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**THE GREAT
PYRAMIDS**

**THE GREAT
BARRIER REEF**

TAJ MAHAL



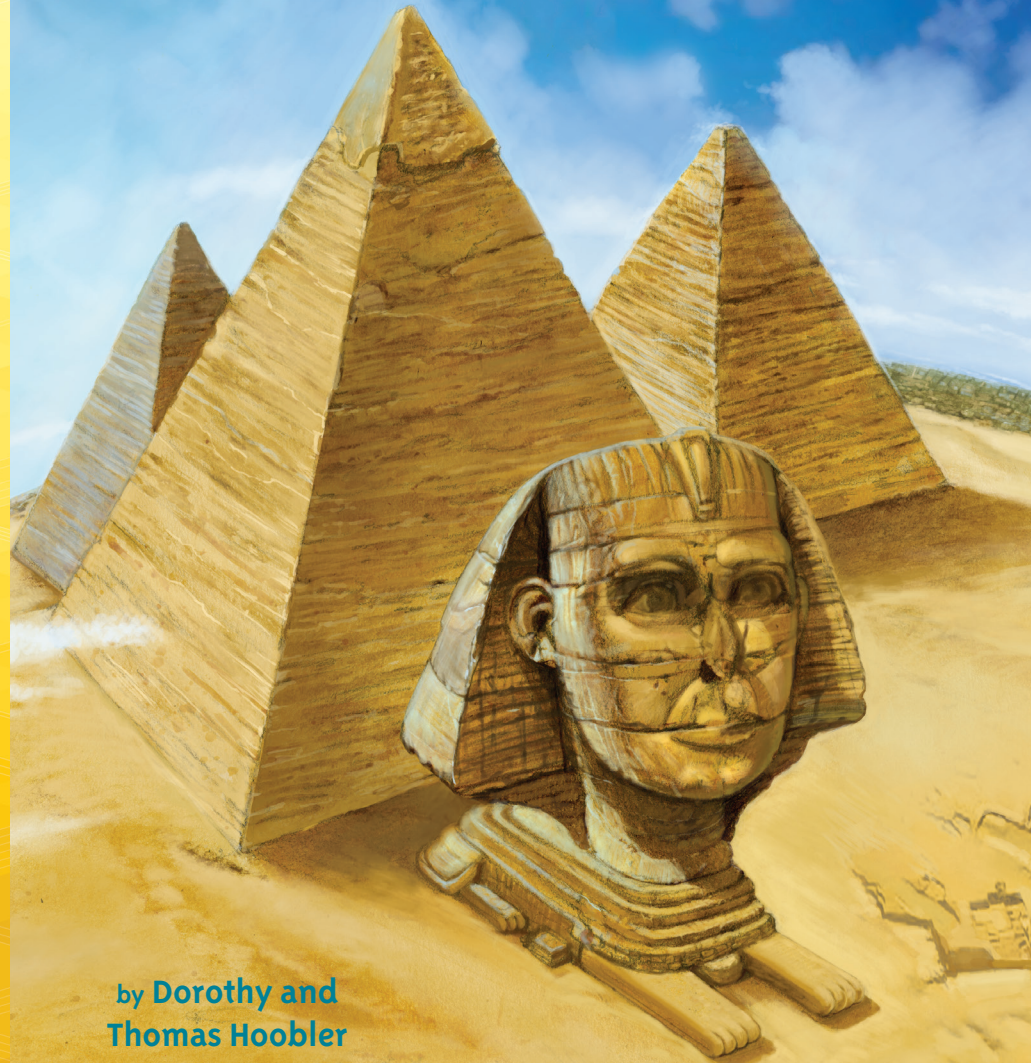


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Where Are the Great Pyramids?



by Dorothy and
Thomas Hoobler

Chapter 4

Building the Pyramids

How was it possible for the Egyptians to build the immense pyramids? Khufu's pyramid alone consists of 2.3 million stone blocks. The average one weighs 2.5 tons—about as much as a small pickup truck. But some stones used for the pharaoh's burial chamber weigh as much as eighty tons! A modern eighteen-wheeler truck can only carry a load about one-fourth that heavy—and the Egyptians moved these stones with human power alone.

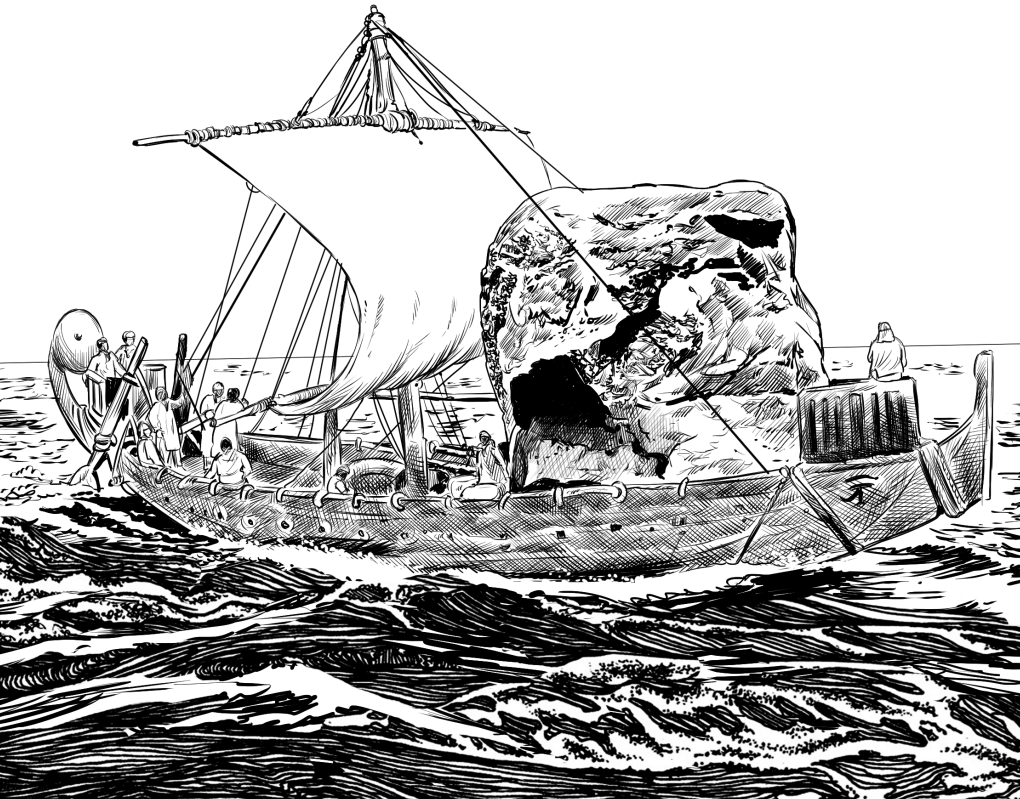
How did they do it? The honest answer is, nobody really knows. But scientists have made some guesses. Workers must have cut the stones from quarries on the opposite side of the Nile, or farther away at Aswan in the south. The workers probably used copper chisels, although none



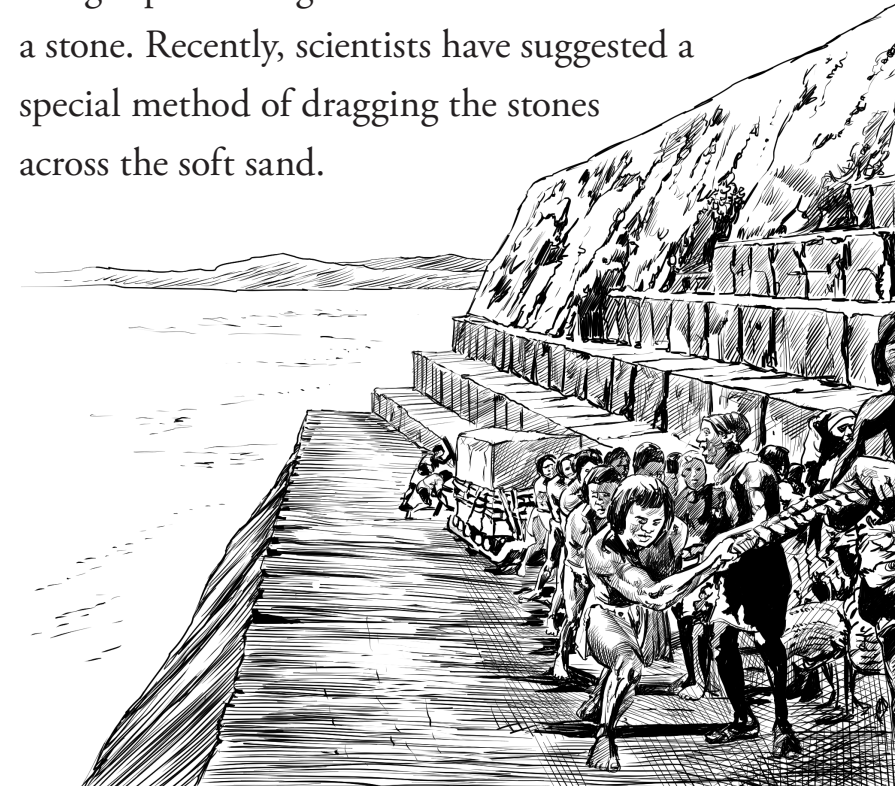
have been found in the quarries. So another way of splitting the stones has been suggested. This was to drive pieces of wood into cracks in the stone. Then water was poured into the cracks. When the wood swelled up, the stone would break.

Each pharaoh probably chose the spot for his own pyramid. The ground had to be smoothed and leveled. A pyramid rests on a square base, and has four sides. Each corner points to a direction of the compass.

The most amazing thing about the pyramids was moving the huge stones. First, they had to be brought down the Nile on wooden boats, made from the cedar that came from Lebanon.

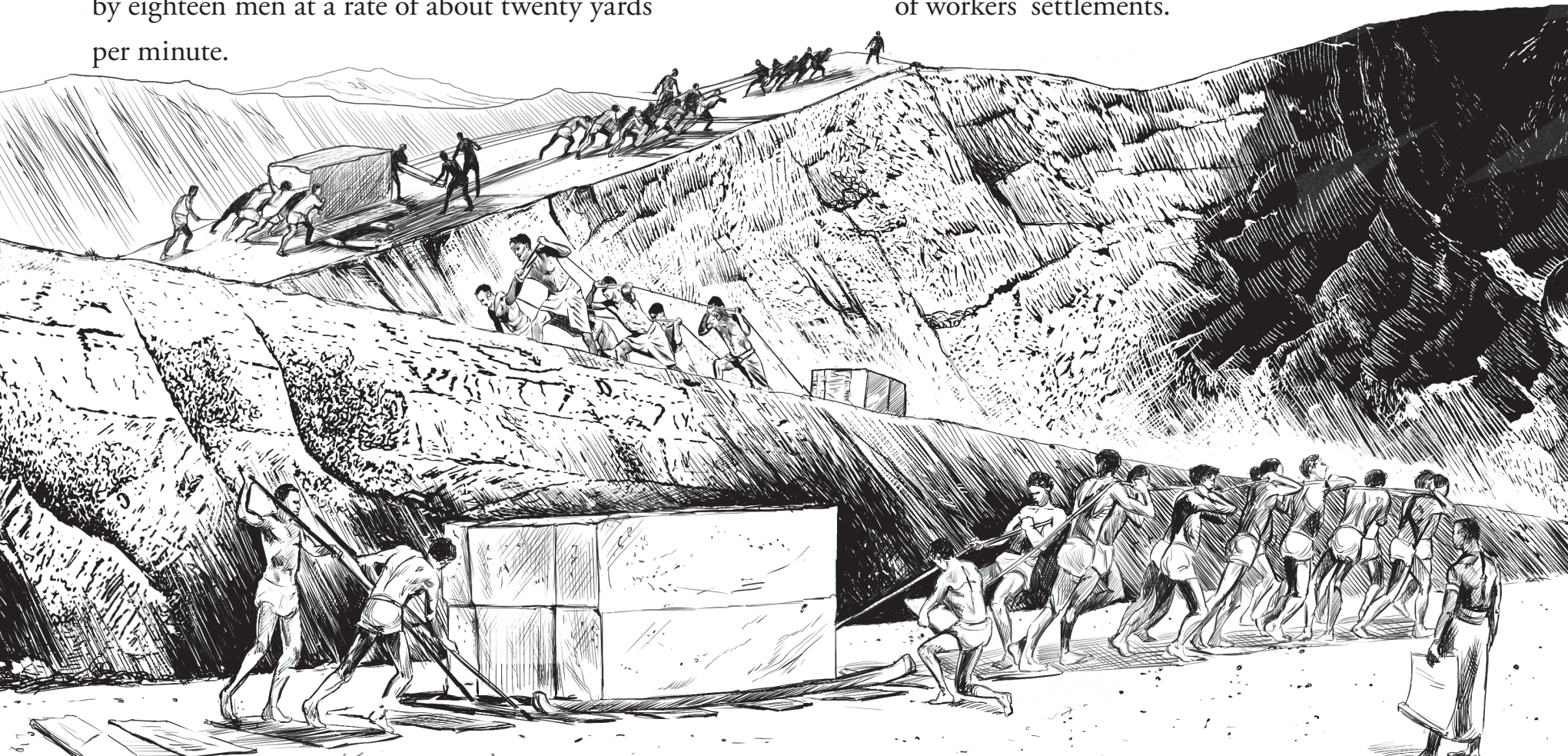


From the river, they were moved to the building area. There were several ways this might have been done. One suggestion is that a canal was built from the Nile. Another idea is that workers built a causeway, or stone road, that led to the pyramid area. The huge stones had to be dragged along this road on sleds. (A wheeled cart holding something that heavy would be crushed.) A picture on a tomb wall showed men using ropes to drag a wooden sled that held such a stone. Recently, scientists have suggested a special method of dragging the stones across the soft sand.



Once the stones reached the building site, a new problem arose: how to move them up the side of the pyramid. Using ramps made of stone or wood seems like the only possible answer. A modern engineering company showed that 2½-ton concrete blocks could be dragged up a ramp by eighteen men at a rate of about twenty yards per minute.

That raises two other questions: how long would the job take, and how many workers would be needed? The ancient Greek historian Herodotus thought thousands of slaves built the pyramids. But modern scientists doubt that slaves were used. They have found the remains of workers' settlements.



There were houses with clothing for both men and women, and even children's toys. That meant the workers lived with their families. Evidence also shows that they ate bread, onions, and garlic, and drank beer three times a day. At the end of the nine-day Egyptian week, they had a feast of grilled fish or fowl, along with wine. This was better food than slaves would have had.

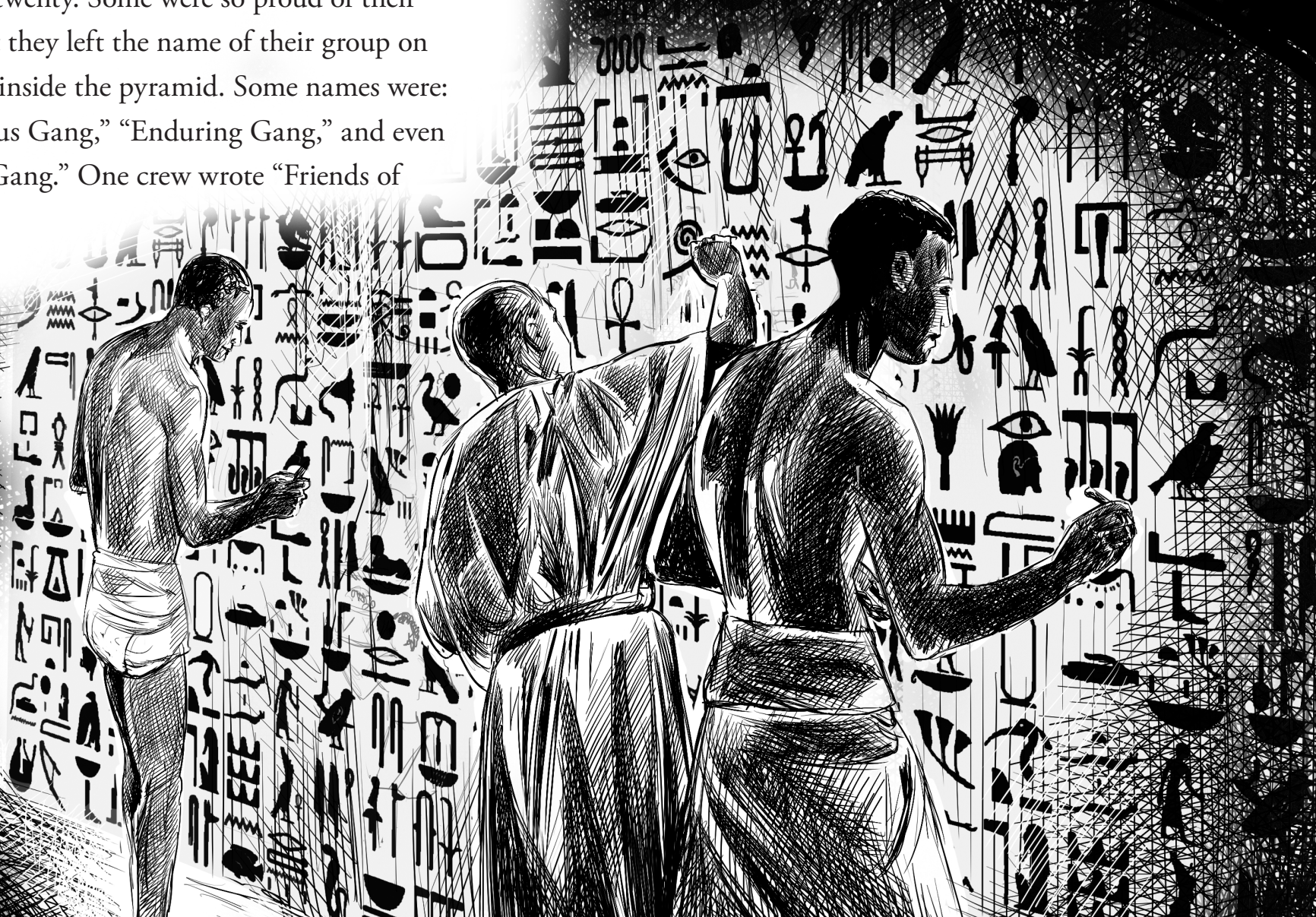


NOTRE-DAME
CATHEDRAL

There was a workforce that labored on the pyramids all year round. During flooding season, these workers were helped by farmers who had spare time. In return, the farmers probably had their taxes lowered.

Scientists use different computer models to figure out how many workers were needed. For the Great Pyramid of Khufu, the best guess is between fifteen thousand and thirty thousand workers over a period of at least ten years. The pyramid had to be finished before the pharaoh died. (By comparison, Notre-Dame Cathedral in Paris took almost two hundred years to build, from AD 1163 to 1345.)

The workers were divided into gangs of two hundred men. Then each gang was split into teams of twenty. Some were so proud of their work that they left the name of their group on the walls inside the pyramid. Some names were: “Victorious Gang,” “Enduring Gang,” and even “Drunk Gang.” One crew wrote “Friends of Khufu.”



In a sense, each pyramid was built from the inside out. Food, clothing, and treasures that the king would need in the afterlife were placed in the burial chamber while it was still open to the outside. Then the rest of the pyramid was built around it. Narrow corridors were made to connect the chamber to the outside world.



The Egyptians were well aware that robbers often stole the treasures from tombs. So workers built false chambers and long corridors that led nowhere. It was dangerous to enter a maze if you did not know the correct way in—and out.

TOMB ROBBERS

KHAFRE'S PYRAMID WAS THE ONLY ONE OF THE THREE GREAT PYRAMIDS TO REMAIN SEALED UNTIL MODERN TIMES. IN 1818, AN ITALIAN COLLECTOR NAMED GIOVANNI BELZONI DISCOVERED A SMALL ENTRANCE. THOUGH IT WAS ONLY FOUR FEET HIGH AND THREE AND A HALF FEET WIDE, HE SQUEEZED THROUGH. THIS WAS NOT EASY, AS BELZONI WAS SIX FEET, SIX INCHES TALL. BUT INSIDE THE BURIAL CHAMBER HE FOUND NOTHING BUT AN EMPTY SARCOPHAGUS WITH A BROKEN LID ON THE FLOOR. ANCIENT TOMB ROBBERS HAD BEEN THERE BEFORE HIM.

NEARLY ALL THE PYRAMIDS AND MOST OF THE STONE TOMBS WERE LOOTED FOR THEIR TREASURE. TOMB ROBBING WAS A RISKY BUSINESS. TRAPS HAD BEEN SET BY THE PYRAMID BUILDERS TO CAPTURE THE ROBBERS. BUT SCIENTISTS HAVE LEARNED THAT SOME OF THE TOMB ROBBERS HAD EARLIER WORKED TO BUILD THE PYRAMIDS. SO THEY KNEW HOW TO AVOID THE TRAPS.



Where Is the Great Barrier Reef?

by Nico Medina

Chapter 4 Creatures of the Reef

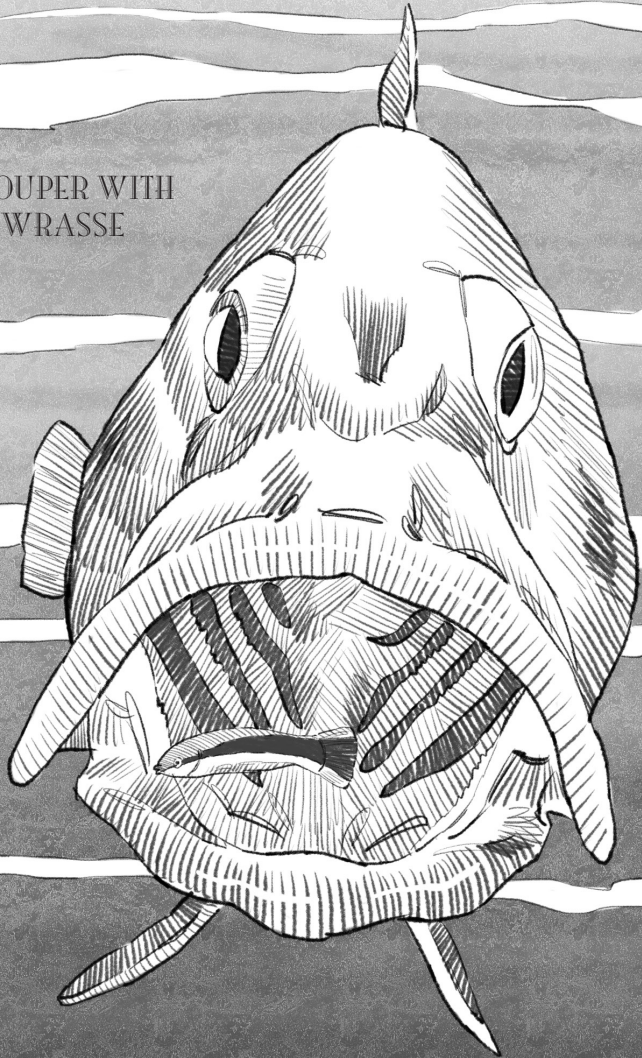
From the tiniest algae to the largest whales, thousands of species of animals live in the Great Barrier Reef. Each serves a purpose in the community.

More than 1,700 species of fish live in the Great Barrier Reef. The Queensland grouper is one of the largest, weighing more than a thousand pounds! The grouper's mouth is so huge, it can swallow sharks and rays whole! But there is one tiny fish that the grouper lets into its mouth and does not eat.

The tiny bluestreak cleaner wrasse swims in and out of the grouper's mouth, eating dead skin and parasites. Every now and then, it vibrates its fins against the inside of the

grouper's mouth. It's reminding the grouper not to swallow it!

GROUPE
WITH
WRASSE



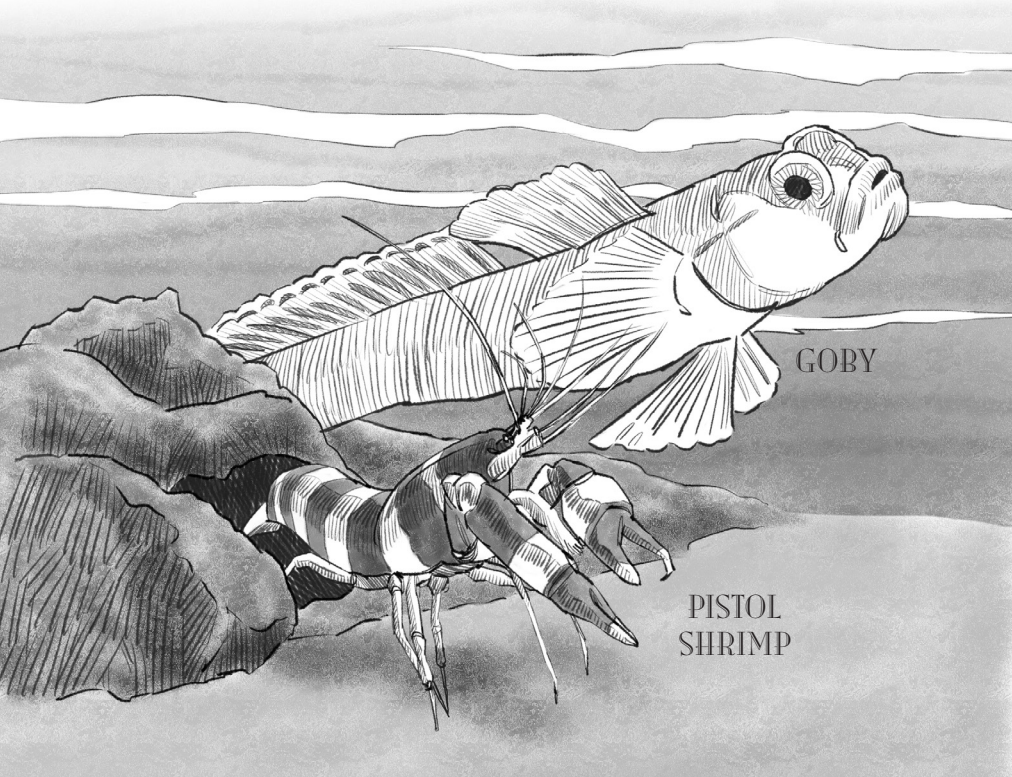
Other large animals like manta rays and sea turtles—even fearsome moray eels—also use the wrasse's “cleaning service.” The wrasse actually “dances” in the water to call attention to itself, and to bring animals to its cleaning station.

MORAY
EEL



Like the relationship between coral polyps and their micro-algae, the cleaner wrasse and its “clients” each get something they need. These relationships exist all over the Great Barrier Reef.

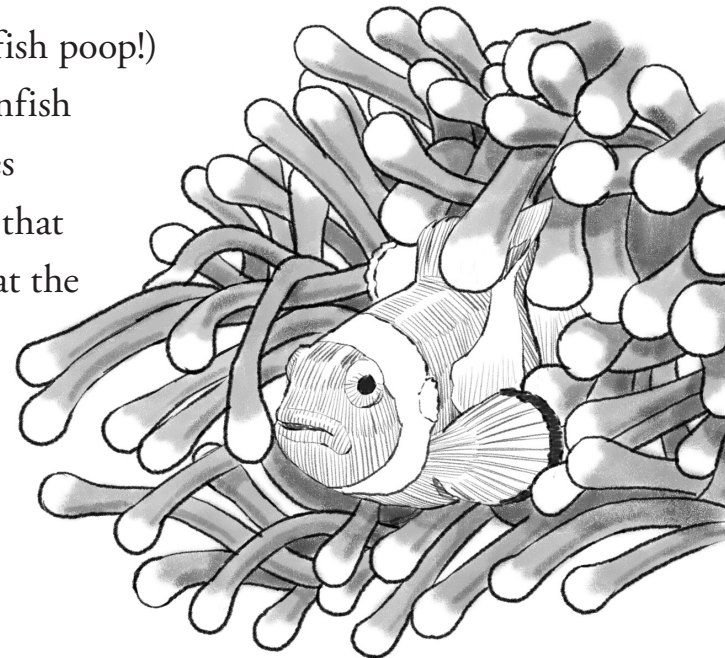
For example, goby fish and pistol shrimp live together in small burrows in the sand. Gobies can see very well, but the shrimp are almost blind. When outside the burrow, a shrimp uses its long antennae to stay in contact with the goby. If the goby sees danger coming, it flaps its tail and swims into the burrow, and the shrimp follows it. In return, the shrimp digs the burrow and keeps the goby's home clean. With the ever-shifting sands, it is a big job.



Clownfish and sea anemones also have a symbiotic relationship. The sea anemone is a relative of the coral polyp. It has poisonous tentacles, which it uses to attack and eat fish. But the clownfish is immune to the anemone's sting. This means the sting does not affect it.

The clownfish makes the sea anemone its home. It is protected from other fish that might get stung by the anemone. In return, the clownfish eats the anemone's old, dead tentacles and keeps the area clean. (The sea anemone even feeds on clownfish poop!)

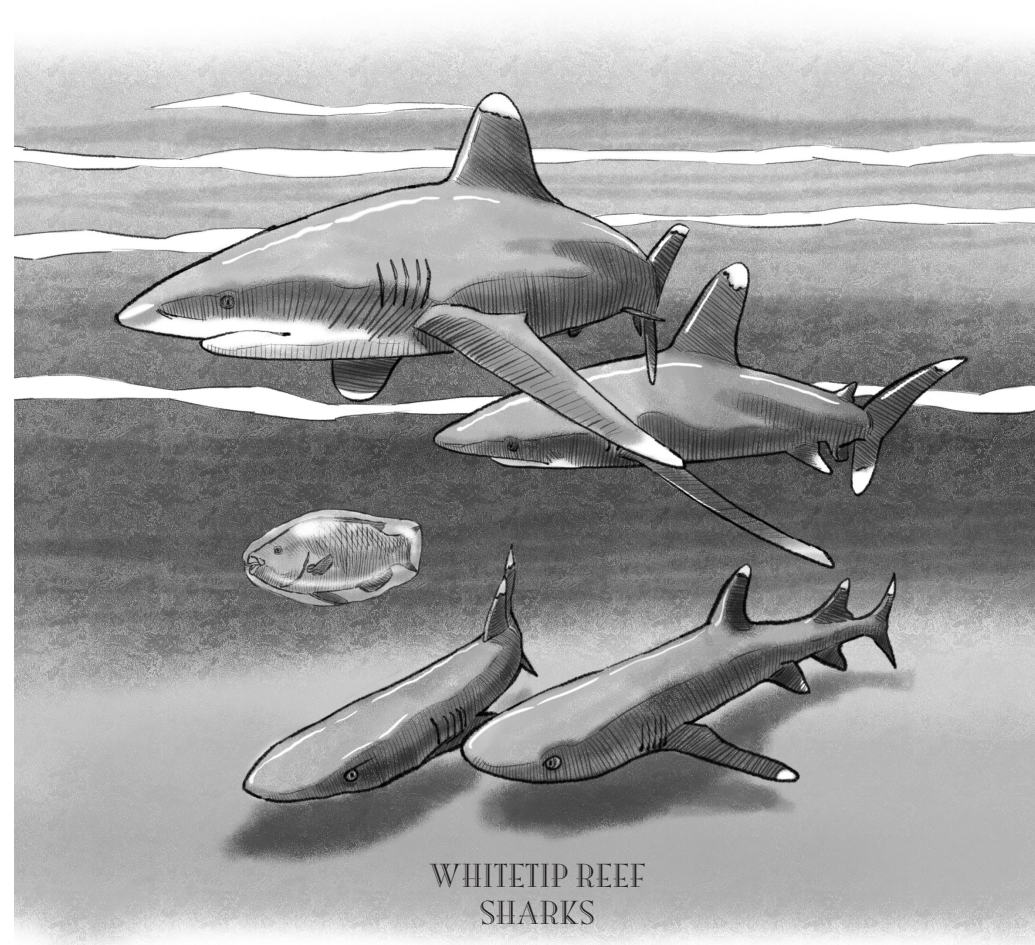
The clownfish also chases away fish that want to eat the anemone.



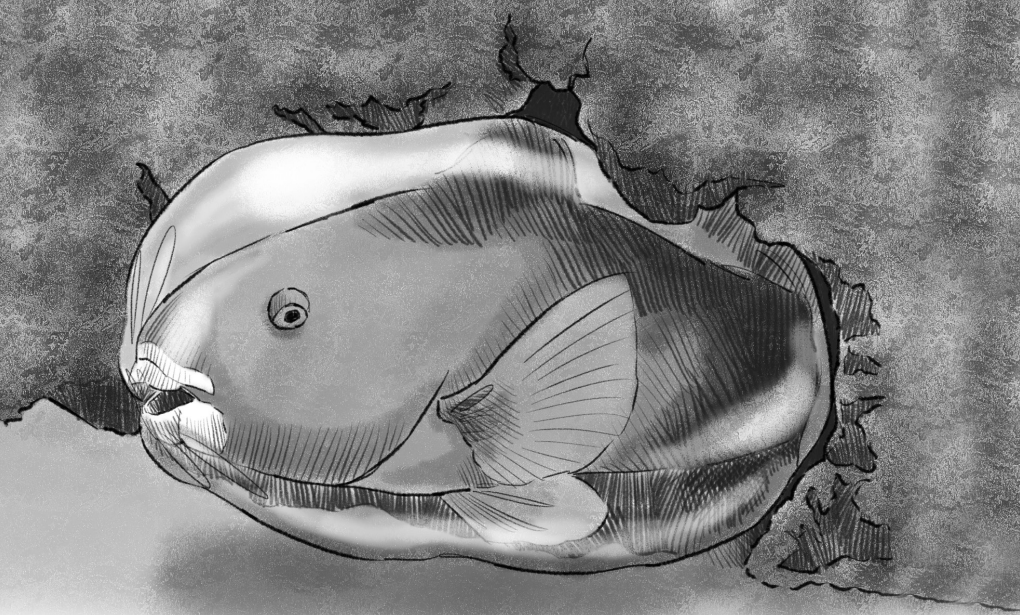
The coral reef itself provides food and shelter for many animals. Crabs, octopuses, and eels live in its nooks and crannies.



During the day, groups of whitetips rest in caves and on the sandy ocean floor. But at night they hunt. Even in the dark, they can find their prey by using their keen sense of smell.



Parrotfish have a trick for escaping the sharks. They cover up their smell by belching out a bubble of mucus. They surround themselves within this spit bubble. Then they go to sleep for the night.



PARROTFISH IN A BUBBLE OF MUCUS

Does this always work? No.

Besides having a superb sense of smell, sharks can also detect tiny movements in the water.

The slender whitetip sharks are also very flexible. When they find their prey, they can wriggle into small cracks in the reef. The fish don't stand a chance.

It's not just sharks that fish have to watch out for.

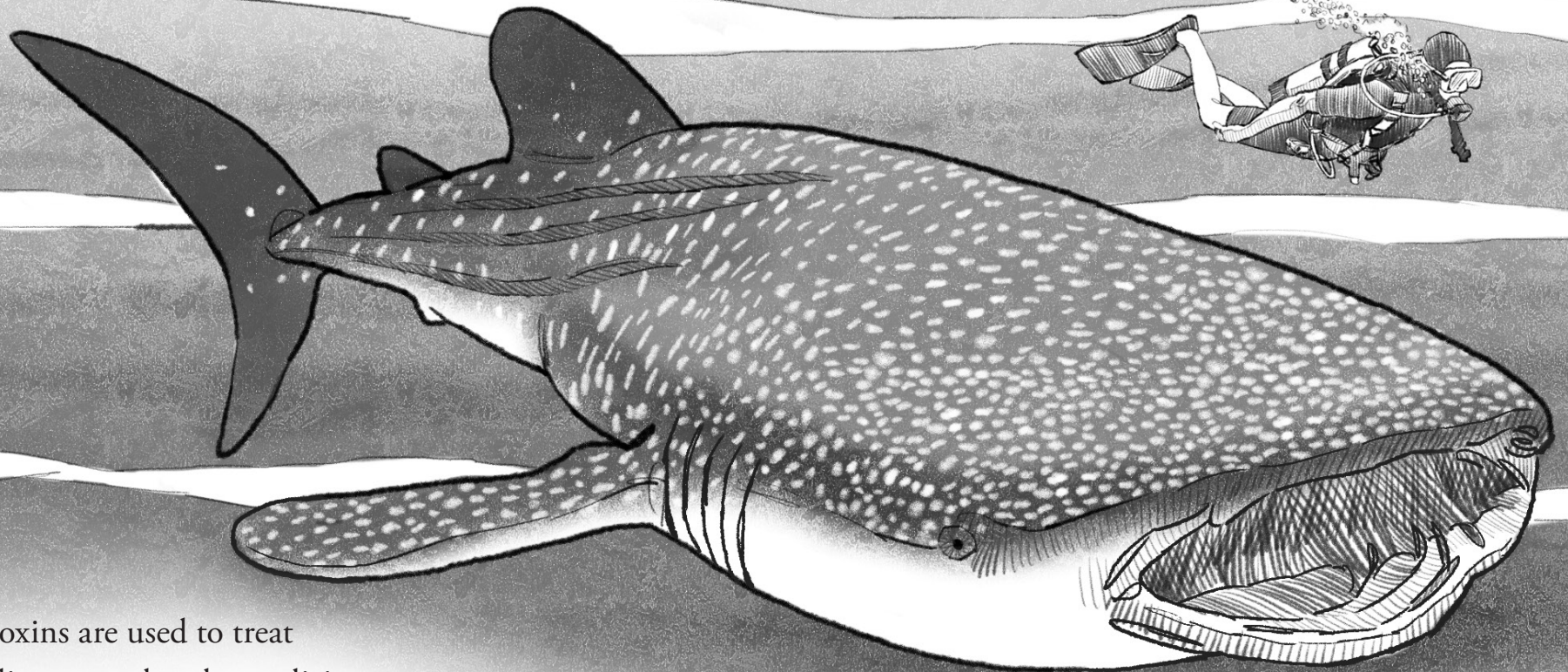
The cone snail is a small but deadly fish-eater. Using its sense of smell, it sneaks up on little fish

as they sleep. When it gets close enough, the snail releases a chemical, drugging the fish so it can't move. Next, the fish is swallowed alive, and a barb inside the snail kills the fish with a shot of poison. Some cone snails shoot a harpoon-like spear at their prey, then pull the fish into their mouth.



CONE SNAIL

There are more than six hundred species of cone snails in the world. About 120 live on and around the Great Barrier Reef. One hundred different types of poison exist in *each* species of cone snail. Some of these toxins can kill a person. But they can also help people. Scientists around the world are studying cone snails. Their

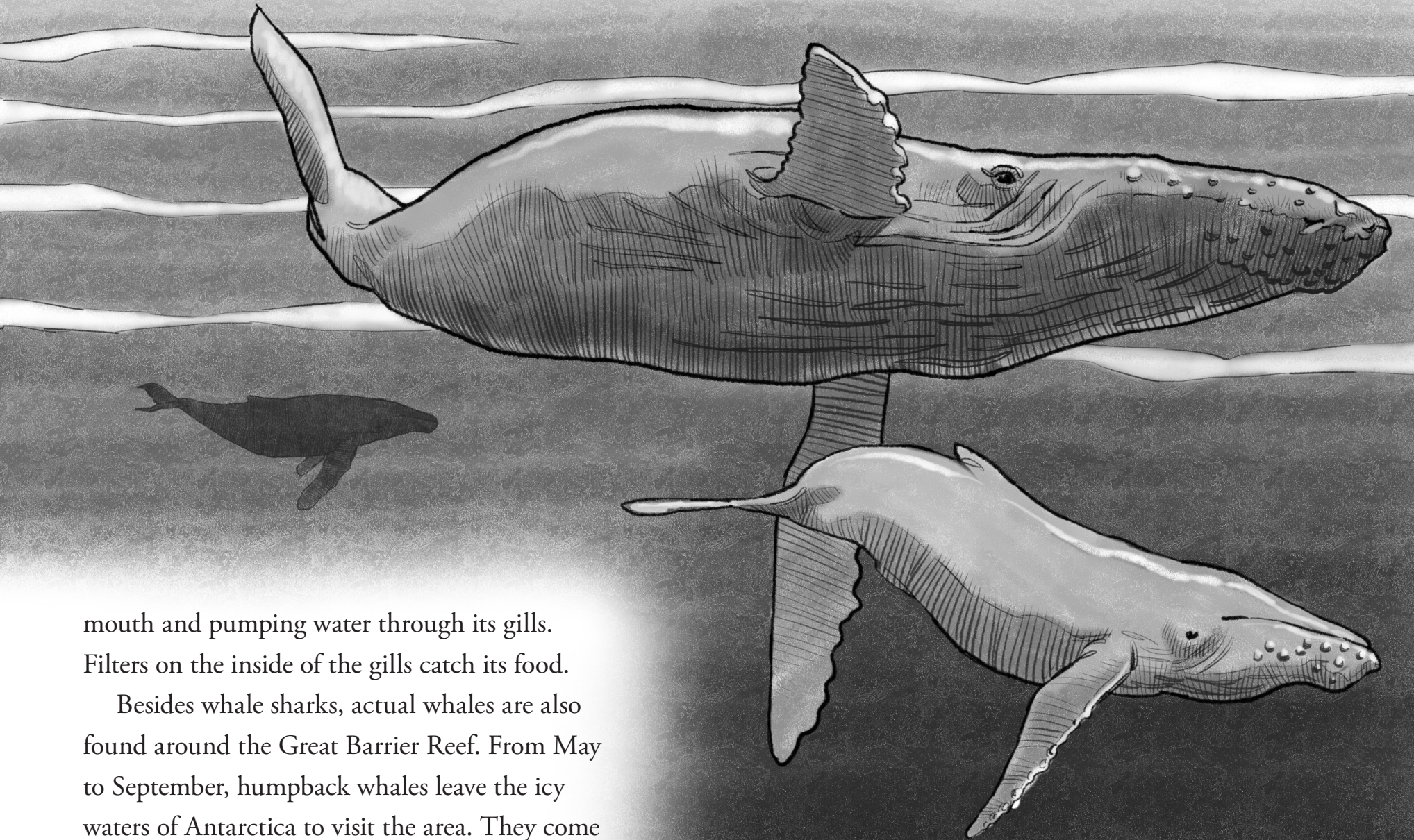


toxins are used to treat diseases and make medicines.

The Great Barrier Reef is also home to ocean giants.

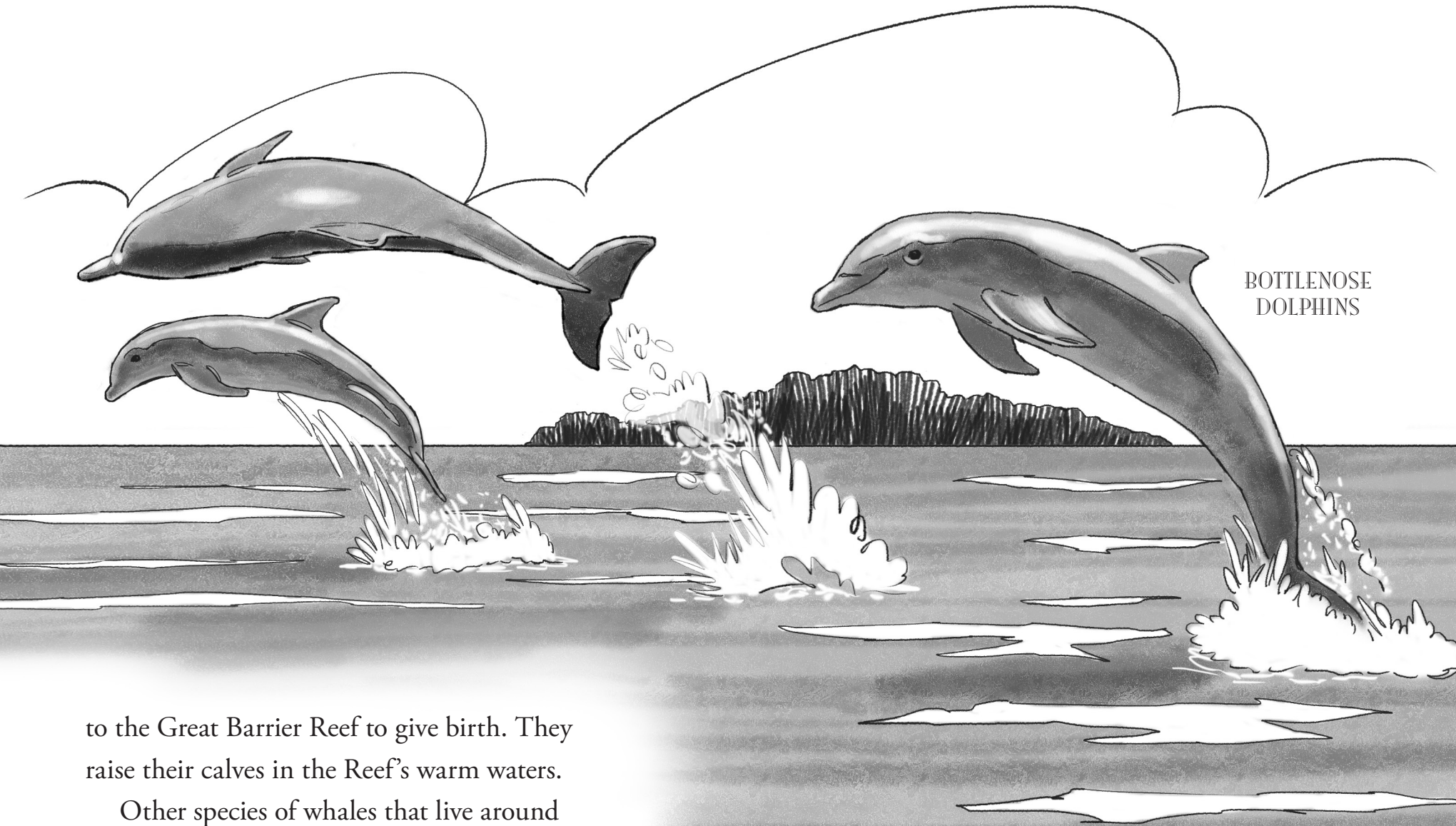
The whale shark is the largest fish in the world. It grows to more than forty feet long and weighs as much as three full-grown African elephants. Despite its size, the whale shark is a

gentle giant. Although its mouth contains more than three hundred rows of teeth, it doesn't eat most sea creatures. That's because the whale shark is a filter feeder. It feeds on krill, plankton, algae, and tiny fish by opening its enormous



mouth and pumping water through its gills. Filters on the inside of the gills catch its food.

Besides whale sharks, actual whales are also found around the Great Barrier Reef. From May to September, humpback whales leave the icy waters of Antarctica to visit the area. They come



BOTTLENOSE
DOLPHINS

to the Great Barrier Reef to give birth. They raise their calves in the Reef's warm waters.

Other species of whales that live around the Reef include sperm, killer, and false killer

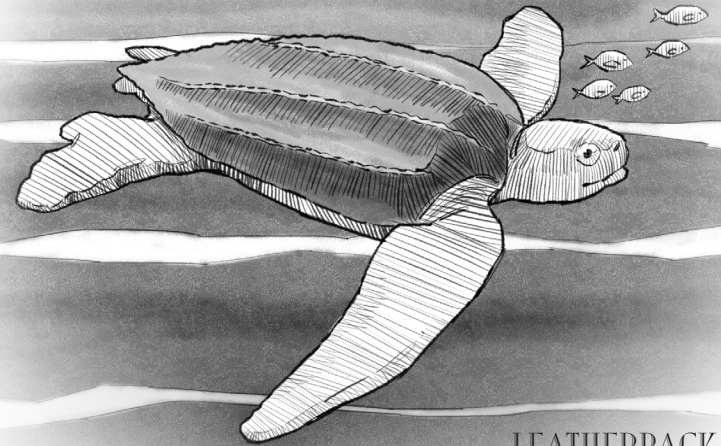
whales. Dolphins live here, too, like the Australian snubfin, bottlenose, and spotted dolphins.

Many species of reptiles live around the Great Barrier Reef—including fourteen species of sea snakes. A sea snake looks a lot like a snake you would find on land, except its tail is shaped like a paddle. This helps it swim better. It can swim underwater for up to two hours without coming up for air. How is it able to do this? It has a large, powerful lung. Its single lung is almost as long as its entire body! Sea snakes are extremely poisonous, but they rarely bite people.

BLACK BANDED
SEA KRAIT



In addition to sea snakes, six species of sea turtles are found on the Great Barrier Reef. The olive ridley turtle is the smallest, weighing around one hundred pounds. Leatherback turtles are the largest—they can be more than six feet long and weigh as much as 1,500 pounds!

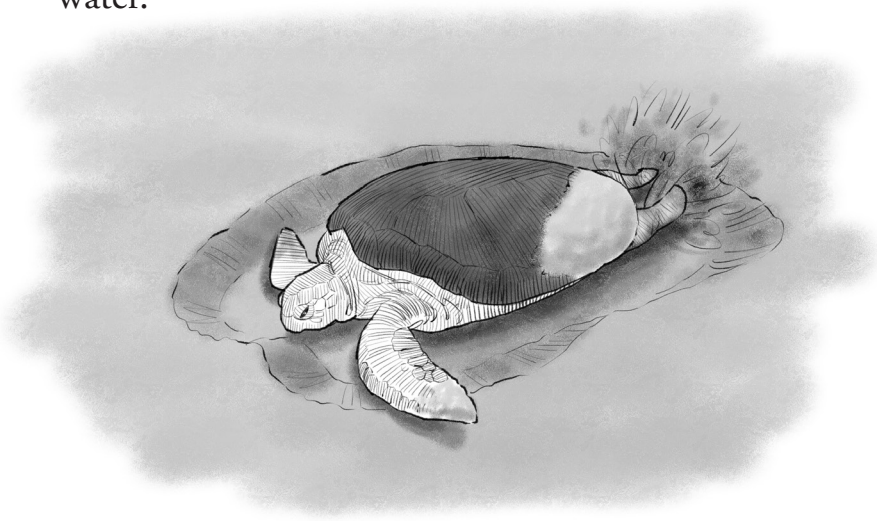


LEATHERBACK
TURTLE

Sea turtles spend most of their life in the water, eating algae, sea grass, shrimp, crabs, and jellyfish. But once a year, thousands of them

come to the beaches and islands of the Great Barrier Reef to lay their eggs.

With its front flippers, the female turtle pulls itself slowly up a sandy beach. It is looking for the perfect spot to make a nest. The sand can't be too powdery or dry. The sea turtle digs out a nest with its back flippers. For the next twenty minutes, it will lay around 120 eggs. Finally, it covers them up with sand and returns to the water.



The temperature inside the nest determines whether the turtles will be born male or



female—cooler nests mean males, and warmer ones mean females. The eggs take two or three months to hatch. After a couple of days of digging, the baby sea turtles all emerge and head straight for the ocean.

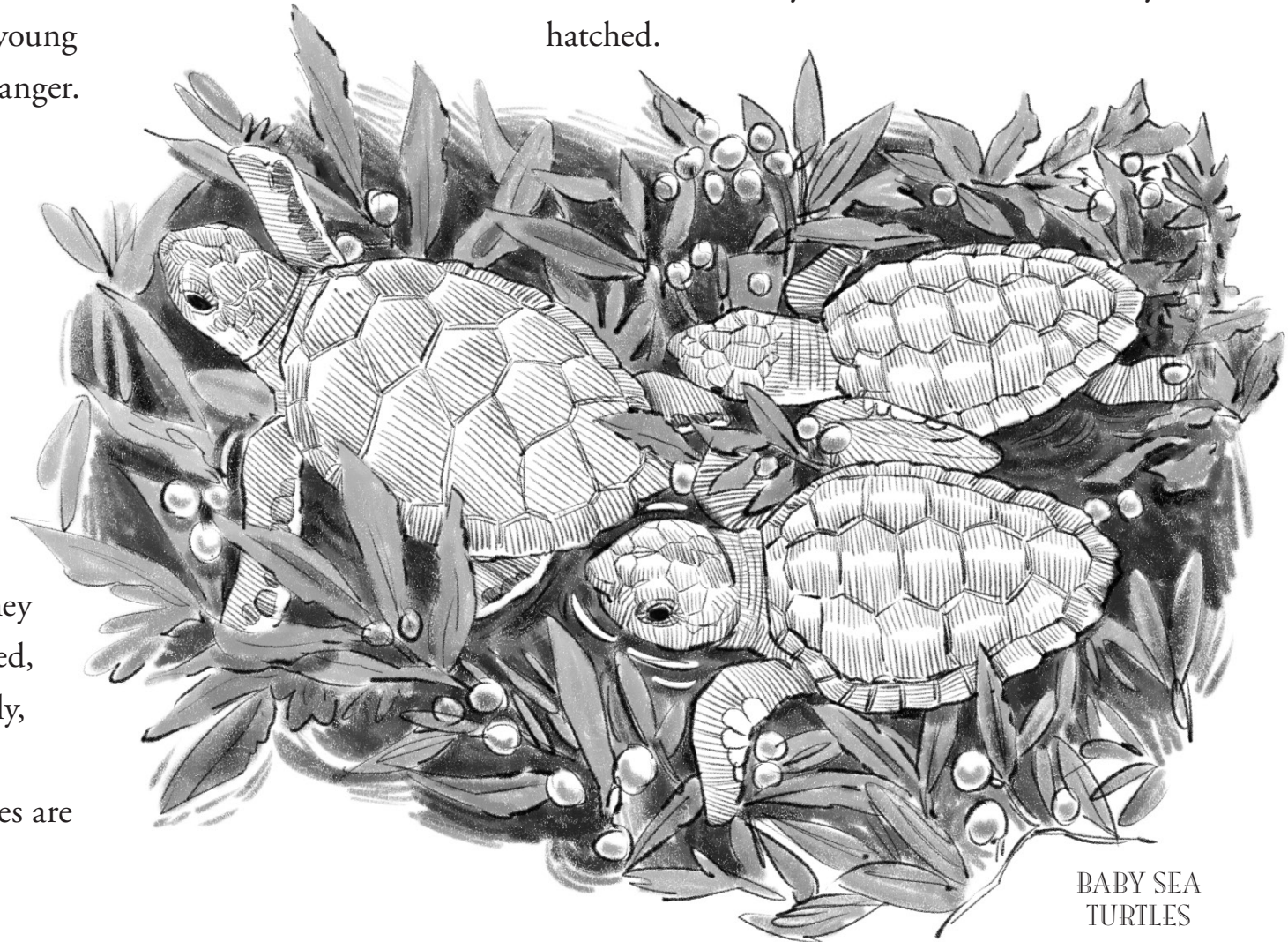
The water may be close by, but the trip is dangerous for the two-inch-long babies. Birds and crabs love to eat the hatchlings.

If the turtles make it to the water, they'll take cover in floating seaweed and ride the ocean currents for hundreds, even *thousands* of miles as they feed and grow.

Out in the open ocean, young sea turtles are in constant danger. They can be eaten, or even caught up in fishing nets. They die from eating floating trash, like plastic, which they can mistake for food.

After five or ten years, when the turtles have grown to about the size of a dinner plate, they return to coastal areas to feed, and grow some more. Finally, twenty or more years after hatching, the baby sea turtles are

all grown up. Only one out of every thousand hatchlings will make it this far. But when they do, the turtles return to the same area, sometimes the very same beaches, where they hatched.



BABY SEA
TURTLES

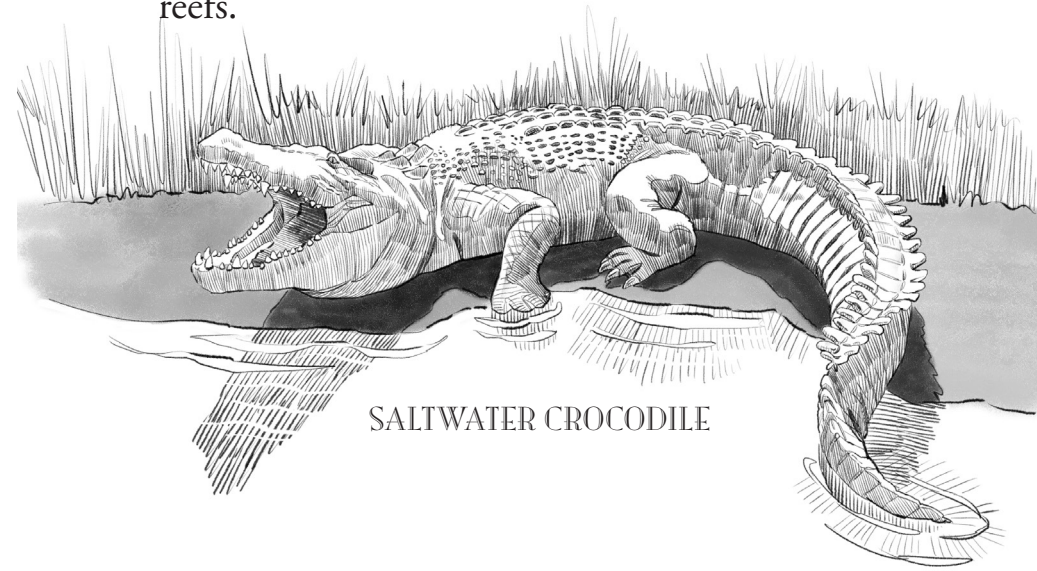


YELLOW-SPOTTED
MONITOR LIZARD

Lizard Island, in the northern Great Barrier Reef, is home to—you guessed it—lizards! Captain Cook named the island for its many yellow-spotted monitor lizards. These four-foot-long lizards use their forked tongues to sniff out prey. They can also balance on their back legs and tail to reach their food—like a tasty, crunchy grasshopper high up in a bush!

The largest reptile in the world can also be found on the Great Barrier Reef. The saltwater crocodile—known in Australia as the “saltie”—can grow to more than twenty feet long and weigh more than two thousand pounds! Salties are extremely dangerous. They have been known to attack and kill humans. It’s rare, however, to see them swimming among the coral reefs. They prefer swamps, creeks, and lagoons near the shore.

From tiny zooplankton and colorful reef fish, to sharks, crocodiles, and whales, so many creatures live in the Great Barrier Reef. But there is more to their beautiful home than just its coral reefs.



SALTWATER CROCODILE

Where Is the Taj Mahal?



by Dorothy and
Thomas Hoobler

Chapter 2 Young Lovers

During the New Year holiday season, the women of the palace always held a fair in the Red Fort. They sold things for charity. It was one of the few times when Muslim women could be seen in public without their veils.



Helping at one of the booths was a fourteen-year-old girl. She came from an important family, but she was not a princess. Khurram stopped at her booth and bought a large piece of glass shaped like a diamond. He is said to have paid ten thousand rupees, an incredibly high price.



But he would have paid almost anything just to please the beautiful young girl. The very next day, he asked his father for permission to marry her. His father agreed on one condition: Khurram had to wait five years and during that time, he could not see the girl. Not even once.

Many things happened during those years. Khurram's father arranged for him to marry a Persian princess. (He was allowed to have four wives.) And even though he had two older brothers, Khurram had been named heir to the throne. That meant he would be emperor after Jahangir died. Becoming the heir entitled Khurram to use a red tent. This honor usually went to the oldest son of the ruler. Khurram was also made a commander in the army.

During these years, the girl from the fair always remained his true love. When the five years were up, Khurram reminded his father of his promise. And his father remained true



to his word. On March 27, 1612, a day chosen as important for a happy marriage, the young couple were wed.

Most people in India were Hindus. So even though the ruling family members were Muslims, much of the ceremony followed Hindu customs. The groom went to the bride's house on the back of an elephant. (Ganesh is a Hindu god with the head of an elephant. He blesses the beginnings of important projects.)



HINDUISM

HINDUISM IS AN ANCIENT RELIGION OF INDIA, THOUGH MANY FOLLOWERS THINK OF IT NOT AS A RELIGION BUT AS A WAY OF LIFE (DHARMA). EVEN SO, HINDUS BELIEVE IN NUMEROUS GODS AND GODDESSES. THERE ARE MANY STORIES ABOUT THE ADVENTURES OF THE GODS AND GODDESSES. COUNTLESS TEMPLES ARE DECORATED WITH STATUES OF THEM. TODAY, MOST INDIANS STILL FOLLOW SOME FORM OF HINDUISM.

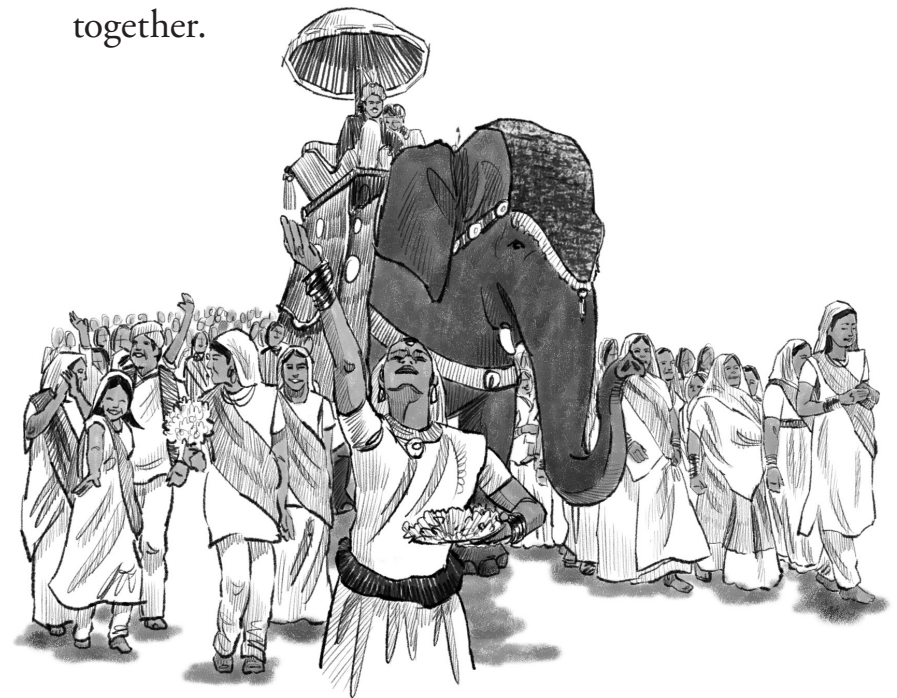


Once the groom arrived, women who hid their faces behind a curtain painted designs on his hands. These were supposed to bring good luck. Khurram's father tied a wedding tiara made of pearls on his son's head.



The bride was asked if she agreed to the marriage. She gave her consent, and the families exchanged gifts. Khurram rinsed his hands in rosewater and drank water to show that he, too, agreed to the marriage. Khurram gave his bride the title Mumtaz Mahal, which means "Chosen One of the Palace." The feasting, with gala parades and fireworks, went on for a month.

It was just the beginning of a wonderful life together.



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