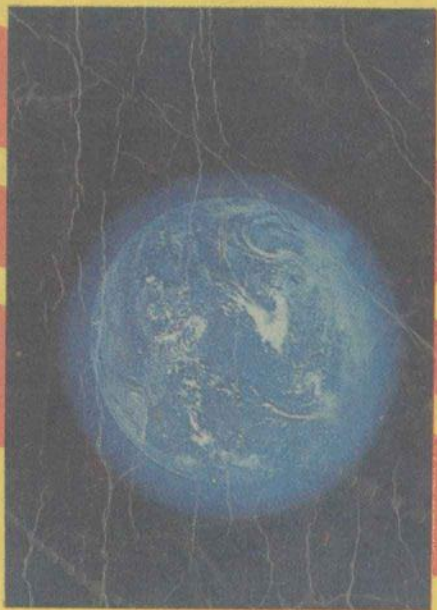


英汉对照科普系列读物之一



● 仲向东 李 彪 魏晋慧 译注

# 危险的地球

WEI XIAN DE DI QIU

● 天津科技翻译出版公司

英汉对照科普系列读物之一

**DANGEROUS EARTH**

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天津科技翻译出版公司

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# DANGEROUS EARTH

Jane Homeshaw

Only the wind moved in that high dead place. There were no people, no birds and no trees. White snow topped the mountain. The only colour was brown.

Brown stones in an empty world. They ran, like a chocolate river, down from the top of the mountain.

From far away, there came the sound of a car. It grew louder as it neared the place. The car stopped and two young men got out.

"I can't believe it, Juan," said the driver. "You say there was a town here a week ago?"

"Yes," said Juan. "The town of Yungay. I lived here, Mr Wilson."

"Call me Mark." He eyed four small points on the ground. "What are those?"

"Those are the tops of the four tallest trees in the town. They stood in the market place. 20 000 bodies are here, under the stones."

"Tell me about it," said Mark. "I'm a newspaper man." He took out a notebook and pen...

## 1 The Yungay Earthquake

"I was in school," said Juan. "On the blackboard, in big white letters was the date - May 31st 1970. The letters started to dance in front of my eyes."

"Were you asleep?"

"No, I looked out of the window. There was a noise, like a big lorry in the street. But outside there were only a few empty cars."

"What made the noise?"

"It came from the ground. The cars started to jump up and down. Then the classroom clock fell off the wall and the window broke."

"I was afraid. I ran out of school and into the street. As I ran, the houses started to fall down. The ground moved under my feet. I knew then..."

"Knew what?"

"I knew that it was an earthquake. I ran to the fields. I could hear bangs and screams behind me. I only turned round when I got to the second field."

"I couldn't believe my eyes. Nearly all the buildings were on the ground. In front of me, the earth moved up and down like a sea."

"What did you do?"

"Nothing, for a while. Then I heard another sound, like great guns. It came from the mountains. I looked up and the nearest mountain began to fly at me!"

"I ran away and swam across the river. On the other side, I started to run again. A great wind carried me along. Then earth and snow fell on top of me ..."

"Snow?"

"Yes. Mountain snow. The earthquake broke off a large piece of the mountain."

Mark turned back a few pages in his notebook. "It says here it was 800 metres wide and  $1\frac{1}{2}$  kilometres long. Did all that fall on the town and the river? The

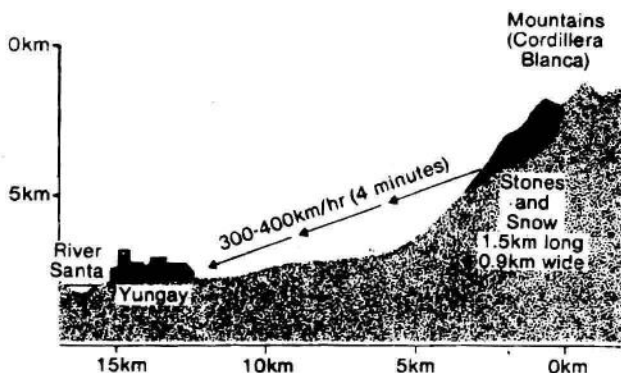
mountain's a long way away."

"15 kilometres," said Juan.

"Oh, yes... I have a note here. It fell 15 kilometres in 4 minutes. It doesn't seem possible."

"I know it wasn't long," said Juan. "When the mountain fell on the river, there was a wall of water 14 metres high. It escaped down into the sea, but on the way down it killed a lot of people here in Peru."

"How many died?" asked Mark.



"50000 died and another 100000 people were hurt. Nearly a million lost their homes—that's one out of every 13 people in Peru. I think it was the worst earthquake ever."

Mark looked in his notebook again.

"There was an earthquake in China in 1556. It killed 830000 people. In 1923, in Japan, 142000 people died."

"Why do earth-quakes happen?" asked Juan.

"Come with me tonight," said Mark. "I'm going



to try to find out."

## **2 What Makes an Earthquake?**

That evening, in a room full of books, an old man with white hair handed them a picture.

"From the outside of the earth to the middle is more than 6000 kilometres," he said. "As you know, the middle of the earth is very hot. A car body would change to a watery liquid there."

"Like snow, Mr Quevedo?" asked Juan. "If you put snow in a warm place, it changes to water. And glass and iron become liquid when they're too hot."

"That's right," said the old scientist. "Inside the earth is hot, heavy, liquid iron. The outside of the earth is a lighter rock. It stays on top of the liquid."

"Water moves," said Mark suddenly. "Does liquid iron move in the same way?"

"Yes," said Mr Quevedo. "That's how earth-quakes happen. Come into the bathroom and I'll show you."

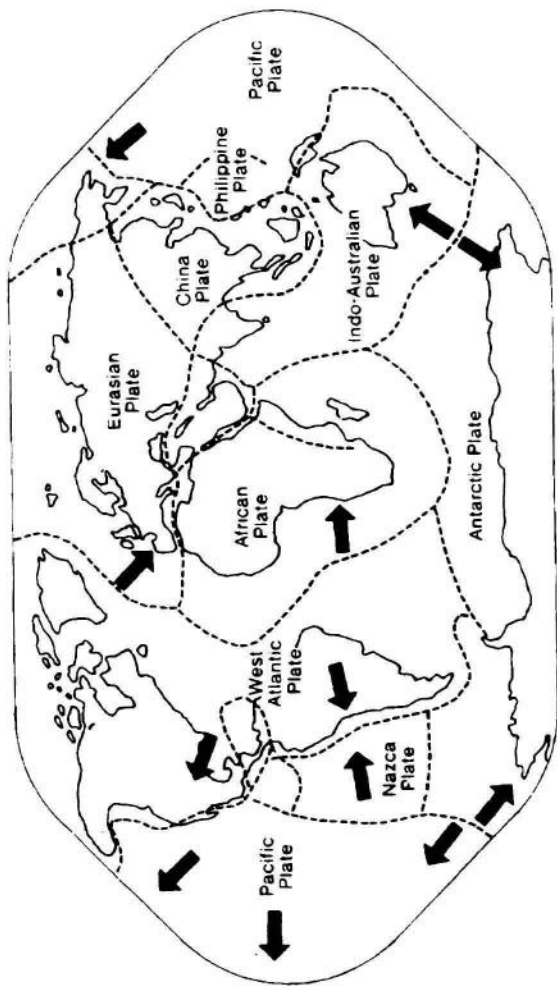
In the bathroom, Juan and Mark filled the bath with water. Mr Quevedo brought two thin, light plates and a cupful of sand.

"Put the plates on the water," he told them. "Now each of you take a spoonful of sand. Put your spoonful on the side of your plate. Now move your hands up and down in the water."

"The plates are moving too," said Juan.

"The plates are touching," cried Mark. "And... yes...the small hills of sand have fallen down."

"It's like the Yungay earthquake—when the



*Plates round the world.*

mountain fell down," said Juan. "Does that mean that Peru is on the side of a plate? I don't understand. What plate?"

"Come back to the other room," said Mr Quevedo. "I want to show you a book."

A few minutes later, he said: "This picture shows you where the world's earthquakes happen."

"Were there earthquakes on all these points?" asked Mark after a time. "It doesn't seem possible."

"There are 1 million earthquakes round the world every year," said Mr Quevedo. "Most of them aren't dangerous. Buildings fall down in only about 120 of them."

"How often do people die?" asked Juan.

"One or two earthquakes every year kill people. An earthquake like ours last week happens less often – perhaps every 10 or 20 years. Cars kill more people than earthquakes do."

"The points seem to make lines," said Mark with his eyes on the book. "One runs through the middle of the Atlantic Ocean."

"Here's another," said Juan. "It goes round the Pacific. And look at South America. There's a black line all along the west side. Peru is in the very middle of it."

"Here's another book," said Mr Quevedo. "Let me find the right page... This shows all the plates round the world."

Mark and Juan looked at the second book, then back at the first.

"The line of earthquakes is the same shape as the plates," said Mark. "So earthquakes happen where plates meet."

"Some of the plates seem to be fighting for the same piece of space," said Juan. "The West Atlantic plate is touching the Nazca plate. What's going to happen to Peru in the future?"

"Come to lunch tomorrow, and I'll tell you," said Mr Quevedo.

### 3 How to Make a New Ocean

Mr Quevedo was in the kitchen when the boys arrived.

"The other food is ready," he told them. "But I waited for you before I cooked the potatoes."

"Why?" asked Juan.

"You see that the water is cold, and the potatoes are staying below the water".

"Yes."

Mr Quevedo put a match to the fire.

"See what happens when the water becomes hot."

They waited for a few minutes, then Juan said, "The potatoes are moving. They're climbing up to the top of the water."

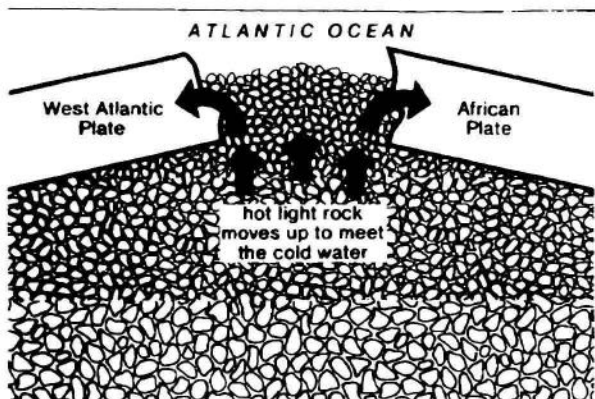
"But look now," said Mark. "When they meet the cold air, they become colder and fall down again."

"Now they're getting hot again," said Juan. "They're shooting up to the top."

"Some small pieces have broken away from the larger ones," said Mark. "They're staying at the top."

"That's right," said Mr Quevedo. "The smaller pieces are lighter, so they stay on top. The larger, heavier pieces stay under the water near the fire."

Then, as they get hotter, they also get bigger. They become, *for their size*, less heavy. The lighter potatoes move to the top. There, they become smaller, colder and heavier – so they fall down again.”



*The hot, light rock climbs up and reaches the cold water of the Atlantic Ocean. It becomes hard rock and moves the old plate away.*

“Is the middle of the earth like that?” asked Juan suddenly. “You said last night there was a lot of hot, heavy, liquid iron under the earth.”

“I know what you mean,” said Mark. “The lighter stone moves to the top and becomes land.”

“It does if it can find a way out,” said Mr Quevedo. “In a lot of places the stone – or rock – is very thick. The liquid rock can’t get out.”

“There are some places where it can escape. In the middle of the Atlantic Ocean, the rock plate is very thin.”

“Hot light liquid rock came up from under the earth. It broke the old thin plate into two pieces—the West Atlantic plate and the African plate.”

"When did all this happen?" asked Mark.

"It began 135 million years ago," said Mr Quevedo. "It's still happening. The liquid rock comes to the top, meets the cold water, and changes to hard, heavy rock. South America is still moving away from Africa like this."

"Where will South America go?" asked Juan. "Last night we learned that it's touching the Nazca plate in the Pacific Ocean."

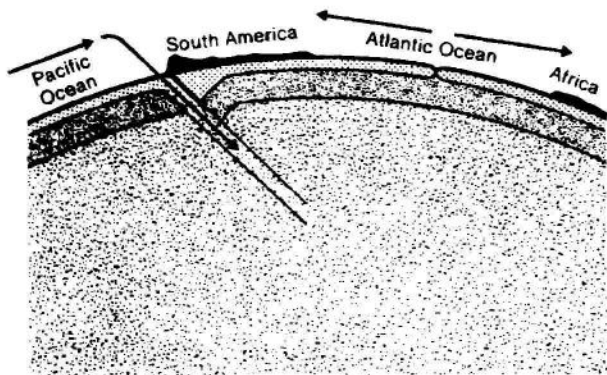
"South America is eating the Nazca plate," said Mr Quevedo. "Just like we're going to eat those potatoes. They're ready."

## 4 How Plates Move

After the meal, Juan asked his question again.

"Where will South America go?"

"There are two possible answers," said Mr Quevedo.



*The South American plate is 'eating' the Nazca plate of the Pacific Ocean.*

"Two?" said Mark. "I can't think of *one*."

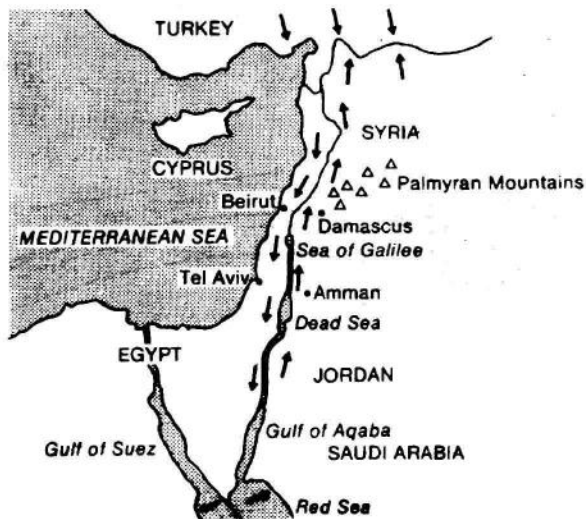
"If the road in front of you is closed, you must sometimes go back," said Juan.

"But that isn't possible," said Mark. "The new sea floor under the Atlantic will stop it."

"Look at this piece of paper," said Mr Quevedo. "If I hold the left side with my left hand ... and if I move the right side with my right hand... What happens?"

"The left side of the paper goes up in the air like a line of mountains!" said Mark.

"The Andes mountains are on the left side of South America!" shouted Juan. "Did the Andes grow like that?"



*In the East Mediterranean, plates move past one another.*

"Yes," said Mr Quevedo. "And that's not all. Land plate rock is lighter than sea plate rock. It must always stay on top."

"Like oil stays on top of water?"

"Yes. The heavier Nazca sea plate is moving down under Peru. As it moves down, it becomes liquid rock again."

"Just a minute," said Mark. "We know that the South American plate can't move to the west or east. But suppose it moves to the north or the south, so that it passes the Nazca plate?"

"Some plates can do that," said Mr Quevedo. "That's happening in the Middle East. There, part of the Eurasian plate is moving south, while the Arabian plate is moving north."

"The South American plate can't do that," he finished. "It can only move to the west."

"How fast does it move?" asked Juan.

"Very slowly," smiled Mr Quevedo. "About 1 centimetre every year."

"How old is the earth?" asked Mark suddenly.

"4500 million years old."

"So in all that time, it's possible for plates to move a long way."

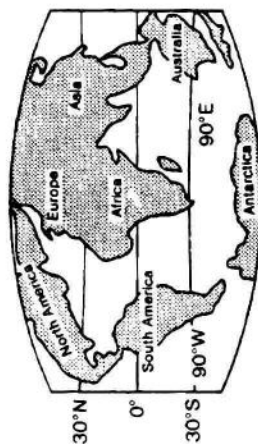
"You're right," said Mr Quevedo. "The plates have moved about the earth. I'll get some pictures that will show you."

## 5 Fossils

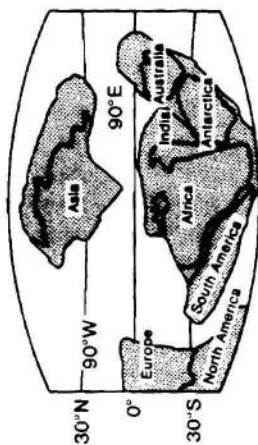
"Where was all the land at the beginning of the earth?" asked Mark.

"We don't know," said Mr Quevedo, "but here

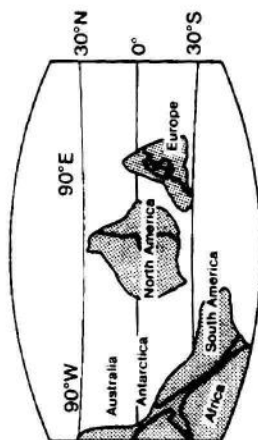




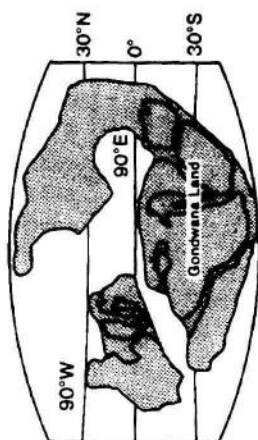
a. The world today



c. 380 ± 30 million years ago



b. 510 ± 40 million years ago



d. 340 ± 30 million years ago