

# ASIMOV

THE FOUNDATION NOVELS

## FOUNDATION



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# PART I

## THE PSYCHOHISTORIANS

1.

*HARI SELDON-... born in the 11,988th year of the Galactic Era; died 12,069. The dates are more commonly given in terms of the current Foundational Era as- 79 to the year 1 F.E. Born to middle-class parents on Helicon, Arcturus sector (where his father, in a legend of doubtful authenticity, was a tobacco grower in the hydroponic plants of the planet), he early showed amazing ability in mathematics. Anecdotes concerning his ability are innumerable, and some are contradictory. At the age of two, he is said to have ...*

*... Undoubtedly his greatest contributions were in the field of psychohistory. Seldon found the field little more than a set of vague axioms; he left it a profound statistical science....*

*... The best existing authority we have for the details of his life is the biography written by Gaal Dornick who, as a young man, met Seldon two years before the great mathematician's death. The story of the meeting ...*

ENCYCLOPEDIA GALACTICA\*

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His name was Gaal Dornick and he was just a country boy who had never seen Tranter before. That is, not in real life. He *had* seen it many times on the hyper-video, and occasionally in tremendous three-dimensional newscasts covering an Imperial Coronation or the opening of a Galactic Council. Even though he had lived all his life on the world of Synnax, which circled a star at the edges of the Blue Drift, he was not cut off from civilization, you see. At that time, no place in the Galaxy was.

There were nearly twenty-five million inhabited planets in the Galaxy then, and not one but owed allegiance to the Empire whose seat was on Tranter. It was the last halfcentury in which that could be said.

To Gaal, this trip was the undoubted climax of his young, scholarly life. He had been in space before so that the trip, as a voyage and nothing more, meant little to him. To be sure, he had traveled previously only as far as Synnax's only satellite in order to get the data on the mechanics of meteor driftage which he needed for his dissertation, but space-travel was all one whether one travelled half a million miles, or as many light years.

He had steeled himself just a little for the Jump through hyper-space, a phenomenon one did not experience in simple interplanetary trips. The Jump remained, and would probably remain forever, the only practical method of travelling between the stars. Travel through ordinary space could proceed at no rate more rapid than that of ordinary light (a bit of scientific knowledge that belonged among the items known since the forgotten dawn of human history), and that would have meant years of travel between even the nearest of inhabited systems. Through hyper-space, that unimaginable region that was neither space nor time, matter nor energy, something nor nothing, one could traverse the length of the Galaxy in the interval between two neighboring instants of time.

Gaal had waited for the first of those Jumps with a little dread curled gently in his stomach, and it ended in nothing more than a trifling jar, a little internal kick which ceased an instant before he could be sure he had felt it. That was all.

And after that, there was only the ship, large and glistening; the cool production of 12,000 years of Imperial progress; and himself, with his doctorate in mathematics freshly obtained and an invitation from the great Hari Seldon to come to Tranter and join the vast and somewhat mysterious Seldon Project.

What Gaal was waiting for after the disappointment of the Jump was that first sight of Tranter. He haunted the View-room. The steel shutter-lids were rolled back at announced times and he was always there, watching the hard brilliance of the stars, enjoying the incredible hazy swarm of a star cluster, like a giant conglomeration of fire-flies caught in mid-motion and stilled forever. At one time there was the cold, blue-white smoke of a gaseous nebula within five light years of the ship, spreading over the window like distant milk, filling the room with an icy tinge, and disappearing out of sight two hours later, after another Jump.

The first sight of Tranter's sun was that of a hard, white speck all but lost in a myriad such, and recognizable only because it was pointed out by the ship's guide. The stars were thick here near the Galactic center. But with each Jump, it shone more brightly, drowning out the rest, paling them and thinning them out.

An officer came through and said, "View-room will be closed for the remainder of the trip. Prepare for landing."

Gaal had followed after, clutching at the sleeve of the white uniform with the Spaceship-and-Sun of the Empire on it.

He said, "Would it be possible to let me stay? I would like to see Trantor."

The officer smiled and Gaal flushed a bit. It occurred to him that he spoke with a provincial accent.

The officer said, "We'll be landing on Trantor by morning."

"I mean I want to see it from Space."

"Oh. Sorry, my boy. If this were a space-yacht we might manage it. But we're spinning down, sunside. You wouldn't want to be blinded, burnt, and radiation-scarred all at the same time, would you?"

Gaal started to walk away.

The officer called after him, "Trantor would only be gray blur anyway, Kid. Why don't you take a space-tour once you hit Trantor. They're cheap."

Gaal looked back, "Thank you very much."

It was childish to feel disappointed, but childishness comes almost as naturally to a man as to a child, and there was a lump in Gaal's throat. He had never seen Trantor spread out in all its incredibility, as large as life, and he hadn't expected to have to wait longer.

2.

The ship landed in a medley of noises. There was the far-off hiss of the atmosphere cutting and sliding past the metal of the ship. There was the steady drone of the conditioners fighting the heat of friction, and the slower rumble of the engines enforcing deceleration. There was the human sound of men and women gathering in the debarkation rooms and the grind of the hoists lifting baggage, mail, and freight to the long axis of the ship, from which they would be later moved along to the unloading platform.

Gaal felt the slight jar that indicated the ship no longer had an independent motion of its own. Ship's gravity had been giving way to planetary gravity for hours. Thousands of passengers had been sitting patiently in the debarkation rooms which swung easily on yielding force-fields to accommodate its orientation to the changing direction of the gravitational forces. Now they were crawling down curving ramps to the large, yawning locks.

Gaal's baggage was minor. He stood at a desk, as it was quickly and expertly taken apart and put together again. His visa was inspected and stamped. He himself paid no attention.

This was Trantor! The air seemed a little thicker here, the gravity a bit greater, than on his

home planet of Synnax, but he would get used to that. He wondered if he would get used to immensity.

Debarkation Building was tremendous. The roof was almost lost in the heights. Gaal could almost imagine that clouds could form beneath its immensity. He could see no opposite wall; just men and desks and converging floor till it faded out in haze.

The man at the desk was speaking again. He sounded annoyed. He said, "Move on, Dornick." He had to open the visa, look again, before he remembered the name.

Gaal said, "Where- where-"

The man at the desk jerked a thumb, "Taxis to the right and third left."

Gaal moved, seeing the glowing twists of air suspended high in nothingness and reading, "TAXIS TO ALL POINTS."

A figure detached itself from anonymity and stopped at the desk, as Gaal left. The man at the desk looked up and nodded briefly. The figure nodded in return and followed the young immigrant.

He was in time to hear Gaal's destination.

Gaal found himself hard against a railing.

The small sign said, "Supervisor." The man to whom the sign referred did not look up. He said, "Where to?"

Gaal wasn't sure, but even a few seconds hesitation meant men queuing in line behind him.

The Supervisor looked up, "Where to?"

Gaal's funds were low, but there was only this one night and then he would have a job. He tried to sound nonchalant, "A good hotel, please."

The Supervisor was unimpressed, "They're all good. Name one."

Gaal said, desperately, "The nearest one, please."

The Supervisor touched a button. A thin line of light formed along the floor, twisting among others which brightened and dimmed in different colors and shades. A ticket was shoved into Gaal's hands. It glowed faintly.

The Supervisor said, "One point twelve."

Gaal fumbled for the coins. He said, "Where do I go?"

"Follow the light. The ticket will keep glowing as long as you're pointed in the tight direction."

Gaal looked up and began walking. There were hundreds creeping across the vast floor, following their individual trails, sifting and straining themselves through intersection points to arrive at their respective destinations.

His own trail ended. A man in glaring blue and yellow uniform, shining and new in unstainable plasto-textile, reached for his two bags.

"Direct line to the Luxor," he said.

The man who followed Gaal heard that. He also heard Gaal say, "Fine," and watched him enter the blunt-nosed vehicle.

The taxi lifted straight up. Gaal stared out the curved, transparent window, marvelling at the sensation of airflight within an enclosed structure and clutching instinctively at the back of the driver's seat. The vastness contracted and the people became ants in random distribution. The scene contracted further and began to slide backward.

There was a wall ahead. It began high in the air and extended upward out of sight. It was riddled with holes that were the mouths of tunnels. Gaal's taxi moved toward one then plunged into it. For a moment, Gaal wondered idly how his driver could pick out one among so many.

There was now only blackness, with nothing but the past-flashing of a colored signal light to relieve the gloom. The air was full of a rushing sound.

Gaal leaned forward against deceleration then and the taxi popped out of the tunnel and descended to ground-level once more.

"The Luxor Hotel," said the driver, unnecessarily. He helped Gaal with his baggage, accepted a tenth-credit tip with a businesslike air, picked up a waiting passenger, and was rising again.

In all this, from the moment of debarkation, there had been no glimpse of sky.

3.

*TRANTOR--At the beginning of the thirteenth millennium, this tendency reached its climax. As the center of the Imperial Government for unbroken hundreds of generations and located, as it was, toward the central regions of the Galaxy among the most densely populated and industrially advanced worlds of the system, it could scarcely help being the densest and richest clot of humanity the Race had ever seen.*

*Its urbanization, progressing steadily, had finally reached the ultimate. All the land surface of Trantor, 75,000,000 square miles in extent, was a single city. The population, at its height, was well in excess of forty billions. This enormous population was devoted almost entirely to the administrative necessities of Empire, and found themselves all too few for the complications of the task. (It is to be remembered that the impossibility of proper administration of the Galactic Empire under the uninspired leadership of the later Emperors was a considerable factor in the Fall.) Daily, fleets of ships in the tens of thousands brought the produce of twenty agricultural worlds to the dinner tables of Trantor....*

*Its dependence upon the outer worlds for food and, indeed, for all necessities of life, made Trantor increasingly vulnerable to conquest by siege. In the last millennium of the Empire, the monotonously numerous revolts made Emperor after Emperor conscious of this, and Imperial*

*policy became little more than the protection of Trantor's delicate jugular vein....*

## ENCYCLOPEDIA GALACTICA

Gaal was not certain whether the sun shone, or, for that matter, whether it was day or night. He was ashamed to ask. All the planet seemed to live beneath metal. The meal of which he had just partaken had been labelled luncheon, but there were many planets which lived a standard timescale that took no account of the perhaps inconvenient alternation of day and night. The rate of planetary turnings differed, and he did not know that of Tranter.

At first, he had eagerly followed the signs to the "Sun Room" and found it but a chamber for basking in artificial radiation. He lingered a moment or two, then returned to the Luxor's main lobby.

He said to the room clerk, "Where can I buy a ticket for a planetary tour?"

"Right here."

"When will it start?"

"You just missed it. Another one tomorrow. Buy a ticket now and we'll reserve a place for you."

"Oh." Tomorrow would be too late. He would have to be at the University tomorrow. He said, "There wouldn't be an observation tower- or something? I mean, in the open air."

"Sure! Sell you a ticket for that, if you want. Better let me check if it's raining or not." He closed a contact at his elbow and read the flowing letters that raced across a frosted screen. Gaal read with him.

The room clerk said, "Good weather. Come to think of it, I do believe it's the dry season now." He added, conversationally, "I don't bother with the outside myself. The last time I was in the open was three years ago. You see it once, you know and that's all there is to it. Here's your ticket. Special elevator in the rear. It's marked 'To the Tower.' Just take it."

The elevator was of the new sort that ran by gravitic repulsion. Gaal entered and others flowed in behind him. The operator closed a contact. For a moment, Gaal felt suspended in space as gravity switched to zero, and then he had weight again in small measure as the elevator accelerated upward. Deceleration followed and his feet left the floor. He squawked against his will.

The operator called out, "Tuck your feet under the railing. Can't you read the sign?"

The others had done so. They were smiling at him as he madly and vainly tried to clamber back down the wall. Their shoes pressed upward against the chromium of the railings that stretched across the floor in parallels set two feet apart. He had noticed those railings on entering and had ignored them.

Then a hand reached out and pulled him down.

He gasped his thanks as the elevator came to a halt.

He stepped out upon an open terrace bathed in a white brilliance that hurl his eyes. The man,

whose helping hand he had just now been the recipient of, was immediately behind him.

The man said, kindly, "Plenty of seats."

Gaal closed his mouth; he had been gaping; and said, "It certainly seems so." He started for them automatically, then stopped.

He said, "If you don't mind, I'll just stop a moment at the railing. I – I want to look a bit."

The man waved him on, good-naturedly, and Gaal leaned out over the shoulder-high railing and bathed himself in all the panorama.

He could not see the ground. It was lost in the ever increasing complexities of man-made structures. He could see no horizon other than that of metal against sky, stretching out to almost uniform grayness, and he knew it was so over all the land-surface of the planet. There was scarcely any motion to be seen – a few pleasure-craft lazed against the sky-but all the busy traffic of billions of men were going on, he knew, beneath the metal skin of the world.

There was no green to be seen; no green, no soil, no life other than man. Somewhere on the world, he realized vaguely, was the Emperor's palace, set amid one hundred square miles of natural soil, green with trees, rainbowed with flowers. It was a small island amid an ocean of steel, but it wasn't visible from where he stood. It might be ten thousand miles away. He did not know.

Before very long, he must have his tour!

He sighed noisily, and realized finally that he was on Tranter at last; on the planet which was the center of all the Galaxy and the kernel of the human race. He saw none of its weaknesses. He saw no ships of food landing. He was not aware of a jugular vein delicately connecting the forty billion of Tranter with the rest of the Galaxy. He was conscious only of the mightiest deed of man; the complete and almost contemptuously final conquest of a world.

He came away a little blank-eyed. His friend of the elevator was indicating a seat next to himself and Gaal took it.

The man smiled. "My name is Jerril. First time on Tranter?"

"Yes, Mr. Jerril."

"Thought so. Jerril's my first name. Tranter gets you if you've got the poetic temperament. Trantorians never come up here, though. They don't like it. Gives them nerves."

"Nerves!- My name's Gaal, by the way. Why should it give them nerves? It's glorious."

"Subjective matter of opinion, Gaal. If you're born in a cubicle and grow up in a corridor, and work in a cell, and vacation in a crowded sun-room, then coming up into the open with nothing but sky over you might just give you a nervous breakdown. They make the children come up here once a year, after they're five. I don't know if it does any good. They don't get enough of it, really, and the first few times they scream themselves into hysteria. They ought to start as soon as they're weaned and have the trip once a week."



He went on, "Of course, it doesn't really matter. What if they never come out at all? They're happy down there and they run the Empire. How high up do you think we are?"

He said, "Half a mile?" and wondered if that sounded naive.

It must have, for Jerril chuckled a little. He said, "No. Just five hundred feet."

"What? But the elevator took about-"

"I know. But most of the time it was just getting up to ground level. Tranter is tunneled over a mile down. It's like an iceberg. Nine-tenths of it is out of sight. It even works itself out a few miles into the sub-ocean soil at the shorelines. In fact, we're down so low that we can make use of the temperature difference between ground level and a couple of miles under to supply us with all the energy we need. Did you know that?"

"No, I thought you used atomic generators."

"Did once. But this is cheaper."

"I imagine so."

"What do you think of it all?" For a moment, the man's good nature evaporated into shrewdness. He looked almost sly.

Gaal fumbled. "Glorious," he said, again.

"Here on vacation? Traveling? Sight-seeing?"

"No exactly. At least, I've always wanted to visit Tranter but I came here primarily for a job."

"Oh?"

Gaal felt obliged to explain further, "With Dr. Seldon's project at the University of Tranter."

"Raven Seldon?"

"Why, no. The one I mean is Hari Seldon. -The psychohistorian Seldon. I don't know of any Raven Seldon."

"Hari's the one I mean. They call him Raven. Slang, you know. He keeps predicting disaster."

"He does?" Gaal was genuinely astonished.

"Surely, you must know." Jerril was not smiling. "You're coming to work for him, aren't you?"

"Well, yes, I'm a mathematician. Why does he predict disaster? What kind of disaster?"

"What kind would you think?"

"I'm afraid I wouldn't have the least idea. I've read the papers Dr. Seldon and his group have published. They're on mathematical theory."

"Yes, the ones they publish."

Gaal felt annoyed. He said, "I think I'll go to my room now. Very pleased to have met you."

Jerril waved his arm indifferently in farewell.

Gaal found a man waiting for him in his room. For a moment, he was too startled to put into words the inevitable, "What are you doing here?" that came to his lips.

The man rose. He was old and almost bald and he walked with a limp, but his eyes were very bright and blue.

He said, "I am Hari Seldon," an instant before Gaal's befuddled brain placed the face alongside the memory of the many times he had seen it in pictures.

4.

*PSYCHOHISTORY-...Gaal Dornick, using nonmathematical concepts, has defined psychohistory to be that branch of mathematics which deals with the reactions of human conglomerates to fixed social and economic stimuli....*

*... Implicit in all these definitions is the assumption that the human conglomerate being dealt with is sufficiently large for valid statistical treatment. The necessary size of such a conglomerate may be determined by Seldon's First Theorem which ... A further necessary assumption is that the human conglomerate be itself unaware of psychohistoric analysis in order that its reactions be truly random ...*

*The basis of all valid psychohistory lies in the development of the Seldon. Functions which exhibit properties congruent to those of such social and economic forces as ...*

ENCYCLOPEDIA GALACTICA

"Good afternoon, sir," said Gaal. "1- 1-"

"You didn't think we were to meet before tomorrow? Ordinarily, we would not have. It is just that if we are to use your services, we must work quickly. It grows continually more difficult to obtain recruits."

"I don't understand, sir."

"You were talking to a man on the observation tower, were you not?"

"Yes. His first name is Jerril. I know no more about him."

"His name is nothing. He is an agent of the Commission of Public Safety. He followed you from the space-port."

"But why? I am afraid I am very confused."

"Did the man on the tower say nothing about me?"

Gaal hesitated, "He referred to you as Raven Seldon."

"Did he say why?"

"He said you predict disaster."

"I do. What does Tranter mean to you?"

Everyone seemed to be asking his opinion of Tranter. Gaal felt incapable of response beyond the bare word, "Glorious."

"You say that without thinking. What of psychohistory?"

"I haven't thought of applying it to the problem."

"Before you are done with me, young man, you will learn to apply psychohistory to all problems as a matter of course. -Observe." Seldon removed his calculator pad from the pouch at his belt. Men said he kept one beneath his pillow for use in moments of wakefulness. Its gray, glossy finish was slightly worn by use. Seldon's nimble fingers, spotted now with age, played along the files and rows of buttons that filled its surface. Red symbols glowed out from the upper tier.

He said, "That represents the condition of the Empire at present."

He waited.

Gaal said finally, "Surely that is not a complete representation."

"No, not complete," said Seldon. "I am glad you do not accept my word blindly. However, this is an approximation which will serve to demonstrate the proposition. Will you accept that?"

"Subject to my later verification of the derivation of the function, yes." Gaal was carefully avoiding a possible trap.

"Good. Add to this the known probability of Imperial assassination, viceregal revolt, the contemporary recurrence of periods of economic depression, the declining rate of planetary explorations, the..."

He proceeded. As each item was mentioned, new symbols sprang to life at his touch, and melted into the basic function which expanded and changed.

Gaal stopped him only once. "I don't see the validity of that set-transformation."

Seldon repeated it more slowly.

Gaal said, "But that is done by way of a forbidden sociooperation."

"Good. You are quick, but not yet quick enough. It is not forbidden in this connection. Let me do it by expansions."

The procedure was much longer and at its end, Gaal said, humbly, "Yes, I see now."

Finally, Seldon stopped. "This is Tranter three centuries from now. How do you interpret that?"

Eh?" He put his head to one side and waited.

Gaal said, unbelievably, "Total destruction! But-but that is impossible. Tranter has never been-"

Seldon was filled with the intense excitement of a man whose body only had grown old. "Come, come. You saw how the result was arrived at. Put it into words. Forget the symbolism for a moment."

Gaal said, "As Tranter becomes more specialized, it becomes more vulnerable, less able to defend itself. Further, as it becomes more and more the administrative center of Empire, it becomes a greater prize. As the Imperial succession becomes more and more uncertain, and the feuds among the great families more rampant, social responsibility disappears."

"Enough. And what of the numerical probability of total destruction within three centuries?"

"I couldn't tell."

"Surely you can perform a field-differentiation?"

Gaal felt himself under pressure. He was not offered the calculator pad. It was held a foot from his eyes. He calculated furiously and felt his forehead grow slick with sweat.

He said, "About 85%?"

"Not bad," said Seldon, thrusting out a lower lip, "but not good. The actual figure is 92.5%."

Gaal said, "And so you are called Raven Seldon? I have seen none of this in the journals."

"But of course not. This is unprintable. Do you suppose the Imperium could expose its shakiness in this manner. That is a very simple demonstration in psychohistory. But some of our results have leaked out among the aristocracy."

"That's bad."

"Not necessarily. All is taken into account."

"But is that why I'm being investigated?"

"Yes. Everything about my project is being investigated."

"Are you in danger, sir?"

"Oh, yes. There is probability of 1.7% that I will be executed, but of course that will not stop the project. We have taken that into account as well. Well, never mind. You will meet me, I suppose, at the University tomorrow?"

"I will," said Gaal.

*COMMISSION OF PUBLIC SAFETY-... The aristocratic coterie rose to power after the assassination of Cleon I, last of the Entuns. In the main, they formed an element of order during the centuries of instability and uncertainty in the Imperium. Usually under the control of the great families of the Chens and the Divarts, it degenerated eventually into a blind instrument for maintenance of the status quo.... They were not completely removed as a power in the state until after the accession of the last strong Emperor, Cleon H. The first Chief Commissioner....*

*... In a way, the beginning of the Commission's decline can be traced to the trial of Hari Seldon two years before the beginning of the Foundational Era. That trial is described in Gaal Dornick's biography of Hari Seldon....*

## ENCYCLOPEDIA GALACTICA

Gaal did not carry out his promise. He was awakened the next morning by a muted buzzer. He answered it, and the voice of the desk clerk, as muted, polite and deprecating as it well might be, informed him that he was under detention at the orders of the Commission of Public Safety.

Gaal sprang to the door and found it would no longer open. He could only dress and wait.

They came for him and took him elsewhere, but it was still detention. They asked him questions most politely. It was all very civilized. He explained that he was a provincial of Synnax; that he had attended such and such schools and obtained a Doctor of Mathematics degree on such and such a date. He had applied for a position on Dr. Seldon's staff and had been accepted. Over and over again, he gave these details; and over and over again, they returned to the question of his joining the Seldon Project. How had he heard of it; what were to be his duties; what secret instructions had he received; what was it all about?

He answered that he did not know. He had no secret instructions. He was a scholar and a mathematician. He had no interest in politics.

And finally the gentle inquisitor asked, "When will Tranter be destroyed?"

Gaal faltered, "I could not say of my own knowledge."

"Could you say of anyone's?"

"How could I speak for another?" He felt warm; overwarm.

The inquisitor said, "Has anyone told you of such destruction; set a date?" And, as the young man hesitated, he went on, "You have been followed, doctor. We were at the airport when you arrived; on the observation tower when you waited for your appointment; and, of course, we were able to overhear your conversation with Dr. Seldon."

Gaal said, "Then you know his views on the matter."

"Perhaps. But we would like to hear them from you."

"He is of the opinion that Tranter would be destroyed within three centuries."

"He proved it, -uh- mathematically?"

"Yes, he did,"- defiantly.

"You maintain the- uh- mathematics to be valid, I suppose.

"If Dr. Seldon vouches for it, it is valid."

"Then we will return."

"Wait. I have a right to a lawyer. I demand my rights as an Imperial citizen."

"You shall have them."

And he did.

It was a tall man that eventually entered, a man whose face seemed all vertical lines and so thin that one could wonder whether there was room for a smile.

Gaal looked up. He felt disheveled and wilted. So much had happened, yet he had been on Trantor not more than thirty hours.

The man said, "I am Lars Avakim. Dr. Seldon has directed me to represent you."

"Is that so? Well, then, look here. I demand an instant appeal to the Emperor. I'm being held without cause. I'm innocent of anything. Of *anything*." He slashed his hands outward, palms down, "You've got to arrange a hearing with the Emperor, instantly."

Avakim was carefully emptying the contents of a flat folder onto the floor. If Gaal had had the stomach for it, he might have recognized Cellomet legal forms, metal thin and tapelike, adapted for insertion within the smallness of a personal capsule. He might also have recognized a pocket recorder.

Avakim, paying no attention to Gaal's outburst, finally looked up. He said, "The Commission will, of course, have a spy beam on our conversation. This is against the law, but they will use one nevertheless."

Gaal ground his teeth.

"However," and Avakim seated himself deliberately, "the recorder I have on the table, -which is a perfectly ordinary recorder to all appearances and performs its duties well- has the additional property of completely blanketing the spy beam. This is something they will not find out at once."

"Then I can speak."

"Of course."

"Then I want a hearing with the Emperor."

Avakim smiled frostily, and it turned out that there was room for it on his thin face after all. His cheeks wrinkled to make the room. He said, "You are from the provinces."

"I am none the less an Imperial citizen. As good a one as you or as any of this Commission of Public Safety."

"No doubt; no doubt. It is merely that, as a provincial, you do not understand life on Trantor as it

is, There are no hearings before the Emperor."

"To whom else would one appeal from this Commission? Is there other procedure?"

"None. There is no recourse in a practical sense. Legalistically, you may appeal to the Emperor, but you would get no hearing. The Emperor today is not the Emperor of an Entun dynasty, you know. Tranter, I am afraid is in the hands of the aristocratic families, members of which compose the Commission of Public Safety. This is a development which is well predicted by psychohistory."

Gaal said, "Indeed? In that case, if Dr. Seldon can predict the history of Tranter three hundred years into the future-"

"He can predict it fifteen hundred years into the future."

"Let it be fifteen thousand. Why couldn't he yesterday have predicted the events of this morning and warned me. -No, I'm sorry." Gaal sat down and rested his head in one sweating palm, "I quite understand that psychohistory is a statistical science and cannot predict the future of a single man with any accuracy. You'll understand that I'm upset."

"But you are wrong. Dr. Seldon was of the opinion that you would be arrested this morning."

"What!"

"It is unfortunate, but true. The Commission has been more and more hostile to his activities. New members joining the group have been interfered with to an increasing extent. The graphs showed that for our purposes, matters might best be brought to a climax now. The Commission of itself was moving somewhat slowly so Dr. Seldon visited you yesterday for the purpose of forcing their hand. No other reason."

Gaal caught his breath, "I resent -"

"Please. It was necessary. You were not picked for any personal reasons. You must realize that Dr. Seldon's plans, which are laid out with the developed mathematics of over eighteen years include all eventualities with significant probabilities. This is one of them. I've been sent here for no other purpose than to assure you that you need not fear. It will end well; almost certainly so for the project; and with reasonable probability for you."

"What are the figures?" demanded Gaal.

"For the project, over 99.9%."

"And for myself?"

"I am instructed that this probability is 77.2%."

"Then I've got better than one chance in five of being sentenced to prison or to death."

"The last is under one per cent."

"Indeed. Calculations upon one man mean nothing. You send Dr. Seldon to me."

"Unfortunately, I cannot. Dr. Seldon is himself arrested."

The door was thrown open before the rising Gaal could do more than utter the beginning of a cry. A guard entered, walked to the table, picked up the recorder, looked upon all sides of it and put it in his pocket.

Avakim said quietly, "I will need that instrument."

"We will supply you with one, Counsellor, that does not cast a static field."

"My interview is done, in that case."

Gaal watched him leave and was alone.

6.

The trial (Gaal supposed it to be one, though it bore little resemblance legalistically to the elaborate trial techniques Gaal had read of) had not lasted long. It was in its third day. Yet already, Gaal could no longer stretch his memory back far enough to embrace its beginning.

He himself had been but little pecked at. The heavy guns were trained on Dr. Seldon himself. Hari Seldon, however, sat there unperturbed. To Gaal, he was the only spot of stability remaining in the world.

The audience was small and drawn exclusively from among the Barons of the Empire. Press and public were excluded and it was doubtful that any significant number of outsiders even knew that a trial of Seldon was being conducted. The atmosphere was one of unrelieved hostility toward the defendants.

Five of the Commission of Public Safety sat behind the raised desk. They wore scarlet and gold uniforms and the shining, close-fitting plastic caps that were the sign of their judicial function. In the center was the Chief Commissioner Linge Chen. Gaal had never before seen so great a Lord and he watched him with fascination. Chen, throughout the trial, rarely said a word. He made it quite clear that much speech was beneath his dignity.

The Commission's Advocate consulted his notes and the examination continued, with Seldon still on the stand:

Q. Let us see, Dr. Seldon. How many men are now engaged in the project of which you are head?

A. Fifty mathematicians.

Q. Including Dr. Gaal Dornick?

A. Dr. Dornick is the fifty-first,

Q. Oh, we have fifty-one then? Search your memory, Dr. Seldon. Perhaps there are fifty-two or fifty-three? Or perhaps even more?



A. Dr. Dornick has not yet formally joined my organization. When he does, the membership will be fifty-one. It is now fifty, as I have said.

Q. Not perhaps nearly a hundred thousand?

A. Mathematicians? No.

Q. I did not say mathematicians. Are there a hundred thousand in all capacities?

A. In all capacities, your figure may be correct.

Q. May be? I say it is. I say that the men in your project number ninety-eight thousand, five hundred and seventy-two.

A. I believe you are counting women and children.

Q. (raising his voice) Ninety eight thousand five hundred and seventy-two individuals is the intent of my statement. There is no need to quibble.

A. I accept the figures.

Q. (referring to his notes) Let us drop that for the moment, then, and take up another matter which we have already discussed at some length. Would you repeat, Dr. Seldon, your thoughts concerning the future of Tranter?

A. I have said, and I say again, that Tranter will lie in ruins within the next three centuries.

Q. You do not consider your statement a disloyal one?

A. No, sir. Scientific truth is beyond loyalty and disloyalty.

Q. You are sure that your statement represents scientific truth?

A. I am.

Q. On what basis?

A. On the basis of the mathematics of psychohistory.

Q. Can you prove that this mathematics is valid'?

A. Only to another mathematician.

Q. (with a smile) Your claim then is that your truth is of so esoteric a nature that it is beyond the understanding of a plain man. It seems to me that truth should be clearer than that, less mysterious, more open to the mind.

A. It presents no difficulties to some minds. The physics of energy transfer, which we know as thermodynamics, has been clear and true through all the history of man since the mythical ages, yet there may be people present who would find it impossible to design a power engine. People of high intelligence, too. I doubt if the learned Commissioners-

At this point, one of the Commissioners leaned toward the Advocate. His words were not heard

but the hissing of the voice carried a certain asperity. The Advocate Hushed and interrupted Seldon.

Q. We are not here to listen to speeches, Dr. Seldon. Let us assume that you have made your point. Let me suggest to you that your predictions of disaster might be intended to destroy public confidence in the Imperial Government for purposes of your own.

A. That is not so.

Q. Let me suggest that you intend to claim that a period of time preceding the so-called ruin of Tranter will be filled with unrest of various types.

A. That is correct.

Q. And that by the mere prediction thereof, you hope to bring it about, and to have then an army of a hundred thousand available.

A. In the first place, that is not so. And if it were, investigation will show you that barely ten thousand are men of military age, and none of these has training in arms.

Q. Are you acting as an agent for another?

A. I am not in the pay of any man, Mr. Advocate.

Q. You are entirely disinterested? You are serving science?

A. I am.

Q. Then let us see how. Can the future be changed, Dr. Seldon?

A. Obviously. This courtroom may explode in the next few hours, or it may not. If it did, the future would undoubtedly be changed in some minor respects.

Q. You quibble, Dr. Seldon. Can the overall history of the human race be changed?

A. Yes.

Q. Easily?

A. No. With great difficulty.

Q. Why?

A. The psychohistoric trend of a planet-full of people contains a huge inertia. To be changed it must be met with something possessing a similar inertia. Either as many people must be concerned, or if the number of people be relatively small, enormous time for change must be allowed. Do you understand?

Q. I think I do. Tranter need not be ruined, if a great many people decide to act so that it will not.

A. That is right.

Q. As many as a hundred thousand people?

A. No, sir. That is far too few.

Q. You are sure?

A. Consider that Tranter has a population of over forty billions. Consider further that the trend leading to ruin does not belong to Tranter alone but to the Empire as a whole and the Empire contains nearly a quintillion human beings.

Q. I see. Then perhaps a hundred thousand people can change the trend, if they and their descendants labor for three hundred years.

A. I'm afraid not. Three hundred years is too short a time.

Q. Ah! In that case, Dr. Seldon, we are left with this deduction to be made from your statements. You have gathered one hundred thousand people within the confines of your project. These are insufficient to change the history of Tranter within three hundred years. In other words, they cannot prevent the destruction of Tranter no matter what they do.

A. You are unfortunately correct.

Q. And on the other hand, your hundred thousand are intended for no illegal purpose.

A. Exactly.

Q. (slowly and with satisfaction) In that case, Dr. Seldon- Now attend, sir, most carefully, for we want a considered answer. What is the purpose of your hundred thousand?

The Advocate's voice had grown strident. He had sprung his trap; backed Seldon into a corner; driven him astutely from any possibility of answering.

There was a rising buzz of conversation at that which swept the ranks of the peers in the audience and invaded even the row of Commissioners. They swayed toward one another in their scarlet and gold, only the Chief remaining uncorrupted.

Hari Seldon remained unmoved. He waited for the babble to evaporate.

A. To minimize the effects of that destruction.

Q. And exactly what do you mean by that?

A. The explanation is simple. The coming destruction of Tranter is not an event in itself, isolated in the scheme of human development. It will be the climax to an intricate drama which was begun centuries ago and which is accelerating in pace continuously. I refer, gentlemen, to the developing decline and fall of the Galactic Empire.

The buzz now became a dull roar. The Advocate, unheeded, was yelling, "You are openly declaring that-" and stopped because the cries of "Treason" from the audience showed that the point had been made without any hammering.

Slowly, the Chief Commissioner raised his gavel once and let it drop. The sound was that of a

mellow gong. When the reverberations ceased, the gabble of the audience also did. The Advocate took a deep breath.

Q. (theatrically) Do you realize, Dr. Seldon, that you are speaking of an Empire that has stood for twelve thousand years, through all the vicissitudes of the generations, and which has behind it the good wishes and love of a quadrillion human beings?

A. I am aware both of the present status and the past history of the Empire. Without disrespect, I must claim a far better knowledge of it than any in this room.

Q. And you predict its ruin?

A. It is a prediction which is made by mathematics. I pass no moral judgements. Personally, I regret the prospect. Even if the Empire were admitted to be a bad thing (an admission I do not make), the state of anarchy which would follow its fall would be worse. It is that state of anarchy which my project is pledged to fight. The fall of Empire, gentlemen, is a massive thing, however, and not easily fought. It is dictated by a rising bureaucracy, a receding initiative, a freezing of caste, a damming of curiosity- a hundred other factors. It has been going on, as I have said, for centuries, and it is too majestic and massive a movement to stop.

Q. Is it not obvious to anyone that the Empire is as strong as it ever was?

A. The appearance of strength is all about you. It would seem to last forever. However, Mr. Advocate, the rotten tree-trunk, until the very moment when the storm-blast breaks it in two, has all the appearance of might it ever had. The storm-blast whistles through the branches of the Empire even now. Listen with the ears of psychohistory, and you will hear the creaking.

Q. (uncertainly) We are not here, Dr. Seldon, to lis-

A. (firmly) The Empire will vanish and all its good with it. Its accumulated knowledge will decay and the order it has imposed will vanish. Interstellar wars will be endless; interstellar trade will decay; population will decline; worlds will lose touch with the main body of the Galaxy. -And so matters will remain.

Q. (a small voice in the middle of a vast silence) Forever?

A. Psychohistory, which can predict the fall, can make statements concerning the succeeding dark ages. The Empire, gentlemen, as has just been said, has stood twelve thousand years. The dark ages to come will endure not twelve, but thirty thousand years. A Second Empire will rise, but between it and our civilization will be one thousand generations of suffering humanity. We must fight that.

Q. (recovering somewhat) You contradict yourself. You said earlier that you could not prevent the destruction of Tranter; hence, presumably, the fall; -the *so-called* fall of the Empire.

A. I do not say now that we can prevent the fall. But it is not yet too late to shorten the interregnum which will follow. It is possible, gentlemen, to reduce the duration of anarchy to a single millennium, if my group is allowed to act now. We are at a delicate moment in history. The huge, onrushing mass of events must be deflected just a little, -just a little - It cannot be much, but it may be enough to remove twenty-nine thousand years of misery from human

history.

Q. How do you propose to do this?

A. By saving the knowledge of the race. The sum of human knowing is beyond any one man; any thousand men. With the destruction of our social fabric, science will be broken into a million pieces. Individuals will know much of exceedingly tiny facets of what there is to know. They will be helpless and useless by themselves. The bits of lore, meaningless, will not be passed on. They will be lost through the generations. But, if we now prepare a giant summary of all knowledge, it will never be lost. Coming generations will build on it, and will not have to rediscover it for themselves. One millennium will do the work of thirty thousand.

Q. All this

A. All my project; my thirty thousand men with their wives and children, are devoting themselves to the preparation of an "Encyclopedia Galactica." They will not complete it in their lifetimes. I will not even live to see it fairly begun. But by the time Tranter falls, it will be complete and copies will exist in every major library in the Galaxy.

The Chief Commissioner's gavel rose and fell. Hari Seldon left the stand and quietly took his seat next to Gaal.

He smiled and said, "How did you like the show?"

Gaal said, "You stole it. But what will happen now?"

"They'll adjourn the trial and try to come to a private agreement with me."

"How do you know?"

Seldon said, "I'll be honest. I don't know. It depends on the Chief Commissioner. I have studied him for years. I have tried to analyze his workings, but you know how risky it is to introduce the vagaries of an individual in the psychohistoric equations. Yet I have hopes."

7.

Avakim approached, nodded to Gaal, leaned over to whisper to Seldon. The cry of adjournment rang out, and guards separated them. Gaal was led away.

The next day's hearings were entirely different. Hari Seldon and Gaal Dornick were alone with the Commission. They were seated at a table together, with scarcely a separation between the five judges and the two accused. They were even offered cigars from a box of iridescent plastic which had the appearance of water, endlessly flowing. The eyes were fooled into seeing the motion although the fingers reported it to be hard and dry.

Seldon accepted one; Gaal refused.

Seldon said, "My lawyer is not present."

A Commissioner replied, "This is no longer a trial, Dr. Seldon. We are here to discuss the safety

of the State."

Linge Chen said, "I will speak," and the other Commissioners sat back in their chairs, prepared to listen. A silence formed about Chen into which he might drop his words.

Gaal held his breath. Chen, lean and hard, older in looks than in fact, was the actual Emperor of all the Galaxy. The child who bore the title itself was only a symbol manufactured by Chen, and not the first such, either.

Chen said, "Dr. Seldon, you disturb the peace of the Emperor's realm. None of the quadrillions living now among all the stars of the Galaxy will be living a century from now. Why, then, should we concern ourselves with events of three centuries distance?"

"I shall not be alive half a decade hence," said Seldon, and yet it is of overpowering concern to me. Call it idealism. Call it an identification of myself with that mystical generalization to which we refer by the term, 'humanity.'"

"I do not wish to take the trouble to understand mysticism. Can you tell me why I may not rid myself of you, and of an uncomfortable and unnecessary three-century future which I will never see by having you executed tonight?"

"A week ago," said Seldon, lightly, "you might have done so and perhaps retained a one in ten probability of yourself remaining alive at year's end. Today, the one in ten probability is scarcely one in ten thousand."

There were expired breaths in the gathering and uneasy stirrings. Gaal felt the short hairs prickle on the back of his neck. Chen's upper eyelids dropped a little.

"How so?" he said.

"The fall of Tranter," said Seldon, "cannot be stopped by any conceivable effort. It can be hastened easily, however. The tale of my interrupted trial will spread through the Galaxy. Frustration of my plans to lighten the disaster will convince people that the future holds no promise to them. Already they recall the lives of their grandfathers with envy. They will see that political revolutions and trade stagnations will increase. The feeling will pervade the Galaxy that only what a man can grasp for himself at that moment will be of any account. Ambitious men will not wait and unscrupulous men will not hang back. By their every action they will hasten the decay of the worlds. Have me killed and Tranter will fall not within three centuries but within fifty years and you, yourself, within a single year."

Chen said, "These are words to frighten children, and yet your death is not the only answer which will satisfy us."

He lifted his slender hand from the papers on which it rested, so that only two fingers touched lightly upon the topmost sheet.

"Tell me," he said, "will your only activity be that of preparing this encyclopedia you speak of?"

"It will."

"And need that be done on Tranter?"

"Tranter, my lord, possesses the Imperial Library, as well as the scholarly resources of the University of Tranter."

"And yet if you were located elsewhere- , let us say upon a planet where the hurry and distractions of a metropolis will not interfere with scholastic musings; where your men may devote themselves entirely and single-mindedly to their work; -might not that have advantages?"

"Minor ones, perhaps."

"Such a world had been chosen, then. You may work, doctor, at your leisure, with your hundred thousand about you. The Galaxy will know that you are working and fighting the Fall. They will even be told that you will prevent the Fall." He smiled, "Since I do not believe in so many things, it is not difficult for me to disbelieve in the Fall as well, so that I am entirely convinced I will be telling the truth to the people. And meanwhile, doctor, you will not trouble Tranter and there will be no disturbance of the Emperor's peace."

"The alternative is death for yourself and for as many of your followers as will seem necessary. Your earlier threats I disregard. The opportunity for choosing between death and exile is given you over a time period stretching from this moment to one five minutes hence."

"Which is the world chosen, my lord?" said Seldon.

"It is called, I believe, Terminus," said Chen. Negligently, he turned the papers upon his desk with his fingertips so that they faced Seldon. "It is uninhabited, but quite habitable, and can be molded to suit the necessities of scholars. It is somewhat secluded-"

Seldon interrupted, "It is at the edge of the Galaxy, sir."

"As I have said, somewhat secluded. It will suit your needs for concentration. Come, you have two minutes left."

Seldon said, "We will need time to arrange such a trip. There are twenty thousand families involved."

"You will be given time."

Seldon thought a moment, and the last minute began to die. He said, "I accept exile."

Gaal's heart skipped a beat at the words. For the most part, he was filled with a tremendous joy for who would not be, to escape death. Yet in all his vast relief, he found space for a little regret that Seldon had been defeated.

8.

For a long while, they sat silently as the taxi whined through the hundreds of miles of worm-like tunnels toward the University. And then Gaal stirred. He said:

"Was what you told the Commissioner true? Would your execution have really hastened the

Fall?"

Seldon said, "I never lie about psychohistoric findings. Nor would it have availed me in this case. Chen knew I spoke the truth. He is a very clever politician and politicians by the very nature of their work must have an instinctive feeling for the truths of psychohistory."

"Then need you have accepted exile," Gaal wondered, but Seldon did not answer.

When they burst out upon the University grounds, Gaal's muscles took action of their own; or rather, inaction. He had to be carried, almost, out of the taxi.

All the University was a blaze of light. Gaal had almost forgotten that a sun could exist.

The University structures lacked the hard steel-gray of the rest of Tranter. They were silvery, rather. The metallic luster was almost ivory in color.

Seldon said, "Soldiers, it seems."

"What?" Gaal brought his eyes to the prosaic ground and found a sentinel ahead of them.

They stopped before him, and a soft-spoken captain materialized from a near-by doorway.

He said, "Dr. Seldon?"

"Yes."

"We have been waiting for you. You and your men will be under martial law henceforth. I have been instructed to inform you that six months will be allowed you for preparations to leave for Terminus."

"Six months!" began Gaal, but Seldon's fingers were upon his elbow with gentle pressure.

"These are my instructions," repeated the captain.

He was gone, and Gaal turned to Seldon, "Why, what can be done in six months? This is but slower murder."

"Quietly. Quietly. Let us reach my office."

It was not a large office, but it was quite spy-proof and quite undetectably so. Spy-beams trained upon it received neither a suspicious silence nor an even more suspicious static. They received, rather, a conversation constructed at random out of a vast stock of innocuous phrases in various tones and voices.

"Now," said Seldon, at his ease, "six months will be enough."

"I don't see how."

"Because, my boy, in a plan such as ours, the actions of others are bent to our needs. Have I not said to you already that Chen's temperamental makeup has been subjected to greater scrutiny than that of any other single man in history. The trial was not allowed to begin until the time and circumstances were right for the ending of our own choosing."



"But could you have arranged-"

"-to be exiled to Terminus? Why not?" He put his fingers on a certain spot on his desk and a small section of the wall behind him slid aside. Only his own fingers could have done so, since only his particular print-pattern could have activated the scanner beneath.

"You will find several microfilms inside," said Seldon. "Take the one marked with the letter, T."

Gaal did so and waited while Seldon fixed it within the projector and handed the young man a pair of eyepieces. Gaal adjusted them, and watched the film unroll before his eyes.

He said, "But then-"

Seldon said, "What surprises you?"

"Have you been preparing to leave for two years?"

"Two and a half. Of course, we could not be certain that it would be Terminus he would choose, but we hoped it might be and we acted upon that assumption-"

"But why, Dr. Seldon? If you arranged the exile, why? Could not events be far better controlled here on Tranter?"

"Why, there are some reasons. Working on Terminus, we will have Imperial support without ever rousing fears that we would endanger Imperial safety."

Gaal said, "But you aroused those fears only to force exile. I still do not understand."

"Twenty thousand families would not travel to the end of the Galaxy of their own will perhaps."

"But why should they be forced there?" Gaal paused, "May I not know?"

Seldon said, "Not yet. It is enough for the moment that you know that a scientific refuge will be established on Terminus. And another will be established at the other end of the Galaxy, let us say," and he smiled, "at Star's End. And as for the rest, I will die soon, and you will see more than I. -No, no. Spare me your shock and good wishes. My doctors tell me that I cannot live longer than a year or two. But then, I have accomplished in life what I have intended and under what circumstances may one better die."

"And after you die, sir?"

"Why, there will be successors- perhaps even yourself. And these successors will be able to apply the final touch in the scheme and instigate the revolt on Anacreon at the right time and in the right manner. Thereafter, events may roll unheeded."

"I do not understand."

"You will." Seldon's lined face grew peaceful and tired, both at once, "Most will leave for Terminus, but some will stay. It will be easy to arrange. -But as for me," and he concluded in a whisper, so that Gaal could scarcely hear him, "I am finished."

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