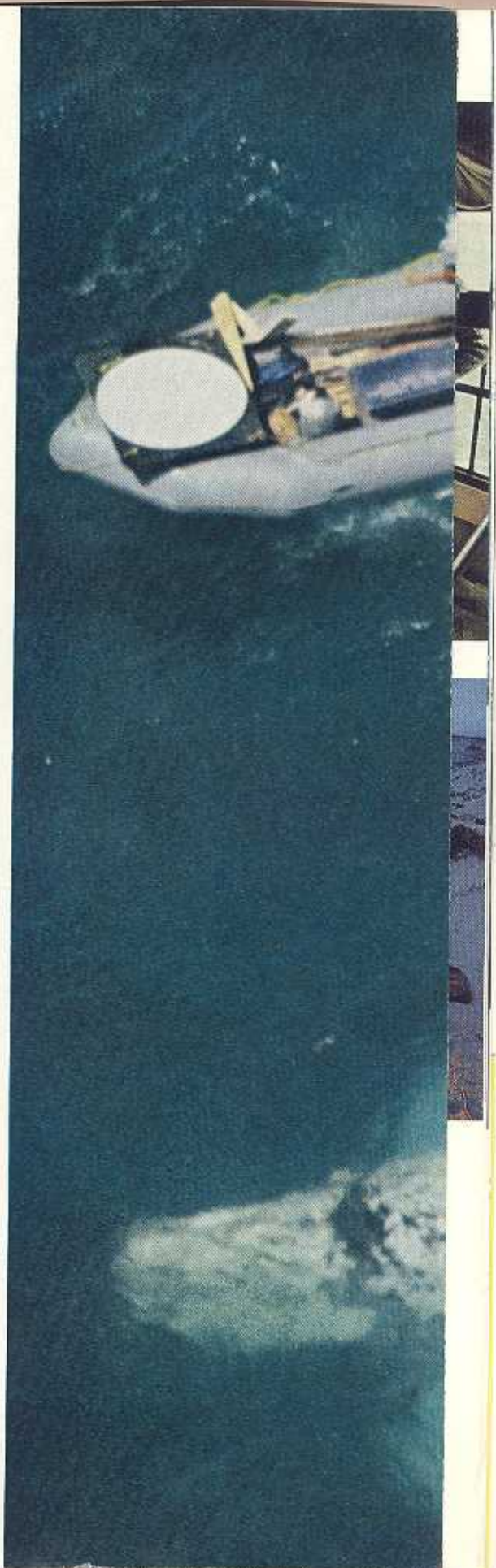
GENESIS 1:21

FORTY TONS of ponderous grace erupt as a southern right whale breaches amid a self-made storm of spray off Patagonia. These frames, taken in just over one second, show a whale near the peak of its leap (**right**), then on its downward course (**top and middle**), and, finally, in a thunderous reunion with the sea (**bottom**). Author Payne believes the maneuver may be a way of saying, "Here I am!" to other whales.

At Home With Right Whales

By ROGER PAYNE, Ph.D.
Photographs by
DES and JEN BARTLETT

In Patagonia a noted zoologist and his family continue research into the life of these giants of the sea



◀ THIS PAGE FOLDS OUT

BY LATE AFTERNOON intermittent squalls had developed into a violent storm. In our research station overlooking Argentina's remote Patagonian coast we watched the wind whip the ocean before us into a maelstrom.

All seemed secure behind our concrete-block walls until I glanced out the window at the porch roof. With ominous sounds it began to part company from the house, threatening to fly off across the Patagonian desert. Shouting for help to my two colleagues, Christopher Clark and Bernd Wuersig, I dashed outside and grabbed a loosened rafter. Chris and Bernd joined me and for 20 minutes we hung on for dear life, alternately being lifted off our feet and set back on the ground as we struggled to lash the roof fast.

Finally we managed to run a rope from the roof to our truck and secure it. The storm abated, and we all trooped back inside.

Such are the winds of Patagonia. For five years my wife, Katy, and I have survived them. We make no claim to be winning—merely surviving. Other creatures along the coast fare considerably better. Often at the height of such blows we have seen what first appeared to be series of explosions offshore, sending up geysers of water that were bundled and hustled away by the wind.

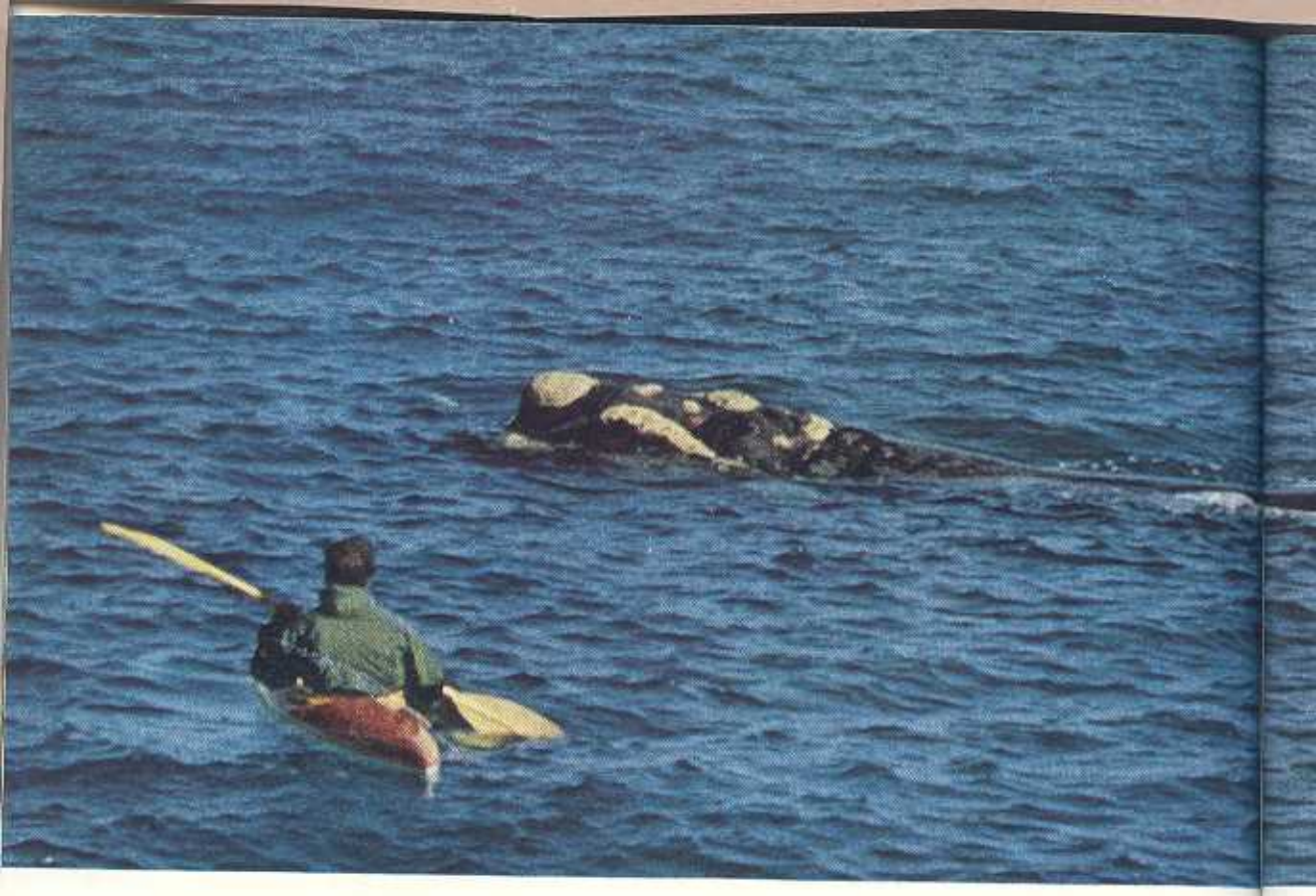
Whales Revel in Stormy Seas

These monumental clouds of spray and foam are made by right whales breaching—leaping into the air to crash back into the sea (foldout, pages 322-324). The creatures that perform these acrobatics are so large, so aloof from the normal torment and buffetings of this world that they are, quite literally, playing with the storm. The same wind that threatens man and his works with destruction is apparently a jovial playmate, a source of boisterous entertainment, to a whale.

This spectacular combination of wild storms and wild whales occurs at Península Valdés, an enormous cape enclosing two large, almost landlocked bays in Patagonia—a tableland wilderness near the southern tip of Argentina (map, page 297). In this isolated area everything—plants, animals, and landscape alike—is shaped by the fierce and unpredictable wind. To the question, "What shall we do today?" there is always the same answer: "It depends on the wind."

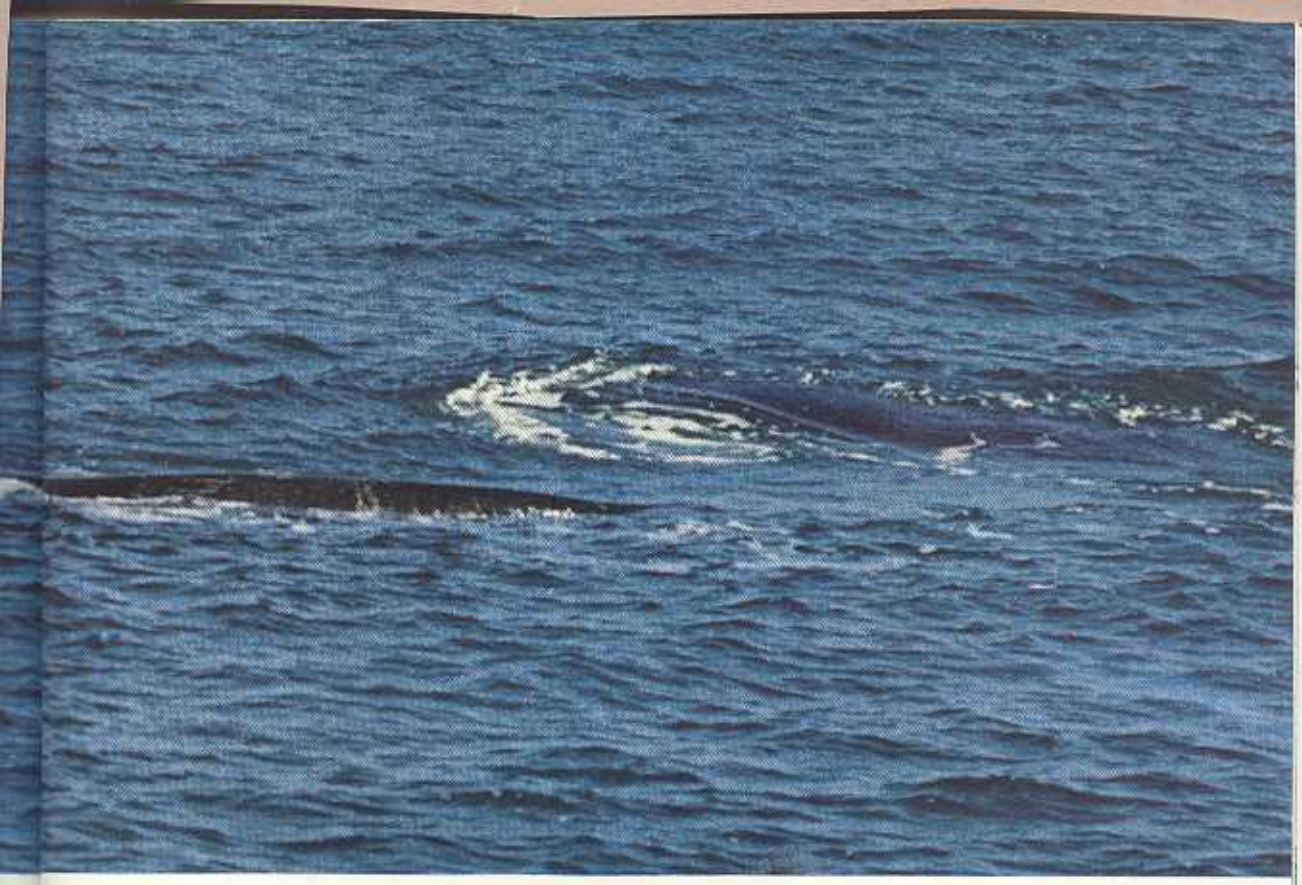
Shadowing a leviathan, the author's wife and an assistant skim alongside a piebald right whale calf (**foldout, left**). A one-meter-wide disk on the bow of the boat is used as a gauge in aerial photographs to measure the whale's length—in this case about 26 feet. With his wife, Katy (**top**), the author monitors whale activity from a clifftop hut above Golfo San José. Through a long night (**above**) he uses a dish antenna and battery-powered recorder to investigate whale noises and their correlation with behavior.

ROGER PAYNE (FACING PAGES)



Veteran whale-watchers, the four Payne children and their mother (**below**) have a ringside seat on the Golfo San José, where Dr. Payne (**above**) kayaks near two lolling right whales. His study, sponsored by the New York Zoological Society and the National Geographic Society, has made Patagonia a home away from home several months a year for his suburban New England family. To children on vacation from the civilized world, the rugged environment presents exciting alternatives. They have the wilds of Patagonia for their playground; whales, penguins, and flightless rheas for their playmates. "What school could offer more?" asks Dr. Payne.

ROGER PAYNE



For five years I have come to this wonderful peopleless world to observe the rare southern right whales that appear off the coast. Each winter they arrive to mate, calve, and raise their young. My interest in studying right whales stemmed from five years of research on humpback whales—particularly on their "songs," those complex and lovely chains of sounds that are repeated for hours on end in the spring.*

In the search for an ideal site to explore whales' behavior, we followed up a lead from the U. S. Antarctic Research Vessel *Hero,* and hit upon Peninsula Valdés.

It was a stroke of extraordinary luck, an event that has profoundly changed my life and that of my family. I have always taken Katy and our four children with me on major expeditions. During our first full-scale study at the peninsula in 1971, John was 9, Holly, 8, Laura, 7, and Sam, 6.

At first we all lived in tents, but later we built a primitive concrete-block building—without such luxuries as heat, lighting, or plumbing—in which to work and live. In all we have made four expeditions, generously supported by the New York Zoological Society and the National Geographic Society. Our research has focused on southern right whale anatomy, acoustics, and population changes, as well as behavior.

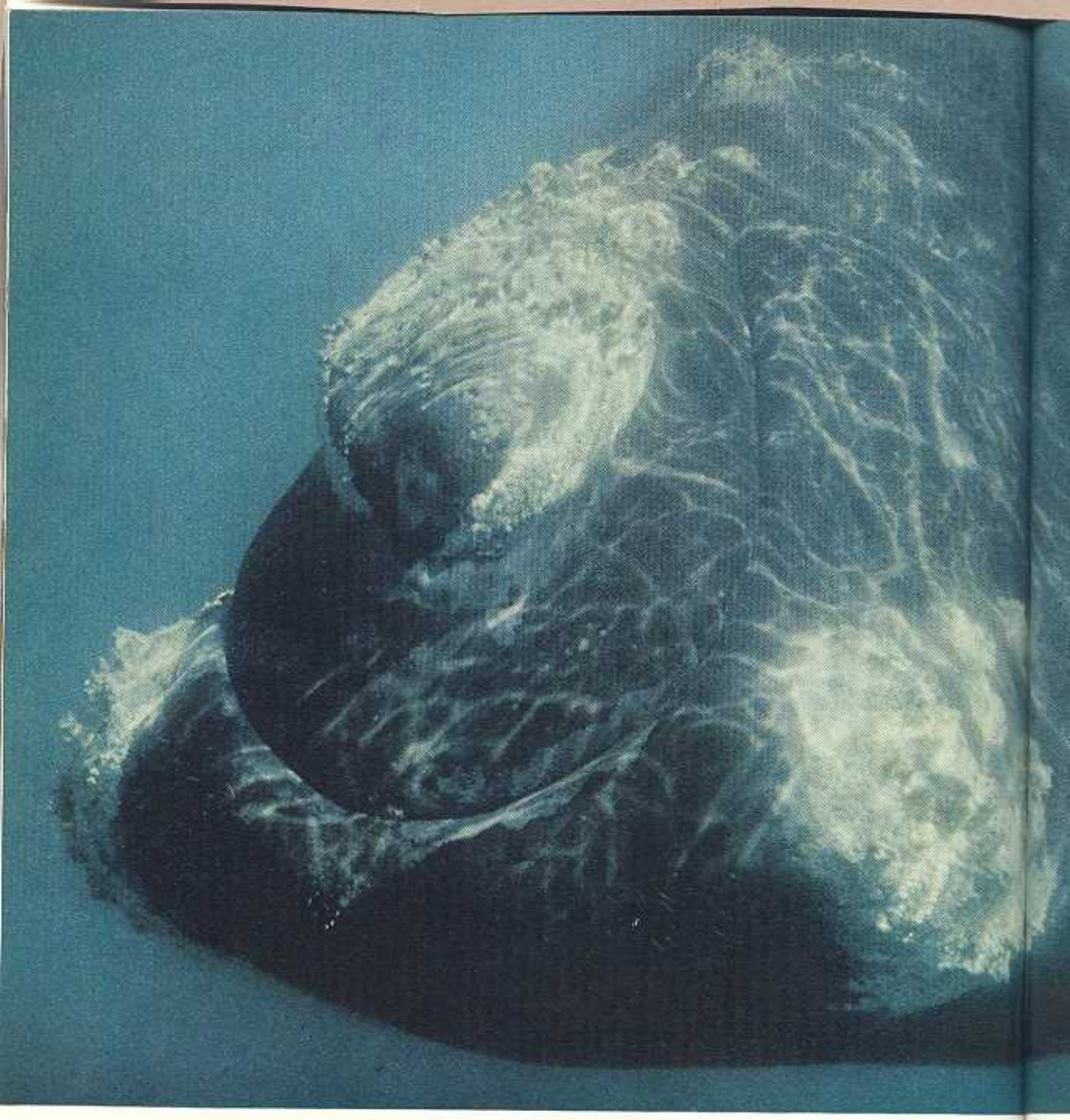
Leviathans Have Colossal Birthmarks

One of the things that convinced me right whales were ideal for study is that, alone among all whales, they are adorned with series of peculiar growths called callosities (following pages and 334-5). On every right whale the number, size, shape, and placement of callosities are unique, making it possible for us—and presumably the whales too—to tell individuals apart on sight.

Callosities consist of thickened white skin, sometimes many inches deep, with a rough outer surface. The rough surface offers excellent anchorage for creatures such as whale lice, barnacles, and smaller organisms, which hitch a ride on the whale and perhaps feed on what spills from its mouth or on bits of dead skin flaking off.

The largest callosity appears as if perched on the whale's head. The old whalers called

*The author described his early research on right whales in the October 1972 NATIONAL GEOGRAPHIC. His recording, "Songs of the Humpback Whale," has delighted listeners the world over.



it the "bonnet," and indeed from some angles it does look somewhat like a 19th-century lady's headgear (above). To the old-timers this was the "right" whale to hunt because it swims slowly, has an unusually rich store of baleen, or whalebone, and floats when dead.

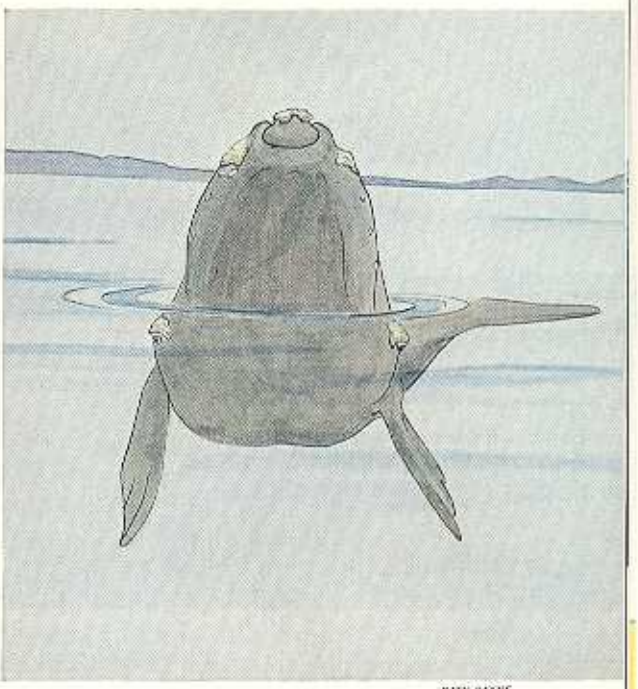
In our studies of callosities we discovered an interesting parallel with human beings. Callosities have scattered hairs growing from them. Curiously, right whales' facial hair grows in the same places that a human's does, and only in those places. The whales appear to have what we call mustaches, as well as eyebrows, beards, and even sideburns!

Callosities seem to serve several functions. One of them is to act as a sort of splash deflector, preventing water from entering the whale's blowhole. Other species of whales also have splash-deflecting structures, but these are usually fairings, or ridges, around the blowhole, quite different in character from the callosities of right whales.

In aggressive situations callosities may have another use. Right whales sometimes

Wraparound grin and tucked-back eyes make even more bizarre a face mottled with calluslike growths called callosities. Uniquely patterned on each right whale, the patches make visual identification easier. Central callosity on upper jaw was called the "bonnet" by whalers reminded of ladies' hats. Whale's left eye is positioned below "eyebrow" callosity, far right.

Bonnet raised, a whale surfaces with eyes just beneath the waterline (**below**), presumably enabling it to see directly ahead. In normal horizontal position, the creature may be able to see only downward and to the sides.



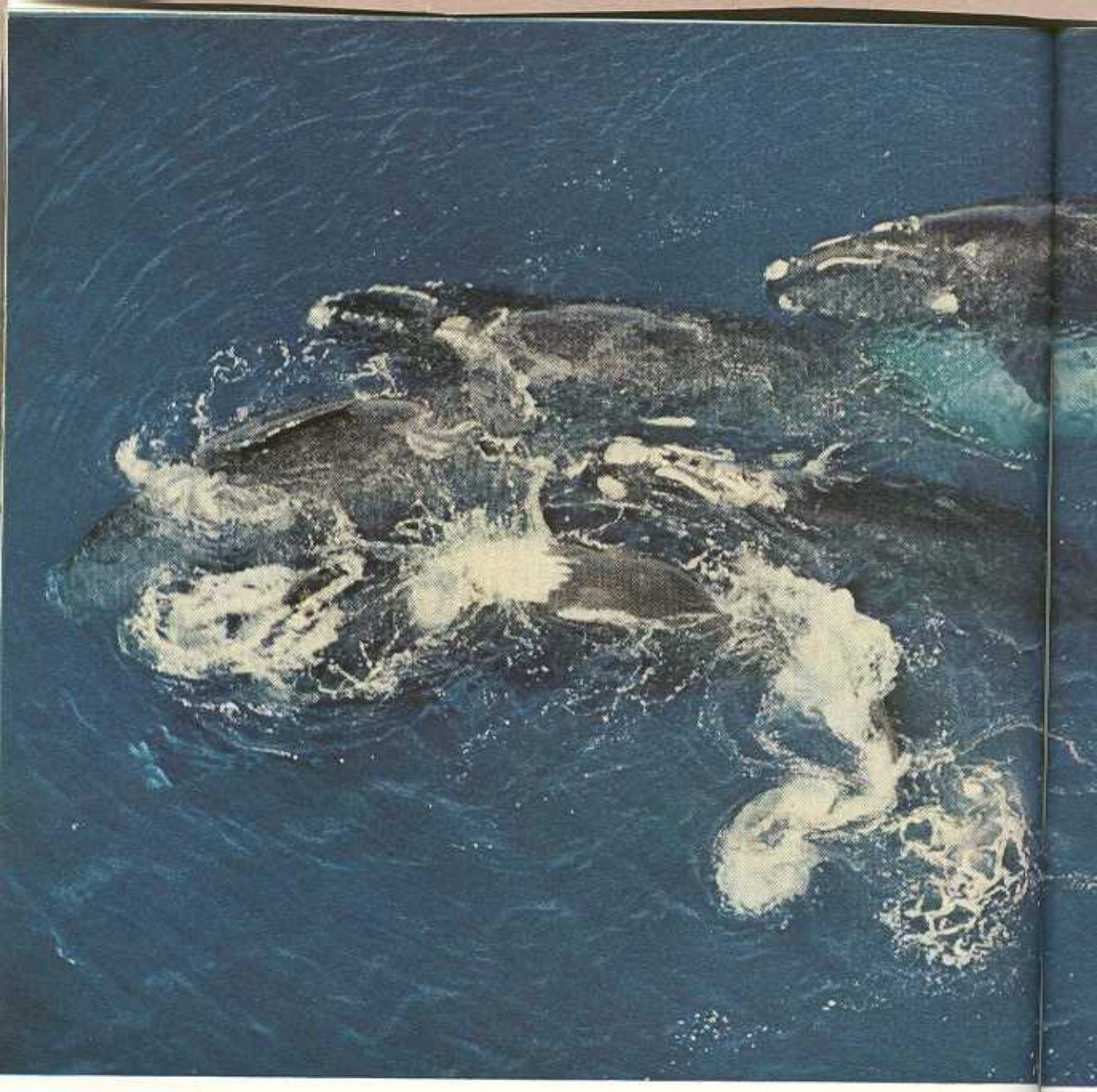
KATY PAYNE

rub their heads across a competitor's flank or back. Since a whale's skin is very soft, even the slightest brush from a crusty callosity could be painful.

Several of our right whales have white spots on their backs that, in addition to callosities, help us keep track of individuals. Y-Spot—or Adele, as we later called her—had a calf in 1971 and then vanished for two years. I thought she had died, but she returned in 1974 with a new calf. To us it was a wonderful reunion. It also taught us that the adult's callosity patterns are constant over long periods and that some females may breed only once every three years.

Such a low birthrate would help to explain the very slow recovery of one of the rarest whale species from two centuries or more of intensive hunting. From a population running to tens of thousands in the past, the southern right whale today numbers perhaps fewer than 1,500 individuals.

When you first see a whale, it is often the spout that attracts your attention. The spout



is, of course, the creature's breath. Like all mammals, whales must breathe air to survive. In the case of the right whale the spout appears as a V-shaped cloud of mist. The creature, like most other great whales, has not one but two blowholes.

Just why the whale's spout is so visible has been the subject of much speculation. Wildlife photographer Des Bartlett's remarkable slow-motion film, along with observations of our own, has helped clarify the question.

Those observations suggest that a visible spout results principally from the atomization of water surrounding the nostrils when the animal exhales sharply. We learned further that invisible spouts often alternate with visible ones in the same whale, and that many more spouts are seen on windy days than on calm ones. The reason, naturally, is that in rougher weather more waves wash over the whale's blowhole.

Breath Brings Life—and Danger

When right whales are being pursued, they often exhale underwater, thus reducing the time they must be at the surface. The advantage is twofold, since it exposes the whale for the shortest possible time and also makes for greater speed. Whales can swim much faster submerged than on the surface.

ROGER PAYNE

Flurry of suitors roils around a female right whale that floats belly up, left center, to elude their collective advances, including those of a white adolescent, at right. In this nonmonogamous society, many or all are likely to win the female's favor. Gestation period among most whales is about one year. The author believes the slow-breeding southern right whale today numbers no more than 1,500 worldwide—down from the tens of thousands that roamed as lords of the sea before man and harpoon entered the picture.

Some observers maintain that whales have halitosis. I have had many whales breathe on me at close range, but only once have I smelled fetid breath.

A whale's breath may give it life, but, alas, it also betrays the animal, often fatally. In many cases it is the spout that announces the presence of the whale to the whaler. Whenever we saw a spout at Península Valdés, we too took note, but instead of trying to close in for a kill, we sat back and watched carefully, often for hours or even days at a time. Slowly, over the years, we began to learn something about the fascinating social lives of these magnificent animals.

Perhaps the most surprising yet persistent feature of life in a herd of right whales is peacefulness. Although six or more males are frequently in direct competition for the same female (left), I have never seen any squaring-off between individuals. In fact, the only behavior among right whales that can possibly be called aggressive consists of occasional mild pushing, shoving, or rubbing against one another.

Likewise, one sees little punishment of young, as with so many animals that nip, kick, or slap their obstreperous offspring. The mother whale simply endures the high jinks of an infant as if her peaceful good nature were an endless resource from which she—and the calf—can draw. I have watched many a calf boisterously playing about its resting mother for hours at a time, sliding off her flukes, wriggling up onto her back, covering her blowhole with its tail, breaching against her repeatedly, butting into her flank—all without perceptible reaction from the mother. When finally she does respond to the torment, it may be only to roll onto her back and embrace the infant in her armlike flippers, holding it until it calms down. It is hard to think of comparable equanimity among any other mammals, including man.

Children Learn in Nature's School

One of the most rewarding aspects of our work at Península Valdés is the rare opportunity it has afforded our children.

The isolated life we led raised some questions among our friends and fellow parents about whether the children longed for their playmates, school, baseball, and television. Of course they occasionally missed such things, but not nearly as much as all of us

miss life at Península Valdés when we are back in Massachusetts.

When our children would go out to play in the desert behind our house or on the enormous tidal flats that stretched before us, I would watch them walk until they vanished into the vast Patagonian sky. And I would not fear for their safety. They would encounter no thugs, drunk drivers, or drug pushers. They would be surrounded by the infinite variety of a million acres of virtually unpeopled coast and desert wilderness—all of it safe, all of it to be explored by them alone.

At supper the four would come home exhausted, full of stories about hunting lizards, stalking Darwin's rheas, watching eagles, or, once, about witnessing—from beginning to end—the birth of a sea lion. Their pockets would be loaded with sand dollars, fossils, bones, dead birds—we learned to greet the children on the porch—flowers, or arrowheads. Deprived? I truly believe they are the luckiest children on earth.

As a result of their experiences, they seem more impressed with what nature can do without man than by what man can do without nature. And as the depth of my children's feeling toward those who would threaten their beloved wilderness and its whales has unfolded, I am struck by the hopeful thought that maybe they and their generation will be able to achieve something that we in our generation only dream about. We relegate to dreamers thoughts of going back to nature. But the children's approach seems fresh and positive—they think in terms of going *ahead* to nature. And unless our generation has room for its children's goals, then we have no future at all.

Wily Females Avoid Suitors

I have mentioned that many male right whales compete, albeit gently, to mate with the same female. At Península Valdés we found that females use several techniques to get rid of unwanted suitors. The commonest

Crusty cetacean: Found only on right whales, callosities are raised patches of rough skin, often several inches thick. The hairs on a whale's face (**left**) appear in much the same places as those on the face of a human male.

Close-up of a callosity (**right**) reveals a seemingly mountainous landscape. "Peaks" are barnacles whose sharp edges may serve to scrape the sensitive skin of a rival whale during courtship scuffles.

Photographer Des Bartlett (**middle right**) carefully plucks a whale louse (**inset**) from a right whale's lower lip. Such tiny hitchhikers may feed off flaked bits of whale skin and also off snippets of food that the whale loses in its food-straining process.

"The right whale is a very sloppy eater," says Dr. Payne. One reason may be sheer size of the vast strainer (**below**) with which the whale feeds on diminutive sea organisms. Made of parallel plates of baleen, or whalebone, that is fringed on the inside with dense hairlike fibers, the strainer mechanism catches small shrimplike krill, or brit. The whale probably scrapes the matting with its tongue to ingest the captured morsels.

To old-time whalers, this once-abundant but now-rare species known as *Eubalaena australis* was the "right" one to catch because it swims slowly, does not sink when it dies, and has a particularly rich store of baleen. The tough, flexible whalebone plates were used for such things as corset stays, umbrella ribs, clock springs, and riding crops.

is to lie belly-up at the surface, in which position the normal posture of mating—the female on an even keel at the surface with the male beneath her holding his breath—is impossible. When a female is in the belly-up posture, the males can be seen swimming around her, breathing quietly, as they wait for her to run out of air. Eventually she must roll over to breathe, and when she does so, the males quickly dive, pushing and shoving to be the first to get into proper alignment for mating.

Often one of the males will try a different strategy, holding his breath for prodigious lengths of time while lying patiently underneath the female and waiting for her to roll her belly toward him to breathe. The longest-held breath I ever timed, 25 minutes, was registered by a male doing just this.

Another trick a female employs is to go into water too shallow for males to get beneath her. Still another ploy occurs when the female hangs vertically, head down in the water, with her tail thrust high in the air. In order to align with her for mating, the male must put *his* tail in the air too. When he does that, his propeller—namely his tail—is out of water and he can't maneuver. All the female needs to do then is revolve slowly, presenting her back to the hapless suitor.

Playful Whales Use Tails for Sails

Only certain females employ this tail-in-the-air strategy. Troff, a mother we grew to know well, was extremely adept at this and did it by the hour. For a period of a couple of weeks whenever we saw a tail held aloft in the bay, we could tell by its unique outline that it was Troff.

One form of behavior among right whales looks similar to mating maneuvers but is actually a fascinating form of play. Of all the things we have so far learned, this one delights me most: Right whales appear to sail! As far as we know, they are the only marine creatures, other than some jellyfish, that use the wind for propulsion. Right whales, however, do it as a game.

When a whale sails, it usually does so alone. The tail is "set" straight up above the surface, and at right angles to the wind. Sailing is usually associated with other, more-obvious forms of play. When a whale is carried by the wind into shallow water so that its head is

Casting an eye, a whale peers inquisitively into the camera—only two feet away. A segment of the lip arches down around eye and "eyebrow" callosity. Approximately the size of an orange, a right whale's eye swivels inside its socket in much the same manner as a human eye.

Keeping tabs on her 18-foot youngster, a mother right whale gives her offspring a reassuring touch with her tail fluke—not unlike a human mother reaching back her hand to make sure junior is close behind.

WILLIAM R. CURTSINGER (BELOW)

bumping along the bottom, it will return upwind, circling around for another sail, like an otter going back up the bank for another slide. As the whale does this, it rollicks and galumphs along in a variety of games we have frequently observed. Sailing is done in winds of from five to thirty knots, and can go on for three or four hours.

Noisy Antics Keep Herd Together

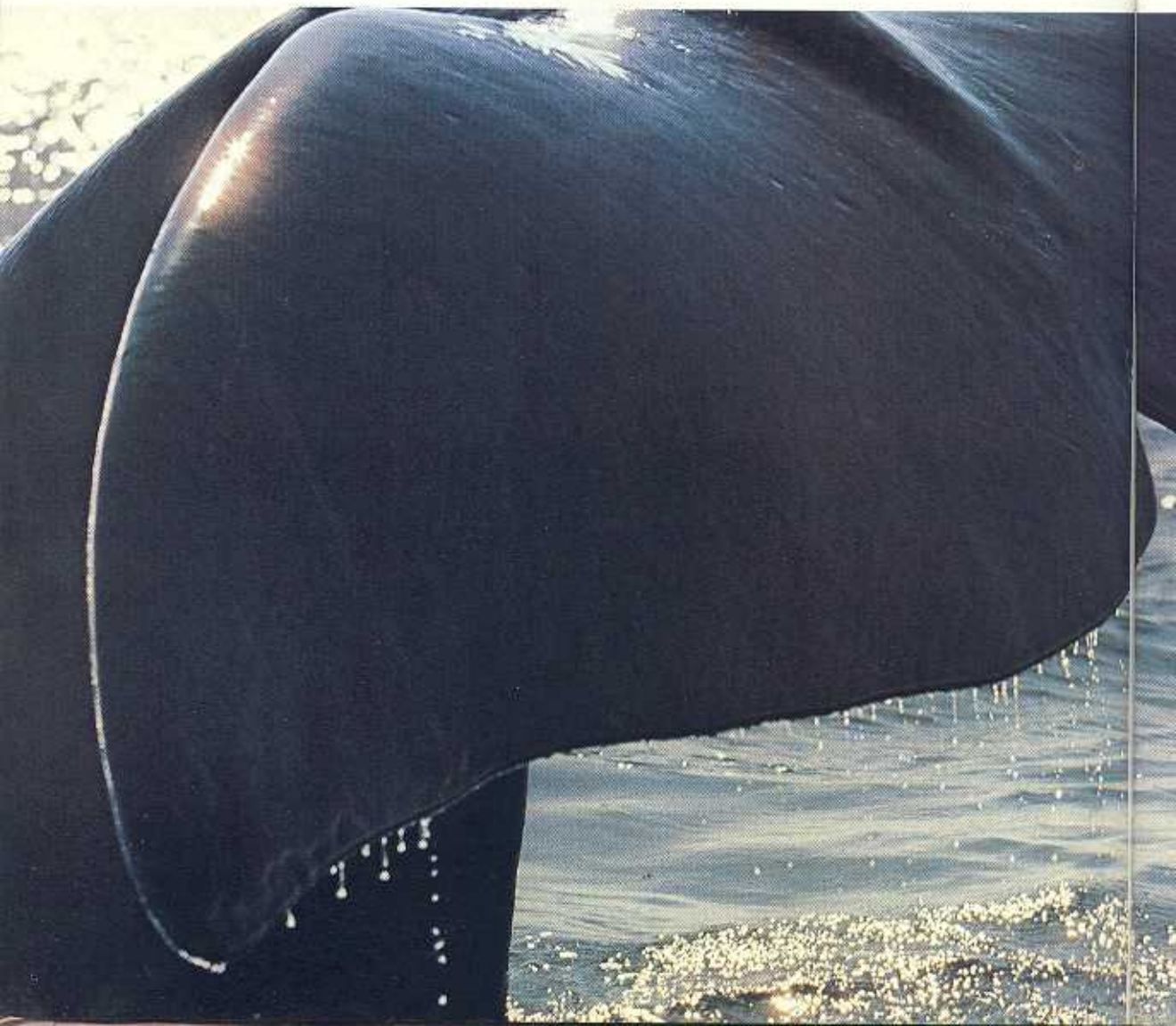
When it comes to this sport, young whales frequently have a lot of trouble attaining the proper set of their tails. What starts as an apparent effort to sail can degenerate into a wild lobtailing session—that is, with the calf throwing its tail into the air and bringing it back down with a thunderous slap.

At other times lobtailing seems to have a definite function. As with flipper-slapping and breaching, it makes a resounding noise. Though we had looked on such behavior as playfulness, we arrived at a second explanation for the noisy surface displays after systematically recording their occurrence in the bay.

Lobtailing, we found, begets lobtailing. When one whale starts lobtailing, or flippering, or breaching, another nearby will follow suit. Thus, in the most elementary sense, the actions are a form of communication.

There is a curious correlation between an increase in wind and an increase in breaching, lobtailing, and flippering. When the wind blows really hard, there are so many right whales splashing spray and foam that it's hard to keep track of who is who.

Increased wind also brings increased wave noise underwater. In shallow bays it particularly increases low-frequency noise—the very frequencies at which whales "speak"—and thus probably drowns out their voices. It may well be that lobtailing, flippering, and



breaching permit the whales to communicate with one another and keep together as a herd, even over the noise of an all-out storm.

The whales are at Península Valdés for only a few months, roughly from July to November. As November approaches, the blooms of plankton begin to increase, and all the whales except females with newborn calves depart for the right whales' unknown feeding grounds, where the shrimplike crustaceans known as krill and other minute forms of marine life are plentiful.

We called the following brief interlude the "time of the mothers and babies." In our five years at Valdés it was always Katy's and my favorite time, for the bond between mother and calf is one of the subtlest and most moving ties on earth.

The whaling industry viewed this bond in a different light. It was a convenience, for the mother whale will not abandon her calf, and since the calf swims slower than its mother, harpooners would aim for it first, using its agony as a way to draw the frantic mother within range.

Such vicious tactics, coupled with relentless hunting, all but eradicated southern right whales, which now are being actively protected by a growing number of nations. The band at Península Valdés may be the single largest population left on earth. This fact alone makes the area a priceless treasure for mankind. In December 1974 the provincial legislature of the Province of Chubut, where Península Valdés is located, enacted a historic law for which the whole world can be grateful. It set aside forever all of Golfo San José, the northernmost of the two bays enclosed by the peninsula, as a permanent sanctuary for right whales.

May other nations be equally wise in preserving their irreplaceable resources. □

Flukes and flippers: Tail flukes some 20 feet across lift skyward (**left**) as a whale dives. Flipper (**above**) has five rows of bones, supporting scientists' belief that the whale's distant ancestor was a five-toed land animal.