

SUMMER SOLSTICE

Charles L. Harness

We turn now to the past, more than two thousand years ago in Egypt, when Eratosthenes was first proving that our world is round. His contention (which he worked out mathematically to a surprising degree of accuracy) was of course heresy at the time... but what if an alien from an advanced star-race had been present to aid Eratosthenes? "Summer Solstice" tells the results with delightful historical accuracy, plus more.

Charles L. Harness has quietly been writing science fiction stories for nearly forty years; they've all been outstanding, including such novels as *The Rose*, *Firebird*, and *The Venetian Court*.

1. The Ship Is Hit

Even as the sleeper lid rose, Khor could see the console lights flashing and he could hear the intermittent buzzer.

The break-sleep alarm. Very often the last sound some spacemen ever heard. His blood pressure began to mount. He wasn't even completely awake, and his body was doing this to him. He shuddered. He would not see home again. Never again the stern Zoology Supervisor. ("What, Khor, still no featherless biped?" And Queva... she had taken the sleep, to wait for him. Beloved Queva. She had given him the key to her casket. "You alone will open. Else I sleep forever." No, Queva, no, no, no... I may never return. But she had done it. The female mind... beyond all comprehension. Well, my friend, what now?)

He deciphered the alarm code mentally as he clambered up from the cushions: the hydraulic system had

been hit, aft. Bad, bad. He had a dreadful premonition of what he would find. Get to it. Know the worst.

He ran a finger around his helmet seal, brushing his scapular feathers. Still air-tight. Next he sat on the side of the casket and wondered whether he should remove his helmet. He decided to leave it on. At least for the moment he wouldn't have to make any decisions about cabin pressure and oxygen.

The alarms-all of them-had now become impatient with him. They had moved from console and wall and had invaded his guts and brain like barbed parasites. "Xeris and Mord," he groaned.

He reached for his heat-suit and simultaneously glanced at the ceiling meter. How long had he been under? Forty cycles. Long time. He closed the suit up and clumped over to the console. First turn off thatpflicht alarm. Now back to the tail of the ship.

Air pressure apparently holding. Which meant the hole in the ship wall self-sealed in good order. The missile-a meteorite?-couldn't have been too big. So why hadn't internal automatic repair handled the problem? As he rounded the passage, the answer literally hit him in the face. A jet of oil struck his visor. The pin hackles on his neck and face stood out in panic. By reflex his hands grabbed the valve wheel and extinguished the flow. He wiped his visor with his sleeve. "By the egg that bore me!" He felt sick. How much fluid had he lost? From the looks of the balls of glop floating weightlessly around him, at least half. How was it possible? Not just one leak? He played the inspection light along the piping array. The whole tubular system was dripping. Some of the holes were big enough to see. Others were microscopic, hiding behind tiny globules of fluid. The meteorite had evidently struck a brittle section of the ship wall, which then had imploded into a thousand high-velocity fragments. He had warned Maintenance last time in. The skin was fatiguing. The chief mechanic had laughed at him.

He sighed and looked around. Oil everywhere. Mocking clusters. All sizes.

Where could he find make-up fluid in this Zaforsaken corner of the galaxy? And repair-tape? He'd used the last of his tape on the solar batteries... how many cycles ago?

"Khor," he muttered gloomily, "you sorry misbegotten space scavenger, you are in serious trouble." He'd have to land. Very funny. (You had to have a sense of humor for these collection missions.) To land, he'd have to find a planet. And not just any planet. One with a civilization sufficiently advanced to supply his needs.

He shuffled back through the collection area, toward the control room. He passed the cage with the ten-legged carnivorous reptile, now quietly sleeping its drugged sleep in the corner. Past the telepathic tree that had tried to charm him into its gluey branches as its next meal. Past the floating head-size ball of fluff that seemed to have no mouth, no food, and no alimentary system, but which had doubled in size since he had first captured it on Sargus-VI. And finally the empty cage: "Featherless biped." Where in the name of Xippor the Remorseless was he to find such an unlikely specimen? You can at least try, the Supervisor had admonished him. There are a lot of unexplored planets out there.

And so to the pilot-console, where he activated the chart screen. Nearest star... there we are. Yellow, medium size. Third generation. Has all ninety-two elements. How about planets? Big one. Too big. And too far out. Also that one with the gorgeous ring. No. The red one? No air. Next. There's one... plenty of water, probably good air. Life? Maybe. Civilization? Maybe. Go on. Two more. Both too hot. Back up to III. No choice, really. I'm going in.

2. Ne-tiy Introspects

Ne-tiy knelt and stared into the mirroring surface of the lotus-pool. She liked what she saw: a young woman of excellent figure, with a face possibly bordering on the beautiful. That figure was sheathed in the classic linen tube, falling almost to her sandals, and supported by broad shoulder straps covering her breasts.

She touched her cheeks just below the eyes. There was a certain sadness about her eyes. She would like to use a little kohl at the corners for cheerful emphasis, and perhaps a little red iron oxide to highlight her cheeks, but her owner, the great priest, had strictly forbidden it. "You live for one thing, and that is not to adorn yourself." And what was that one thing? If and when the priest gave the signal, she was to offer the poisoned wine to a certain person.

She tried hard not to think about it. But it was no use. She could think of nothing else.

The priest, who served only the sun-god Horus, had bought her in the slave market at On, ten years ago. Her parents had been imprisoned for debt, and she had been turned over to the temple of the cat goddess, Bast. And then things had become blurred. She remembered she had cried a lot. Things had been done to her. In the end she knew only fear, hate, and that she was going to endure.

And then the great inquisitor priest, Hor-ent-yotf, had bought her, and had taught her certain skills. "You will enter the house of the Librarian," he had said. "You will listen to all that he does and says."

"Why, my lord?"

"Why is not your concern?"

But she knew why. Hor-ent-yotf (the name meant avenger of the father of Horus) was licensed by the Greek pharaoh to sniff out heresy and impiety in the low and the high. Especially in the high, for they were the most influential. Anything demeaning the sun-god Horus was suspect. The penalty was death. She shivered.

If she were called upon to kill Eratosthenes, what would she do?

For six months she had lived as a trusted servant in his house. He knew horses, and had taught her. She had driven his chariot. He liked that. His family raised thoroughbreds, back in Cyrene, where the pasturage was rich and blue-green. When she drove with him, her body rubbed against his within the light wicker framework of the vehicle. Something had awakened within her. And now it had come to this: to be near him was torture, and not to be near him was worse.

She stared down into the pool and passed her fingertips slowly over her abdomen. "How can I ever bear his child? He doesn't know I exist. I need to be rich. I need exalted office. High priestess of some god or other. But it is hopeless, for I am nothing, and I will remain nothing."

A shadow fell on the water. She arose and turned slowly, impassively, head bowed. She did not need to look up. She saw without seeing; the shaven bald pate, eyes lengthened by dark cosmetics, the thin pleated linen skirt with cape, the leopard skin, complete with claws, tail, and fanged, glaring head. His hands hung at his sides. Her eyes rested on his long fingernails.

On his right hand he wore three deaths, shaped as rings, each with its tiny jeweled capsule. First was the copper ring, which had a capsule shaped as Set, the god of darkness. On the middle finger was the silver

ring, bearing the face of the evil goddess Sekhmet, who slew Osiris. Finally was the gold ring, on his fourth finger. Its capsule was a sardonic bow to the Greek conquerors, for it bore the face of their god Charon, who ferried their dead across the River Styx to Hades.

The faint north wind moved a sharp blanket of incense around her face. She realized that it had been the smell that had announced him.

“Where is he?” said Hor-ent-yotf.

“He has gone forth into the streets, my lord.”

“When does he return?”

“In the afternoon.”

“I have reason to think he has found the directions for the tomb of the heretic pharaoh Tut-ankh-amun. Has he mentioned this?”

“No, my lord.”

“Be watchful.”

“Yes, my lord.”

“There is another matter. In a secluded courtyard at the Library he is making a measurement of the disc of Horus. Listen carefully. Let me know if he says anything about it.”

“As my lord wishes.” She listened to the sandals crunching away down the pea-gravel path. Then she turned back to the pool, as though trying to hide in the beauty of the flowered rim. The Greeks had brought strange and beautiful flowers to Alexandria: asphodels, marigolds, a tiny claret-colored vetch, irises purple and deep blue. Purple and white anemones, scarlet poppies.

She wished she were a simple, mindless blossom, required only to be beautiful.

Ah, Hor-ent-yotf, great Avenger, thou demi-god, I know you well. Your mother was impregnated by the ka of Horus the hawk-god, divine bearer of the sun disc. Flights of golden hawks whirred over your house at your birth, calling and whistling to you. So it was said. As a boy apprentice in the temple at Thebes, you saw the glowing god descend from the sun, and he spoke to you. Avenge me, the god said. Find the tomb of Tut-ankh-amun, who married the third daughter of the heretic pharaoh Ikhnoton, who denied me. Destroy that tomb, and all that is within.

So it was said.

She shivered again.

3. Rabbi Ben Shem

Eratosthenes had been wandering the streets for an hour, vaguely aware of the sights, sounds, and smells of Alexandria at high noon.

The Brucheum, the royal quarter of the great city, was totally Greek, as Greek as Athens, or Corinth, or even far Cyrene, where he was born. As thoroughly Greek as the great Alexander had intended, when he strode about this shore opposite the Isle of Pharos, a bare eighty years ago and said: build the walls here, the temples there, yonder the theatre, gymnasium, baths... The mole, the Heptastadia, was built from the city out to the island, dividing the sea into two great harbors. Ptolemy Philadelphus kept his warships in the eastern harbor. Commercial shipping used the western harbor.

Alexandria, the greatest city in the world, the Gem of the Nile, the Pearl of the Mediterranean, was indeed Greek. But more than Greek. All races lived here. Egyptians, of course. And Jews, Nubians, Syrians, Persians, Romans, Carthaginians. (Those last two were quite civil to each other here in the city, though several thousand stadia to the west their countrymen were happily slaughtering each other on Sicily and adjacent seas.)

He was passing now through the northeast sector, along the Street of the Hebrews. The Jews had a specially elegant quarter, a politeumata set aside for them by Alexander himself, in gratitude for their help in his Persian campaigns.

“Greetings.”

He looked up. Was someone calling to him? Yes, there was the rabbi, Elisha ben Shem, coming down the steps of the synagogue. “Greetings, noble Eratosthenes!”

The geometer-librarian bowed graciously. “Peace to the House of Shem! How goes the translation?”

“Oh, very well indeed.” The priest stroked his flowing silver beard and chuckled. “Why I laugh, I do not know. It really isn’t funny.”

Eratosthenes looked doubtful. “Well, then...?”

Ben Shem grinned. “You have to be Jewish to see it, my friend. You and I converse in Greek, the tongue of the Hellenes. I am also fluent in classical Hebrew, in which our Holy Scriptures were written. I can also speak Aramaic and the other local dialects of Judea. But did you know there are forty thousand Jews here in Alexandria who speak, read, and write Greek and only Greek? They can’t read a word of the Books of Moses, and the Psalms of David are mysteries to them.”

“I knew that,” said the man of measures. “That’s why Ptolemy brought seventy scholars from Jerusalem here to translate the Hebrew texts into Greek. Seventy. The Septuagint. Actually, seventy-two, wasn’t it?”

Ben Shem sighed. “Ah, Eratosthenes my dear boy. So learned. So earnest. But think of it! Jews translating Hebrew into Greek for Jews. Where is the subtle sense of irony, the love of paradox, that set your ancestors apart from peasant minds? If you had your way, Achilles would overtake Zeno’s hare with a single pulse beat.”

“Rabbi...”

“Oh, never mind.” He turned his head a little. “You are still attempting to determine the size and shape of the Earth?”

“Yes, still at it.”

“Are you close to a solution?”

“Now, rabbi. You know I must report all findings first to his majesty.”

“Yes, of course.” He cleared his throat. “You will be at the palace tonight? To celebrate the coming of the Nile flood?” They stopped before the residence of the priest.

“I’ll be there,” said Eratosthenes.

4. The Stone Cutter

He crossed the great intersection at the magnificent mauso-lea. Here Alexander was laid to rest, in a marvelous glass-and-gold coffin. And in the tomb adjacent, the first Ptolemy. Beyond, to the west, lay the Rhacotis, originally the haunt of fishermen and pirates. Now, however, eighty years after the Conqueror had paced out the unborn city, it was full of the run-down shops and abodes of artisans, poets (mostly starving), and astrologers, raffish theatres, baths (some clean), slums, and certain facilities for sailors.

And so into the Street of Stone Cutters, and the first shop on the corner. He could hear the strike of chisels well before he entered the work yard. In the center, four slaves stripped to loin cloths chipped away at a copy of the Cnidus Aphrodite. The assistant project master hovered about the crew anxiously, calling, coaxing, occasionally screaming. They all ignored the newcomer. Eratosthenes shrugged and passed on into the shop. Little bells rang somewhere and the man behind the counter looked up, squinting and coughing. Stone dust had long ago impaired his eyes and lungs. “Ah, Eratosthenes,” he muttered, rising. “Greetings, and welcome to my humble shop.” He groaned softly as he tried to bow.

“And greetings to you, good Praphicles. I trust the gods are kind?”

“Alas, great geometer, business is terrible. When our present commissions are completed I expect that we shall starve.”

The visitor smiled. Business was always terrible and starvation always lay in wait for the old fraud. Even in his semi-blindness Praphicles was still the most highly skilled of stone workers in the quarter. He turned away clients, and he owned half the real estate on the waterfront.

“Well, then,” said Eratosthenes dryly, “before the gods utterly abandon you, perhaps we had better conclude our business.”

“Ah yes.” The ancient master reached down into a cupboard under the counter, pulled out the work, and laid it carefully on the cedar surface.

It was a statuette of the Titan Atlas, bent, with arms arched backwards and up, as though already holding his great burden, Earth. It was cut from the famous red granite of Syene. The base held an inscription in Greek, which Eratosthenes verified by reading slowly to himself.

The old sculptor’s eyes never left him.

“It is beautiful,” said the visitor. “The years have not dimmed your hands, old friend. Your fingers grow

even more skillful, if that is possible.” He pulled a purse from his cloak and dropped it to the counter. “The balance.”

Praphicles made no move toward the little leather bag. He said, “The commission was interesting, especially in what was not commissioned.”

“You don’t make sense.”

“The Earth that Atlas will hold... where is it? Who will supply it?”

“I’ll attend to that.”

“And what shape will it be? He is positioned to hold a disc, or a cylinder, or a square. Or perhaps even a sphere.”

Eratosthenes smiled. “How are the wagers running, good Praphicles?”

“Two to one that you will report to his majesty that the Earth is shaped like a disc. Even odds for a cylinder. Three to one against a square. Ten to one against a sphere.” He pushed the bag of staters back to Eratosthenes. “Just give me a hint,” he whispered. “And keep your purse.”

The geometer chuckled, pushed the money back, and picked up the little statue. “I will pray to the gods to save your business, old friend.”

Out again. Still walking west, and getting closer to the Eunostos harbor.

5. The Horoscope

He thought of one of the great Periclean speeches, as recalled (and probably polished up a bit) by Thucydides.

“Each single one of our citizens, in all the manifold aspects of life, is able to show himself the rightful lord and owner of his own person, and do this, moreover, with exceptional grace and exceptional versatility.”

Well, Pericles, perhaps that was the way it was with you and your Athenians, but that’s not the way with me. When my career-nay, my very skin!-is at risk, I feel neither grace nor versatility. I feel afraid. For I have a fair idea already how my calculations are going to come out. When I make my report, a great many people will be very, very upset. Hor-ent-yotf had warned me not to make any measurements whatever involving the sun. “It is heresy,” the priest had said. “Not even a Greek under royal protection may break our religious laws with impunity.”

So why am I here, in this street, at this hour? I know very well why.

But I mustn’t show my anxiety. What would Marcar think? He and I studied together under the Stoic Ariston, in Athens. After that, we went our separate ways. But now here we are again in Alexandria.

Ah, Marcar, thou man of Mesopotamia, part mystic, part mountebank. Which part dominates? No matter. We have always been able to talk together.

And now it was time to be careful. Not against robbers or pickpockets. That wasn't the problem at all. The problem was simply this: he was now in the Street of the Mathematici Chaldaei, and he would just as soon not be recognized. What would the good rabbi say if he saw the highly rational geometer walking into the shop of an astrologer? The holy man would indeed have his cherished laugh!

Eratosthenes pulled his cloak up around his face and began walking in an anonymous shuffle. He was barely halfway down the street when small dirty urchins began tugging at his tunic. "My lord! Beautiful pictures! Naked ladies! All different positions! Mine are best! Painted directly from Ptolemy's harem. No! Straight from Eratosthenes' secret scrolls at the Library! No pictures! Real live women! No waiting! Cheap! My virgin mother! Only twenty drachmas!"

By Zeus and Hera! He struck out at them, but they scattered nimbly, like a flock of water birds.

A strong hand grabbed his sleeve. "In here, you old lecher!"

"Marcar!" He stepped into the antecourt and his host slammed the great door behind them. "Thanks, old fellow. I was coming to see you, anyhow."

"I know." He motioned to the table and chairs.

"You always say that. Actually, you hadn't the faintest idea I would visit you today."

"Maybe not today, exactly. But soon. You say you don't believe in the stars, August Eratosthenes; yet you come here because you are not completely sure. You are curious." He poured two goblets of Persian wine. "So what do you want of me?"

"Nothing. Everything."

The astrologer smiled faintly. "Translating: Does your horoscope predict anything horrible in your immediate future?"

The geometer gave him a hard look. "Well?"

"But the answer would be meaningless to you, friend, because you do not believe in astrology, or horoscopes, or star-fates."

Eratosthenes sighed. "You're right, you know. I can't have it both ways. I can't denounce horoscopes in one breath and ask for mine in the next. But it's always good to see you, Marcar." He started to rise.

The Chaldean waved him back down. "Not so fast. Tarry a bit. Who requires total belief, old friend? Not I. And what is belief, anyway? A curious mix of tradition, garbled facts, superstition, prejudice-and once in a great while, perhaps a little truth thrown in to thoroughly confuse the picture." He sipped at his cup. "Let us clear the air. I suspected you might come. So this morning I constructed your horoscope."

The Greek looked across the table in surprise, but was silent.

"You might at least ask," said Marcar. "You owe me that much."

The librarian smiled. "I ask."

"Well, then. At the outset, please understand that a horoscope makes no absolute predictions, at least of

the type you are thinking about. No chart will ever say to you, Eratosthenes, you will die at sunup tomorrow. At most your chart will say, Eratosthenes, you will be presented with the possibility of dying on such and such a day, and perhaps at such and such an hour.”

“Go on,” said his visitor quietly.

The Mesopotamian shrugged. “You have given the gods much trouble in recent days, and I think that even now the matter is not fully decided. I see Gaea, the Earth goddess. You would strip her naked. You would say, her size and shape are thus and so. I see Cronos, the god of time. You would have lovely naked Gaea turning, turning, turning under the lascivious scrutiny of Cronos. Apollo stands still in the skies, and leers.”

Eratosthenes laughed. “What a marvelous way of saying the Earth rotates and moves around the sun.”

“Ah yes. The heliocentric hypothesis. But that’s only part of the difficulty. The scientific pros and cons are quite beyond me, my esteemed colleague. All I can say is, that’s the problem that brings the risk. May I be blunt?”

“It would be most refreshing.”

“The wrong answer to your present geodetic research may well get you assassinated.”

“By Ptolemy?”

“I don’t read pharaoh... I see a woman... young, beautiful, dedicated.”

“So you know about Ne-tiy. Placed in my house by the Horus-priest, Hor-ent-yotf.”

“Everyone knows. The female cobra within the flower basket. Why don’t you get rid of her?”

“Nonsense. He’d find someone else. Meanwhile, she’s where I can keep an eye on her.”

Marcar shrugged. “That’s up to you, of course. But the risk to your life is not the only matter of significance. There’s another thing.”

“Oh?”

“You will have a visitor. A most remarkable visitor, from a place far away. I am tempted to say he is a god, but I know how you feel about the gods. Like you, Eratosthenes, he faces a great trouble. But you can help him, and he can help you.”

The mathematician chuckled. “Now that, friend from the marshes, is a prediction. Years away, of course. It’s always safe to predict things that happen ten years from now.”

Marcar smiled. “According to the signs, he arrives on the first day of the New Year.”

“There you go again. Which New Year? The New Year when Sirius is first seen in the dawn skies, announcing that the Nile will begin its rise? In fact, tomorrow, in the hour before sunrise? Or do you mean the New Year of the current Egyptian calendar, the first day of Thoth, which is actually two hundred days away? I remind you that the Egyptian calendar is based on 365 days, not 365 and a quarter, as shown by the stars, and that it loses one full year every 1,460 years. The last time the

calendar was right was 1,171 years ago. It won't be right again until 289 years from now. So-which New Year, most noble charlatan?"

Marcar's eyes gleamed. "Your sign is Cancer. And however you calculate it, O great geometer, Cancer begins at midnight tonight, and announces the first day of the summer solstice. In the dark morning skies Sirius will indeed be seen, heralding the New Year, and the awakening of Hapi, which you Greeks call the Nile, with great festivities beginning in all towns and villages the entire length of the river, and continuing for twenty-one days, with carousing, merriment, and consumption of seas of barley beer."

Eratosthenes laughed heartily. "I take it, most astute astrologer, that buried in that Rhea-flood of rhetoric is an assertion that my relevant New Year is within the small hours of tomorrow morning, beginning with Sirius ascendant?"

"Thou seeest all, wise Eratosthenes."

"I see that you are a fraud, more colossal than any pyramid at Gizeh."

"My lord overwhelms me with his flattery." He leaned forward. "Now that your stomach is weak with laughter and your defenses breached, may we talk of your sun-project?"

"It's a bit premature."

"In any case, presumably you have by now determined the shape of the Earth? Perhaps you could tell an old friend?"

"My report goes first to Ptolemy. You know that."

"Of course, of course. Nevertheless, what harm is a hint... in strictest confidence?"

The mapmaker grinned. "I hear the odds are disc, two to one; cylinder, even; three to one against a square; and ten to one against a sphere." He rose to leave. "Later, Marcar. Later. I promise."

"If you live," whispered the astrologer.

The visitor stopped. He turned around slowly. "Have you drawn the horoscope of Hor-ent-yotf?" It was a stab in the dark, a flash-of what? Psychic insight? Stupidity?

Marcar peered at him most strangely. Finally he said, "Why do you ask?"

"Never mind. Really none of my affair." But he knew. The astrologer had lifted the veil on the sinister Egyptian, and he had not understood what he had seen. It was pointless to press the seer further. One thing was certain: the fates of Eratosthenes and Hor-ent-yotf were inextricably interwoven, like designs into a funerary shroud.

He bowed and left.

6. The Shadow

And so home again, away from smells and noises and dirty streets. Eratosthenes nodded to the

gatekeeper and walked up the palm-lined entrance toward the central gardens. He paused under the colonnade and looked out toward the focus of the courtyard. There, as he had ordered, the scribe Bes-lek sat cross-legged in front of the shadow cast by the man-high gnomon, and he was chanting. Bes-lek had selected his own chant, a hymn, really, something addressed to Horus the sun god, a recital not too long, not too short. As the Greek watched, the clerk finished his mumbled litany, dipped his reed pen into the little pot of charcoal ink, and made a tiny dot at the tip of the gnomon shadow on the circular stone flagging. Then he commenced again. "Horus, giver of light, son of Osiris and Isis, shine down upon us in thy journey across the sky..." It was in Egyptian, and between the foreignness of the language and the garbled maundering, the sense was largely lost on the librarian.

Eratosthenes walked up the gravel path toward the chanter. Bes looked up and saw him coming, but his droning mumble did not waver. The geometer looked down at the white flagging with critical eye. Bes sat just outside a concave curve of dots. He had begun about an hour before noon, and now it was about an hour after noon. The dots showed longer shadows at the beginning, growing shorter as noon approached, then growing longer again as midday was passed. The dot closest to the gnomon base would be the one for noon. That was the one to measure. "Bes," he said, "my faithful friend, I can see from the marks that you have made a fine record of the god's overhead course. The matter is complete, except for measuring the noon angle. Get up now, stretch your legs, and then help me with the angle rod."

"Aye, thank you master." The little man groaned with great eloquence as he struggled to his feet. "Such strain, such care. My poor joints. I shall ache for days. For the pain, perhaps my lord could allot two extra puncheons of fine barley beer."

"Two?"

"One for my wife. The dear creature assumes all my pains. And considering that the festivities begin tonight."

"Two, then. Tell the steward. But first, hold the angle rod. Put the point on that inner dot, the one closest to the gnomon. Yes, that's it. Steady, while I rest the upper edge on the top of the gnomon. Fine, fine. A good angle. Now, let me take the precise measurement on the protractor arc. Yes. Seven degrees, twelve minutes, I'll take the rod."

"Is it done, master?"

"One more measurement. I need to know the distance of the dot to the base of the gnomon." He placed the rod at the base of the gnomon and alongside the noon dot. "Hm. Check me here, Bes. What number do you read?"

The scrivener squinted. "It is one and a quarter units, and yet it is a generous quarter."

"We'll call it one and a quarter." He doesn't ask why, thought Eratosthenes. He doesn't wonder. He doesn't care. Not one hoot of the owl of Athena in Hades. He gets his daily bread, with an occasional extra ration of beer. He has his gods and his feast-days, and he's happy. A true son of the Nile. Well, why not? It seems to work for him. He said, "Tell the guard of the kitchen I said to give you three puncheons of good brown khes, suitable for Ptolemy's own table. One for you, one for your wife, and one to lay on the altar of Horus, the hawk-god of the sun, who has favored us today."

Bes bowed low. "The master overwhelms me."

He's not even being sarcastic, thought Eratosthenes. "Go," he said.

And now back to the calculations. The gnomon was ten units high. The leg measurement was one and a quarter. The tangent of the sun angle was therefore one hundred and twenty-five thousandths. What was the angle? It ought to check out pretty close to seven degrees, twelve minutes. He had trigonometric tables in the Library that would give the value. Check. Confirm. Recheck. Pile up the data. It's the only safe way.

Why was he doing this? Who cared whether the earth was a globe? Who cared what size that globe might be? Not Ptolemy Philadelphus, his lord and master, the pharaoh-god, who had brought him here to run the great Library. In fact, Ptolemy had made veiled references to temple pressures. Hor-ent-yotf, the high priest of Horus, was complaining that these studies were demeaning to the hawk-deity and might even foreshadow a revival of monotheism, as attempted by Ikhnaton a thousand years ago. That misguided pharaoh had proclaimed, "There is but one god, and he is Aton, the sun. Pull down all other temples." The crazed pharaoh had been slain and his name obliterated from all monuments. Over the years the tombs of all his descendants, direct and collateral, had been searched out and desecrated.

All except one, mused the geometer. The boy pharaoh, who married the third daughter of the heretic. The youth had been assassinated, of course, and then properly and secretly buried, along with suitable treasures, in a hillside in the necropolis at Thebes. However, before the Aton-haters could find the grave, the tomb of the fourth Rameses was dug in the cliffside just above, and the boy-king's grave was buried under the quarry chips. Eratosthenes had seen the maps and read the reports, and then he had hidden them away.

And why was he thinking of the tomb of Tut-ankh-amun? Because it was knowledge that might save his life.

He passed on into the building and walked through silent halls into the mathematics room. Here he found the scroll of trig tables and ran his finger down the tangent columns. The angle whose tan is one hundred twenty-five thousandths. Here we are. Seven degrees, seven and one-half minutes. I was looking for seven degrees, twelve minutes. Well, not bad. Within experimental error? And how good are these tables? Some day soon, redo the whole thing. Suppose I take the average. Call it seven degrees, ten minutes, or almost exactly $1/50$ of a circle. Base line, Syene to Alexandria, 5,000 stadia.

So if the Earth is a sphere, 5,000 stadia is $1/50$ of its circumference, which is, therefore, 250,000 stadia.

Two hundred and fifty thousand stadia.

That's what the numbers said. But was it really so? Such immensity was inconceivable.

He rubbed his chin in perplexity as he walked over to the big table where his map was spread out. His greatest work. Ptolemy himself had praised it and had accorded the ultimate flattery of reproducing the map in mosaic in the floor of his study. Copyists were turning out duplicates at the rate of one every two weeks, and probably making all sorts of errors in their haste. For which he, the author, would be blamed, of course.

He bent over the sheet.

It had been a magnificent effort, drawn mostly from documents in the library: travelers' reports (especially Herodotus'); terse military accounts; letters; local descriptions; sea captains' logs; census and tax reports. To the west, it showed the Pillars of Hercules; and even beyond that, Cassiterides, the

tin-islands discovered by Himilco the Phoenician. To the east, Persia, conquered by Alexander, and on to India and the Ganges River. And beyond that a mythic land, Seres, where a fine fabric called silk was woven. Then the legend isles of Cipangu (which he didn't even show). But the whole known world, from west to east, was at most 75,000 stadia-less than one-third of the sphere he had just calculated.

And yet he knew his numbers were right.

There was more to the world than he or anyone else had dreamed.

Was the rest simply water? Vast, barren seas? Or, on that other invisible hemisphere, were there balancing land masses, with peoples and cities and strange gods? His heart began to pound. He knew it was futile to speculate like this, but he couldn't help it. Some day...

7. The Light

Khor sniffed the cabin air. Was it going stale? Yes, the CO₂ was definitely building. Which meant the absorbers were very nearly saturated. Why hadn't the alarm sounded? And then he noticed. The purifier bell was ringing. And the proper red light was flashing. Swamped by his other troubles, he just hadn't noticed. Alkali. Did he have any more? No. He re-membered shaking out the last flecks of sodium carbonate from the container. He had tossed the empty box into the disposal.

Was there any chance of finding alkali down there on that watery little planet?

Conserve. Conserve. Breathe slowly, slowly. Khor, you luckless zoologist. Whatever possessed Queva to give you her sleep key? Not very smart of her.

Well, now, Planet III, just what sort of world are you? Is there intelligent life down there, waiting to hand me emergency tape, a barrel of oil (meeting hydraulic spec K-109, of course), and a basket of alkali? And (who knows) maybe they'll hand me a featherless biped as I leave.

How silly can I get?

He watched the 3-D shaper carve out a fist-sized copy of the planet sphere: blue for oceans, brown for continents, white for polar ice. He pulled the ball out of the lathe and studied it. Very, very interesting. How big? No way to tell. All he got was shape and surface. No matter. Maybe he was going to live after all. There had to be something down there. He put the ball in a fold of his space-jacket.

Back now to the screen.

Looking visually. Night-side. But no city lights? No civilization? Take her around again. Another orbit. Try north-south. Nothing? Not yet. Night side again. Maybe I'm too high. Lower... lower still. Watch out! Water! Slow down. I'm over some kind of sea. Hey-a light! A big one! It's a light house! Better switch on my running lights... what's the convention? Alternating red... green... white... blue. Plus a forward search beam. By Zaff, I see buildings. Spread out... a city. Saved!

Where to put down?

8. Arrival

Eratosthenes wrapped his woolen cloak tighter about him as he stared out to sea. It was the last hour of evening and the first of night. Dark sea was indistinguishable from dark sky. The constant north wind pushed back the dubious perfumes of the delta and the royal harbor, to his rear. He inhaled deeply the crisp salt air blowing in from the reefs.

He stood on the balcony of the great light house, on the Isle of Pharos, that long spit of limestone protecting Alexandria from the encroaching Great Green. He was so high, and the air so pure, that he didn't even have to use mosquito ointment.

Ah, Pharos-isle of strange and diverse fortunes! Menelaus, bound homeward from the Trojan War, blown ashore and becalmed by angry Zeus, nearly starved here, with disdainful Helen. So Homer sang. How long ago? Eight centuries, perhaps nine. But then eighty-two years ago the great Alexander came. "A fine island," he said. "It will shelter a new city, over there on the delta." He paced it out, where to put everything. Everything but the final essential building: his tomb. The first Ptolemy had built that and then had brought the body back.

"Eratosthenes." he said to himself, "you're dodging the issue. You're thinking about everything except the problem." Ah, yes. So he had confirmed (in his own mind at least) that the Earth was a sphere, with a circumference of 250,000 stadia. But it was too much. A globe that size! Incredible. Or was it? There was, of course, a rough check, available to anyone. You didn't have to go to Syene. You didn't have to look down a well at high noon, on the day of the solstice. There was another way. Just an approximation, of course.

He walked a slow circuit of the balcony, pondering vaguely the beauty of the night sea and the twinkling lamps of the city. It was lonely here, and he could think. No one to bother him. The lighthouse keepers knew him as the curator of the great Library, and let him come and go as he pleased. Far below in the courtyard Ne-tiy waited patiently with the chariot.

To the north nothing was visible except the stars and the light shaft thrusting out horizontally from the great concave mirror at the top of the tower. He had come here to think about that light beam. It was supposed to be visible out to sea for 160 stadia. To him, that was one more proof that the Earth was spherical. The light was visible out to sea to the point where the Earth's curvature shut it off. He reviewed the problem in his mind. He saw the diagram again. Circles. Tangents. The height of the Pharos tower, taken with the seaward visibility. That would give an angle-call it alpha- with the horizon. That angle alpha would be identical to the angle-call it beta-at the center of the Earth subtending the 160-stadia chord of the light shaft. The lighthouse was two-thirds of a stadion high. The sine of the angle alpha was therefore two-thirds divided by 160, or 417 hundred thousandths. Next, the angle whose sine was 417 hundred thousandths was about $14\frac{2}{3}$ minutes, or about $\frac{1}{1500}$ part of a circle, and finally, 1500 times 160 gave you 240,000 stadia. Close enough to the Syene measurement of 250,000. So he couldn't be too far wrong. He had done the numerical work already. He knew the result before he came out here tonight. But he still found it hard to believe. The Earth couldn't possibly be that big. Or could it? Had he made an error somewhere? Maybe several errors? Actually, the measurements using the lighthouse were not easy to make. Sighting the Pharos light had to be done at sea from a pitching, bobbing boat. Subtractions had to be made for the height of the perch at the mast top.

He clenched his jaw. He had to believe his numbers. He had to believe his rough check. And he had to believe the only conceivable conclusion that his calculations offered. The Earth was indeed a huge sphere, in circumference 240,000 to 250,000 stadia, more or less.

The question now was, should he so report to Ptolemy, and possibly get himself discharged from his post at the Library. Or worse?

He was due at the palace by midnight. He would have to decide within hours.

He had just turned back, to descend the outer stairway, when something in the dark northern skies caught his eye. Lights, moving, flashing. And different colors. Red... green... white... blue... flashing, on and off. And then that terrific shaft of white light... brighter even than Pharos... coining straight at him!

He threw his arm up over his eyes. There was a roar overhead. The tower shook. And then the thing was gone... no, not entirely. There it was, over the Library quarter... hovering now, stabbing its blinding light beam down. He raced around to the side of the light tower.

What in the name of Zeus!

Was it now over his house, the great manse entrusted to him by Ptolemy Philadelphus? He stared in horrified amazement.

By the wine bags of Dionysus, the thing was... descending into his fenced park.

For a moment he was paralyzed. And then he recovered and started down the stairs. Outside, he awoke the dozing charioteer. "Ne-tiy! Home! Home!"

9. Encounter

Khor read the preliminary data in the analyzer. Oxygen, nitrogen, air density, viscosity, temperature... Nothing obviously toxic. Gravity a little low. No matter. Everything within acceptable limits. He turned off the lights and got out. Fortunately for the ship (not to mention his unwitting host), he had come down in a clearing. There were trees and hedges on all sides. Tiny little things, but they would provide shelter. He had landed within some sort of private estate, and very likely he could complete his repairs without the bother of curious and/or hostile crowds. And what did they look like? If they built cities, they must have hands, and legs to get about, and certainly they were able to communicate with each other. Probably very handy little fellows.

He walked on the cropped turf back to the rear of the ship. Yes, there was the hole. He played the light on it and around it. The outer plate had laminated over nicely. Only the interior would need attention. Well, get with it. Start knocking on doors. "Could I borrow a few hundred xil of adhesive tape? And a load of high-spec hydraulic fluid (you supply the container). Plus a var of sodium carbonate. Just enough to get me to a star some nine light cycles away."

And that raised another problem. What language did these creatures speak? Better get the telepathic head-band. He crawled back up the hatchway and returned with it. Suppose they're unfriendly? Should I bring a weapon? No, I've got to look absolutely peaceful.

His ear tympani vibrated faintly. Noises. Wheels churning in loose gravel. Cries, addressed, he thought, to a draft animal of some sort. Two different voices? They had seen his ship come down, and they had driven here to confront the trespasser.

Fair enough. He unfolded the long veil, starting at his head, over the teleband, and quickly draped his

entire body from head down to talons. (No use alarming them right at the outset!) Then he propped up his portable beam between rocks in the clearing so that it would shine on him.

He listened to the cautious steps on the fine pebbles, closer, closer.

And there they were, two of them, standing just outside the light circle.

By the pinions of Pinar! Featherless bipeds!

One seemed calm, the other fearful and fidgety. The calm one stepped out into the light.

Excellent! thought the visitor. It has stereoscopic eyes, nostrils, mouth, ears. Not the most attractive alien he had ever encountered; yet not the ugliest, either. Somewhere in between.

Khor held up both hands to show they were empty, then bowed slowly.

The calm one repeated the gesture with great dignity.

Khor spoke through the tele-band into the mind of his host. "My name is Khor."

The Greek showed his surprise. "You understand Greek? And you are able to speak into my mind? How is this? Whence came you?"

Khor pointed to the band around his head, visible in outline under his body veil.

"Ah," said Eratosthenes. "A mental language device. Fantastic. But where—" He jerked. Strange thoughts... strange sounds... sights... smells... were forming in his head. He gasped. "You are from a distant world? A star?"

Khor nodded.

The geometer gulped. "Are you a god? The messenger Hermes perhaps?" (How could he be asking this? He didn't believe in gods!)

"No. I am a mortal, like yourself. My people are a little more scientifically advanced than yours, that's all."

"Why are you here?"

"I was on a collection expedition. I work for a museum, the same as you. I was searching for certain plants... animals... I was loaded up, and on my way home, when a meteorite hit my ship. I had to land for repairs."

"I see. I think I see. Can I help you?"

"I don't know. I will need certain things. Certain... tapes. Certain oils. Some... alkali. And then perhaps some geodetic information."

"Such as?"

"The circumference of your world, Terra, considered as a sphere."

The Greek eyed his visitor sharply.

Khor hesitated. "Have I asked a forbidden question? Is something, how do you say it, taboo? Or perhaps you were not aware that Terra is a sphere?"

"That I had indeed surmised. No, I was simply struck by the coincidence. I have been working on the problem for the past several weeks, and very recently, actually within the last few hours, I have obtained some sort of answer. But why do you need to know?"

"I can use Terra's rotational velocity to help fling the ship into escape orbit, when the time comes to leave. To determine that velocity, I need to know Terra's circumference."

"I think I can provide a fair estimate."

"Excellent."

Eratosthenes had to stop and think a moment. Khor needed the velocity of the rotating Earth? Well, of course. The Earth rotated. That's why the sun appeared to move around the Earth. But that wasn't all. The Earth must revolve around the sun, from a very great distance, once a year. And that's why the sun appeared to move through the zodiac once a year. Actually, it was the Earth that was moving. The sun stood still. The heliocentric hypothesis wasn't a hypothesis. It was a fact. And if the Earth moved around the sun, so did all the five other planets: Mercury, Venus, Mars, Jupiter, Saturn. And so the sun was a star, much like millions of other stars. Did all those other stars out there have planets, with strange life forms, thinking, working, loving? His heart beat faster as he thought about it. Whom could he tell? Nobody. "A visitor from another star told me." Next stop, the madhouse. It made him smile just to think about it.

But back to reality, and the present. "So then, Khor, can I offer you the hospitality of my house? Not a Ptolemaic palace- but yet not a hovel, either. Food of all sorts, wines brought in from all parts of the world. Baths, hot and cold. Servants to assist you. You could relax while we dine, and you could describe your needs to me."

"Your offer is most attractive. Truly, I have a great need. But I do not wish to cause problems for you. I read in your mind certain names: Ptolemy... Hor-ent-yotf... even the female at your side, Ne-tiy. Who are these people? How can they harm you?"

"Harm me? Perhaps the words are too strong. Ptolemy rules-owns-this land, called Egypt. He is a Greek, a foreigner, and he tries to rule softly, and to give no great offense to the people, aside from taking their money. But Hor-ent-yotf, a high priest of the hawk-god Horus, likewise rules, in that he reigns over the minds and souls of the people. Ne-tiy is a slave, put in my house by Hor-ent-yotf. She is his property, even as his clothing and his cosmetic box are his property. Do you read my thoughts in this matter, honored stranger?"

"I do, and I reply with thoughts. You propose to do a thing offensive to Ptolemy, and horrifying to Hor-ent-yotf, and because of this thing the priest may kill you. Or perhaps make the female kill you. Is this the situation?"

"It is so."

"I find this quite alarming. Obviously, I do not understand your ways. Please explain."

“It is a very complex matter, O visitor from great distances. Perhaps we can continue over cakes and wine?”

“Fourteen percent CH₃CH₂OH?”

“I beg your pardon?”

“Just thinking out loud. A pleasure, Eratosthenes. Just let me close up the bucket.”

10. Repairs

“To each his own custom,” thought Eratosthenes. “We Greeks eat while reclining on an eating couch. The Egyptians sit in chairs. But you stand.”

“At all times,” replied the thoughts of his visitor. “We stand to eat, drink, study, work, even to sleep. Our skeletal structure requires it.” His gloved hand clasped the wine cup and brought it to his lips through a slit in his body veil.

The Greek heard a “clack” as the metal goblet struck something hard. “Well then, let us look to your needs. First, strips of adhesive cloth. Tapes, you call them. That we have in abundance. It is the custom of the country to use them as bandages to wrap the bodies of the dead, in preparation for burial.” He held up a piece of white cloth. “This is a rather fine linen, woven from the flax plant. Every Egyptian family saves scraps of cloth against the inevitable burials. The pieces are ripped into strips: narrow bandages for the fingers, wider ones for the limbs and torso.” He tore off a strip and handed it to Khor, who examined it closely.

“What makes it stick?” asked his visitor.

“They dip it in liquid balsam. It sets up hard in a couple of hours.”

“It ought to work,” said Khor. “Now, about the oil.”

“We have several kinds: olive oil, from the fruits of the olive tree. It’s used in cooking and in our lamps. Castor oil... several grades. This is from the castor bean. It has medicinal uses, and is also a fine lubricant. The army uses it in the oil packing for its chariot wheels. And linseed oil... which we boil and then use in paints and varnishes.”

“Back up. This castor oil... is there a refined grade?”

“Indeed yes. Settled over charcoal and filtered through fine linen.”

“I’d like to try that. And now one more thing. A bit of alkali.”

“Alkali... ?” The geometer frowned.

“Sodium carbonate would do nicely. Hm. That’s making it worse, isn’t it? How to describe it... let me think. It would be bitter to the taste, very soluble in water, turns red wine blue. Fizzes in vinegar. Can be boiled with fats and oils to make soap...”

“Oh! Of course! Natron! We use it in embalming. It helps desiccate the corpse. But how would you use natron in your ship?”

“Simple. During wake-periods on my ship, my lungs give off a waste gas, which we call carbon dioxide. It can become toxic if allowed to reach high concentrations. The alkali absorbs it.”

“Well then, I think the next step is to gather up these things and take them out to your ship. I’ll call the servants. No-I can’t. They’re all down in the city, celebrating the New Year. You and I and Ne-tiy will have to do it.”

“It’s just as well. Less risk to the ship.”

To the extent that any of the geometer’s aplomb had left him, very nearly all of it had by now returned. He said, “As you may have read in my mind, it is the practice for one of our Library clerks to go through every incoming ship to look for new books to copy. I wonder...”

“Ah, my friend. I have dozens of books, none in any Earth-language. The Maintenance of Ion Drives... Collecting on Airless Worlds... Operation of the Sleep Casket. Some with holos, for which you’d need a laser reader. But I

tell you what. You like maps. Before I finally leave, I’ll give you a sort of map.”

“Fair enough.”

An hour later Khor, Eratosthenes, and Ne-tiy had wound the last of the linen strips around the hydraulic tubes, refilled the depleted oil surge tank, and secured the amphora of natron in the storage locker.

“The balsam resin will require a couple of hours to cure and harden,” said Eratosthenes. “And I am due at Ptolemy’s palace very soon. May I suggest that you join me?”

“Won’t I excite comment?”

“Hm. You’re a bit taller than average. However, just keep covered with your body cape. I’ll tell Ptolemy you’re a foreign visitor and your religion requires the covering.”

“Is it an offense to you, my host, that I conceal my body from you in this way?”

The Cyrenian smiled. “Since you are my guest, it pleases me that you do as you see fit.” He bowed. “This way to the chariot.”

11. Ptolemy on His Balcony

On this night of the summer solstice, the beginning of the three weeks of madness celebrating the rising of the river. Ptolemy the Second, called Philadelphus, stood on his balcony and looked out over the royal harbor. Shading his eyes, he could barely make out the tiny light swinging in slow arcs in the blackness. At his request, the captain had fixed the lantern at the top of the mast of the royal barge. Why? No reason given. He had simply said, do it, and it was done. Actually, it was a token of a promise to himself: tomorrow he would be on that ship, headed south on the Nile, with all concerns of state receding

sternward.

For five thousand years the rulers of Egypt had made this trip. Tradition held that when the sun ceased his northward journey, pharaoh would set forth, sailing all the way to Thebes, to ensure a proper flood. If pharaoh did not thus set forth on the bosom of Hapi, the river would not rise. If the river did not rise, there would be no sowing, and no harvest. Famine would grip the land. The tax gatherers would gather little or nothing. The army could not be paid. The dynasty could fall.

Superstitious nonsense?

Who was he to say?

It was best to go along with it. Anyhow, he always looked forward to the long trip on the river. He just wished Arsinoe were still alive.

Noises in the streets below brought his eyes down to the parade of dancing torches. The annual infection had spread even here, to the guarded serenity of the royal quarter. In a way it was unsettling; yet on the whole it was reassuring that the people were content to stay within their multi-millennial rut. No riots, no revolutions, no marches against the granaries. Not this week, anyhow. Let the beer flow!

He looked around as a woman in an elegant linen dress and cape parted the hangings and stepped out to join him. A thick black wig, artfully dusted with gold powder, fell to her shoulders. She was his concubine of the month. Her name was Pauni, daughter of a noble house. He named them for the current Egyptian month. It was the only way he could attach names to their beautiful faces. And so it had been, since the death of Arsinoe, his true sister-wife, twenty years ago. By Greek ideas, that marriage had been incest; but it was quite in the pharaonic tradition. A bit of irony: in the river tongue, the word for concubine was “sne-t,” which meant “sister.”

(Ah, Arsinoe, Arsinoe. I loved you greatly. You should not have died. It was the only unkind thing you ever did.)

“Respect their traditions. Respect their religion. Worship their gods,” his great father Ptolemy, Alexander’s general, had told him. “Be pious. You lose nothing, and you will preserve the dynasty.” He took the woman by the arm and they listened in silence to the revelry. “The old man was right,” he muttered.

“Who, my lord?” said Pauni politely.

“My father. When the Persians conquered Egypt, they flouted the local religions. Ochus, the satrap, killed the sacred bull. The priests invoked a terrible curse on him, and on his masters in Persepolis. And so Alexander came, and destroyed Persia. He came to Egypt, and gave all honor to the priests. He sacrificed to Apis and other native gods. He made the great journey across the desert, without road or path, to the sanctuary of Ammon at Siwah. There the priests declared his divine descent, and that he was indeed the son of Ammon.” He reflected. “Did I ever tell you about Alexander’s trip across the desert to Siwah?”

(Several times, my lord.) “No, sire, I don’t recall that you did.”

“Ah. Well, then. The storms had destroyed the roads. Even the guides were lost. The sun was pitiless, and the men were dropping from heat stroke. But the gods sent a great flock of ravens, who flew in circles overhead, and shaded Alexander. And if the guides made a wrong turn, the birds screamed until

they went straight again.”

“Amazing,” said Pauni.

The royal Greek sighed again. If only he didn't owe so much money to so many people. The Jews had helped him- and his father-finance the great light tower on Pharos. It had been finished these nine years, and the treasury was still paying. And the Egyptian priests. The public debt was soaring because of their demands for new temples. And then there was the standing army, all mercenaries, and they liked to be paid regularly, in hard clanking brass. And the navy. A thousand years ago Rameses had not been troubled with ships that sailed the Great Green. And two thousand years ago the pharaohs didn't even use money. There wasn't any. It hadn't been invented yet. Go, said Khufu to his peasants. Build me a tomb-pyramid. One million men, working twenty years. And they had done it, and not an obol paid out to anyone. Alas, how things had changed. “Who rules Egypt?” he mused softly. “Do I? No. Do the one million Greeks who have settled here? No. Well, then, do the priests and their seven million fellahin? Or is the land a hopeless anarchy?”

By now she was used to this. “Speaking of priests,” Pauni reminded him gently, “the high priest of Horus is here. Also Rabbi Ben Shem. And then the other notables: Eratosthenes and his lady. The geometer brings a very strange guest, who covers his body with a long black veil. And then there are the consuls and ambassadors-Claudius Pulcher the Roman, Ha-milcar Barca, the Carthaginian...”

Ptolemy suppressed a groan. Eratosthenes. He had tried to forget him, but of course it was impossible. The man of measures was going to make his report tonight. And what will you say, noble philosopher? How big is the world? As to that, say anything you like. But the shape! Declare Earth a flat square, or a disc, or a cylinder. Any of these. But you know you must not say “sphere” or “ball” or “globe.” That's heresy, mathematician. Don't betray me, my brother Greek.

There is a long line waiting to take your place as curator of the great Library. And it isn't just me you should worry about. If you say “sphere,” the local hokies will have you floating in the canal before the night is out.

He paused. The girl looked up at him in grave concern. He thought: she knows I am fifty-nine, and that I am dying. Ah, to be young again. No, don't turn back. Let it be finally done. Nothing really matters very much anymore. From here on in, let us have peace. He smiled. “Perhaps we should rejoin our guests.”

12. Heresy

A little cluster had already formed around the two ambassadors. The Carthaginian was explaining something: “One of my purposes here is to obtain copies of the world map of Eratosthenes.”

“And what good is that?” growled Claudius Pulcher, the Roman.

“Carthage will probably win our present war with Rome, noble ambassador. If so, we will expand into Spain and Gaul. For that we will need good maps. If we lose-may Baal save us!-we will certainly need to recoup our fortunes, and we would look to western Europe for that. Again we would need good maps. Including-“ (here he gave the stolid Pulcher a crafty leer) “a good showing of the passes through the Alps.”

“Passes... ?”

“For our war elephants.”

The Roman general stared at him blankly. Then recognition dawned. “Oh-you mean from Gaul, over the mountains into Italy.” He began to laugh. He laughed so hard he spilled his wine. “Excuse me.” He walked back to the credentia for a refill.

Ptolemy watched him for a moment, then turned back to the Carthaginian. “The great Alexander was always fearful of war elephants. He never really discovered how to cope with them. Quite an idea, Hamilcar Barca.”

“But there’s still a problem,” said Eratosthenes. “We have several reports by travelers in the Library. They all say the passes are very narrow, barely wide enough for a horse. How will you get your elephants through?”

“You should read more of your own books, learned scroll-master,” said Barca. “The mountains are made of calx.

Vinegar dissolves calx. We shall bring hundreds of casks of vinegar. The mountains shall melt away, and the great war beasts shall pass.”

“Why does Carthage disclose its strategy to Rome in advance?” asked Ptolemy.

The young Carthaginian grinned. “No harm in it at all. First, they think we lie, that we try to deceive them. Therefore, they won’t bother to defend the passes. Second, they’re so confident that if and when they do fortify the passes they would so tell us. Third, they are incapable of thinking in terms of empire for themselves, so they can’t conceive that their enemies would have such impossible ideas. They lack imagination. They don’t know what dreams are.”

“They seem to have done very well despite these deficiencies,” demurred Eratosthenes. “Three hundred years ago they were just a fishing village on the Tiber. Now they rule the entire Italic peninsula. Who needs dreams?”

“You have a point, mapmaker. Well then, reverse the case. We Phoenicians needed dreams, and we produced them. We have established trading outposts at the limits of the known world. We have sailed through the Pillars of Hercules to the Tin Islands. We have circumnavigated Africa. We have traded in the Black Sea. Our ships rule the Western Mediterranean, and business on great waters has made us rich. And all because we had a vision. We still have it, and with it, we shall beat the Romans.”

“Peace, gentlemen,” said Ptolemy. Wars and rumors of war made him uneasy. “Let us talk of other things. Eratosthenes, how go the angles?”

“Today, my lord Ptolemy, the day of the summer solstice, I measured the angle of the sun at high noon. I found it to be seven degrees and ten minutes.”

The Second Ptolemy smiled graciously, yet warily, and with a warning in his eyes. “And pray what is the significance of seven degrees and-what was it-?”

“Ten minutes, my lord. Significance?” The geometer eyed the Greek pharaoh carefully. “To determine the significance, we may need the assistance of the priests”—he bowed gravely to Hor-ent-yotf and Rabbi Ben Shem—“and the historians”—a bow to Cleon, the Homeric exegetist—“and perhaps to other

philosophers, living and dead.”

Claudius Pulcher had meanwhile returned from the credentia with a wine refill. “Aside from all this assistance, real or threatened,” he grumped, “can anyone tell me the significance of seven degrees and ten minutes?”

“By itself, nothing,” volunteered Hamilcar Barca. “However, taken with certain other measurements, it could give you the size and shape of the Earth.” He said to the librarian: “Am I right?”

Eratosthenes sighed, and glanced at Ptolemy from the corner of his eye.

“Oh, go ahead,” said the pharaoh wearily. (And oh, to be on that barge!)

The Greek shrugged. “At Syene, where the finest red granite is quarried, a tall pole casts no shadow at noon on the day of the summer solstice, and the sun shines directly into the wells. This is so because Syene lies almost directly on the Tropic of Cancer. Also, Alexandria lies almost due north of Syene, at a distance of 5,000 stadia. Now seven degrees and ten minutes is about 1/50 of a full circle, so 5,000 is 1/50 of a full circle on the Earth. Thus we multiply 5,000 by 50, and we get 250,000 stadia as the circumference of the Earth.”

“One moment,” interposed Ptolemy. “You say 5,000 stadia. How did you measure that?”

“From cadasters-registers of land surveys for tax purposes, made by the Second Rameses, over a thousand years ago. The exact dimensions of the nomes are given. It’s a matter of simple addition, from Syene to the sea, with certain adjustments.”

The Roman frowned. “I still don’t see. What’s a ‘stadia,’ anyhow?”

Hamilcar Barca smiled. “The singular is stadion. A bit over eight stadia to your Roman mile. Using your units, General, the world is a sphere about 30,000 miles in circumference.”

“Ridiculous,” breathed Pulcher. “It can’t possibly be that big.”

“This is entirely unofficial,” interposed Ptolemy hastily. “The Great House takes no position. . . .”

Rabbi Ben Shem smiled uneasily. “Dear Eratosthenes. . . the Earth cannot be a sphere. Our Holy Scriptures state, ‘the four corners of the Earth.’ “

“I think we may be overlooking the obvious,” said Hor-ent-yotf. “Our esteemed geometer assumes the sun is so far away that its rays, as received here, are parallel. The assumption is totally unwarranted, as I shall show. There are other, much more reasonable conditions that will give the same data.” He pulled a piece of papyrus from his linens and inspected it. “If the sun is 40,000 stadia distant, it will give your same shadow angle of about seven degrees here at Alexandria, will it not, Eratosthenes?”

The mathematician smiled. “Quite so-assuming the Earth is flat.”

“As is indeed the case,” said the Roman ambassador.

Hamilcar Barca shook his head. “Like the Greeks, we Carthaginians are a seafaring people. On shore, when we watch a ship come in, we see first the tip of the mast, then the sails, then the bow. That means to us that the Earth is a great ball, and that the ship comes up into view over the curvature. It is the same

at sea. For example, my trireme arrived here at night. We came in, guided by the great Pharos light tower. At first, our man at mast-top could not see the light at all. And then, suddenly, 'Light ho!' and there it was, just over the belly of the sea."

There was a moment's silence, broken by Ptolemy. His voice was strained. "This is a very interesting discussion; yet I do not feel that we can ignore a thousand years of research and thought that have gone into the problem. Certainly the ancient authorities leave no doubt on the question. Homer said the Earth was a flat disc, bounded by the River Oceanus. A decade before the battle of Marathon, Hecataeus announced the same fact."

"One moment, your majesty," said Hamilcar Barca. "Your own Aristotle believed the Earth to be a sphere because of the round shadow on the moon, during lunar eclipse."

Ptolemy shrugged. "Homer's disc, head-on, would cast a round shadow."

"My lords," said Rabbi Ben Shem harshly, "I make no attempt to define or deal with impiety. Certainly Greek history provides ample precedent. I have read widely in your Library, Eratosthenes, and I can cite your own laws and applicable cases. Your Anaxagorus propounded a heliocentric system, and wrote that the sun was a big blazing ball, bigger even than the Peloponnesus. He was condemned to prison for his impiety. Pericles was barely able to save his life. Aristarchus also proposed a heliocentric cosmos, and was accused of impiety. Alcibiades was recalled from the Syracuse campaign to face charges of impiety to Hermes: whereupon Athens lost the war. Socrates was executed for impiety. Protagoras confessed agnosticism and fled Athens with a price on his head."

Ptolemy rubbed his chin. "I, for one, believe Homer, who declared the Earth to be flat, with its omphalos-navel-at Delphi. A sphere seems quite impossible. People at the antipodes would walk with their heads hanging down. Trees would grow downward. Rain would fall up. These things cannot be." He fixed a grim eye on Eratosthenes. "The gods gave us a flat world, my young friend. Adjust your numbers to fit the facts, not the other way around." And so having delivered his views, and having thus dried his throat, he and Pauni left the group in search of the wine table.

"Well, then, man of the Library," said Ben Shem, with just a hint of triumph, "you will of course recant?"

Eratosthenes found his body turning, not to face the rabbi, but instead to Hor-ent-yotf. It was to the priest of the hawk-god that he gave his answer: "No! I do not recant. I do not retract. It is as I said." The hawk-priest stared at him without the slightest expression.

"Oh!" said Ben Shem. "You claim the Earth is a sphere?"

"Yes."

"And it circles the sun?"

"Did I say that? If I didn't, I meant to."

"Aiee!" shrieked the rabbi. "Heresy, heresy compounded!" He pulled at his beard, and a few hairs tore loose.

"Sorry," said the Greek apologetically. "I didn't know you'd take it this way."

The priest stumbled away, muttering.

Khor shot a thought into the geometer's mind: "Science is a very upsetting subject around here."

"Yes."

Hamilcar Barca broke in. "May I ask a question about your 5,000-stadia measure to Syene?"

"Of course."

"Does that include a rake-off by your local priests? Say, one-sixth?"

"How do you mean?"

"Well, suppose the true measurement is actually 4,285 stadia. Do the priests add one-sixth, or 715, for their share of the grain crops?"

"Yes." It was Hor-ent-yotf who answered. They all looked around at him. "From the time of Menes," said the priest, "the first pharaoh, who united upper and lower Egypt, the temples have taken one-sixth of the crops. We do this painlessly, by telling the farmer his plot is one-sixth larger than it really is."

Eratosthenes was embarrassed. "I am caught in a gross error. The circumference is then 4,285 times 50, not 5,000 times 50. More accurately, the circumference is"-he thought a moment-"214,250 stadia, or about 26,000 Roman miles."

"The one-sixth difference is not significant," said Hor-ent-yotf. "The crux of the matter is, you have attempted to heresy of the gravest order." He signaled to Ne-tiy. She glanced once at Eratosthenes, then followed the hawk-priest away from the group.

"Watch him," warned Khor. "I see into his mind. He has condemned you, and he means to kill you."

The geodesist shrugged. "It had to come."

"Shouldn't you leave now?"

"Why delay the confrontation? It might as well be here. Regardless of what happens to me, Ne-tiy can drive you back to your ship."

"I wasn't thinking of that. When the time comes, I can manage by myself."

"Can you see them?" asked Eratosthenes. "You are taller."

13. Something in the Wine

"I see them both very well. He and the female approach the wine table. He whispers to her. She is to put something in your wine."

"Poison."

"Yes. You are to die by poison. The mind of the female is in a great turmoil. She wants to refuse. But the

priest threatens her. Ah, she looks back this way. but she cannot see you. What a strange expression on her face, Eratosthenes. How is one to interpret it?"

"Horror, possibly. She does not really want to kill me. She resists strongly, but I think probably she will make the attempt. From childhood, this is what the temple trained her to do."

"They argue some more. He insists. He says to her, if she fails, servants will bind her mouth and limbs, and carry her in a cart to the temple pool, and the crocodiles will feed. And you will die in any case."

"Pleasant fellow."

"Perhaps you should leave with me, Eratosthenes. As you know, I still seek a bipedal specimen. On my world you need have no fear of assassination."

The librarian laughed forlornly. "Don't tempt me, admirable visitor. What are they doing now?"

"Nothing as yet. I am in the mind of the priest. He is thinking about rings on his fingers, and three white powders. Arsenic... strychnine... aconite. Arsenic is tasteless, but takes a while, probably too long for what he wants. Also you might get sick and vomit. Strychnine? A good one. Not much is needed. Acts in a few minutes. Whole body goes into mortal spasm. He's seen a man die, lying flat, resting only on his heels and the back of his skull. But strychnine is bitter. You might taste it and not drink the wine. No, no strychnine for you. It's aconite. The deadliest known poison. It is extracted from a delicate plant that looks like a tiny helmet or hood, and which grows in mountains called the Alps, far to the north of the Roman domains. A crystal the size of a grain of sand can be fatal. You are quickly paralyzed. Your heart stops. Death is quick. Ah, he's moving. He cups his hand over a wine goblet. The cap on his golden ring opens. A powder falls into the wine. He gives the goblet to the girl. He snarls at her, and she moves away. Look sharp, Eratosthenes! Here she comes!"

And there was Ne-tiy, standing before him quietly. "I have brought wine, my lord."

He looked at her in glum silence.

She raised the cup to her own lips.

"No!" he cried. He struck the cup away. It clattered to the floor, splashing red liquid over carpet and guests, who stared around in dismay. "Sorry!" cried the geometer. "So clumsy of me!" He called a serving man to bring mop and bucket.

Ne-tiy had not moved. "True, my lord, I could not harm you. Yet, what you have done to me just now is a cruel thing. For now I face a very painful death. The wine would have been... like going to sleep."

"Khor, take care of her for a moment." His voice grated harshly in his own ears. "Take her out on the balcony. I'll join you there in a little while." Now, Hor-ent-yotf, you son of river scum, where are you?

14. The Bargain

He found him quickly. If Hor-ent-yotf was surprised, he didn't show it.

Eratosthenes controlled his voice carefully, as though he were discussing the weather, the cost of grain,

or whether the eastern harbor might need dredging this year. “I understand that Ne-tiy has refused to kill me. This despite your direct order. So that now her own life is forfeit. Is this not so?”

“Why should I stand here, talking to a Greek spawn of Set? Yet it is so. She failed. She dies.”

“Let us bargain, high avenger of Horus.” Should he include his own life in the negotiations? No. Too demeaning. Just Ne-tiy. He said, “I will buy her.”

“Ah?” The small eyes peered suspiciously at the heretic. “With what?”

“Information. I know the burial site of the boy-pharaoh, Tut-ankh-amun.”

The eyes of the priest popped. “You lie! You lie most vilely!”

Eratosthenes smiled. “No. It is so. Tut, son-in-law of that great heretic, Ikhnaton, who decreed the worship of Aton, the sun, and desecrated all other temples. Ikhnaton, who built Akhetaton, an entire city, devoted to the worship of Aton...”

“The City of the Criminal!” breathed the priest. “He died. And we destroyed his city. We destroyed everything of his. All-“

“Except the tomb of Tut... who married Ikhnaton’s third daughter.”

“Prove it!” hissed Hor-ent-yotf. “Prove you really know!”

“I have seen the records. The report, for example.”

“Report? What report?”

“The one written by the captain of pharaoh’s guards. He caught the grave robbers in the act of breaking in. He slew them on the spot, reinforced the entrance, and posted a guard.”

“Goon.”

“I can give you the record of the final funerary banquet, held within the tomb itself. Eight necropolis officials ate five ducks, two plovers, a haunch of mutton. They drank beer and wine, and they swept up all residue with two small brooms, put the debris in a special jar, and buried the jar in a pit outside the tomb. I have seen the jar.”

The Avenger of Horus studied the librarian, and his eyes narrowed in a crafty squint. “How much can you tell me about the location?”

“It’s in the Necropolis of Thebes, in the Valley of Kings.”

“Hm. That’s a big place. Specifically-?”

“No specifics as to place until we have an agreement.”

“I see. His queen, the vile spawn of the criminal pharaoh Ikhnaton?”

“Her name was Ankhesenamun. But she was not buried with the boy king.”

“Interesting.” The priest hesitated. “But certainly the tomb was re-entered subsequently?”

“No. The entrance was later further sealed, one might say almost by accident. I have verified that the seal is undisturbed.”

“The last of the Atonist hell-people,” muttered the priest. “Pull him out of his death-lair. Burn the infidel mummy. The gold and silver go to the servants of Horus.”

“Is it a bargain?”

The holy man hesitated. They both waited for a time in silence.

Eratosthenes sighed. “The excavation will be expensive. A hundred slaves must be rented and housed and fed for several weeks. You will need ready money. I will sign over my Cyrenian estates to you, together with my gold on deposit in local banks.”

Hor-ent-yotf still seemed lost in thought.

“If we cannot agree,” said the librarian gravely, “I will be forced to take a certain action.”

“Oh, really?” The priest’s mouth curled. “Exactly what?”

“I will turn over Tut’s location to the Council of Antiquities. They will excavate at government expense. There will be great excitement, presaging a revival of Aton-ism.”

The priest clenched his fists. “You wouldn’t!”

“I would.”

“Yes, Greek, I think you would... for you are the ultimate obscene evil...”

“Well?”

“But hear me well, son of darkness. We speak only of the faithless slave girl. What Horus intends to be your fate, only the god can say.”

“Such is my understanding.”

“Then consider it done.” The priest struck his chest with his fist. “I will have the temple clerks draw up the agreement, in hieroglyphics and in Greek, and I will come with it to the Serapeum tomorrow afternoon. We will sign before witnesses.”

“Yes.” Eratosthenes turned back toward the balcony. The priest hesitated for a moment, then followed at a dozen paces. He swirled his cloak about him as though to minimize contamination from the air the Greek passed through.

15. Sirius Rising

As he stood on the balcony with the girl, Khor found himself thinking of Queva, and Ne-tiy, and how they seemed to blend into one person, one passionate loving mind. "I will wait for you," Queva had said.

He had followed closely the negotiations between Eratosthenes and Hor-ent-yotf. Ne-tiy had saved the Greek's life at apparent cost of her own, and now the man had given up all that he had to save her. Khor would not have believed these creatures capable of such nobility. But there it was. Strong stuff. How was he going to enter this in the ship's log? The Supervisor would neither believe nor understand. So skip it all. Maybe tell Queva someday.

I'm very nearly done here, thought the star-traveler. Just one more little job. Ah, come on out on the balcony, Eratosthenes. And here comes Hor-ent-yotf, right behind you. That's good, very good. He shot a thought to the Greek: "Dawn is coming, friend. Look, there's my home star-rising just over the sea!"

"Sirius?" said Eratosthenes, pointing.

"Sothis!" said Hor-ent-yotf, giving the Egyptian name for the great blue star.

Khor spoke again to the mind of Eratosthenes: "Your Sirius-my home star. And a fine conclusion to a profitable visit. You see the first heliacal rising of Sirius, or Sothis, and you tell me that means the Nile has now started to rise. It means the summer solstice, and great festivities throughout the land, going on for days. Thank you for all your help in repairing my ship, and for your contributions, including this last."

"Our pleasure, esteemed visitor!" Then he stopped. "This... last?"

"Especially this last," replied Khor cryptically. "It is time for me to go. If I launch within the next few minutes, my trajectory vectors out directly toward Sirius."

"I'll call Ne-tiy, and she'll run you over to your ship." He was still puzzled.

"No need. I know where it is."

"But how-?"

"Ah, my friend, I see you really didn't know. Well then, in view of what is about to happen, perhaps you should have some important witnesses. Get Ptolemy and one or two others. Quickly now."

Eratosthenes felt a lump of cold lead forming in his stomach.

"Hurry!" said Khor. Through the black body veil the command burst like the hiss of the great gyrfalcon.

Gods! thought the Greek. That was an actual shouted command! He's vocalizing! The librarian sliced through the balcony drapes and stumbled into Claudius Pulcher, arm in arm with Ptolemy. "My lords," he gasped, "could you please join me on the balcony?"

"What's up, Eratosthenes?" demanded the Greek pharaoh. "Oh, I know-Sirius is now visible? Is that it?"

"Majesty, if you please..." Eratosthenes pulled the drapes aside.

A little crowd was already gathering: Pauni... Hamilcar Barca... a dozen gilded dignitaries.

The tall shrouded figure faced them all, then bowed especially to Ptolemy. "Thank you for a pleasant evening, ruler of Egypt," he said in harsh sibilant tones. He took his shroud with both hands and in a smooth majestic motion pulled it away from his head and body, then let it fall to the floor.

They stared.

The great head was entirely feathered. The mouth was an amber beak. Feathers scintillated on arms and chest. Some sort of breech-clout covered the groin. The legs terminated in scales and in what were almost human feet, except that the toes were taloned. As in the raptor birds of the Nile, a horizontal fold over each eye gave the face a stern, even fierce expression.

Eratosthenes now realized that the outlander was a consummate actor, that every word, every gesture, was planned for its dramatic effect, and that this terrified audience lay in the hands of Khor.

The mystery-creature now made his feathers vibrate, so that they excited nearby nitrogen atoms, and surrounded his plumaged body in a golden triboluminescent glow.

Ptolemy dropped his wine cup. Even Eratosthenes, who had suspected something like this would happen, was stunned.

"Horus!" gasped Hor-ent-yotf. "Thou art the god!"

"Thou sayest, worthy Hor-ent-yotf," hissed the visitor.

"To your knees, everyone," roared the priest.

And so they did. With one exception. Rabbi Ben Shem tore his cloak and ran screaming from the room.

Khor looked full at Hor-ent-yotf. "Come."

Hor-ent-yotf rose and walked forward, as though tranced. Khor took the man in his arms. "Arise, all, and witness," he commanded.

Gigantic wings unfolded from Khor's shoulders. The spread of those great pinions exceeded even the breadth of the balcony.

And now even Eratosthenes was done in. He pronounced slowly, quietly, and with great conviction, his favorite schoolboy oath. "Holy... excrement... of Zeus!"

Khor ignored him. "Since I take with me this holy man, I must appoint and sanctify a person to take his place, and to rule my holy temples in his stead. I name Ne-tiy. Come forward, child!"

They made way for the slave-girl. She bowed before the winged thing.

"I name thee High Priestess for Horus, for Egypt, and for all the world, exalted above all men, above even my noble son, the pharaoh Ptolemy. Take thee to mate whom thou wilt. Be fruitful, and be merry. I go."

He held the priest with one hand and tossed something to Eratosthenes with the other.

Next, there was a tremendous rush of air from the fantastic wings, and the giant birdman leaped over the

balustrade and was gone.

Eratosthenes watched for a moment. At least the coursing creature was headed in the right direction.

Should he feel sorry for Hor-ent-yotf? He decided that maybe he should. However, he didn't. A character flaw, possibly. But who was perfect?

The rest of them joined him at the parapet. AH eyes were looking out over the city, searching the skies. And now a collective gasp. "There!" cried someone. "The chariot!" shouted another. "See the lights!"

"Straight into the rising sun!"

He turned away and hefted the strange ball Khor had thrown to him. No time now to study it in detail, but he knew intuitively what it was: a model of the Earth.

He raised his eyes. Ne-tiy was standing at the entrance-way, looking at him. The geometer walked toward her. "How it is on his world, I do not know. But in Greek lands, the man takes the woman, though she be exalted, and of the highest rank. And so I take thee, Ne-tiy."

She gave him a sweeping bow and a most marvelous smile.

16. The River

"I hope the Horus affair has taught you a lesson," said Ptolemy. "I think you must now be quite convinced."

The two couples rested under the rear canopy of the royal yacht, which was moving upriver with its great red sail stretched tightly by the north wind. Pauni and Ne-tiy were immersed in private murmurs while the men talked intermittently.

"I have learned much," admitted Eratosthenes.

"For myself," continued the Greek pharaoh, "I never had any doubt that the gods were real. It is a bit puzzling, though, that the god would take that priest. I never thought much of Hor-ent-yotf. Always considered him a dangerous fanatic. Shows how wrong even I can be."

"A memorable man," murmured Eratosthenes.

In silence they watched a riverside village pass. The river had now risen to the stage where the house-clusters were accessible only by causeways and moles. The brown people had drawn back into their reed and wattle cone-roofed huts to let father Hapi drop his bounty. In a couple of months the waters would recede. The farmers would sow their wheat and barley, and finally they would reap. Four months of flood and receding water, four months of sowing and growing, four of harvest and drying up. Then repeat. And repeat. They had been doing this for more than fifty centuries. From time to time conquerors had flowed in, then out again, like waves on the seashore. Nubians... Hyksos... Assyrians... Persians. And now the Greeks. A million Greeks, up and down the river. How long would we last? Who throws us out? Rome? Carthage? "Majesty," said Eratosthenes, "what happened to those two ambassadors?"

“Interesting, that. They both got word that Panormus, on Sicily, fell to the Roman besiegers. Barca was recalled to Sicily to organize the Carthaginian guerrillas. Pulcher will return to Rome to organize an army to fight Barca. It’s all insane, isn’t it? What will they do with Sicily? Who cares? But Sicily isn’t really the point, is it?”

Eratosthenes shrugged. “No. Actually, there are two points: one is greed, the other conquest. If Carthage wins, her greedy ships will sail west to Cipangu... the Indies... perhaps in our generation. They sail for trade and profit. If Rome wins, we will not see the antipodes for a thousand years. They go nowhere they cannot conquer. And they move only on roads.”

“I fear I must agree,” said Ptolemy. “We Greeks used to go out to colonize. But that spirit is dead. It died five hundred years ago.” The pharaoh’s nose twitched. He looked back toward the incense tripods on the stern of the yacht. “We cover the smell of death with other smells.” The braziers burned balsam, carnation, anise, and the blossoms of assorted flowers.

Eratosthenes smiled. He didn’t really care for the artificial smells either. Actually, he preferred the river odors: willows, reeds, orchards, palms, fish (living and dead), the dung of humans and beasts, all veneered by this massive rising water and its suggestion of distant melting snows. He studied the beads of condensate on the chill sides of his silver goblet.

Ptolemy was watching him. “It’s cooled with crushed ice. Improves the tang and fights the heat. The locals prefer their beer warm. Do you realize they have never seen ice? They don’t even have a word for it in their language.”

“Curious,” said Eratosthenes absently. Ice... snow... he mused. I made a special map of the Nile, beyond the cataracts, south to the confluence of the Blue and White Nile. Melting snow... that’s what starts the yearly flood. Snow on far, equatorial mountains. Vast mountain ranges, far to the south. And feeder lakes. Big ones, inland seas. Some day we’ll find them.

Ptolemy squinted around toward the ladies. “The priests are putting on quite a show at Thebes, in the great temple of Karnak. We would all be honored if the Betrothed-of-Horus could open the ceremonies.”

“So it is written,” said Eratosthenes gravely.

“Good. Settled. Religion, true religion, keeps a country alive, don’t you agree, dear Eratosthenes?”

“Oh, quite.”

“You’ve read Herodotus, of course. You recall that the Greeks at Marathon called on the great god Pan to terrify the Persians, and he did, and we won.”

(Not to mention, we had a very smart general, thought Eratosthenes.)

“And you know,” continued Ptolemy, “that Athena herself saved our fleet at Salamis. She was actually seen to alight on the prow of Themistocles’ flagship.”

“So I recall.”

“So then, quite aside from the appearance of Horus last night, it is plain that the gods exist, and have been with us from the beginning. Clearly, they control human affairs. We must yield to the gods in all

things, Eratosthenes. When science and religion conflict, science must yield.”

Ptolemy took the geometer’s silence for assent. “Did I ever tell you of the great Alexander’s journey to the shrine of Ammon, at Siwah?”

(Many times, thought Eratosthenes.) “I don’t seem to recall...”

“Well then. My father, the first Ptolemy, told it to me. Storms had completely obliterated the desert roads. Nothing to be seen but a sandy waste. The priests wanted to turn back. ‘No,’ said Alexander. ‘If I am truly a natural son of Ammon, the god will send a guide.’ And no sooner than spoken, here were these two serpents, rising out of the hot sands. ‘Follow us,’ they said, and off they went...”

(Wasn’t it two ravens last time? thought Eratosthenes.) “Amazing,” he said.

“He said to her, ‘Be fruitful; be merry.’ “

The map-maker had to think a moment. “Yes, the god Horus, to Ne-tiy.”

“Not to you, though, Eratosthenes. Nothing merry about geometry.”

“No.”

“My father knew Euclid, who wrote his Elements back there in Alexandria. Father tried to plow through the Elements. Tough going. Complained to the master, there should be an easier way. Euclid replied, ‘My lord, there is no royal road to geometry.’ Father was so impressed that he founded the chair of mathematics at the Library. We’ve had a world-renowned geometer there ever since. Including you, young fellow.”

“I am honored. And grateful.”

“Actually, things turned out rather well for you.”

“Yes.”

To their rear the young women were talking in low tones. He heard a strange tinkling sound, as of little silver bells. He started to turn, then stopped. He knew what it was. Ne-tiy had laughed. He had never heard her laugh before. He relaxed and looked out over the river, to the west. The sun was a glowing semicircle, growing smaller and smaller as it dropped below the darkening hills.

“Gizeh,” said Ptolemy, shading his eyes as he pointed into the sunset. “Have you ever seen the pyramids?”

“Yes, sire. But perhaps the ladies...”

The two women were already at the rail, looking out over the distant sands. The men joined them. They were all thrall'd to silence by the three immense structures.

Egypt, O Egypt, thought Eratosthenes. Land of cyclopean architecture and bestial gods. Where does awe leave off and disgust begin?

Twilight was brief. The sailors were already lighting lamps along the ship’s walkways. Upriver, along the

shore, more lights were visible. Torches, thought the mathematician. A lot of them. And the sound of sistra and tambourines, with shouting and singing and much merriment. The whole city was turning out to greet the pharaoh.

“We’re coming into Memphis,” said Ptolemy. “I’ll have to join in the temple ceremonies, and Pauni and I will sleep in the palace tonight. You can join us, or you can remain on board.”

“If it please you, we’ll stay.”

“I thought you might. You and the priestess may have my quarters. Everything is prepared. Until tomorrow, then.”

17, Khor’s Globe

Ne-tiy watched with uneasy curiosity as Eratosthenes opened the chest and carefully removed the little statue of Atlas, his back and arms still bent to receive his as yet invisible burden.

“I see writing on the base. An inscription in Greek,” she said. “What does it say?”

“It says, ‘Tell my friends I have done nothing unworthy of philosophy.’ -Hermius.”

“What does it mean? And who was he, this Hermius?”

“Hermius was a Greek who studied with Aristotle, under Plato. He was captured by the Persians and tortured. He said these words, and then he died.”

“I see. You admire him.”

“Very much.” From another compartment he pulled out the ball that Khor had tossed to him on the balcony. Bigger than his fist, smaller than his head. It fit exactly on the titan’s back.

“What is that?” whispered Ne-tiy.

“The world globe. Khor made it, and gave it to me as he left.”

They both studied it in silence. It was clear she did not understand. Perhaps it was just as well. He was not sure he understood. It might have been better if Khor had never come. No, that wasn’t so. He was very lucky that Khor had come.

But this globe... the artifact was far ahead of its time.

(She stole an uneasy look at his face.)

My great world map, he thought, over which I have labored so many years... compared to this it is almost nothing. A bare 80 degrees out of 360. We have not even scratched the surface. Most of the world is still out there, unknown, undiscovered. Who will be the first to find it? I wish I were a great sea captain. I’d take a dozen ships. Sail out through the Pillars of Hercules. Due west. Into the western hemisphere. And there meet those two great continents. How to get around them? Perhaps a northwest passage through the north polar sea? Or around the southern tip of the southern land giant? And then on, for a complete circumnavigation of the globe.

He sighed. Not in his lifetime. Perhaps not in a hundred years. Maybe not even in a thousand. But eventually ships would go forth to that new land. And find what? Cities? Savages? Strange animals and plants? No way to tell.

Back to Earth, map-maker! He pressed the globe's north polar cap with his index finger. There was a click, and a tiny spot of light began to pulse, on and off, on the facing side of the sphere.

Ne-tiy gasped. "What is that?"

"The light simply marks the spot where we are. See?" He pointed. "We are here, at Memphis. See the river? Yesterday the light point was on Alexandria, on the Great Green. In five days it will be at Thebes. Calm down, it won't hurt you. Down here is the rest of Africa. Above, Italy, Gaul, Iberia, the Tin Islands, Thule. East, India, Seres, Cipangu."

"Are there really such places?"

"Yes. Do you want to see the other side?"

"... I don't know."

"Well, then, we won't look."

"Can you turn off the little light? It's like the eye of Horus, watching us."

He laughed, but turned it off. "You know what Homer said."

"What did Homer say?"

" 'Though all gods and goddesses look on, yet I gladly sleep with golden Aphrodite.' "

"I have a better one," said Ne-tiy. (For she knew she held the ultimate refutation of all science: geodetics... math... cartography... the rising of stars... the solstice of suns.) "Aie se philo-I love thee forever." She held out her arms.