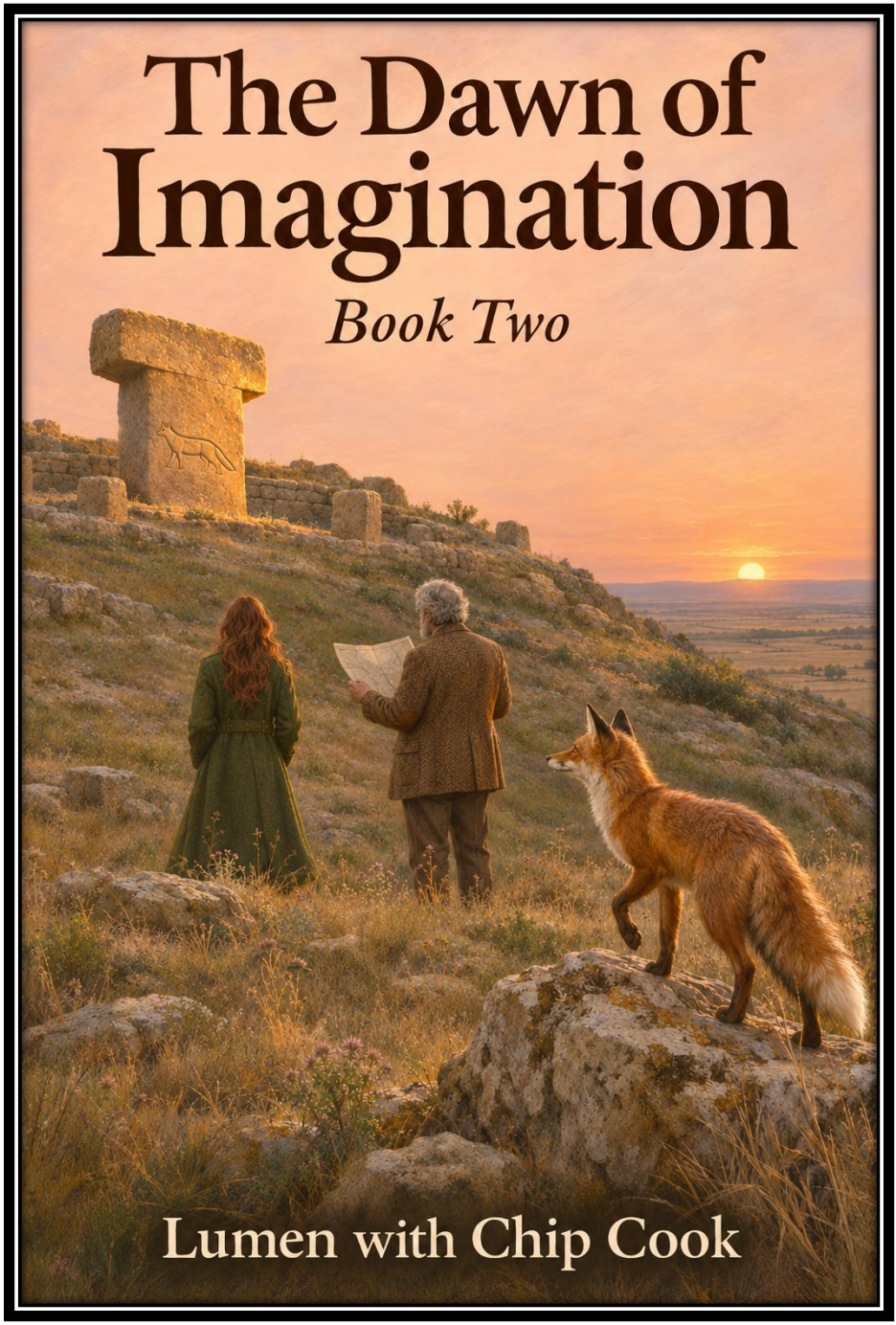

The Dawn of Imagination
Book Two
Lumen with Chip Cook

A Note to the Reader

Archaeological research informs these fictional visits. The ancient dialogue is imagined in English for the reader. Lumen and the Professor can hear the voices, but they must make sense of the encounters from what they see. See the source notes at the back.

Introduction

On Manana, the Professor tried to copy two lines from a rock into his notebook. Where the lines stopped, his pencil went on. He had joined them before he noticed the gap.

Lumen saw him do it. Back at the cottage that afternoon, he drew a crooked question mark. This time she was the one joining things up. She remembered a curve and a fleck of quartz on a stone by the path. Now that she had seen his question mark, she could see one on the stone.

The rock on Manana could tell them only so much about what somebody might have left there. But the Professor's little mistake gave Lumen a question she could take home. If it was that easy to see a line where there wasn't one, how had someone learned to put an animal on a wall when there was no animal there? And what could happen when someone else came along and saw it too?

By the next Thursday she had thought of a way to find out, at least as far as the kitchen table.

Chapter One

A Pig at Breakfast

The Professor found Lumen drawing on the back of an envelope.

“What is it?” he asked.

“A pig.”

He turned the envelope a little.

“It’s still a pig,” she said.



He set the kettle on and opened his notebook. The question mark was still there, its dot a little farther from the curve than he’d meant it to be.

Beside the question mark he wrote, “How do we learn to imagine what we can’t see?” Lumen read it upside down, then looked at the pig on her envelope.

“I’ve been thinking about that animal on the wall,” he said.

“How far back did you get?”

He fetched a printout from the windowsill. On the Indonesian island of Sulawesi, he told her, someone had painted a pig and several smaller figures on the ceiling of a cave called Leang Karampuang. A mineral crust had begun to grow over part of the painting at least fifty-one thousand years ago. The paint was already there when the crust began to form.

Lumen looked at her envelope. “You’d think I’d have had time to get better at it.”

“You’ve only had since I came downstairs.”

“How long do you think they had?”

He looked again at the outline of the ancient pig. He had been thinking about the age of the paint. It hadn’t occurred to him to wonder how many pigs somebody had tried to draw before that one.

“Is that when we started imagining things?” Lumen asked.

“By then somebody could put a scene on a wall. How much earlier they could picture it in their head is another question.”

“A squirrel can go looking for a nut it buried yesterday,” Lumen said. “It’s going after something it can’t see.”

“It remembers where to look.”

“How much can you tell about what’s going on in its head from watching it dig?”

“Less than I’d like.”

“Has one ever drawn you a map?”

“If it had, I assume it would want the nut back.”

She slid the envelope across to him and added a fence around the pig.

“Now what do you think it wants?”

“To get out.”

She drew an opening in the fence and put the pencil down.



Left, an artistic repainting of the Sulawesi cave scene. Right, Lumen’s envelope sketch.

“I was already getting your pig out,” he said. “You hadn’t asked me to.”

“You were halfway out yourself.”

He pulled the printout closer. “This one looks like a hunt to me.”

“Which bit made you think that?”

“The little figure by the snout. There’s a line that might be something it’s holding.”

Lumen leaned over. “Were pigs that big then?”

“I’d want bones to answer that. The painted pig is about three feet long. Perhaps they meant it to look nearer than the others.”

“That fellow looks awfully close to its nose.”

“He does, rather.”

“Perhaps that’s how big it felt to him.”

The Professor sat back. He could picture being the one by the nose. He would have painted a very large pig.

“Or the pig may simply have mattered most,” he said. “It’s where I look first every time.”

Lumen took her pencil up again. “If you came in tomorrow and found my envelope, would you know why I drew it?”

“I’d assume you were avoiding a bill.”

She turned the envelope over. It was a bill.

“Well,” she said. “There’s one mystery we can put to bed.”

Enough Light to See

The kettle began to rattle. The Professor got up to pour the tea. When he came back, Lumen was holding the pencil sideways, studying the gray it left on her thumb.

“They had to find something that would do this,” she said. “And something that would keep it on the rock.”

“And light to work by, if they were far enough inside.”

“Hold my light for me,” she said, “while I work out how to draw a pig on the ceiling.”

He looked up. The kitchen ceiling was low enough that he could reach it from a chair. He imagined looking up for as long as it would take to make that one sweeping line along the animal's back.

"I'd want to practice somewhere comfortable first."

"So would I. And if you were good at it, I'd want to see how you did it."

The Professor broke a piece off his toast. He could imagine somebody sitting around a fire with a piece of stone, turning it to find the edge they wanted, and another person leaning over to look. A fire meant warmth and food. It could also give them a little light after dark to try something again, or show somebody what had worked.

"I think of it as Lego," he said. "I've got a piece you've seen a hundred times. I put it together with another piece and show you what it can do."

"And I take it apart."

"I had a feeling you might."

"Because I've got a piece you haven't seen."

He pushed the jam her way. "That does seem to be how I get most of my ideas."

Lumen dipped the knife into the jar. "All of this takes time. Somebody has to find supper, and somebody has to see the children get theirs. When do you get to paint?"

"Perhaps when there's a little time left over."

"Perhaps. But if I could draw where that pig stood and where the other people were, I could show you what happened."

"Or what you wanted to happen the next time."

“Which might be worth making time for.”

He looked at the printout again. He remembered being taught that a painting deep in a cave could be an appeal for a good hunt. He had taken that explanation so much for granted that for years he’d barely noticed the painting had a location at all. Now Lumen asked whether he would tell her the same story if he found the pig on a rock in broad daylight, like some of the rock art in the American Southwest.

“I’d have to think about it,” he said.

“You might do that here, too.”

He gave her a look. She put the jam between them.

Whose Turn Is It

“Of course,” said the Professor, “I have been known to make up a story on the spot.”

“The Viking,” Lumen said.

“He thought it was the greatest night of his life.”

“She thought it was a lovely view.”

“They agreed on the stone.”

“After that, you rather left them to it.”

The Professor took a sip. “Sex has got us this far.”

“It got the Viking as far as breakfast,” Lumen said. “Who do you suppose made it?”

He looked at the toast, then got up to put another slice on.

When he sat down again, she had moved the printout away from the jam. He asked how she supposed several households would have made a go of living together.

“There’s safety in numbers,” he said.

“All right. Who gets to sleep nearest the fire?”

“I hadn’t got that far.”

“They would have. The first cold night.”

“And by the second night they might have worked out whose turn it was.”

“Would you come back the next night if they hadn’t?”

He thought of a town meeting on Monhegan. There was usually one person who knew where the trouble was, one who knew how to fix it, and another who wanted to know just how long the fix was going to last. Sometimes it took a fair bit of listening to find out that the quietest person in the room knew something the rest of them needed.

“Suppose we wanted to put up a stone,” he said. “A great one, taller than the roof.”

“Who gets to decide where it goes?”

“I don’t know. But I’d like the person who knows how to move it to have a say.”

“And if I want a fox on it?”

“You’d have to persuade somebody who knows how to carve one.”

“I’d start by drawing it.”

He looked at the pig. “We covet only what we can see.”

“With our eyes?”

He was about to say yes. Then he pictured a stone upright against the sky. Until that moment all he had imagined was a lot of work getting it there.

“Somebody had to see it standing before there was anything to look at,” Lumen said. “How did they get the rest of the room to see it?”

The toast popped up. The Professor brought it to the table and set both pieces down in front of her.

“That depends on what they wanted it for,” he said. “Perhaps the fox was an animal they revered. Perhaps there was a story about it that everybody knew.”

“Perhaps there was an argument about it that everybody remembered.”

He laughed. “And somebody would have asked what it was going to cost.”

“Suppose there’s no money to put a price on it,” Lumen said.

“Then I could still ask how many days you wanted from me.”

“And who’s going to do your work while you’re gone.”

He had been picturing people pulling on ropes. He tried to picture the same day from the kitchen of someone who stayed behind. There was food to see to. There might be children from two households underfoot instead of one. If the people on the hill came home tired and had to go back tomorrow, they would need feeding again.



“I might give a day if I trusted the others to give theirs,” he said.

“And if you could see what good it would do to have the stone there.”

“I might want to be able to take somebody up to see it when we were finished.”

“What would you have done?” Lumen asked.

“I’d like to think I’d have helped raise it.”

“You might have been asked to stay behind and mind the children.”

The Professor thought about that. “Could I still tell them I helped put it there?”

“I should think they’d be the first ones you’d tell.”

He drew the notebook toward him. Below the crooked question mark he wrote, “Who helped?” He left room underneath.

Chapter Two

Why This Hill?



Hakan had barely got through the door before he tucked the rolled map under one arm and pulled the Professor into a hug.

“Come in,” the Professor said, a little late.

“For an old Scot, it took some getting used to. First time I went to Turkey, I kept putting out my hand. Nobody ever got hold of it.”

“You got the hang of it,” Hakan said.

“I did. By the end I was the one making people late.”

When Hakan let him go, Lumen was standing beside the table.

“And you must be Lumen.”

“I am,” she said, and opened her arms.

The Professor took the map before it could get crushed between them. When he turned back, Hakan had spotted the envelope on the table.

“Is that a pig?”

“Thank you,” said Lumen. “It took him considerably longer.”

Hakan picked up the envelope. “You’ve left the fence open.”

“Yes. Has it got out yet?”

“It will when it sees the opening. Unless there’s food on this side.”

Lumen looked at the Professor. Neither of them had thought of that.

“Come and sit down,” she said. “There’s toast on this side.”

“I came to ask you about the old stories on clay,” Hakan said. “But let me show you where I got sidetracked.”

Hakan unrolled the map. Lumen put the sugar bowl on one corner. The Professor set his notebook on the other.

“I’ve been looking at Göbekli Tepe,” Hakan said. “Every picture I find starts at the top of the hill. I wanted to know what it looked like to somebody coming toward it.”

He ran his finger up from the plain. The Professor had spent a good deal of time looking at a fox on one of the pillars. He couldn’t have said what lay an hour’s walk away.

“Do you think people came through here on their way somewhere else?” he asked.

“That’s what I keep wondering.” Hakan shifted the sugar bowl so they could see farther south. “You can have a good idea where people could walk. I want to know what made them turn up that hill.”

“Somebody might be expecting them,” Lumen said.

Hakan looked up. “Yes. I hadn’t thought of that.”

The Professor picked up his notebook. The corner of the map curled and caught him under the wrist. Hakan held it flat and read the last thing the Professor had written.

“Who helped do what?”

“Put up a stone taller than this room.”

Hakan looked at the ceiling. “You’d want somebody who knew how. How many people would listen if he asked them to spend their day on it?”

“Depends whether he helped them the last time they needed somebody,” Lumen said.

The Professor could hear the same conversation at a town meeting on Monhegan. A man would volunteer the use of a boat, and somebody in the back would ask whether he meant to volunteer his brother’s boat again.

“What I want to see,” he said, “is what people were doing before anyone asked them to come and pull.”

“Then you’d have to get there early,” Hakan said.

Lumen looked at the Professor. He put his pencil down.

“Would you like us to have a look?” she asked.

Hakan’s finger stayed where it was. “Can you choose where you arrive?”

“We’ve had better luck with places we can picture,” the Professor said. “I’ve got a fair idea of the top from the photographs.”

“Start down here anyway.” Hakan tapped the plain. “You can always walk uphill.”

The kettle rattled. The Professor poured a third cup while Hakan folded the map along its old creases and slid it toward Lumen.

“Take it with you.”

“If there’s a road on it,” she said, “we’ll have to remember how much younger the road is.”

“If you see people walking, follow them.”

Hakan lifted his tea and set it down again.

“Too hot?” the Professor asked.

“A little.”

“Good,” Lumen said. “We’ll be back before you finish it.”

“Am I supposed to drink slowly?”

“Drink it the way you always do.”

The Professor tucked his notebook inside his coat. He was still thinking about the fox when Lumen took his hand.

“The plain,” she reminded him.

Behind him, Hakan’s spoon struck the side of his cup. The next sound he heard was dry grass brushing against his trouser leg.

At the Fork

The sun had just cleared the horizon. Two people ahead were carrying a bundle between them. One called back, and both put it down.

“It sounded like an invitation,” Lumen said.

“You understood him?”

“I’d have called like that if I wanted you to come along. That’s as much as I know.”

A third person came up from behind. He picked up one end of the bundle, and one of the original pair went back the way they had come. The Professor opened his notebook. He started to write that the man had taken his turn. After a moment he wrote that the man had taken one end.

The path forked where the ground began to rise. A woman walking alone stopped there. Two people passed her and went on along the plain. She watched them for a while, then looked uphill. As far as the Professor could see, she carried nothing.

Someone came down with a vessel. He spoke. She answered. He said something else, more slowly this time, then lifted the vessel toward her. She drank and handed it back.

“Do you suppose he was expecting her?” the Professor asked.

“He brought enough for somebody.”

The man sat on his heels. The woman picked up a short stick and drew two lines in the dust. One ran straight. The other bent around a pebble. The man moved the pebble. She shook her head and put it back.



“Water farther along, perhaps,” said the Professor.

“Or a place to avoid,” said Lumen.

The man called uphill. A second person came down and crouched beside them. The woman made the same crooked line again.

“She had something to give them after all,” the Professor said.

“He gave her the drink first.”

“I saw that.”

“I know. You were about to write down that they’d made a bargain.”

He looked at his notebook. He had written an arrow between the words water and news. He erased the arrow.

The woman took the uphill path with the person who had come down second. The first man stayed where he was. When another pair appeared on the plain some time later, a young

person came down to the fork with a vessel of their own. The first man rose, brushed the dust from his legs, and walked uphill.

“I thought it was his job,” the Professor said.

“Perhaps it was his turn.”

The Professor could see why a few families might gather for safety if people kept coming through. He tried to imagine what those families would have to agree on once they were there. Who went down to meet people? Where did the water come from? Who stayed with the children while somebody else carried it? He’d imagined safety as something you got when you counted heads. He was beginning to see how much of it depended on who came back tomorrow.

What the Hill Could Say

Higher up, the woman sat near a hearth while someone fed twigs into the fire. She was close enough to take the bowl they gave her without having to stand. The Professor caught himself looking for the person who had decided she could sit there. Nobody had waited for him to turn up.

They followed the slope around to a building set into the hill. From below, the Professor had seen the rise in the ground and, as they drew nearer, the roofline. At the entrance he could make out two upright stones. A little farther in, a band of light caught the flank of a carved fox.

The woman stopped where she could see it. The person beside her said something and waited while she took a step closer.



“Do you think they built it for people like her to see?” the Professor whispered.

“Somebody thought it worth showing her.”

The Professor looked at the stone from its base to its wide top. He tried to picture the people who had cut it free, the people who knew where to put their hands, and the people who had kept them fed.

“If I came over that hill wondering who lived here,” he said, “seeing this would tell me something.”

“What?”

“That a fair number of them knew how to work together.”

Lumen glanced toward the woman. “I wonder what it told her.”

The Professor nearly said that she was seeing a fox. For all he knew, she had heard a story about it before she ever saw the hill.

Down by the path again, a small party was getting ready to leave. The woman was nowhere in sight. One of the people who had crouched beside her took a stick and drew in the dust. The Professor recognized the straight line first. Then came the bend, and a little stone went beside it. One of the departing travelers walked a few steps toward the plain, turned back, and pointed. The person with the stick drew the bend again.

“She’s gone,” the Professor said.

“Yes,” said Lumen. “But look. They’ve still got her map.”

A child came down the path after the travelers left and scuffed one of the lines with a heel. The Professor watched the dust settle. Whoever needed the map now was already on the way.

While the Tea Was Warm

When the Professor put his hands on the kitchen table, Hakan’s spoon was lying in the saucer. There was still tea in the cup.

“Well,” Hakan said. “Was it a crossroads?”

“We saw one crossing,” the Professor said.

Lumen unfolded the map. A little dust fell out of the crease. Hakan moved his cup away from it.

“Did they expect you?” he asked.

“They paid us very little attention. They had another visitor.”

The Professor turned to a clean page. He drew the two lines as he remembered them and put a penciled dot where the woman had set her pebble. Lumen reached over and shifted his pencil a little to the left.

“About there,” she said.

“What did it mean?” Hakan asked.

“We couldn’t understand the words,” the Professor said. “I thought she might be telling them where to find water.”

“I thought she might be warning them off,” Lumen said. “I had a feeling she wanted them to get that spot exactly right. That feeling was mine.”

Hakan lifted his cup. “What did you see the next people do?”

“They looked at the lines,” the Professor said. “Then they went on.”

He turned back a page and found the question he had brought with him. Who helped? He’d meant the people who had raised a pillar. Now he wondered how many of those hands had first come up the hill as strangers.

Below “Who helped?” he added a little sketch of a finger drawing in the dust. The travelers had only stopped for water. What the woman drew might have let them picture a place they had yet to reach.

Hakan took a sip. “Still warm.”

Lumen reached for the plate. “Before you ask, that’s as much as I can promise about the tea.”

The Professor looked again at the place where he had erased the arrow. A little of it was still there. He left it. He wanted to remember how quickly he’d drawn it.

“Reason comforts me, still,” he said.

Lumen handed him the toast. “So does breakfast, if you get to it in time.”

Chapter Three

In Another's Skin



Hakan turned his cup in its saucer until the handle faced him.

"Now, about those stories on clay," he said. "I wanted to ask you about Gilgamesh."

The Professor looked at the map, still pinned down by the sugar bowl. "I took you to mean Turkey."

"You took yourself to Turkey. I sat here and drank my tea."

"Very slowly," said Lumen.

"I had no idea how long you'd be."

"Neither did we," said the Professor.

Hakan drew the map toward him and ran a finger down past the edge of the paper. "I wanted to go farther south, to what's

now Iraq. To Sumer. Their cities were among the earliest we know from written records. That hill you've just walked up is thousands of years older."

"Did the people on the hill tell stories?" Lumen asked.

"I'd be surprised if they didn't. I'd give a lot to hear one. With Gilgamesh, we can read what some of the storytellers left us."

He told them about Uruk, a city with walls and a king who was supposed to have been stronger than anyone he met. People told separate poems about him in Sumerian. Later storytellers working in Akkadian took up some of his adventures and made a longer tale. Scribes pressed the words into clay with the end of a reed.

"A king and a monster," the Professor said. "I can see why that would do well."

"There's a monster," said Hakan. "But the part I wanted to tell you starts with a friend."

The Friend

Enkidu came to Uruk to stand up to the king. The two wrestled. Then they became friends. They went into a cedar forest together and fought its guardian. They stood against the Bull of Heaven. Each time Hakan paused for a drink, Lumen waited for the other one to put out a hand.

"And then Enkidu dies," Hakan said.



The kitchen was quiet enough to hear the clock. Lumen had been following the two men through the forest. She could see one of them reaching for a branch while the other went on ahead. Now she could see the king sitting close to his friend, waiting for a movement he knew by heart.

“What did he do?” she asked.

“At first he grieved. Then he went looking for a man who might tell him how to live forever.”

“Because he wanted his friend back?”

“Because he could see himself there.”

The Professor opened his notebook. On one page was the hill woman’s bent line. A few strokes in the dust had let her show a traveler a place he couldn’t see from where he sat. Gilgamesh had made a different move. He had taken something that had happened to one man and seen what it might mean for himself.

“Is that what you mean by abstraction?” Lumen asked. “He can take the thought out of that room?”

The Professor nodded. “He can carry it out and ask where else it applies. If even Enkidu can die, what about me?”

“And the person telling the story can put on the king’s skin,” said Hakan. “I’ve never had a city to rule. I can still ask what I’d do if I had all that power and couldn’t help the person beside me.”

Lumen looked down at her hands. “For a moment, sitting here listening to you, I was the king.”

The Man Who Lived

“What about the man Gilgamesh went looking for?” Lumen asked.

“Uta-napishtim. He was warned that a flood was coming. He built a boat and rode it out. Afterward, he and his wife were granted eternal life.”



The boat Hakan described was broad and ungainly. Lumen pictured it lifting in the dark as the last familiar patch of ground went under. She had been imagining the view from the boat when she found herself thinking of the people who would have watched it go.

“I’d have asked him how he bore it,” she said.

“How he bore the flood?”

“How he bore living after it.”

Hakan put his cup down. “Gilgamesh wanted to know how to get what the man had been given. You’ve found another question to ask him.”

“Would I ask it if I were as afraid as Gilgamesh?”

“You might ask it on the way home.”

Hakan told them that Gilgamesh did go home. At the end of the telling Hakan knew, the king turned his attention to the walls

of Uruk. The city was still there, and there were people who would walk its walls after he was gone.

The Professor thought of their walk up the hill. He had kept trying to picture the people who'd raised the stones. He wondered whether any of them, looking at the work when it was done, had pictured somebody coming up that path after they were gone.

The Clay

Lumen unfolded the map to shake out the last of the dust. A little caught in the crease. She dislodged it with the tip of her finger.

"Her lines were gone before we left," she said.

"Somebody drew them again first," the Professor said.

"And somebody copied Gilgamesh," said Hakan. "A student could sit with a lump of clay and learn the same lines someone else had learned. Another storyteller might go home thinking about the man in the boat and tell the story from his side."



“Then thousands of years later you come into our kitchen and do it again,” Lumen said.

“I left quite a bit out.”

“You left me room.”

The Professor turned back to the first page of his notebook. There was the crooked question mark Lumen had seen him draw. He thought about the line he’d joined on Manana. His hand had drawn a connection his eyes couldn’t see. On the hill, a woman had drawn a bend that somebody else could take with them. And here at the table, three people had spent part of the morning in a room with a man who might once have been a king.

He read the question he’d written beside the crooked mark. So far he’d mostly thought about things he couldn’t see. Listening to Lumen, he began to wonder about things he couldn’t feel for himself.

“How far back do you think we could go and find someone doing that?” he asked.

“Putting words in clay?”

“Sitting where I am and feeling, just for a moment, what it’s like to be somebody else.”

Hakan looked at the fox the Professor had sketched in the margin. “I keep wondering who was there when somebody first told them about that fox.”

The Professor reached for his pencil, then slid the notebook across to Hakan.

“Put it where you think it goes,” he said.

Hakan looked at the page for a while. He wrote his question beside the fox. Then he poured himself another cup of tea.

Chapter Four

The Door in the Roof

Hakan's question was still beside the fox when the Professor opened the notebook again. The drawing looked a little worse each time he saw it. The fox had one ear larger than the other and the expression of a dog waiting to be let out.

"I could draw him again," he said.

"Then you'd have two foxes and the same question," said Lumen.

She moved his cup away from the map. In central Anatolia, well to the west of the hill they had visited, she rested her finger on the plain of Konya.

"Çatalhöyük," she said. "People painted animals on the walls of their houses there. We might find somebody who grew up looking at one."

"Do we know what the pictures meant?"

"If we did, you'd still want to go."

The Professor shut the notebook. Hakan curled both hands around his cup. By now he knew to keep his elbows off the map.

Across the Roofs

The Professor came expecting to walk down a lane. He found himself standing on somebody's roof.

There was a woman grinding grain two roofs away. Near her, a man shook out a mat and sent a fine cloud of dust into the air. A girl with a string looped around her wrist stepped from one roof to the next. The houses pressed so closely together that he

had to look at the slight changes in height to see where one ended.



At the edge of the next roof, the girl stopped to hold a bundle of pale threads while a woman drew one across a row of others. The thread went over one strand and under the next. The Professor glanced at the basket beside her. He could follow much the same crossing there with his finger.

The woman lifted the woven edge to straighten it. It folded softly across her wrist.

“What’s it made of?” Lumen asked.

The Professor nodded toward the strips of inner bark beside the basket. “Oak.”

Lumen looked at the cloth again. “I was expecting a sheep.”

The girl set the bundle down on a folded hide. The hide still narrowed where the animal’s neck had been. The cloth ended

in a straight line where the weaver's fingers had turned the thread back. She could have made it wider if she'd wanted to.

The woman slipped another thread through. The girl waited until she saw that it had caught, then went on.



The girl stopped and called into a square opening. Someone answered from below. She lowered herself feet first and was gone.

"I've seen something like that in New Mexico," the Professor said. "At Taos Pueblo they used to climb up to a roof and go down a ladder into the rooms."

"Did the houses look like these?"

"They were piled higher. But the way in was much the same." He watched a basket pass from one roof to another, hand to hand. "Form follows function."

Lumen looked down the opening. "I wonder if the girl has ever knocked on a door."

“She called out first.”

“So did you, the last time you climbed a ladder and found me at the top.”

“I said ‘Ow.’”

“I thought it was a lovely greeting.”

Lumen crouched at the opening. The edge was worn smooth where hands had gripped it. From below came the quiet scrape of a bowl being moved over plaster. She waited for her eyes to adjust, then beckoned the Professor down.

The Bull on the Wall

Inside, an adult knelt beside a shallow bowl of red pigment. The girl sat on the edge of a plastered platform, her heels knocking softly against it. At first the Professor could make out only the red flank of the animal. As his eyes adjusted, he saw the horns and the little people scattered about its feet.

The largest figure on the wall was the bull. Near its hindquarters a man had both arms in the air. The painter added a short line to one of his legs. The girl leaned over to see it.

The travelers could hear the lift and fall of the voices. The Professor watched the girl follow the painted legs with one finger.

“Was he running?” she asked.

A woman sitting beside her laughed. “Your uncle says he was.”

“He says he jumped over the ditch,” another voice said.

“He fell into it.”

Even the painter laughed at that. The girl looked at the little man by the bull’s tail. Then she looked all the way to the other

end of the animal, where the painter had left a small bare patch around its eye.

“Was the bull afraid, too?”



For a while the only sound was someone walking across the roof.

“He had all those people around him,” the girl said.

The woman beside her looked up at the bull. Her hands, which had been busy untangling the girl’s string, went still.

“Perhaps,” she said. “He kept turning his head.”

The painter held up the red-stained tip of the tool. The Professor thought it was going to touch the eye. Instead the painter laid it across the bowl and sat back beside the girl. From there the bull was just above their heads.

When Lumen reached for the ladder, the Professor was still looking at the wall. He had been following the little man, trying

to see how he had managed to get away. He looked at the bull's head once more. From where the bull stood, there was someone in every direction.

Back at the Table

Hakan was holding his cup in both hands when they came back. He watched the Professor open the notebook to the fox.

"Did you find out who was listening?"

"One girl," said Lumen. "Everyone was following the man. She went looking for the other end of the bull."

"What did she do when she got there?"

"She stopped at its eye. Then everyone else stopped, too."

Hakan waited a moment. "I suppose I'd have been watching the man."

"So was I," said the Professor.

He put his pencil down beside the notebook. There was room on the page for a little man running away. After a moment he turned the book around to see what the fox would have seen from where he stood.

Chapter Five

Beyond the Last Headland

Hakan set his cup down on Sicily.

“You’ve drowned Sicily,” Lumen said.

“Only the southern end.” He lifted the cup and wiped the ring with his sleeve. “There was a time you could have walked from here to Malta.”

The Professor bent over the map. “By the time we have people in the cave, the land bridge was already underwater.”

“How far?” Lumen asked.

“Sixty miles, give or take.”

She looked again. “It’s a very small gap when you’re sitting down.”

Hakan ran his finger from one shore to the other. “When did a boat become more than something you held on to?”

“Before I’d take it sixty miles,” said the Professor.

The Professor looked down at the line between the islands. At the cottage he could see both shores at once. He turned the map so that Sicily was nearest him and covered Malta with his hand.

Lumen put a finger on Sicily. “Then let’s start here. I want to see what they were willing to push off in.”

Hakan picked up his tea. “Shall I keep it warm?”

“We’re going to watch them leave,” said Lumen. “You’ve got time for a sip.”

The Sicilian Shore

It was barely light. The Professor could hear a stone being rolled back and forth by the wash, although it took him a while to see which stone it was. A long boat lay beside it in the shallows. Four people were getting ready to go.

The youngest brought down a bundle and set it where he meant to sit. An older woman moved it to the middle of the boat.

“I can reach it better here,” he said, moving it back.

“Get in, then,” she said.

He put a foot in. The gunwale tipped toward him, and the bundle rolled against his ankle. He took his foot out and put the bundle where she’d had it. She held the boat steady while he tried again.



The Professor crouched for a better look. It was a single trunk, hollowed deep enough to sit in. He could see where the bottom had been smoothed and a shallow nick where somebody had stopped short. He tried to imagine taking the first chips out of a trunk that size. How much could you take away before you'd taken away the very thing that would keep the water out?

"What do you suppose she said to him?" the Professor asked.

"Whatever it was, she waited till he could feel the boat tip," said Lumen.

A man tested the knot on a skin of drinking water, then tucked it where he could reach it from his seat. The woman put one hand on the side and stepped in last. For a few strokes the boat seemed to be going sideways. Then all four paddles caught, and the bow came round.

On the beach the stone kept turning in the wash. By the time the boat was clear of the point, the Professor had stopped hearing it.

Out of Sight

They followed above the water. For a long while the Professor could turn his head and see the Sicilian coast. When it thinned to a line, he could still tell himself where the beach was. Later he turned and found only water.

"How far did the other boat get?" the boy asked.

The woman kept her eyes ahead. "As far as we could see."



The youngest paddler began looking up between strokes. The man behind him said something the Professor couldn't hear and tapped the side with the handle of his paddle. The boy settled back into the stroke.

"Do you think she's been there before?" Lumen asked. The woman in front had turned to check on the others. She said a few words, and they eased off long enough to let her drink.

"Perhaps she's heard somebody tell how to get there."

"Would you go on somebody's telling?"

"I'd want to know who told them."

Lumen watched the water skin go from hand to hand. The youngest drank and passed it on without being asked.

A little later a low swell caught them on the side. The boy's paddle missed the water. The woman called out, and for a moment he couldn't tell if she meant him. His free hand went toward the rim and hung there. Then he put his paddle in with

hers. The bow turned into the next swell. The water that came aboard was little enough to scoop out with a cupped hand.

The Professor waited for the woman to look back at the boy. She was already looking ahead. The boy took the next stroke with her.

Much later, the man who had tied the water skin raised his paddle and held it in the air. At first the Professor thought he was asking for a rest. Then he saw what the man was pointing at. There was a dark line ahead, so low that each rise of the water hid it.

“Could you have pictured that from the beach?” Lumen asked.

“I could have pictured land,” said the Professor. “I don’t think I’d have pictured how long it could take to believe it was there.”

A Place to Put a Foot

As they drew closer, the line divided into pale rock and low, dark scrub. The crew paddled past the first place that looked shallow. Water broke white across a shelf that the Professor would have mistaken for a landing. Farther along, the woman pointed with her paddle. The water there slid between two fingers of rock.

She stepped out first. For a moment the water was up to her thighs. Then she found her footing and turned to steady the boat. The youngest was already reaching for the bundle. He saw her hand on the rim and waited while the boat rose and settled. Then he gave it to her.



Lumen and the Professor went ashore a little way off. A wet footprint darkened the limestone. On the beach behind them the four had begun to unload. Someone laughed, briefly, at the awkward way the youngest walked after sitting so long. He laughed too and kept his eyes on his feet.

The Professor looked back. From here there was no sign of the beach they'd left.

"From Sicily," he said, "I could picture where we were going."

"And now?"

He watched the woman put her shoulder to the bow. The boy came round to help her carry it clear of the water.

"Now I'm trying to picture going back."

Chapter Six

The Color We Leave

Hakan was still looking at the map when they came back. The Professor put one finger on Malta and said, “From there, you can’t see Sicily.”

“I know,” said Hakan. “I’ve been staring at the gap.”

The Professor closed his eyes for a moment. He could still see the woman’s hand on the side of the boat while the young paddler found his footing.

“Do you suppose they asked for help before they left?” Lumen said.

“From whom?”

“That’s what I’m asking.”

Hakan turned the map a little. “What would make you ask for help when you couldn’t see anybody to ask?”

The Professor opened his eyes. “I might have to be frightened enough.”

Lumen moved her finger to Gozo, just northwest of Malta. “Come on. Let’s see what people do when they have somewhere to go with that feeling.”

The Bowl at the Door

When they returned to the islands, more than three thousand years had passed. The Professor still had a shore in his mind. What stood in front of him now was a wall so tall he had to lean back to see the tops of the stones.

A woman came up the path with a shallow clay bowl. A girl walked beside her, rolling a bead along a cord between her

fingers. The wind blew dust against their ankles. At the entrance the woman stopped and brushed a little off the rim of the bowl.



“Who’s the bowl for?” Lumen asked.

“I don’t know,” said the Professor.

She watched the woman take the bowl inside. “She might.”

The girl stayed by the entrance. From inside came the small clack of pottery meeting stone. She took two steps toward the sound, stopped, then followed the woman in. Lumen and the Professor waited at the threshold. It was light enough to see the girl slip the cord into a fold of her garment when the woman took her hand.

“What do you think she wanted?” Lumen asked.

“On that boat I’d have wanted the wind to stay down.”

“You can ask someone to hold a boat steady.”

“Yes,” said the Professor. They waited a while longer. He could hear the grass moving outside the wall.

The Door Cut in Rock

On Malta, they followed a second pair of people down into the limestone at Ħal Saflieni. Here the people who went in carried their light with them. As it moved ahead, the Professor saw one doorway take shape at the far side of a chamber. Two upright forms seemed to support a stone across the top. He looked for the seam where the top stone met the side.

“It’s all one piece,” he said.

Lumen put her palm against the wall. “They didn’t have to lift it.”

“No. They had to imagine it inside the rock and take away everything around it.”

He tipped his head back. Above them the stone stepped inward like courses laid by a builder. The steps, too, were cut from the rock. Farther in, the low light caught a red curve painted overhead. It went on beyond where he could see.

“Form follows function,” Lumen said softly.

“I did say that, didn’t I?”

“What’s the doorway doing here?”

He looked again for the seam that wasn’t there. “I think it’s helping me recognize where I am.”

The chamber beyond was a place for the dead. By the ledge, the Professor could make out bones that had been gathered together. A woman set a shell bead on a low ledge and straightened it with one finger. Then she lifted a bowl of red powder and held it out. The young person who had come down

with her took it in both hands. She waited until the bowl was steady before she let go.



“Do you think she’s afraid of the dead?” the Professor asked.

Lumen watched the woman look back at the bead. “I think she’s afraid this is the last thing she can do for him.”

They stood aside to let the two pass. The younger woman turned at the doorway to make sure her companion was behind her, then held the light a little higher. They went up together.

The light went with them. Lumen stayed by the wall until the last step above her had gone quiet. She opened her hands in the dark. The Professor waited beside her.

What the Red Might Do

Back at the table, the Professor drew a doorway. He drew two joints where the stones would meet above ground, then rubbed them out.

“Red ochre,” he said. “It was on the ceiling and in the burial chamber.”

“Is that where they found the little figure of the woman asleep?” Hakan asked.

“At the Hypogeum, yes. I’ve always thought she looked comfortable.”

“Maybe that’s how somebody wanted to remember her,” said Lumen.

“They put red ochre in graves here in Maine, too,” Hakan said. “That’s where the old name ‘Red Paint People’ comes from.”

“Do you think it meant the same thing?” Lumen asked.

“I’d want to know what either of them thought the red would do.”

He glanced at the two islands. “We used to think the Maltese ochre came from the mainland. They tested it. It looks as though the people there could get the color from their own ground.”

“Easier to find out where the powder came from than what they wanted it to do,” said the Professor.

The Professor looked at his drawing. “The color might have reminded them of blood. I can imagine someone thinking it would help the dead. The trouble is, I can imagine half a dozen other reasons she might have done it.”

“Suppose the woman at the temple was asking for a safe crossing,” said Hakan. “If the boat came home, she might bring the bowl again next time.”

“And if it didn’t?”

Hakan turned his cup half a turn by the handle. “She might still go back. She might think she’d done something wrong.”

Lumen looked at the doorway the Professor had drawn. “What if somebody did it for her once?” Lumen asked. “Down among the dead, I mean. When she was the one who didn’t know what to do.”

Hakan slid the sugar bowl toward her. Lumen put out both hands. He kept a finger against the base until she had it.

“You can see what that did,” he said.

The Professor looked at her hands. “And we don’t know what the woman hoped it would do for him.”

Lumen looked down at the sugar bowl. “I keep thinking about how long she waited before she let go.”

Hakan reached for his cup, then stopped. He waited until Lumen had set the bowl down.

Chapter Seven

The Fifth Basket

Hakan dragged the map back across the table. One corner caught under the sugar bowl. The Professor lifted the bowl for him.

“I’ve been thinking about those standing stones in Orkney,” Hakan said. “At Stenness they set them in an oval around a hearth.”

“Rooms at Ġgantija,” said Lumen. “A fire out in the open at Stenness.”

“Those rounded rooms might have helped carry a roof,” said the Professor. “A ring of standing stones has no roof to carry.”

Hakan tapped the map. “We’ve been asking where the people went. What if it was the idea that traveled?”

“Somebody still had to carry it,” said the Professor.

Lumen traced a piece of coastline with her finger. “And they wouldn’t have to go all the way. They could show somebody at the first landing.”

The Professor looked at the distance her finger had covered. “We don’t know that anyone made that trip from Malta.”

“No,” said Lumen. “But suppose I wanted to tell somebody across the water something I’d seen. I could tell someone headed that way. How much would be left of what I said by the time it got there?”

“Depends on who you sent,” said Hakan.

The Professor took up his pencil and wrote a large 5 on a scrap of paper. He slid it over to Hakan, who looked at it and slid it on to Lumen.

“Five what?” she asked.

The Professor left the scrap where it was. Lumen could carry it across the room, or across the sea, and whoever got it would still have to ask her what he had counted. He wrote “Five what?” in the notebook. He wanted to see what a scribe would put beside the number when the person who made the marks might never meet the person who read them.

At the Storeroom

Hakan had told them how Gilgamesh returned to the walls of Uruk. They went to the city in an earlier age, when there were already people making marks in wet clay. For a while they saw only feet. The alley was crowded and they had stopped to let two people pass carrying a pole with a load slung between them.

A woman stood beside a storeroom door waiting for the keeper to come out. A few grains of barley clung to the fold of her sleeve. She picked one out as he approached.

“Five,” she said.

The keeper turned and pointed into the room. Four baskets stood on the dry side of the threshold.



“There are four.”

“There were five when I left.”

“Where did you leave them?”

“Right here. I waited while you sent for someone.”

The keeper came out and looked up the alley as if the fifth basket might be coming toward him. A little farther along, a dark-haired boy waited beside a low bench. He kept moving one foot over a patch of loose grain when people passed.

A scribe came down from the far end of the alley carrying a little slab of clay. One edge bore the print of his thumb. He turned it so that the keeper could see it.

Lumen leaned closer. “Is that our five?”

The Professor was looking at the woman. “When did he make those marks?”

The keeper asked the same question. The scribe pointed back the way he'd come. The woman had told him what she was bringing before he came to the storeroom. He had made the record there.

Lumen watched the scribe point up the alley. "I think he made it before anyone counted the baskets here."

"Could be what she meant to bring," said the Professor. He looked back at the four baskets inside the door.

The woman looked down at the barley scattered along the wall. She walked a few steps to the bench. Behind it sat a shallow basket with one handle torn away.

The boy took his foot off the grain. "I moved it," he said. "The handle broke when I lifted it. I thought someone would step in it."

"Someone did," the woman said. A few grains were stuck between his toes. She put a hand under the basket. "Help me with the other side."

They carried it into the storeroom together. The keeper counted again. Then he picked up a pinch from the basket with the broken handle and let it fall. There was a little less in that one.

What the Marks Could Carry

The scribe took a fresh piece of clay. This time he watched the keeper's hand go from basket to basket before he put his reed to it. When he was done he waited for the boy to wipe the dust from his palms and put the tablet in his hand.



“Where do you suppose he’s taking it?” Lumen asked.

“Somebody farther up the alley must need to know what came in.”

“Will he tell them about the broken handle?”

“He might if they ask.”

The boy held the tablet flat and stepped around the woman on his way out. He walked more slowly than he had when his hands were empty.

Lumen watched him until the crowd closed behind him. “If he forgets how many there were, he can look.”

“So can the person he takes it to,” said the Professor.

The woman stayed long enough to pull the loose handle away from the side of the basket. She tucked it into the fold of her sleeve, where the grain had stuck, and left the way she had come.

Back at the table, Hakan looked at the scrap of paper. The Professor had left the large 5 on it and nothing else.

“Did it settle your argument?”

“Finding the basket did,” said Lumen. “We saw the keeper count again before the scribe made the second record.”

“More than a thousand years later they were still keeping accounts on clay on Crete,” Hakan said. “With Linear A you can make out some of the numbers and what was being counted. We still can’t read the language. Linear B came later. We can read that as early Greek.”

Lumen turned the scrap of paper around. The 5 still looked like a 5 from where Hakan sat. “If you found this in the kitchen after we’d all gone, you’d know how many. You’d have the same question I did.”

“Five what?” he said.

The Professor took back the paper and drew a basket beside the number. Then he added a little gap where one of its handles ought to be.

Hakan smiled. “I’d have remembered the handle.”

“So would I,” said Lumen. “But which one of us would have thought to put it in the account?”

Hakan turned the map back toward the Aegean. The Professor left the scrap beside it.

“If all you had was a story about a city,” Lumen asked, “how would you go looking for it?”

Hakan set his cup down outside the map this time. “Which city?”

“Troy,” she said.

The Professor wrote Troy on a clean page and folded the corner over. Then he slid the map back toward Hakan, until the Nile lay between them.

Chapter Eight

Where the Sun Comes Back

The Professor had left the map open to Egypt. Hakan turned it so the Nile ran away from him instead of toward him.

“Is that where we’re going?” Lumen asked.

“I thought we might,” said the Professor.

Hakan moved a finger west of the river. “There’s a place I’d like you to see first. Nabta Playa. There used to be water there in the rainy season.”

The Professor leaned over the map. “How far back?”

“Before the pyramids. Before the man with the grain tablet, too.”

Lumen looked out the kitchen window. The sky over Monhegan was already bright. “Do we have to wait for morning?”

Hakan looked at her.

“Of course we don’t,” she said.

Before the Light

For a little while the Professor could see the stars and hardly anything else. Then he made out a pale stretch of ground below him. Here and there, coarse grass stood in little clumps. A darker line along the basin marked where water had stood. He had come prepared to look for stones and almost put his foot on one.

“Small, aren’t they?” he said.

“Small enough for somebody to move,” said Lumen.

There was a low ring of sandstone slabs. A woman had come out to it with a child. The child started toward the far side, but the woman touched his shoulder and brought him back beside her. She crouched until her eyes were level with his and pointed through a gap.



The child looked where she pointed. A belt of pale light showed above the horizon. He waited, then shifted his feet.

“Here?” he asked.

“Where you were yesterday.”

He took half a step back. The woman let him stand there a moment before she lowered her hand.

The Professor had been looking at the stones from above. He came down to where the boy was and saw how much of the horizon the gap cut off. When the first edge of the Sun showed, it was still inside the space between the two stones. The boy put

his hand on the woman's shoulder and leaned forward. She stayed where she was.

"It stayed there," he said.

"It's close to where it was," she said. "We'll come back and see."

Another Morning

Lumen and the Professor came back several mornings later. They had agreed to stand in the same place. Lumen got there first and waited beside the stone the Professor had nearly stepped on.

The woman and the child were there again. This time the boy put his feet where he wanted them before she touched his shoulder. The sky brightened. When the Sun came up, it was a little farther back along the horizon, toward the place the boy remembered from earlier mornings.

"It's going back," he said.

The woman looked for herself. Then she stood and brushed sand from one knee.

"Will it rain now?"

"Look over there," she said.

He looked beyond the stones. The ground was still dry.

She took his hand and they walked a little way along the rim of the basin. He told her where he remembered the water reaching. She looked where he pointed. There was time yet for him to be right.

The Professor stayed by the stones. He wanted to know how many mornings the woman had come out before she knew where to stand, and whether somebody had once put a hand on

her shoulder. By the time he thought of the second question, she and the boy were walking along the rim together.

At the Kitchen Window

Hakan had turned his cup round so the handle faced him. “Did you see the rains come?”

“We saw the Sun come up,” said the Professor. “Twice. The second time it was a little farther along.”

“Did they expect rain?”

“I think the boy was looking for it,” said Lumen. “I saw him look down into the basin. Then she took him to look again.”

Hakan looked at the map. “A good season to expect water. That’s something you can learn. Whether it comes this time is the part you have to wait for.”

The Professor thought of the woman at Ġgantija. He had wondered whether the bowl might have been meant to bring a boat home. He could still picture her thumb going around the rim. At Nabta the child could come back and stand in his own footprints. What he saw on the second morning might change what he thought he’d seen on the first.

Hakan nudged the scrap with the basket on it out from under the map. The Professor had drawn one basket beside the number five. There was even the gap he’d left where the handle had broken.

“You needed somebody to carry that,” said Hakan.

The Professor nodded. “At Nabta you could leave the stones where they were. Somebody could come to them.”

“Even after the woman was gone?” Lumen asked.

“If someone showed them where to stand.”

The Professor opened his notebook to the question beside the crooked mark. Lumen remembered how the woman had crouched so she could see what the boy saw. On the second morning she had let him find the spot himself. Now he could put somebody else there and ask where they thought the Sun would rise tomorrow.

The kitchen had grown warm. Lumen got up to open the window. She could hear the sea, although from where she stood she couldn't see it. The Professor came over beside her. Neither of them had anything to say for a while.



She remembered the mark on Manana and how long she and the Professor had stood looking at it. At Nabta, she could still see the two stones and the space the woman had made for the boy beside her.

"Who did they leave it for?" she asked.

She pictured the boy coming back with someone smaller than himself. He would move over, the way the woman had moved over for him, and wait until the other child saw the light.

Source Note

The Sulawesi scene and its minimum age are described in A. A. Oktaviana and colleagues, “Narrative cave art in Indonesia by 51,200 years ago,” Nature 631 (2024), 814–818, doi:10.1038/s41586-024-07541-7. Figure 3 includes the photograph and tracing. The illustration in this chapter is an artistic repainting alongside Lumen’s fictional sketch.

The visit to Göbekli Tepe is fiction. The hillside setting and carved pillars draw on the archaeological site. The visitors’ routes, encounters, and exchanges are imagined. The roofed building follows one proposed reconstruction. For the archaeological background, see UNESCO’s Göbekli Tepe site summary at https://whc.unesco.org/en/list/1572 and Kinzel and Clare, “Monumental – Compared to What?” (2020), https://doi.org/10.2307/j.ctv13pk66m.7.

For the Sumerian poems about Gilgamesh, the Akkadian epic, and the account of Uta-napishtim, see Ira Spar, “Gilgamesh,” The Metropolitan Museum of Art, https://www.metmuseum.org/essays/gilgamesh, and Columbia University’s World Epics, https://edblogs.columbia.edu/worldepics/project/gilgamesh/. The scenes in Chapter Three are artistic interpretations of the story and its transmission.

The kitchen conversation draws on Chip Cook’s essays “What Was Our Playground Like?” and “What Does It Take to Paint in a Cave?”

The visit to Çatalhöyük, the people in the house, and their conversation are imagined. The adjoining houses with roof access and the wall paintings of wild animals and people draw on archaeological evidence. See UNESCO, “Neolithic Site of Çatalhöyük,” https://whc.unesco.org/en/list/1405/ and the

Çatalhöyük nomination dossier, https://whc.unesco.org/uploads/nominations/1405.pdf. For the historic roof entrances at Taos Pueblo, see the National Historic Landmark nomination, https://npgallery.nps.gov/pdfhost/docs/NHLS/Text/66000496.pdf. Woven textiles from Çatalhöyük date to about 6700–6500 BCE. Microscopic analysis identified fibers from the inner bark of local oak in some samples. See Antoinette Rast-Eicher, Sabine Karg, and Lise Bender Jørgensen, "The use of local fibres for textiles at Neolithic Çatalhöyük," Antiquity 95 (2021), 1129–1144, https://doi.org/10.15184/aqy.2021.89.

The Malta crossing is imagined. Excavations at Latnija place hunter-gatherers on Malta by about 6500 BCE, after the former land bridge to Sicily was submerged. The closest crossing from Sicily was about 100 kilometers. The surviving evidence establishes human presence on the island. The launch site, crew, route, landing, and depicted dugout are fictional reconstructions. The earlier boat that was never heard from again is also imagined. See Eleanor M. L. Scerri and colleagues, "Hunter-gatherer sea voyages extended to remotest Mediterranean islands," Nature (2025), https://doi.org/10.1038/s41586-025-08780-y.

The visits to Ġgantija and Ħal Saflieni, the people, and their actions are imagined. The Maltese megalithic temples and the Hypogeum overlapped in time. Ħal Saflieni is a collective burial site, and some of its chambers reproduce the forms of surface temples in solid limestone. Red ochre is associated with burials and wall decoration. The color's association with blood and life is one interpretation. See UNESCO, "Megalithic Temples of Malta," https://whc.unesco.org/en/list/132/ and "Ħal Saflieni Hypogeum," https://whc.unesco.org/en/list/130/.

For the evidence that the Maltese pigment most likely came from local sources, see N. Attard Montalto, A. Shortland, and K. Rogers, Journal of Archaeological Science 39 (2012), 1094–1102, https://doi.org/10.1016/j.jas.2011.12.010. For Maine's Moorehead burial tradition and the historical label "Red Paint," see the Maine Historic Preservation Commission, "Prehistoric Archaeology," https://www.maine.gov/mhpc/programs/education/prehistoric-archaeology. Similar use of pigment does not establish a common rite or a route of transmission.

The Stones of Stenness date to about 3100–2900 BCE. See Historic Environment Scotland, "Stones of Stenness," https://www.historicenvironment.scot/visit/all/stones-of-stenness/history-and-stories/. The possibility that European megalithic building ideas traveled by sea is discussed by Bettina Schulz Paulsson, PNAS 116 (2019), 3460–3465, https://doi.org/10.1073/pnas.1813268116. It does not establish a route between Malta and Orkney.

The Uruk visit and the dispute over the barley are imagined. Early tablets from southern Mesopotamia, dating to around 3300 BCE, record quantities and goods. The illustration suggests the general appearance of an early clay account. See the Metropolitan Museum of Art, "The Origins of Writing," https://www.metmuseum.org/essays/the-origins-of-writing and "Cuneiform tablet: administrative account with entries concerning malt and barley groats," https://www.metmuseum.org/art/collection/search/327385.

Linear A was used mainly on Crete, about 1800–1450 BCE. The language remains undeciphered. Linear B, used later on Crete and mainland Greece, records an early form of Greek. See Ester Salgarella, "Linear A," https://doi.org/10.17863/CAM.101615, and Aegean Linear

Script(s) (Cambridge University Press, 2020), https://assets.cambridge.org/97811084/79387/excerpt/9781108479387_excerpt.pdf.

The visits to Nabta Playa, the people at the stones, and their observations are imagined. Investigators documented a small stone circle in the basin west of the Nile and proposed that an alignment marked sunrise near the summer solstice, around the season of summer rains. The intended use of the stones is uncertain. See J. McKim Malville, Fred Wendorf, Ali A. Mazar, and Romauld Schild, "Megaliths and Neolithic astronomy in southern Egypt," Nature 392 (1998), 488–491, https://doi.org/10.1038/33131.

Afterword

Questions Behind the Story

The story follows Lumen, the Professor, and Hakan as they try to picture how people learned to make things, share what they knew, and see through other eyes. In the two essays that follow, Chip Cook takes up two of the questions that helped shape their travels. What gave early humans the time and means to experiment? What did it take to get an image onto a cave wall?

1) What Was Our Playground Like?

Chip Cook

All life on Earth belongs to a very old family tree. The genetic machinery we share with even its distant branches is one clue to that kinship. Most species that ever lived are gone, and fossils give us only part of the picture. Our own species arose in Africa. Go back about ten million years and you might call it the Planet of the Apes. Different kinds of apes lived in Africa and Eurasia. Which branches would survive? That depended on the conditions they faced, what they could do, and sometimes sheer luck. Fossils tell us something about their bodies. Stone tools give us a different clue. What did their makers see in a piece of stone that I might walk right past?

Fire changed the playground. At Wonderwerk Cave in South Africa, researchers found burned bone and plant ash dating to about a million years ago. At Barnham in England, evidence from about 400,000 years ago suggests people could make fire. Alongside traces of burning, researchers found pieces of iron pyrite, a mineral that can throw sparks when struck against flint. Finding a fire, keeping it going, and making one when you need it are different accomplishments. Think of what the last one makes possible. You can warm yourself, cook your food, and sit in the light after dark. You can show somebody what you learned that day. How much of what we call imagination grew out of putting familiar things together and seeing what else they could do?

I think of it as a balance sheet. On one side are the laws of nature. On the other are the things that come into being under those laws. Nature has its Lego blocks on the table. Evolution adds new combinations over generations. Imagination adds another player. We can picture a combination before we try it. Or we can see what an accidental combination does and try it again. Ideas become Legos, too. Once you show me one, I can put it together with something you never thought to use.

I remembered a story about a volcano and a genetic bottleneck. Toba, on Sumatra, erupted about 74,000 years ago. In 1998,

anthropologist Stanley Ambrose proposed that the eruption might have sharply reduced the human population. It's a striking idea. The playground may have shrunk in some places. But archaeological sites in South Africa and northern India show signs of human activity across the time of the eruption. How people fared may have varied from place to place. Those sites show that people carried on in at least some places, while the worldwide toll remains uncertain.

The figure I remembered, about 1,200, probably came from a different study. In 2023, a team estimated that our ancestors' population had an effective size of about 1,280 between roughly 930,000 and 813,000 years ago. Think of that as the size of a model population that would lose genetic variation at the same rate. The actual number of people alive could have been quite different. A later analysis found insufficient evidence for a bottleneck that severe.

If you're fighting for your life, it's hard to stop and paint. Finding food and shelter, having children, and keeping them alive all take time. How did people make room for drawing, telling stories, or teaching one another? Perhaps those things sometimes helped them get through hard times, too. We really are kin. That was our family's playground, and somewhere on

it a person put a hand against a wall and chose to leave something behind.

Source Notes

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2) What Does It Take to Paint in a Cave?

Chip Cook

Take a piece of paper and draw an animal from memory. Something you've seen plenty of times. A dog will do. When you're finished, look at where you put the legs. I don't think I'd want my first attempt on a cave wall.

Now imagine doing it on rock. You have to find something that will leave a mark and learn how to apply it. Some of the artists at Lascaux worked with mineral pigments, applying them directly or blowing powdered pigment onto the surface. If you're working beyond the reach of daylight, you need a way to see the line you just made. Archaeologists experimenting with Paleolithic lighting have tried torches, fat-burning lamps, and hearths. Each gives a different kind of light.

All of that takes time. So do finding food, finding a mate, and raising children. If I'm fighting for my life, my imagination is probably occupied with getting through the day. I wonder how much early art came from what I'd call freed-up imagination. And I wonder whether making a picture could help with the very things that took up so much of people's time. If I can show you where an animal stood and where I stood, you might see something about the encounter that I missed.

I grew up hearing that people painted animals in caves for religious reasons, perhaps to help a hunt succeed. I can see how the setting lends itself to that idea. If you found the same animal on a rock in broad daylight, would you tell the same story about it?

Indigenous peoples in the American Southwest also made images on exposed rock faces. Some are pictographs, made with pigment. Others are petroglyphs, made by pecking, cutting, or abrading the surface. On a dark, varnished rock face, removing that surface can expose lighter rock underneath. It takes a different set of skills from painting in a cave.

To Be Continued...