

# Submerged Dinosaurs

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## SUBMERGED DINOSAURS

### **Future Adventurer**

You must know that at least ninety percent of the science and technology that you will read in this collection of books is real. The research vessels, laboratories, rockets, submarines, microscopes, spacesuits, telescopes, dinosaurs, plants, whales, fish of the abyss, suns and even galaxies, exist or have truly existed somewhere in this wide world...or beyond it. Each adventure is based upon my own crazy travels throughout the past twenty five years of writing news stories about science, and following in the steps of some documentary producer. That said, of course there is fiction! What good adventure book will not have the freedom to fantasize a bit? But these fantasies, where they occur, are based upon technologies that could also be perfectly possible.

This collection was written thinking of all those minds, like yours, filled with curiosity and avid of exploration, the force that has made possible each and every one of humanity's greatest advancements...and that will continue to do so in the future.

So, you want to become an astronaut, surgeon, engineer, archaeologist or biologist? Just remember what Wernher von Braun –the inventor of the greatest rocket of all times, the rocket that took the first men to the Moon– answered, when people told him that his was an absurd dream:

“I have learned to treat the word *impossible* with the greatest of care.”

**Angela Posada-Swafford**  
**Miami Beach 2013**

*To my sister Ruby Posada, who believed in this project from the very start, and who curled up on her cozy couch to read chapter after chapter as they came out of the oven like small rolls of bread, some without salt, others without pepper, some a bit burnt, and others just right. Her valuable comments and suggestions proved to be right on target.*

### **A special invitation**

“Simon, there’s an e-mail from Aunt Abi!” shouted Lucas, as his fingers expertly flew over the keyboard. “Guess what she’s invited us to!”

“What? Go on, read it now!” his cousin Isabel shouted back, as she rushed up the stairs, her long auburn hair flouncing out behind her.

“It’s to spend a week at sea in a research ship,” Lucas replied, his eyes glued to the monitor. He was twelve and had the bronzed looks of an eternal beach boy, with smooth jet-black hair. “Simon, where *are* you? It all sounds too good to be true! The ship was originally used to look for oil, but now they use it for research. On this voyage, they’re going to try and discover why the dinosaurs died 65 million years ago. They think it was because of a meteorite that fell into the sea... Hey, Simon....!” he called again, impatiently.

“Calm down, man, here I am,” answered his older cousin over Lucas’s shoulder, a broad grin on his perfectly-formed face. “What’s an oceanographic ship to do with dinosaurs?” he asked in that soft-spoken way that caused many hearts to flutter among the girls at school.

“Well, let me read Abi’s e-mail,” said Lucas.

Dear Simon, Isa and Lucas,

In a few days I’ll be going on board – I hope with you three and, of course, Juana – one of the world’s largest research ships; she’s standing off the Florida coast. Her mission is to travel the seven seas making deep holes, hundreds or thousands of feet below the seabed. They’re looking for clues to understand the history of Planet Earth; but, I’ll give you all the details (and anyway, I suggest you read the attached note that I wrote for a magazine a few weeks ago). And the real idea of this six-day cruise is to test the theory that 65 million years ago a meteorite six miles across hit the sea off the Yucatan peninsula, now part of Mexico. The impact was so hard that it set up waves over 600 feet high and created a cloud of dust and gases that filled the air for a long time – so it killed not just the dinosaurs but also three quarters of all living things on the planet. And these holes they’re going to drill off Florida could give us the answer to the great mystery...”

“Waves 600 feet high? Does that mean that the dinosaurs drowned?” interrupted Isabel, straightening up her blue, square-framed glasses which always slipped off to the right and made her astonished eyes look even wider. She hated her glasses with a consuming passion because (she said) they made her look ugly. Sometimes she took them off so that the bigger boys at school wouldn’t notice; but that was frustrating because then the whole world went out of focus.

“I don’t know, Isa, perhaps they did,” replied Lucas, as he entered the words *dinosaur death* on his keyboard, and instantly hundreds of pictures and texts popped up on the screen. “But if they drowned, then why marine life die too? That doesn’t make sense.”

When something caught Lucas' interest he couldn't let go of it without finding out the answer at once, wherever he was, whatever the time. He would be silently up and out of bed in the middle of the night, because his curiosity kept him awake. That was the way he had discovered all sorts of tricks on the Internet, worthy of a Sherlock Holmes, to find the answers to the most unlikely questions.

“And how on earth are we going to board the ship if she's out at sea?” asked Simon. “This time I think it'll be hard to persuade Mom to let us go. You know how nervous Abi's adventures make her!” This way of reasoning was typical of Simon, the most thoughtful one in the group.

“I don't care how we will get on board, whether on a fast boat, or a submarine, or parachuting over it, it will be the coolest adventure! Your mother may say 'no', Simon and Isa, but what's more important is that mine says 'yes'. We all know how she can persuade yours when it means joining Abi as she works on one of her articles for the magazine,” said Lucas with a mischievous smile.

He was right. The three sisters were very united. The eldest was Simon and Isabel's mother, the second was Lucas' mother; and the youngest was Abigail, a science reporter, writing for a well-known magazine. Her investigations had thrust her into all kinds of adventures, and she often found a way of inviting the children to go along during the holidays to one of her exciting working trips. She had promised that someday she would take them to other wonderful places, like the bottom of the sea, or Africa, or the South Pole. Before they started living these adventures with their aunt, the children had no

idea that the work of scientists could be so amusing. At the same time, Aunt Abigail quickly became the children's confidante; something special about her allowed Abi to put herself in their shoes. By instinct, she knew what they liked, what annoyed them, what scared them; it was almost telepathic.

"Parachuting over the ship?" Isabel asked shyly, already backing away from the idea in fear.

She was a delicate nine year-old very girly girl, stronger than her thin frame led to believe. Much given to adorning her hair in all possible shapes with blue ribbons, she was sometimes a spoiled brat, but she was growing up and was now a solid member of the group in their perilous adventures.

"Don't pay any attention to him, you know what a beast Lucas is", said Simon arching his blonde eyebrows towards his cousin in disapproval. "Besides, Isa, think: Dinosaurs. We will be looking for clues about the dinosaurs. Your best friends. I even wonder if we might not find a bone or two buried under the sea."

Isa's eyes lit up immediately. She had a fascination with anything relating to the giants of the past. She liked to imagine them walking the streets of modern cities as if they were perfectly normal, holding conversations with passers-by about their own worlds.



“I’m sure Juana won’t have a problem in getting a yes from *her* mom,” she said, referring to Lucas’ best friend at school, who had practically become part of the group since the first adventure with them a year ago.

Juana lived out in the country. She had no brothers or sisters, and was lonely, kind of brazen and disorganized. She was fascinated by anything to do with nature, and collected everything from sand (which she kept in jars), seeds, leaves, snails and sloughed-off insects’ wings. Whenever she went on a trip she would keep a diary in which she made notes and drawings of everything she saw. She was probably the most excitable and fearless of the four - and the one who lost her head most often.

“Of course they’ll let Juana go!” said Lucas, “From what Abi writes, Professor Basalt is on the ship. Remember, we met him at Christmas? He’s a geologist, a distant cousin of Juana’s father – there’s a coincidence for you!”

“A what?” asked Isabel.

“A geologist. A scientist who studies how the mountains, the continents, the oceans and the planets were formed. You’ll be seeing that in school soon,” replied Simon with an understanding smile.

“Pass me the mobile, Simon, I can’t wait to tell Juana,” said Lucas, stretching his arm, eyes still on the screen in front of him.

A week later everything had been arranged just as Lucas had foreseen. The kids met Aunt Abigail in Miami, and the day after they were scheduled to go on board the research ship, although still Abi wasn't saying how.

Her nose pressed to the window of the chopper, Isabel thought back to the magazine article her aunt had sent and tried to imagine that she had seen a dinosaur on that fateful day 65 million years ago when the meteorite struck. In her mind's eye, she saw scenes of a family of tyrannosaurs quietly preparing to eat....

.... Just when the little carnivores started to tear off strips of muscle from the leg of a dinosaur freshly killed by their mother, a light appeared on the horizon. It quickly became more intense and the young tyrannosaurs looked upwards with curiosity. Their scaly faces were bathed in a new, golden light. Their wild yellow eyes flickered for an instant, then, they went back to their lumps of meat. They knew nothing about it, but the meteorite had just struck two thousand miles from their pine forest, and the distant glow they had seen was in fact an explosion a million times stronger than an atomic bomb, opening up a crater 125 miles wide and 10 miles deep in the Earth's cortex.

The dark blue of the Caribbean changed to a series of green patches and the kids could clearly see the bottom of coral and sand through the oval windows of the airplane.

"Wow! Look at those corals!" Juana exclaimed nervously, brushing aside a lock of smooth red hair from her cheek. She always kept it cut short and tucked under an orange baseball cap that matched the bright tones of her pants – she never wore skirts. Her eyes, the same cobalt blue as the sea below, held their gaze on the scene. Lucas used to say that

when Juana's blue eyes started to throw off sparks it was time to make tracks. But once she'd become your friend, a bomb wouldn't shift her loyalty.

The sea commanded an attraction for Juana that she could not put into words. If she was in it, out of it or on it, she felt a great force inside her which made her happy, capable of anything. She couldn't understand why some people were afraid of the water. She felt as much at ease on the bottom of a swimming pool as when she was at home.

"My parents promised to let me take the diving classes they give at school when I reach Sixth Grade. I can't wait!" Then she added hopefully, "Can we go into the sea from this ship?"

"I don't know," replied Lucas, "But I do know that you'll have to wait at least two years before you take the diving classes: the pressures diving puts on the body are not good for you when you're growing. I saw that on TV. And it's not because you aren't brave..." he added, nodding towards Simon, "This Juana knows how to pick up a sea porcupine without pricking her fingers and she's gone into a tank to snorkel with sharks. You could almost say she grew up with them!"

"Oh, please!" protested Juana, blushing as she saw Simon's look. He had just taken off his headphones after a two-hour MP3 concert from his super-rock-heroes. The band had perfected a creative fusion of grunge and alternative rock and their latest single was being downloaded by the millions. "And don't make such a big thing of it – what

happens is that my parents are always going on diving trips to an island a friend of ours has off the coast. And I adore the sea, I can't keep away from it."

Simon looked at her enviously. When he was small he'd had the same passion for the sea as Juana; but on one stormy afternoon during the holidays the boat in which he and his father were sailing had turned over. His father lost his life trying to save Simon, who was trapped under for what seemed to him an eternity. Ever since, he had sometimes dreamed of diving into the deep open sea, only to find that it was a pool of quicksand that dragged him down and down. Sometimes the sand turned into his father's hands, grasping him firmly by the ankles.

"You sound just like Aunt Abigail," he said, pushing the painful memory from his mind. "She says that she has seawater in her veins instead of blood, with shrimp and fish and all. She can't see a puddle without wanting to jump into it. My mother says she gets mixed up in so many adventures that one day she'll land up in another world."

"Isa's the one who's in another world – look at her!" exclaimed Juana suddenly, turning back to the window. Isabel's forehead was still glued to the glass; now, though, her eyes weren't looking at the sea, but at her apocalyptic scene in pre-history....

....For a few minutes the tyrannosaur chicks went on eating undisturbed. The glow dimmed a little, but in its place there rose up a thick pall of dark smoke. Then, the Earth began to shake. The chicks raised their eyes and started to gobble with fear. The shaking became stronger and made them lose their balance. Like the shockwave of an atom bomb, a blast of wind savaged the prehistoric forest, tearing out the pines by their roots. The tyrannosaurs were swept up roughly into a mortal maelstrom of rock and vegetation. Then the wind fell away for an instant,

but the wave washed back in the opposite direction, laying waste to everything in its path. The column of smoke grew and grew until it filled the sky, and the heat was suffocating. A shower of flaming rocks crashed down, setting everything it touched on fire. The few animals still alive by then died off one by one, asphyxiated by the heat and the poison-laden air...

Miami Beach came up in the distance, surrounded by fair beaches glittering under the sun. A line of buildings towered up in the shore of the milky-green sea. The plane came to rest in the humid heat.

“Where is she? Have you spotted her?” asked Lucas as they came out of the arrivals hall.

“Yes, there she is! Can’t you see that hat of hers?” said Simon as he started to run over in that direction.

“Hey! Hi there, boys and girls! Simon!” shouted Aunt Abigail brandishing her straw hat. She was a woman of about forty with short hair and blond curls in several shades, always untidy, and a permanent smile on her face. She was wearing khaki shorts and a black blouse, and carrying a canvas and leather bag over her shoulder. The whole effect made her look as if she were just off on safari in the African bush. “How was the *trip*? Isn’t the view from the plane *lovely*? Isa, you’re looking very *thin*, are you eating properly?” she gushed without pausing for breath as she hugged them one by one, and “My *darling* Juana I’m *so* happy they let you come this year too! Definitely the group’s not complete without *you*.”

Juana remembered that she had liked Abigail's warmth from the moment she first met her. She could still hardly believe that anyone could take it upon themselves to lead four children on expeditions or field trips all round the world. But, well, Abi was just *different*.

That night Aunt Abigail's explanations came alive again in Isa's dreams. The film which her feverish imagination had started to produce ended with a scene which made her cry, even in her sleep...

"Slowly the sun went out on the world of the dinosaurs and the sky took on an unnatural darkness. This enforced winter stopped the plants from taking in the sunlight and making green leaves to feed the herbivores, and the herbivores were food for the carnivores. So, thousands of millions of creatures began to die. Creatures that swam, creatures that crawled and creatures that flew started to fall to the ground, like autumn leaves, disappearing forever. The mother tyrannosaur lay on the grass, her body badly twisted, her mouth gaping. The rain of burning rock melted her beautifully-veined skin and muscles, baring her enormous predator's teeth. Slowly, the sun and the ages turned her remains to stone. And one day, millions of years later, an expert on fossils with her blond hair tied back in pleats and blue square-framed glasses crouched over a rock exposed on a mountainside. Her fingers trembling with excitement, she stroked the muzzle of this powerful queen of the jungle, as if afraid that she might wake her up."

### **A rough ride**

The day dawned bright, not a cloud on the horizon. When the group reached the airport, they were taken across to the heliport, which was behind the runway for the big planes. An army-like chopper was waiting near the heli company's small office. The doors were open, and an employee was removing the fuel line. A dark-haired, clean-shaven man came out of the building, putting on some dark glasses with golden frames. He was quite tall, and dressed in an olive-green uniform full of shields with eagles and helicopters on them. When he saw the children, he beckoned them to come over.

“Good morning,” he said with a smile. "So, you are the next crew of the Deep Ocean Driller, are you? My goodness, I would say that the scientists who go on that ship are getting younger every day, eh? I’m Major Allston, you can call me Terry. I’ll be your pilot this morning. It’s a wonderful day for flying, but before we start up, we’re going to take some safety measures. Have any of you flown in a helicopter?

"No,” answered Lucas and Simon as one.

"I have, three years ago,” said Juana. "During summer holidays with my parents in Hawaii.

"Good. Then you'll remember that rule No. 1 is that when the helicopter rotors are switched on, you must never let yourself get out of the pilot's sight, and never, never walk behind the tail rotor, isn't that right?" said Terry seriously, fixing his eyes on her.

"Sure," answered Juana, a little intimidated, stuffing her hands into the pocket of her overalls, which were orange with a pattern of lime-green flowers.

"That's the most important thing. Especially, the moment when we land on the ship, when I won't be able to switch off the engines while you get down. I have seen some nasty accidents in the past, in which adults have disobeyed the rule, and have been literally sucked into the air intake in the tail rotor," added Terry, taking off his sunglasses and looking at each of them seriously. "But now I know that there will be nothing to worry about with this group, you all seem to be very intelligent!" he said, smiling again. "Now, where are you going to sit? I am going to give you each a seat, because in a helicopter it is crucial that weight should be properly distributed. Abigail, you will have to go to the left at the back, to be a counterweight to me, since the pilot sits on the right. You two can sit in the middle seats," he said, pointing to Simon and Lucas. "And you go in the window to the right behind me," he said putting his hand on Isabel's shoulder. "And I suppose the lucky one who is going to be copilot is my red-headed friend," he said turning to Juana. "All right, everyone to their places!"

"I was bursting to go up front...! Juana, take lots of photos!" exclaimed Lucas, disappointed, and handing her a tiny digital camera which he took out of the front pocket of his shirt.



"Don't you worry too much," said Terry, "I guarantee that all of you will have the chance to ride in this helicopter once more next week, to make a trip round the ship. And then you will be able to take turns because there'll be no luggage to carry, and they will be short flights."

Terry and an assistant showed the children how to put on their safety belts, which were different from all ordinary airplanes. They had straps over the shoulders and at the sides, which clicked into a huge round button. Terry sat in his place, put on a pair of blue and green belts and a heavy helmet with earphones, which each of the other passengers had too. Then, he flicked a number of switches, and with a high-pitched whine, the rotors began to turn, slowly.

"If you want to talk, press this button, and let it go when you are going to listen," Abigail had to shout to make herself heard over the roar of the rotors, which were turning more and more rapidly, making the helicopter tremble.

The assistant closed the doors, made a signal to Terry, and walked away. Now sounding like thunder, the engines came to maximum power. Terry spoke to the control tower, waiting for an answer, and then moved a lever in the middle of the floor which came up to his knees. The helicopter started to rise with the nose pointing steeply forward, and tilted to the side.

"Why, it's as if we were about to fall down!" shouted Isabel, half terrified and half

fascinated, as the horizon seemed almost perpendicular to them.

"Do you feel a heaviness in your body?" said Lucas. "It's the force of gravity, increased by turning and speed! I like it, I like it a lot!"

"Look at the view!" shouted Simon, "We are flying so low that we can see the details of the houses, people in the swimming pools in their backyards, and the trees! Juana, how do you feel up there in front?"

"Stop interrupting, I'm trying to see how this thing flies!" exclaimed Juana intensely without taking her eyes off the instrument panel. "We are at an altitude of 200 feet and rising, 230... 300... 500... East... Correction, North East... 1,000 feet. How high are we going to go?"

"About 5,000 feet," answered Terry, taking out a map which he had put in the pocket in his trouser leg.

"Deep Ocean Diver, this is Bell 212. Leaving Miami, 8:42 a.m. Estimated time of arrival, 11:28 a.m. Over."

"Deep Ocean here. Good morning, Terry. Copy that. How is the weather there? Over," said at a woman's voice, with some interference.

"Spectacular. Not a single cloud. Wind is 3 knots," said Terry as the helicopter

left the beach behind, and they came out over the open sea, gaining altitude. "And how are things over there...? I know there is going to be some wind. Over."

"The wind is moderate, but it's going to be stronger. We have Force Three seas. We expect this will go up to Force Four in two hours. Hurry along. Over"

"Copy that and thanks! Out."

"Is that thing of the Force Four wind serious?," asked Simon, taking off the dark glasses which made him look as if he had walked off the set of an action film.

"Let's say that there's going to be a little movement," answered Terry, looking at his map and making adjustments to his instruments. "A Force Four class wind is between 11 and 16 knots, which means waves a couple of meters high, with small white crests on top. At the moment, we have about 5 knots, and as you can see, conditions are smooth. The helicopter is almost not moving. When we arrive, we will wobble a bit, but nothing to worry about," he added quickly, seeing Juana's face beside him. "I have flown in winds much worse than this..."

"Abi, why is this ship off Florida and not in Yucatan, where the dinosaurs' meteorite fell?" asked Simon suddenly, without thinking about what Terry had just said.

"Good question," answered Abigail, "Well, think of a puddle with sand in it. If you throw a large stone in it, it will fall on the sand and make it spurt out in all directions.

So if you go to the place where the stone landed, you won't find much. But if you go a little further away, you will see the sand mixed up with bits of the stone which you threw. That is exactly what we are looking for: microscopic splinters of the enormous meteorite which were scattered hundreds of kilometers from Ground Zero, forming a really huge crater."

"Hundreds of kilometers?" asked Simon. "Was the crater as big as that?"

"To be accurate, 200 km," interrupted Lucas, "The meteorite was a ball 10 km across which came at 25 km per second. It is as if Mount Everest had fallen on top of you, in flames. And the crater which it left is bigger than the Grand Canyon in Colorado... I read that..."

"Yes, we know..." interrupted Juana, winking at Simon. "You read it online. Aren't you a genius?... I don't know what we'd do without you," she added, smiling ironically.

"And can't you see the crater, Abi?" Juana went on, ignoring Lucas's annoyed glance.

"Well, no, not at first sight," answered Abigail. "It is hidden under the bottom of the sea, under layers and layers of sediment, in other words, the mud on the rocks which has accumulated over millions of years, as the sea rose or fell."

The mainland had now disappeared, and the whole horizon was sea. A steely-blue sea, decorated only by the tiny white tips of the waves.

"What is the highest this helicopter can go?" asked Lucas. He was still rather annoyed at Juana's sarcasm, though it was nothing new and not ill-intentioned, but recently had begun to irritate him more. So what, if he knew more than the others?

"About 10,000 feet... Or about 10 Eiffel Towers piled one on top of the other," explained Terry.

"Is that all?" interrupted Juana, disappointed and taking a picture of the sea through the transparent plexiglass under her feet. "Much less than an airplane, then".

"Some helicopters can fly up to 18,000 feet; that is 18 times the height of the Eiffel Tower. They use them, for example, in mountain rescue," explained Terry.

"Why can't they fly higher?" wondered Juana.

"A helicopter is different from a jet, because it has propellers and rotors to "claw" at the air, instead of a turbine, which sucks the air in and blows it out at the back," said Terry. "The higher you go, the thinner the air, the fewer particles and the fewer molecules. And there comes a point in which the blades on the propellers can't find anything to hold them up, and you fall down."

"So that's why it's also more difficult to breathe up in a mountain, because there are fewer oxygen particles at greater heights," offered Abigail, lifting her eyebrows. "Do you remember the time we were in one of those snowy peaks in Colombia, and we got to the top out of breath, and with a headache?"

"Oh, of course I rem....." Lucas started to say, when the roar of the main rotor changed its pitch to something sharper, and the helicopter tilted abruptly. Juana's camera shot across the cabin to Terry, and came to rest against the main control lever.

"What's happening?" squeaked Isabel anxiously.

"An unexpected gust of wind," said Terry calmly, controlling the lever. "Tighten your belts a little, everybody. We are coming on to what I'd call the dancefloor. There are Force Four winds, as they told us. Hold that camera tight, because this lever is the most delicate thing we have on board. It is the helicopter's steering wheel. A sharp blow could make us very unstable."

The machine began to wobble more and more strongly.

"How much further is it?," cried Isabel, holding onto Simon, who put his arm around her shoulders. He felt partly responsible to his parents for the security of his group. Were they really in some kind of trouble?

"Less than an hour," answered Abigail from the other side, looking fixedly at

Terry's instruments. Then, she stretched out her arm to the little girl and squeezed her hand, and gave her a wink. "It is just a little wind..."

But then Abigail saw that they were losing height. 4800... 4500... 4100... 15 minutes later, the shaking started to get stronger. The wind had definitely increased, and Terry was forced to ride the gusts, which he did by planning the helicopter perpendicular to the surface of the sea. Isabel's eyes were wide in panic, but she didn't say a word.

"And now it must be like Force Five, doesn't it?" shouted Lucas, trying to keep a casual tone, although his legs were shaking. "Look at the sea, there are more white crests than before!"

"Look, what's that in the distance? There, to the left!" said Simon, looking over Juana's shoulder, and Juana took the binoculars from Abigail.

"It's a ship! I think it's our ship!" cried Juana, feeling the force of gravity push her against the left wall, while Terry made a turn in that direction. "But how strange it looks! It has a huge tower in the middle of the bridge!"

"Remember what I explained to you, this used to be an oil ship," said Abigail. "It is a structure made to be able to extract oil, and now we use it to take samples of the sediments from the sea bottom."

"It's just too weird. Like a science fiction ship! I never imagined a boat with a

tower that large!" exclaimed Juana, temporarily forgetting the bucking of the helicopter.

"Deep Ocean Driller, Bell 212," called Terry, without a trace of emotion in his voice. "I have you on my horizon. Do you copy me? Over."

"Deep Ocean here, Terry we can see you. Windspeed increasing to 30 knots. That is more than we forecast this morning. Be careful".

At that moment, a gust pushed the helicopter downwards, making it fall hundreds of feet in a few seconds, and bringing them dangerously close to the dark blue sea. Everyone was so overwhelmed that nobody could find a word. Isabel was pallid, and Lucas's forehead was sweating. Juana had her eyes glued to the binoculars, and Simon, still with his arm round Isabel, felt his mouth do dry, as he tried to concentrate on the landing pad on the ship, which could now clearly be seen at the stern.

"Well, guys, let me introduce you to your home for the next week," exclaimed Abigail, in the voice of a Master of Ceremonies, who goes ahead with the show whatever is happening outside the tent. "The Deep Ocean Driller is the largest and most complex oceanographic ship in the world. Fifty scientists from any number of different countries live and work there, and are on a permanent cruise of all the seven seas. Their objective is to uncover the secrets which nature has hidden under the seabed, to learn how the Earth was formed, how this planet works inside, and how that affects us who live on its surface. This ship almost never touches port. She is always on the high seas. It is a privilege to be able to reach her..."



"If we ever arrive!" murmured Simon, while the helicopter came closer to the white and grey ship and started to circle and fly lower and lower. The closer they came, the more menacing the sea looked.

The ship was more than 400 feet long, and was full of cranes, aials, and white radar dishes which turned in all directions, contrasting with the red surface of the bridge, and the lifeboats. They passed parallel to the drilling tower, which was almost as tall as the ship was long. The structure ruined the image which everyone had in their heads of what a conventional ship looks like. But the Deep Ocean Driller was far from being a conventional ship. Hundreds of sections of grey pipe lay in an orderly pile in the middle of the bridge, taking up a large part of the space on board. Next to them was a channel which carried the segments of tubing to the place where they were joined up to form a single pipe thousands of meters long, able to reach the bottom of the sea, and then drill into the heart of the Earth.

Terry made a spectacular turn, and flew along the wave tops, and the children could appreciate the very high walls of the hull from which great jets of water fell into the sea as if in slow motion. They passed a few meters from the enormous black iron anchor which was hanging from the bow, leaving a streak of reddish oxide on the hull, which pranced like a nervous horse. They were so close that the children could see people moving rapidly towards the stern to prepare for their arrival.

"Bell 212. We have waves 20 feet high, and crosswinds on the stern."

"Roger that," said Terry quickly. "Right, my brave passengers, now we must match the rise and fall of the waves on approach, so that when the ship rises, we go down a little... Let's go!"

And, like a giant dragonfly, he took up position behind the ship, moving slowly down. At the first attempt, the stern of the Deep Ocean Driller unexpectedly bucked like a wild colt at a rodeo, and Terry had to break off the maneuver in order to avoid crashing. The waves beat furiously against the ship as if they wanted to punish it for daring to challenge them. The second attempt, riding through a gust of wind, was an exemplary landing. With the rotors still turning, three of the ship's crew wrapped in yellow windbreakers hurried to secure the helicopter to the deck with thick steel cables, while another two brought a safety cable for the passengers. Several people were watching the operation grimly, leaning against a number of points on the deck.

Inside the chopper, five mouths let out a simultaneous sigh of relief.

"Phew! Well, the fact is that I should congratulate you all," said Terry with a broad smile while he moved levers and switched off the buttons which lessened the noise of the rotors. "You behaved like a pilot with guts. A lot of other people in your place would have lost control, and that would have made my work difficult. But I see that you have the stuff of adventurers in you". He opened the door, and shouted to make himself heard above the roar of the wind and the sea. "Now get out carefully, and don't let go of the safety cable. As you can see, back here there is nothing to stop you from falling into

the sea."

"Thank you Terry! An unforgettable flight," shouted Abigail, jumping onto the bridge. Isabel and Juana, give me your hand! Simon and Lucas, remember to walk in front of the helicopter, not behind it!"

"Welcome aboard, my name is Olga, I am the first officer. Please hold onto this rope and follow me!" shouted a stout woman with very short blond hair, who pointed to a knotted rope which had been stretched out like a balustrade. "Someone will take your luggage directly to your cabins. Captain, Mama Alcatraz is in her nest, and the guests are going to the reception room," she said, speaking over her radio, while the group made their way through a labyrinth of corridors and stairs, with cries of surprise.

## **On board**

The first thing that the four of them noticed was the bucking and rolling of the ship. Lucas congratulated himself mentally for having put on his all-terrain boots, since the ship was constantly rolling, and making them lose their balance. The second thing they noticed was the enormous amount of noise produced by goodness-knows-what machinery and generators everywhere. Following Olga and her walkie talkie, they went down a narrow stairway, crossed an outside corridor in which all kinds of cables and buoys were heaped up, and went through a thick door with a lever which required great strength to move it.

"How heavy it is!" exclaimed Juana, holding open the door so that the other three could pass through. "I can hardly hold it!"

They entered a passageway which was divided into a series of narrow corridors with cream-painted walls, green floors and doors on both sides. The noise outside was replaced by the dry hum of air conditioning.

"What's that smell?" asked Lucas, looking in all directions. "It's like fresh paint".

"Yes, mixed with engine oil," said Simon.

Olga went up some very narrow stairs which took them to a corridor wider than the previous one, with a dark blue carpet. The walls were lined with wooden paneling, showing photographs of the ship in all the seas of the world. To the left, one door said "Captain". And to the right, another said "Lounge". They went into that one, and found an attractive area with comfortable sofas, bookshelves full of books, and a huge television screen on top of which was a scale model of the ship.

Olga went up to the children, took off her yellow windbreaker, and said to them in a cheerful voice, "Right, now I can say hello! Goodness, I'm sorry you had such a rough flight. The fact is, it took us all by surprise. Well little one, how do you feel?" she asked, stroking Isabel's forehead, "Do you feel dizzy? You look a bit pale."

"No...," Isabel began to say, feeling conscious of her glasses, but she was interrupted by a loud voice behind her, "Come on, a true sailor doesn't get worried by a little wind!" exclaimed a short man with grey hair and warm eyes who came in through the door followed by another man who was looking distracted. His booming voice did not match the rest of his body. Isabel thought that he was missing a pipe and a long beard.

"Ladies and gentlemen, welcome on board the Deep Ocean Driller, the best research ship in the world, not only because of its laboratories but because of its crew, its kitchen, its bunks, the films, and of course, because of its Captain, and that's me!" he said laughing explosively. "You must be Abigail, that's right isn't it?" he said shaking the aunt's hand vigorously, "Mike Allweather. We are very pleased to have you visit us. The truth is that your famous magazine has not got thought us worthy of its attention before.

It will not be disappointed now. Here, something interesting happens every day. May I introduce Professor Basalt, the chief scientist on this cruise, although I think you already know each other...

"Oh, of course! Hello Abigail, how delightful, welcome!" exclaimed the Professor, who was sixtyish, had lost almost all his hair, and wore faded jeans and an old T-shirt with the logo of an Antarctic research ship.

"Well Juana, I am very happy that your father has allowed you to take this trip. The fact is, it is a rare opportunity, which I hope you will be able to appreciate..."

"Professor, they aren't going to be able to appreciate anything if we don't let them rest up, and first we'll show them their bunks," interrupted Olga, bringing a tray loaded with refreshing drinks and yummy-looking cookies. "Captain, Abigail will be with Clelia Nolan, the paleontologist in M-17. I had booked the four children in M-19. So, there will be no problem with the 12-hour "hot bed" shift.

"The hot bed?" asked Lucas with his mouth full.

"In some Navy ships, and some research ships, there is more crew than beds," explained the Captain, sitting on the sofa opposite to them. "This means that while half the crew is working, the other half sleeps –that's how we solve the problem-. But you will all be sharing a cabin, so you can come and go when you like."

"And every shift is 12 hours?" asked Simon.

"Yes, the hours are long. That's because, as you will see tonight, drilling work practically never stops; the samples from the seafloor are constantly arriving on board and have to be classified, photographed and studied. It is the same endless routine for the two months of each voyage."

"Right, let's go, then" exclaimed Olga, leading again through corridors and up to the outside. "This ship has seven decks or floors. The bunks are forward, on this level, beside the library, the conference room and the hospital."

"Where are the life vests?" asked Simon, remembering the Titanic, his favorite film, and the sinking of that mighty passenger ship at the beginning of the 20th century.

"Good boy!" said Olga, smiling and sheltering from the wind behind a protruding wall. "I was just about to show them to you. Now pay attention, they are in all these white boxes which are distributed in various parts of the ship's outer corridor. Unfortunately, we don't have life vests for children, but these smaller ones would be useful to you if there was an emergency... Which reminds me, that I have not given you a number in the lifeboat; we have four of them on board, enough for all the crew. Yours is No. 1. Don't forget that".

"What is the alarm signal?" Asked Simon, under the benevolent gaze of Abigail, who loved to see Simon in action when he was trying to be responsible.

"Six short blasts of the whistle, followed by a longer one means that you have to get hold of a vest and go to your lifeboat at once. Which is the boat?" asked Olga, looking at them closely.

"Number one!" they replied in chorus.

"All right, let's go in," she said, entering the corridors by another door. "The dining room is one level down. Mealtimes are written on the on a board in the dining room. But if you are hungry at any moment, you just have to come down. Amaro, the chef, always leaves some fantastic snacks on a table. Here, you eat better than in any restaurant! In fact, they prepared lunch as a welcome, just for you, because everyone else has already eaten. Go down and eat now if you like. This is a map of the ship, and your bunks are up there ahead. Anything you need, come and see me on the bridge, all right?" she said, and turned away.

I think I'll call her Mama Hen," remarked Abigail, as the others chuckled, once Olga had disappeared upstairs. "And here on board she has at least 50 little chickens, between the scientist and us! Well, guys, I'm going to start work," she added as she took a small notebook from her enormous canvas bag. "While I do some interviews, you go explore the ship, but be careful not to be a nuisance, and ask first before you go anywhere in. How is everybody?" She said, embracing Simon and Juana. "This afternoon we'll visit Professor Basalt and his colleagues, and have them tell us what it is they are investigating. We're going to have a cool time here, you'll see!"



"See you later, Aunt Abi," said Simon, entering the cabin which had been assigned to them, followed by the others. "Not bad, huh?" he added, looking around him.

It was small; there were four bunks decorated with dark blue mattresses with lamps at the top. Each had a small curtain for privacy and to keep out the light. There was a single round porthole through which they could see the white-crested waves, and in the corner was a washstand with a mirror. Through the door into the bathroom, they could see a yellow floor, which had seen better days. The only decoration on the walls was an orange lifesaver.

"I want the top one!" cried Lucas, jumping up the ladder.

Then, suddenly, Isabel sat down on the bed, visibly tired.

"Are you dizzy?" asked Juana.

"I don't know," answered Isabel, "I suddenly felt very sleepy, it's as if the ship was a huge rocking cradle, which never stops moving backwards and forwards.

"Oh, you too? That's a relief. I thought it had only happened to me," said Juana.

"It's happening to all of us," sentenced Simon. "What we need is a good lunch. Let's go!"

So the four of them went out with map in hand. It was easier than they thought to find the dining room. As Olga had said, it was deserted, and the metal doors which separated it from the kitchen were closed. But there were two tables in a corner, with hot dishes on them, and they had laid five places.

"Oh, look! An icecream machine!" shouted Juana. "With chocolate and nuts and everything. And what is that in the glass case? Cheesecake with cherries! Can we just serve ourselves?" she said doubtfully.

That's what Mother Hen said," replied Simon jokingly. "Well, as far as I'm concerned I'm going to start attacking those chicken fingers. They look delicious!"

So they spent lunch making comments about the flight and the food, and they laughed every time the soda can rolled from one side of the table to the other with the running of the sea. Yes, these were definitely holidays which any other school kid would dream about.

"Juana, nobody is going to beat us in the science project next term!" exclaimed Lucas. "Can you imagine? Just by making a report on what this ship does, we have it made."

"That's right!" answered Juana up with a smile. "I was doing very badly in science projects until I started to go out and join you on excursions with Abi."

"But once, you did very well," said Lucas. "When you announced that you were going to turn any chicken leg into rubber."

"Rubber! But how can you do that??" asked Isabel astonished, diverted from her attack on the cup of chocolate ice cream.

"That's what I said," said Lucas, "If I remember right, the recipe said, '1. Put a chicken bone in a glass with vinegar. The best bones are the breast bones. 2. Leave it to soaking for.....' how long was it, Juana? 'Three days?'"

"Two days," she replied. After that, you have to change the vinegar and leave it for two more days."

"And what happened?" asked Simon, with interest.

"The bone became soft and flexible like rubber. I mean it," said Juana. "I had to explain to the class that the bones were made of hard minerals like calcium, which is the same as is in milk, and from a flexible thing which I've forgotten what it's called".

"And?" asked Isabel, with a spoonful of ice cream suspended in the air.

"That the acid in the vinegar makes the calcium disappear, leaving only the flexible part," Lucas finished the explanation. "Where on earth did you get that recipe?"

"From an Internet site with science for children," answered Juana. "Lucas, I'm surprised you didn't know that, because you're always stuck to that screen. Do you feel better Isa?" she asked, quickly changing the subject at Lucas' face. "I'm not so tired now, and also, I've only just got over the scare in a helicopter."

"Me too," said Isabel, looking a little more serious. "I hope the trip back won't be as rough."

"Well, I propose that we explore the ship," said Lucas, getting up from the table. He felt very curious, and wanted to see every square inch of that strange ship, and how they made holes thousands of meters below the seabed. He had still not understood how the mud from down there could explain the death of the dinosaurs, the formation of the mountains, or "how the Earth worked," as Abigail said.

They went out onto the main deck, hanging on to the guard rails, which were everywhere to make sure that they did not fall over the side.

"Let's go to the left, where the tower is," decided Simon.