

NOW A MAJOR MOTION PICTURE

WHY ARE THEY HERE?

A R R I V A L

TED CHIANG

TED CHIANG

ARRIVAL

PICADOR

For Brian Chiang and Jenna Felice

CONTENTS

TOWER OF BABYLON

UNDERSTAND

DIVISION BY ZERO

STORY OF YOUR LIFE

SEVENTY-TWO LETTERS

THE EVOLUTION OF HUMAN SCIENCE

HELL IS THE ABSENCE OF GOD

LIKING WHAT YOU SEE: A DOCUMENTARY

STORY NOTES

ACKNOWLEDGMENTS

COPYRIGHT ACKNOWLEDGMENTS

TOWER OF BABYLON

Were the tower to be laid down across the plain of Shinar, it would be two days' journey to walk from one end to the other. While the tower stands, it takes a full month and a half to climb from its base to its summit, if a man walks unburdened. But few men climb the tower with empty hands; the pace of most men is slowed by the cart of bricks that they pull behind them. Four months pass between the day a brick is loaded onto a cart, and the day it is taken off to form a part of the tower.

Hillalum had spent all his life in Elam, and knew Babylon only as a buyer of Elam's copper. The copper ingots were carried on boats that traveled down the Karun to the Lower Sea, headed for the Euphrates. Hillalum and the other miners traveled overland, alongside a merchant's caravan of loaded onagers. They walked along a dusty path leading down from the plateau, across the plains, to the green fields sectioned by canals and dikes.

None of them had seen the tower before. It became visible when they were still leagues away: a line as thin as a strand of flax, wavering in the shimmering air, rising up from the crust of mud that was Babylon itself. As they drew closer, the crust grew into the mighty city walls, but all they saw was the tower. When they did lower their gazes to the level of the river-plain, they saw the marks the tower had made outside the city: the Euphrates itself now flowed at the bottom of a wide, sunken bed, dug to provide clay for bricks. To the south of the city could be seen rows upon rows of kilns, no longer burning.

As they approached the city gates, the tower appeared more massive than anything Hillalum had ever imagined: a

single column that must have been as large around as an entire temple, yet rising so high that it shrank into invisibility. All of them walked with their heads tilted back, squinting in the sun.

Hillalum's friend Nanni prodded him with an elbow, awestruck. 'We're to climb that? To the top?'

'Going *up* to dig. It seems . . . unnatural.'

The miners reached the central gate in the western wall, where another caravan was leaving. While they crowded forward into the narrow strip of shade provided by the wall, their foreman Beli shouted to the gatekeepers who stood atop the gate towers. 'We are the miners summoned from the land of Elam.'

The gatekeepers were delighted. One called back, 'You are the ones who are to dig through the vault of heaven?'

'We are.'

The entire city was celebrating. The festival had begun eight days ago, when the last of the bricks were sent on their way, and would last two more. Every day and night, the city rejoiced, danced, feasted.

Along with the brickmakers were the cart-pullers, men whose legs were roped with muscle from climbing the tower. Each morning a crew began its ascent; they climbed for four days, transferred their loads to the next crew of pullers, and returned to the city with empty carts on the fifth. A chain of such crews led all the way to the top of the tower, but only the bottommost celebrated with the city. For those who lived upon the tower, enough wine and meat had been sent up earlier to allow a feast to extend up the entire pillar.

In the evening, Hillalum and the other Elamite miners sat upon clay stools before a long table laden with food, one table among many laid out in the city square. The miners spoke with the pullers, asking about the tower.

Nanni said, 'Someone told me that the bricklayers who work at the top of the tower wail and tear their hair when a brick is dropped, because it will take four months to replace, but no one takes notice when a man falls to his death. Is that true?'

One of the more talkative pullers, Lugatum, shook his head. 'Oh no, that is only a story. There is a continuous caravan of bricks going up the tower; thousands of bricks reach the top each day. The loss of a single brick means nothing to the bricklayers.' He leaned over to them. 'However, there is something they value more than a man's life: a trowel.'

'Why a trowel?'

'If a bricklayer drops his trowel, he can do no work until a new one is brought up. For months he cannot earn the food that he eats, so he must go into debt. The loss of a trowel is cause for much wailing. But if a man falls, and his trowel remains, men are secretly relieved. The next one to drop his trowel can pick up the extra one and continue working, without incurring debt.'

Hillalum was appalled, and for a frantic moment he tried to count how many picks the miners had brought. Then he realized. 'That cannot be true. Why not have spare trowels brought up? Their weight would be nothing against all the bricks that go up there. And surely the loss of a man means a serious delay, unless they have an extra man at the top who is skilled at bricklaying. Without such a man, they must wait for another one to climb from the bottom.'

All of the pullers roared with laughter. 'We cannot fool this one,' Lugatum said with much amusement. He turned to Hillalum. 'So you'll begin your climb once the festival is over?'

Hillalum drank from a bowl of beer. 'Yes. I've heard that we'll be joined by miners from a western land, but I haven't seen them. Do you know of them?'

‘Yes, they come from a land called Egypt, but they do not mine ore as you do. They quarry stone.’

‘We dig stone in Elam, too,’ said Nanni, his mouth full of pork.

‘Not as they do. They cut granite.’

‘Granite?’ Limestone and alabaster were quarried in Elam, but not granite. ‘Are you certain?’

‘Merchants who have traveled to Egypt say that they have stone ziggurats and temples, built with limestone and granite, huge blocks of it. And they carve giant statues from granite.’

‘But granite is so difficult to work.’

Lugatum shrugged. ‘Not for them. The royal architects believe such stoneworkers may be useful when you reach the vault of heaven.’

Hillalum nodded. That could be true. Who knew for certain what they would need? ‘Have you seen them?’

‘No, they are not here yet, but they are expected in a few days’ time. They may not arrive before the festival ends, though; then you Elamites will ascend alone.’

‘You will accompany us, won’t you?’

‘Yes, but only for the first four days. Then we must turn back, while you lucky ones go on.’

‘Why do you think us lucky?’

‘I long to make the climb to the top. I once pulled with the higher crews, and reached a height of twelve days’ climb, but that is as high as I have ever gone. You will go far higher.’ Lugatum smiled ruefully. ‘I envy you, that you will touch the vault of heaven.’

To touch the vault of heaven. To break it open with picks. Hillalum felt uneasy at the idea. ‘There is no cause for envy —’ he began.

‘Right,’ said Nanni. ‘When we are done, all men will touch the vault of heaven.’

The next morning, Hillalum went to see the tower. He stood in the giant courtyard surrounding it. There was a temple off to one side that would have been impressive if seen by itself, but it stood unnoticed beside the tower.

He could sense the utter solidity of it. According to all the tales, the tower was constructed to have a mighty strength that no ziggurat possessed; it was made of baked brick all the way through, when ordinary ziggurats were mere sun-dried mud brick, having baked brick only for the facing. The bricks were set in a bitumen mortar, which soaked into the fired clay, forming a bond as strong as the bricks themselves.

The tower's base resembled the first two platforms of an ordinary ziggurat. There stood a giant square platform some two hundred cubits on a side and forty cubits high, with a triple staircase against its south face. Stacked upon that first platform was another level, a smaller platform reached only by the central stair. It was atop the second platform that the tower itself began.

It was sixty cubits on a side, and rose like a square pillar that bore the weight of heaven. Around it wound a gently inclined ramp, cut into the side, that banded the tower like the leather strip wrapped around the handle of a whip. No; upon looking again, Hillalum saw that there were two ramps, and they were intertwined. The outer edge of each ramp was studded with pillars, not thick but broad, to provide some shade behind them. In running his gaze up the tower, he saw alternating bands, ramp, brick, ramp, brick, until they could no longer be distinguished. And still the tower rose up and up, farther than the eye could see; Hillalum blinked, and squinted, and grew dizzy. He stumbled backwards a couple steps, and turned away with a shudder.

Hillalum thought of the story told to him in childhood, the tale following that of the Deluge. It told of how men had once again populated all the corners of the earth,

inhabiting more lands than they ever had before. How men had sailed to the edges of the world, and seen the ocean falling away into the mist to join the black waters of the Abyss far below. How men had thus realized the extent of the earth, and felt it to be small, and desired to see what lay beyond its borders, all the rest of Yahweh's Creation. How they looked skyward, and wondered about Yahweh's dwelling place, above the reservoirs that contained the waters of heaven. And how, many centuries ago, there began the construction of the tower, a pillar to heaven, a stair that men might ascend to see the works of Yahweh, and that Yahweh might descend to see the works of men.

It had always seemed inspiring to Hillalum, a tale of thousands of men toiling ceaselessly, but with joy, for they worked to know Yahweh better. He had been excited when the Babylonians came to Elam looking for miners. Yet now that he stood at the base of the tower, his senses rebelled, insisting that nothing should stand so high. He didn't feel as if he were on the earth when he looked up along the tower.

Should he climb such a thing?

On the morning of the climb, the second platform was covered, edge to edge, with stout two-wheeled carts arranged in rows. Many were loaded with nothing but food of all sorts: sacks filled with barley, wheat, lentils, onions, dates, cucumbers, loaves of bread, dried fish. There were countless giant clay jars of water, date wine, beer, goat's milk, palm oil. Other carts were loaded with such goods as might be sold at a bazaar: bronze vessels, reed baskets, bolts of linen, wooden stools and tables. There was also a fattened ox and a goat that some priests were fitting with hoods so that they could not see to either side, and would not be afraid on the climb. They would be sacrificed when they reached the top.

Then there were the carts loaded with the miners' picks and hammers, and the makings for a small forge. Their foreman had also ordered a number of carts be loaded with wood and sheaves of reeds.

Lugatum stood next to a cart, securing the ropes that held the wood. Hillalum walked up to him. 'From where did this wood come? I saw no forests after we left Elam.'

'There is a forest of trees to the north, which was planted when the tower was begun. The cut timber is floated down the Euphrates.'

'You planted an entire *forest*?'

'When they began the tower, the architects knew that far more wood would be needed to fuel the kilns than could be found on the plain, so they had a forest of trees planted. There are crews whose job is to provide water, and plant one new tree for each that is cut.'

Hillalum was astonished. 'And that provides all the wood needed?'

'Most of it. Many other forests in the north have been cut as well, and their wood brought down the river.' He inspected the wheels of the cart, uncorked a leather bottle he carried, and poured a little oil between the wheel and axle.

Nanni walked over to them, staring at the streets of Babylon laid out before them. 'I've never before been even this high, that I can look down upon a city.'

'Nor have I,' said Hillalum, but Lugatum simply laughed.

'Come along. All of the carts are ready.'

Soon all the men were paired up and matched with a cart. The men stood between the cart's two pull rods, which had rope loops for pulling. The carts pulled by the miners were mixed in with those of the regular pullers, to ensure that they would keep the proper pace. Lugatum and another puller had the cart right behind that of Hillalum and Nanni.

‘Remember,’ said Lugatum, ‘stay about ten cubits behind the cart in front of you. The man on the right does all the pulling when you turn corners, and you’ll switch every hour.’

Pullers were beginning to lead their carts up the ramp. Hillalum and Nanni bent down and slung the ropes of their cart over their opposite shoulders. They stood up together, raising the front end of the cart off the pavement.

‘Now *pull*,’ called Lugatum.

They leaned forward against the ropes, and the cart began rolling. Once it was moving, pulling seemed to be easy enough, and they wound their way around the platform. Then they reached the ramp, and they again had to lean deeply.

‘This is a light wagon?’ muttered Hillalum.

The ramp was wide enough for a single man to walk beside a cart if he had to pass. The surface was paved with brick, with two grooves worn deep by centuries of wheels. Above their heads, the ceiling rose in a corbelled vault, with the wide, square bricks arranged in overlapping layers until they met in the middle. The pillars on the right were broad enough to make the ramp seem a bit like a tunnel. If one didn’t look off to the side, there was little sense of being on a tower.

‘Do you sing when you mine?’ asked Lugatum.

‘When the stone is soft,’ said Nanni.

‘Sing one of your mining songs, then.’

The call went down to the other miners, and before long the entire crew was singing.

As the shadows shortened, they ascended higher and higher. Shaded from the sun, with only clear air surrounding them, it was much cooler than in the narrow alleys of a city at ground level, where the heat at midday could kill lizards as they scurried across the street. Looking

out to the side, the miners could see the dark Euphrates, and the green fields stretching out for leagues, crossed by canals that glinted in the sunlight. The city of Babylon was an intricate pattern of closely set streets and buildings, dazzling with gypsum whitewash; less and less of it was visible, as it seemingly drew nearer the base of the tower.

Hillalum was again pulling on the right-hand rope, nearer the edge, when he heard some shouting from the upward ramp one level below. He thought of stopping and looking down the side, but he didn't wish to interrupt their pace, and he wouldn't be able to see the lower ramp clearly anyway. 'What's happening down there?' he called to Lugatum behind him.

'One of your fellow miners fears the height. There is occasionally such a man among those who climb for the first time. Such a man embraces the floor, and cannot ascend further. Few feel it so soon, though.'

Hillalum understood. 'We know of a similar fear, among those who would be miners. Some men cannot bear to enter the mines, for fear that they will be buried.'

'Really?' called Lugatum. 'I had not heard of that. How do you yourself feel about the height?'

'I feel nothing.' But he glanced at Nanni, and they both knew the truth.

'You feel nervousness in your palms, don't you?' whispered Nanni.

Hillalum rubbed his hands on the coarse fibers of the rope, and nodded.

'I felt it too, earlier, when I was closer to the edge.'

'Perhaps we should go hooded, like the ox and the goat,' muttered Hillalum jokingly.

'Do you think we too will fear the height, when we climb further?'

Hillalum considered. That one of their comrades should feel the fear so soon did not bode well. He shook it off; thousands climbed with no fear, and it would be foolish to

let one miner's fear infect them all. 'We are merely unaccustomed. We will have months to grow used to the height. By the time we reach the top of the tower, we will wish it were taller.'

'No,' said Nanni. 'I don't think I'll wish to pull this any further.' They both laughed.

In the evening they ate a meal of barley and onions and lentils, and slept inside narrow corridors that penetrated into the body of the tower. When they woke the next morning, the miners were scarcely able to walk, so sore were their legs. The pullers laughed, and gave them salve to rub into their muscles, and redistributed the load on the carts to reduce the miners' burden.

By now, looking down the side turned Hillalum's knees to water. A wind blew steadily at this height, and he anticipated that it would grow stronger as they climbed. He wondered if anyone had ever been blown off the tower in a moment of carelessness. And the fall; a man would have time to say a prayer before he hit the ground. Hillalum shuddered at the thought.

Aside from the soreness in the miners' legs, the second day was similar to the first. They were able to see much farther now, and the breadth of land visible was stunning; the deserts beyond the fields were visible, and caravans appeared to be little more than lines of insects. No other miner feared the height so greatly that he couldn't continue, and their ascent proceeded all day without incident.

On the third day, the miners' legs had not improved, and Hillalum felt like a crippled old man. Only on the fourth day did their legs feel better, and they were pulling their original loads again. Their climb continued until the evening, when they met the second crew of pullers leading empty carts rapidly along the downward ramp. The upward

and downward ramps wound around each other without touching, but they were joined by the corridors through the tower's body. When the crews had intertwined thoroughly on the two ramps, they crossed over to exchange carts.

The miners were introduced to the pullers of the second crew, and they all talked and ate together that night. The next morning, the first crew readied the empty carts for their return to Babylon, and Lugatum bid farewell to Hillalum and Nanni.

'Take care of your cart. It has climbed the entire height of the tower, more times than any man.'

'Do you envy the cart, too?' asked Nanni.

'No, because every time it reaches the top, it must come all the way back down. I could not bear to do that.'

When the second crew stopped at the end of the day, the puller of the cart behind Hillalum and Nanni came over to show them something. His name was Kudda.

'You have never seen the sun set at this height. Come, look.' The puller went to the edge and sat down, his legs hanging over the side. He saw that they hesitated. 'Come. You can lie down and peer over the edge, if you like.' Hillalum did not wish to seem like a fearful child, but he could not bring himself to sit at a cliff face that stretched for thousands of cubits below his feet. He lay down on his belly, with only his head at the edge. Nanni joined him.

'When the sun is about to set, look down the side of the tower.' Hillalum glanced downward, and then quickly looked to the horizon.

'What is different about the way the sun sets here?'

'Consider, when the sun sinks behind the peaks of the mountains to the west, it grows dark down on the plain of Shinar. Yet here, we are higher than the mountaintops, so we can still see the sun. The sun must descend further for us to see night.'

Hillalum's jaw dropped as he understood. 'The shadows of the mountains mark the beginning of night. Night falls on the earth before it does here.'

Kudda nodded. 'You can watch night travel up the tower, from the ground up to the sky. It moves quickly, but you should be able to see it.'

He watched the red globe of the sun for a minute, and then looked down and pointed. 'Now!'

Hillalum and Nanni looked down. At the base of the immense pillar, tiny Babylon was in shadow. Then the darkness climbed the tower, like a canopy unfurling upward. It moved slowly enough that Hillalum felt he could count the moments passing, but then it grew faster as it approached, until it raced past them faster than he could blink, and they were in twilight.

Hillalum rolled over and looked up, in time to see darkness rapidly ascend the rest of the tower. Gradually, the sky grew dimmer as the sun sank beneath the edge of the world, far away.

'Quite a sight, is it not?' said Kudda.

Hillalum said nothing. For the first time, he knew night for what it was: the shadow of the earth itself, cast against the sky.

After climbing for two more days, Hillalum had grown more accustomed to the height. Though they were the better part of a league straight up, he could bear to stand at the edge of the ramp and look down the tower. He held on to one of the pillars at the edge, and cautiously leaned out to look upward. He noticed that the tower no longer looked like a smooth pillar.

He asked Kudda, 'The tower seems to widen further up. How can that be?'

'Look more closely. There are wooden balconies reaching out from the sides. They are made of cypress, and

suspended by ropes of flax.'

Hillalum squinted. 'Balconies? What are they for?'

'They have soil spread on them, so people may grow vegetables. At this height water is scarce, so onions are most commonly grown. Higher up, where there is more rain, you'll see beans.'

Nanni asked, 'How can there be rain above that does not just fall here?'

Kudda was surprised at him. 'It dries in the air as it falls, of course.'

'Oh, of course.' Nanni shrugged.

By the end of the next day they reached the level of the balconies. They were flat platforms, dense with onions, supported by heavy ropes from the tower wall above, just below the next tier of balconies. On each level the interior of the tower had several narrow rooms inside, in which the families of the pullers lived. Women could be seen sitting in the doorways sewing tunics, or out in the gardens digging up bulbs. Children chased each other up and down the ramps, weaving amidst the pullers' carts, and running along the edge of the balconies without fear. The tower dwellers could easily pick out the miners, and they all smiled and waved.

When it came time for the evening meal, all the carts were set down and food and other goods were taken off to be used by the people here. The pullers greeted their families, and invited the miners to join them for the evening meal. Hillalum and Nanni ate with the family of Kudda, and they enjoyed a fine meal of dried fish, bread, date wine, and fruit.

Hillalum saw that this section of the tower formed a tiny kind of town, laid out in a line between two streets, the upward and downward ramps. There was a temple, in which the rituals for the festivals were performed; there were magistrates, who settled disputes; there were shops, which were stocked by the caravan. Of course, the town

was inseparable from the caravan: neither could exist without the other. And yet any caravan was essentially a journey, a thing that began at one place and ended at another. This town was never intended as a permanent place, it was merely part of a centuries-long journey.

After dinner, he asked Kudda and his family, 'Have any of you ever visited Babylon?'

Kudda's wife, Alitum, answered, 'No, why would we? It's a long climb, and we have all we need here.'

'You have no desire to actually walk on the earth?'

Kudda shrugged. 'We live on the road to heaven; all the work that we do is to extend it further. When we leave the tower, we will take the upward ramp, not the downward.'

As the miners ascended, in the course of time there came the day when the tower appeared to be the same when one looked upward or downward from the ramp's edge. Below, the tower's shaft shrank to nothing long before it seemed to reach the plain below. Likewise, the miners were still far from being able to see the top. All that was visible was a length of the tower. To look up or down was frightening, for the reassurance of continuity was gone; they were no longer part of the ground. The tower might have been a thread suspended in the air, unattached to either earth or to heaven.

There were moments during this section of the climb when Hillalum despaired, feeling displaced and estranged from the world; it was as if the earth had rejected him for his faithlessness, while heaven disdained to accept him. He wished Yahweh would give a sign, to let men know that their venture was approved; otherwise how could they stay in a place that offered so little welcome to the spirit?

The tower dwellers at this altitude felt no unease with their station; they always greeted the miners warmly and wished them luck with their task at the vault. They lived

inside the damp mists of clouds, they saw storms from below and from above, they harvested crops from the air, and they never feared that this was an improper place for men to be. There were no divine assurances or encouragements to be had, but the people never knew a moment's doubt.

With the passage of the weeks, the sun and moon peaked lower and lower in their daily journeys. The moon flooded the south side of the tower with its silver radiance, glowing like the eye of Yahweh peering at them. Before long, they were at precisely the same level as the moon when it passed; they had reached the height of the first of the celestial bodies. They squinted at the moon's pitted face, marveled at its stately motion that scorned any support.

Then they approached the sun. It was the summer season, when the sun appears nearly overhead from Babylon, making it pass close by the tower at this height. No families lived in this section of the tower, nor were there any balconies, since the heat was enough to roast barley. The mortar between the tower's bricks was no longer bitumen, which would have softened and flowed, but clay, which had been virtually baked by the heat. As protection against the day temperatures, the pillars had been widened until they formed a nearly continuous wall, enclosing the ramp into a tunnel with only narrow slots admitting the whistling wind and blades of golden light.

The crews of pullers had been spaced regularly up to this point, but here an adjustment was necessary. They started out earlier and earlier each morning, to gain more darkness for when they pulled. When they were at the level of the sun, they traveled entirely at night. During the day, they tried to sleep, naked and sweating in the hot breeze. The miners worried that if they did manage to sleep, they would be baked to death before they awoke. But the pullers had made the journey many times, and never lost a man, and

eventually they passed above the sun's level, where things were as they had been below.

Now the light of day shone *upward*, which seemed unnatural to the utmost. The balconies had planks removed from them so that the sunlight could shine through, with soil on the walkways that remained; the plants grew sideways and downward, bending over to catch the sun's rays.

Then they drew near the level of the stars, small fiery spheres spread on all sides. Hillalum had expected them to be spread more thickly, but even with the tiny stars invisible from the ground, they seemed to be thinly scattered. They were not all set at the same height, but instead occupied the next few leagues above. It was difficult to tell how far they were, since there was no indication of their size, but occasionally one would make a close approach, evidencing its astonishing speed. Hillalum realized that all the objects in the sky hurtled by with similar speed, in order to travel the world from edge to edge in a day's time.

During the day, the sky was a much paler blue than it appeared from the earth, a sign they were nearing the vault. When studying the sky, Hillalum was startled to see that there were stars visible during the day. They couldn't be seen from the earth amidst the glare of the sun, but from this altitude they were quite distinct.

One day Nanni came to him hurriedly and said, 'A star has hit the tower!'

'What!' Hillalum looked around, panicked, feeling like he had been struck by a blow.

'No, not now. It was long ago, more than a century. One of the tower dwellers is telling the story; his grandfather was there.'

They went inside the corridors and saw several miners seated around a wizened old man. '—lodged itself in the

bricks about half a league above here. You can still see the scar it left; it's like a giant pockmark.'

'What happened to the star?'

'It burned and sizzled, and was too bright to look upon. Men considered prying it out, so that it might resume its course, but it was too hot to approach closely, and they dared not quench it. After weeks it cooled into a knotted mass of black heaven-metal, as large as a man could wrap his arms around.'

'So large?' said Nanni, his voice full of awe. When stars fell to the earth of their own accord, small lumps of heaven-metal were sometimes found, tougher than the finest bronze. The metal could not be melted for casting, so it was worked by hammering when heated red; amulets were made from it.

'Indeed, no one had ever heard of a mass of this size found on the earth. Can you imagine the tools that could be made from it!'

'You did not try to hammer it into tools, did you?' asked Hillalum, horrified.

'Oh no. Men were frightened to touch it. Everyone descended from the tower, waiting for retribution from Yahweh for disturbing the workings of Creation. They waited for months, but no sign came. Eventually they returned, and pried out the star. It sits in a temple in the city below.'

There was silence. Then one of the miners said, 'I have never heard of this in the stories of the tower.'

'It was a transgression, something not spoken of.'

As they climbed higher up the tower, the sky grew lighter in color, until one morning Hillalum awoke and stood at the edge and yelled from shock: what had before seemed a pale sky now appeared to be a white ceiling stretched far above their heads. They were close enough now to perceive the

vault of heaven, to see it as a solid carapace enclosing all the sky. All of the miners spoke in hushed tones, staring up like idiots, while the tower dwellers laughed at them.

As they continued to climb, they were startled at how *near* they actually were. The blankness of the vault's face had deceived them, making it undetectable until it appeared, abruptly, seeming just above their heads. Now instead of climbing into the sky, they climbed up to a featureless plain that stretched endlessly in all directions.

All of Hillalum's senses were disoriented by the sight of it. Sometimes when he looked at the vault, he felt as if the world had flipped around somehow, and if he lost his footing he would fall upward to meet it. When the vault did appear to rest above his head, it had an oppressive *weight*. The vault was a stratum as heavy as all the world, yet utterly without support, and he feared what he never had in the mines: that the ceiling would collapse upon him.

Too, there were moments when it appeared as if the vault were a vertical cliff face of unimaginable height rising before him, and the dim earth behind him was another like it, and the tower was a cable stretched taut between the two. Or worst of all, for an instant it seemed that there was no up and no down, and his body did not know which way it was drawn. It was like fearing the height, but much worse. Often he would wake from an unrestful sleep, to find himself sweating and his fingers cramped, trying to clutch the brick floor.

Nanni and many of the other miners were bleary-eyed too, though no one spoke of what disturbed their sleep. Their ascent grew slower, instead of faster as their foreman Beli had expected; the sight of the vault inspired unease rather than eagerness. The regular pullers became impatient with them. Hillalum wondered what sort of people were forged by living under such conditions; how did they escape madness? Did they grow accustomed to

this? Would the children born under a solid sky scream if they saw the ground beneath their feet?

Perhaps men were not meant to live in such a place. If their own natures restrained them from approaching heaven too closely, then men should remain on the earth.

When they reached the summit of the tower, the disorientation faded, or perhaps they had grown immune. Here, standing upon the square platform of the top, the miners gazed upon the most awesome scene ever glimpsed by men: far below them lay a tapestry of soil and sea, veiled by mist, rolling out in all directions to the limit of the eye. Just above them hung the roof of the world itself, the absolute upper demarcation of the sky, guaranteeing their vantage point as the highest possible. Here was as much of Creation as could be apprehended at once.

The priests led a prayer to Yahweh; they gave thanks that they were permitted to see so much, and begged forgiveness for their desire to see more.

And at the top, the bricks were laid. One could catch the rich, raw smell of tar, rising out of the heated cauldrons in which the lumps of bitumen were melted. It was the most earthy odor the miners had smelled in four months, and their nostrils were desperate to catch a whiff before it was whipped away by the wind. Here at the summit, where the ooze that had once seeped from the earth's cracks now grew solid to hold bricks in place, the earth was growing a limb into the sky.

Here worked the bricklayers, the men smeared with bitumen who mixed the mortar and deftly set the heavy bricks with absolute precision. More than anyone else, these men could not permit themselves to experience dizziness when they saw the vault, for the tower could not vary a finger's width from the vertical. They were nearing

the end of their task, finally, and after four months of climbing, the miners were ready to begin theirs.

The Egyptians arrived shortly afterwards. They were dark of skin and slight of build, and had sparsely bearded chins. They had pulled carts filled with dolerite hammers, and bronze tools, and wooden wedges. Their foreman was named Senmut, and he conferred with Beli, the Elamites' foreman, on how they would penetrate the vault. The Egyptians built a forge with what they had brought, as did the Elamites, for recasting the bronze tools that would be blunted during the mining.

The vault itself remained just above a man's outstretched fingertips; it felt smooth and cool when one leapt up to touch it. It seemed to be made of fine-grained white granite, unmarred and utterly featureless. And therein lay the problem.

Long ago, Yahweh had released the Deluge, unleashing waters from both below and above; the waters of the Abyss had burst forth from the springs of the earth, and the waters of heaven had poured through the sluice gates in the vault. Now men saw the vault closely, but there were no sluice gates discernible. They squinted at the surface in all directions, but no openings, no windows, no seams interrupted the granite plain.

It seemed that their tower met the vault at a point between any reservoirs, which was fortunate indeed. If a sluice gate had been visible, they would have had to risk breaking it open and emptying the reservoir. That would mean rain for Shinar, out of season and heavier than the winter rains; it would cause flooding along the Euphrates. The rain would most likely end when the reservoir was emptied, but there was always the possibility that Yahweh would punish them and continue the rain until the tower fell and Babylon was dissolved into mud.

Even though there were no visible gates, a risk still existed. Perhaps the gates had no seams perceptible to

mortal eyes, and a reservoir lay directly above them. Or perhaps the reservoirs were huge, so that even if the nearest sluice gates were many leagues away, a reservoir still lay above them.

There was much debate over how best to proceed.

‘Surely Yahweh will not wash away the tower,’ argued Qurdusa, one of the bricklayers. ‘If the tower were sacrilege, Yahweh would have destroyed it earlier. Yet in all the centuries we’ve been working, we have never seen the slightest sign of Yahweh’s displeasure. Yahweh will drain any reservoir before we penetrate it.’

‘If Yahweh looked upon this venture with such favor, there would already be a stairway ready-made for us in the vault,’ countered Eluti, an Elamite. ‘Yahweh will neither help or hinder us; if we penetrate a reservoir, we will face the onrush of its waters.’

Hillalum could not keep his doubts silent at such a time. ‘And if the waters are endless?’ he asked. ‘Yahweh may not punish us, but Yahweh may allow us to bring our judgment upon ourselves.’

‘Elamite,’ said Qurdusa, ‘even as a newcomer to the tower, you should know better than that. We labor for our love of Yahweh, we have done so for all our lives, and so have our fathers for generations back. Men as righteous as we could not be judged harshly.’

‘It is true that we work with the purest of aims, but that doesn’t mean we have worked wisely. Did men truly choose the correct path when they opted to live their lives away from the soil from which they were shaped? Never has Yahweh said that the choice was proper. Now we stand ready to break open heaven, even when we know that water lies above us. If we are misguided, how can we be sure Yahweh will protect us from our own errors?’

‘Hillalum advises caution, and I agree,’ said Beli. ‘We must ensure that we do not bring a second Deluge upon the world, nor even dangerous rains upon Shinar. I have

conferred with Senmut of the Egyptians, and he has shown me designs which they have employed to seal the tombs of their kings. I believe their methods can provide us with safety when we begin digging.'

The priests sacrificed the ox and the goat in a ceremony in which many sacred words were spoken and much incense was burned, and the miners began work.

Long before the miners reached the vault it had been obvious that simple digging with hammers and picks would be impractical: even if they were tunneling horizontally, they would make no more than two fingers' width of progress a day through granite, and tunneling upward would be far, far slower. Instead, they employed fire-setting.

With the wood they had brought, a bonfire was built below the chosen point of the vault, and fed steadily for a day. Before the heat of the flames, the stone cracked and spalled. After letting the fire burn out, the miners splashed water onto the stone to further the cracking. They could then break the stone into large pieces, which fell heavily onto the tower. In this manner they could progress the better part of a cubit for each day the fire burned.

The tunnel did not rise straight up, but at the angle a staircase takes, so that they could build a ramp of steps up from the tower to meet it. The fire-setting left the walls and floor smooth; the men built a frame of wooden steps underfoot, so that they would not slide back down. They used a platform of baked bricks to support the bonfire at the tunnel's end.

After the tunnel rose ten cubits into the vault, they leveled it out and widened it to form a room. After the miners had removed all the stone that had been weakened by the fire, the Egyptians began work. They used no fire in

their quarrying. With only their dolerite balls and hammers, they began to build a sliding door of granite.

They first chipped away stone to cut an immense block of granite out of one wall. Hillalum and the other miners tried to help, but found it very difficult: one did not wear away the stone by grinding, but instead pounded chips off, using hammer blows of one strength alone, and lighter or heavier ones would not do.

After some weeks, the block was ready. It stood taller than a man, and was even wider than that. To free it from the floor, they cut slots around the base of the stone and pounded in dry wooden wedges. Then they pounded thinner wedges into the first wedges to split them, and poured water into the cracks so that the wood would swell. In a few hours, a crack traveled into the stone, and the block was freed.

At the rear of the room, on the right-hand side, the miners burned out a narrow upward-sloping corridor, and in the floor in front of the chamber entrance they dug a downward-sloping channel into the floor for a cubit. Thus there was a smooth continuous ramp that cut across the floor immediately in front of the entrance, and ended just to its left. On this ramp the Egyptians loaded the block of granite. They dragged and pushed the block up into the side corridor, where it just barely fit, and propped it in place with a stack of flat mud bricks braced against the bottom of the left wall, like a pillar lying on the ramp.

With the sliding stone to hold back the waters, it was safe for the miners to continue tunneling. If they broke into a reservoir and the waters of heaven began pouring down into the tunnel, they would break the bricks one by one, and the stone would slide down until it rested in the recess in the floor, utterly blocking the doorway. If the waters flooded in with such force that they washed men out of the tunnels, the mud bricks would gradually dissolve, and again the stone would slide down. The waters would be retained,

and the miners could then begin a new tunnel in another direction, to avoid the reservoir.

The miners again used fire-setting to continue the tunnel, beginning at the far end of the room. To aid the circulation of air within the vault, ox hides were stretched on tall frames of wood, and placed obliquely on either side of the tunnel entrance at the top of the tower. Thus the steady wind that blew underneath the vault of heaven was guided upward into the tunnel; it kept the fire blazing, and it cleared the air after the fire was extinguished, so that the miners could dig without breathing smoke.

The Egyptians did not stop working once the sliding stone was in place. While the miners swung their picks at the tunnel's end, the Egyptians labored at the task of cutting a stair into the solid stone, to replace the wooden steps. This they did with the wooden wedges, and the blocks they removed from the sloping floor left steps in their place.

Thus the miners worked, extending the tunnel on and on. The tunnel always ascended, though it reversed direction regularly like a thread in a giant stitch, so that its general path was straight up. They built other sliding door rooms, so that only the uppermost segment of the tunnel would be flooded if they penetrated a reservoir. They cut channels in the vault's surface from which they hung walkways and platforms; starting from these platforms, well away from the tower, they dug side tunnels, which joined the main tunnel deep inside. The wind was guided through these to provide ventilation, clearing the smoke from deep inside the tunnel.

For years the labor continued. The pulling crews no longer hauled bricks, but wood and water for the fire-setting. People came to inhabit those tunnels just inside the vault's surface, and on hanging platforms they grew

downward-bending vegetables. The miners lived there at the border of heaven; some married, and raised children. Few ever set foot on the earth again.

With a wet cloth wrapped around his face, Hillalum climbed down from wooden steps onto stone, having just fed some more wood to the bonfire at the tunnel's end. The fire would continue for many hours, and he would wait in the lower tunnels, where the wind was not thick with smoke.

Then there was a distant sound of shattering, the sound of a mountain of stone being split through, and then a steadily growing roar. And then a torrent of water came rushing down the tunnel.

For a moment, Hillalum was frozen in horror. The water, shockingly cold, slammed into his legs, knocking him down. He rose to his feet, gasping for breath, leaning against the current, clutching at the steps.

They had hit a reservoir.

He had to descend below the highest sliding door, before it was closed. His legs wished to leap down the steps, but he knew he couldn't remain on his feet if he did, and being swept down by the raging current would likely batter him to death. Going as fast as he dared, he took the steps one by one.

He slipped several times, sliding down as many as a dozen steps each time; the stone steps scraped against his back, but he felt no pain. All the while he was certain the tunnel would collapse and crush him, or else the entire vault would split open, and the sky would gape beneath his feet, and he would fall down to earth amidst the heavenly rain. Yahweh's punishment had come, a second Deluge.

How much further until he reached the sliding stone? The tunnel seemed to stretch on and on, and the waters were pouring down even faster now. He was virtually running down the steps.