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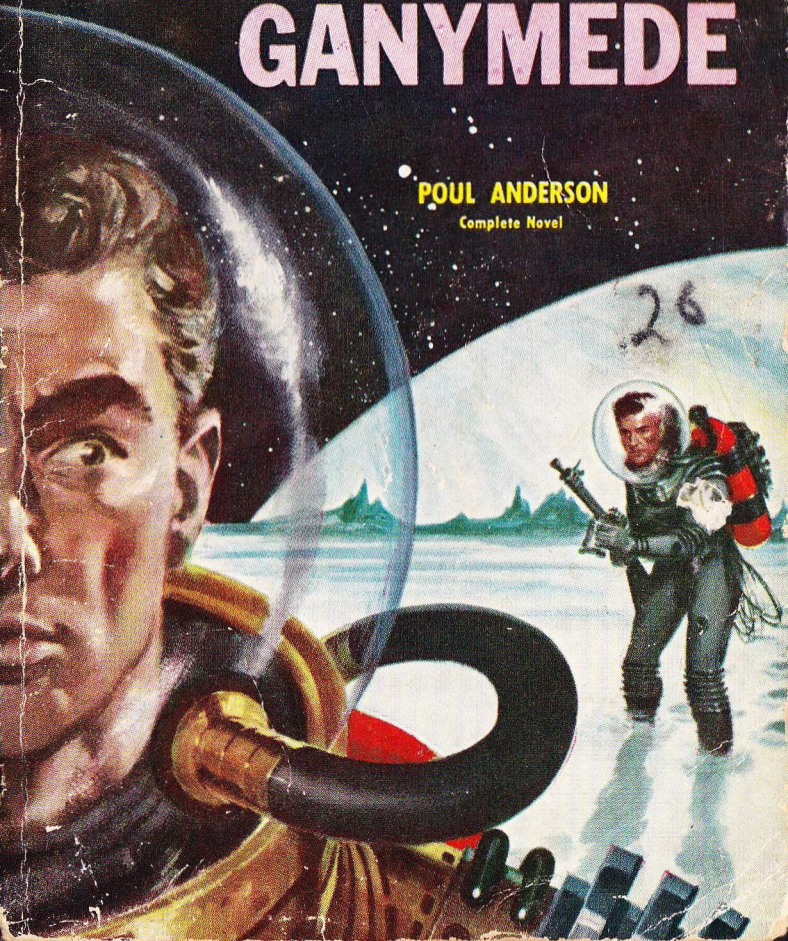
TWO COMPLETE NOVELS 35c

THEY'D PATTERN THIS WORLD TO FIT THE PEOPLE

THE SNOWS of GANYMEDE

POUL ANDERSON

Complete Novel





EINSTEIN WAS THEIR MODEL— MACHIAVELLI THEIR GUIDE

When the Order of Planetary Engineers sent Hall Davenant to Ganymede for a terraforming survey, they knew that the job on the airless, frigid Jovian moon would be tough. Changing it to resemble Earth—with fertile land, water, and good air—was the biggest and most important planet conversion job ever attempted by the Engineers.

But they hadn't counted on the already too Earthlike behavior of the Ganymede colonists, who had never altered the ancient Earth-born habits of intrigue, bigotry, and double-died treachery.

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second complete novel**

CAST OF CHARACTERS

Hall Davenant

He found nuclear physics simpler than understanding the people around him!

Lyell

His mistake was in being too civilized.

Thorval Kruse

Deep thought was never his strongest feature.

Angel-Three Garson

On his planet he was an Angel; on ours he'd be a Devil.

Cinc-Four Halleck

Someone else pulled the strings on this human puppet, until one day they were cut.

Roberts-John

He sat like a mole waiting for the executioner.

THE SNOWS OF GANYMEDE

by
POUL ANDERSON

ACE BOOKS, INC.
23 West 47th Street, New York 36, N. Y.

THE SNOWS OF GANYMEDE

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WAR OF THE WING-MEN

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CHAPTER 1

THREE dead men walked across the face of hell. Their feet groped past frozen rock, now and then they stumbled in the wan light, and always they heard the thin, bitter mumble of wind and felt the cold gnawing at their flesh. Around them there was death, naked stone reaching for a cruel sky of stars, a lean, poisonous whirl of snow which was not snow, that whipped about them and then lay still to crunch under their tread. Jupiter was low in the south, a great shield which glowed amber.

They had been walking for a long time now, it seemed like forever, and ahead of them was nothing but another endlessness of walking. Speech had died within them. Their feet were numbed clods which rose and struck the ground and rose again. There was so little awareness left that they did not feel the small jarring of their boots against rock and snow. It was very quiet.

Hall Davenant wondered dimly if he had not always been walking from nothing to nowhere, across the snows of Ganymede, with Jupiter enormous on the horizon and the stars cold overhead. He wondered if he had not dreamed all his past, if Earth and Luna and mankind were not the fleeting vision of the only life in the world as it stumbled mad through desolation.

Yamagata spoke. After so long a silence, it was a shock to hear his remote, toneless voice. "We're not going to make it."

There was another stillness while Kruse found words. Then: "Doesn't look like it. But there's no point in sitting and waiting."

Pick-up-your-right-foot—glide—down! Pick-up-your-left-foot—glide—down!

"Not the way we're going, we won't," said Yamagata. One gauntleted hand jerked toward the gauges on his shoulder. "Look. Oxygen for barely two hours more. Juice for maybe three, but it's no use staying warm if you can't breathe."

"Oh, well," said Kruse. "We weren't going anywhere anyway."

Pick-up-your-right-foot—glide—down!

There was a time, several thousand years ago it seemed, when Davenant could not have listened to them talking thus without a shiver in his guts. But cold and hunger and weariness had dragged at him so long that it didn't make any difference now.

His companions looked blocky and inhuman in their helmeted suits. It was as if they were demons leading him into darkness. But it didn't matter now.

Dreamily, Davenant considered all the hope and strength which had once laid within him. He had meant to be a soldier in man's finest war, the fight of all men against a blind and indifferent nature which had brought their kind forth without caring. But she was too strong, he thought vaguely; one casual giant shrug of a planet's shoulders, and her parricide children were tumbled into ruin.

No, this wasn't the way an Engineer ought to be thinking, he told himself. Even at the gates of death, there should still be pride. Ganyমেদে had stripped it from him, until he was nothing but a lurching blindness.

Yamagata continued, almost absent-mindedly: "We might be headed in more-or-less the correct direction. We might get a decent reception, if and when we arrive."

"Or we might get shot down," said Kruse. "Forget it."

"They may be just beyond the next hill," said Yamagata. "Or they may be—shall we say—three hours off. And we have oxygen for two hours."

Pick-up-your-left-foot—glide—down!

"Now, our information is a good deal more important than any one of us," went on Yamagata. "The Abbey has got to know. All right, I have an idea."

Kruse slipped on a sheet of ice. He caught himself wearily, his fall was slow, and he got up without bothering to curse.

"Torvald, you have people at home, don't you?" asked Yamagata.

"Yeh," said Kruse. "Parents, a couple of sisters. And there was a girl who—never mind."

"How about you, Hall?"

"Not to speak of," said Davenant mechanically.

"Nor I. And you're younger. Wait a minute." Yamagata stopped. The others went on for several long low-gravity paces before their slowed brains brought them around again.

Yamagata's face was like wrinkled yellow cloth in the pouring Jupiter light. It had a little smile as he peered through his face-plate. "They'll stick my name in Heros' Hall or some such foolishness," he said. "What I wish you'd do, if you live, is drink a beer for me at the Beacon in Luna City."

"Wait a minute—" Kruse took a step toward him, but was too late. Yamagata had already turned off his oxygen valves. Now, quite simply, he fumbled at some screws and lifted his helmet.

Moist air within rushed out in a freezing cloud. Blood bubbled on his lips, ran from his nose and ears as pressure dropped, and congealed. He swayed for a long time before toppling.

The face, under its sudden mask of ice, was puffed and distorted beyond humanness. Kruse stooped over. Even through the bulky suit, he could be seen to shake.

"He shouldn't have done that," he mumbled. "He shouldn't

have done it." The wind slipped under his voice, a ghostly whistle.

Davenant felt ill. But his training rose within him. This was part of what it meant to be an Engineer. At the very least, Yamagata had returned that knowledge to him.

"He gave us *each* an hour's oxygen," he said.

"Yes. I wish he hadn't."

"*Somebody* has to make it, if that's possible at all." Davenant felt tears on his cheeks. "We're wasting time standing here."

"I—suppose so, kid."

Kruse turned the body around and unclipped the bottles and accumulators. Then he laid Yamagata out—the arms were not yet too rigid for him to fold the hands across the breast, but he couldn't close the bulged-out eyes. There was nothing else to do. Rising, he helped Davenant fasten on the new equipment.

"Let's go," he said.

They went around a high dark bluff, and the body was lost to sight.

After a while, Davenant said: "I wonder if we shouldn't do the same. One survivor is better than none. We could match for it."

"No," said Kruse. "That's cutting our number too low. Come on."

Davenant shook his head, as if he had been struck. But the shock had given him back his manhood. As he walked, he could even remember, and he tried to sort out how it had begun. Take it from the beginning, back at the Abbey—

Pick-up-your-right-foot—glide—down! Pick-up-your-left-foot—glide—down!

CHAPTER 2

SEEN FROM outside, in the harsh bright flare of sunlight or the deep soft blue which poured from Earth, the Abbey was a fantastic witches' castle, perched on the cruel heights of Archimedes Crater like the nest of some inhuman robber baron. It was built of native stone, great rough-hewn blocks forming towers and walls of immense thickness. All of it had a purpose, aimed at the future—spires for observation and testing, walls and roofs to shut out raw vacuum. But in appearance it was still archaic. It looked as if it had always been on the Moon.

There was a road winding up to it, and a landing field for local rockets; further back was a spaceport, where the shining ships were like spears poised at heaven. There were also guns and arsenals and launching racks for guided missiles, but they were hidden, and nothing was said about them. They had been stocked against a day of trouble which might or might not come.

Inside, there was an endlessness of rooms and passages, burrowing deep into the ground or climbing to the highest towers. Some of these were for maintenance—food, water, air, power. In case of need, the place could be made self-sufficient. Others were storerooms; still others were laboratories where testing and research never ended; the rest were sleeping chambers, refectories, assembly and recreation centers.

There was always sound here—the whisper of ventilators and engines, footfalls, talk, and music.

This was Archimedes Academy, headquarters and training school of the Order of Planetary Engineers. Few called it anything but the Abbey.

Hall Davenant walked down a corridor. It was of dressed stone, high and vaulted, the tapestries and murals and fluorotubes never quite lifting its cool gloom. He walked fast and crisply, his boots slamming in pride on the flagging, his gray tunic and trousers forced into a painful neatness. That was the dress uniform of Field Service.

His shoulders bore the silver comets of Tech-Two rank, and on his breast was the helium-atom insignia which said his speciality was nucleonics. He was a young man, with a young man's openness in his rather long face, blue eyes, yellow hair, close cropped in the approved Engineer style.

He passed a couple of cadets, teen-aged boys who saluted him with bone-cracking smartness. He responded, thinking that cadets were a nuisance, always going through the rituals. For of course seniors had to conform before them. That was part of the training. It did not occur to him that he had graduated only three years previously.

Further on, he met an elderly lab-man in the loose robe and short beard affected by that service. This one had the gaunt, deep-burned features of a man who had been in Field in his younger days and retired to the Abbey—for teaching, research, and administration—when his body could no longer take deep space. He stopped Davenant, who knew him slightly. "Hear you're going to Jupiter," he said.

"Well—yes. Survey only this trip."

"I know. Just wanted to ask you to pick me up some samples of green callistite. I've used up all we had, and want to run some more tests on it. Damnedest stuff I ever saw."

"Different geology, different minerals, within limits," Davenant said tritely.

"I know. And you tell me how we're going to sink shafts fifty kilometers deep without knowing the properties of the strata. I lost two months' work on Mars once, because we didn't know just how friable the sandstone around Thor

was. For God's sake, spend a little time with a sonic probe before drawing up your specs!"

"Certainly."

Davenant got away as fast as he decently could. After seven years of training, he thought, and three of Field Service—Venus and the Belt—he ought to know the elements of his trade!

Still space was big, and other planets could be unearthly in startling and deadly ways. You were never sure. An Engineer always walked with his life in his hands. The labs were there to give him as firm a grip as possible, but even so the tablets in Heros' Hall were getting overly numerous.

He came to the office he wanted and pushed the scanner button. The man inside, Lyell, saw his face and punched to open the door for him. He entered, came to attention, and saluted. Lyell was his new captain, and some of them stood on ceremony even among seniors.

The lean gray man waved him negligently to a chair. The office was furnished as austere as most of the Academy. That had a definite purpose, like everything else; it kept the men used to discomfort, of which deep space had plenty. Field men did not marry if they wanted to stay in that branch. They lived at the Abbey, and their sprees when on leave were carried out incog. Eventually, of course, most who survived would acquire wives. Then they got apartments in the underground village at the foot of the castle, became lab-men or technies, perhaps at last made the Council.

Lyell was old to be a spacer.

Few Engineers ever left the Order. Their seven years as cadets included mind training under some of the most skilled psychotechnicians in the Solar System, and when they were through, the Order and its *esprit de corps* were part of them.

Davenant looked around. Everybody else seemed to be

there. Akihito Yamagata, small and quiet: geologist. Torvald Kruse, big and red-haired and cheerful, the son of a rancher on Venus: heavy construction. René Falkenhorst from Mars, tall and slender and dark: mechanical engineer. Yuan Li, a trifle on the portly side, always smiling just a bit: biological engineer. Davenant himself, was atomics expert. And Arthur Lyell, stiff and gray, with enough all-around experience to qualify him for chief.

The men sat before the captain's desk, not speaking. Spacers learned to conserve talk, lest they exhaust the supply on a long tour of duty. There was a haze of smoke in the air from cigarettes and pipes.

"I wanted to have a short conference with you," said Lyell. His eyes went around their circle. "You'll be in centrifuge and so forth from now on until we leave, and once in space we'll be busy enough studying up technical details. As you know, we're off to the Jovian System on preliminary survey. The Jovians want us to terraform Ganymede and Callisto—a big job since the survey alone may well take a year. Not many comforts of home out there. I suppose you're all willing to go?"

"Of course," said Davenant, and felt rather juvenile for having spoken.

"Not much is known about the Jovian System or its settlers," Lyell went on. "I'm having the library stat copies of what books and articles we have. The moons seem to be poor in natural resources, so one thing we'll have to keep an eye out for is means of payment."

He must have noticed Davenant's faint shock, for he smiled and explained, "Yes, I know that sounds contrary to the spirit of the Charter. The Planetary Engineers exist to make space available for all men, regardless of race, creed, or political affiliations. Nevertheless, ever since the Order broke away from being a branch of the Union government and became an independent organization, it's had to pay its own way.

"So far, it's done well. We're by far the wealthiest and most influential private organization in the System. But a whole job of planetary transformation is so costly that we can't go into the red. The Jovians are poor in fissionables, and will probably be unwilling to part with any, so we'll look for other resources. In fact, we may have to set up some industries for them to make things we can use to pay the Order. Bear that in mind."

"We always need small spaceships and machinery replacements," said Falkenhorst. "They should be able to make those."

"It's a thought," said Lyell. "But what I most wanted to emphasize was this: you know the Order is strictly non-political. Events have justified us. During the late Humanist Revolution, for instance, we were the only major group left undisturbed. We cut loose from the government because we foresaw trouble coming. Well, it came, and it is still going on, and things are going to get worse before they get better. If the Order is to survive the antiscientific reaction building up on Earth, it will have to stick by its policy."

"That isn't going to be easy. Jupiter, as the only state outside the Union, is distrusted on the inner planets, and people won't thank us for building up their potentials. The Jovians won't like us either, since we are inner planetarians. And from what little is known, Jovian society is such a turbulent mess that we'll doubtless be pulled twenty ways at once by as many conflicting power groups."

"But no matter what the provocation, remember your training and the rules, even if I should die and leave you on your own. The Planetary Engineers exist to serve *all* mankind. Sometimes that sounds vapidly idealistic, but it's the only way we can preserve our identity and privileges, the only way we can weather the storm that is coming. The medieval Church was another supranational organization. Its attempts to interfere with separate states led only to

trouble and ultimate failure, but in its character as the friend of all mankind it was honored and powerful. When that power began to be used for personal and local ends, the Church broke up. It's an example we might all bear in mind."

He grinned and turned to a thick sheaf of papers on his desk.

"All right, gentlemen. Lecture's over. Now let's get down to particulars."

CHAPTER 3

"DURING the lunatic years of the latter twentieth century the White American Church arose and became popular in the southern states of the old U.S.A. Like the contemporaneous Pilgrims, it represented reaction—partly against the troubles which preceded, accompanied, and followed World War III, partly against the spreading of scientific method in human relations which those same troubles forced as the only solution. Unlike the Pilgrim Church, the White Church method was not an attempt to return to a fancied norm, but an eccentric leap toward an imaginary millennium. It was not elaborately rationalized, but violently anti-intellectual; it was not austere, but given to curious orgiastic rites.

"Some local politicians encouraged it so as to gain an organized, reliable voting body, and eventually it dominated many communities. Its intellectual isolationism caused it to go to still further extremes, especially against the concept of equal rights for all races and the widening public appreciation of rational, scientific thought. However, as it grew in wealth, to become of some importance, it necessarily acquired an intelligentsia and a systematized philosophy.

"The increasingly effective program of undermining anti-rational organizations and beliefs, which was an important feature of the so-called New Enlightenment, eventually began to shrink its membership. The Second Conference of Rio had also made it obvious that before long the limited world government of the U.N. would be superseded by the complete federalism of the Solar Union which the White American doctrine considered intolerable.

"Imitating the earlier Pilgrim exodus to Mars, the Church decided to found a colony on Ganymede, the Jovian System being chosen for its remoteness and the general lack of competitive interest in settling it. A large ecological-unit spaceship, the *American*, was built, and a number of smaller ones obtained. The scheme was that some thousands of members would go out to start the colony while the rest stayed at home and worked to finance the project.

"In a decade or so of heroic effort, the city of X was firmly established—thus named to suggest the mysterious character of divinity and its dwelling. But meanwhile the financial drain had proved too great for the Mother Church. A membership which had hitherto been loyal broke away in large part because it was being impoverished by demands for money. Psychodynamic technicians of the government were adroit in using the discontent as a wedge for propaganda. By Twenty-one hundred A.D., the Jovial colonists found themselves without a sponsor, no ties to Earth, almost completely cut off by the expense of travel to their system.

"They sent occasional observers and representatives to Earth, but there was no Union governor over them since they seemed neither to need nor want one. Occasional reports about them still come in, rumoring the evolution of a strange and ruthless culture which through a series of 'revelations' has been changed far from the original concept.

"But on the whole the Jovians have remained an isolated

and unknown tribe. Their declaration of independence while the Union was confused by the Humanist Revolt on Earth, and their persistent refusal to rejoin, merely emphasizes their already accomplished secession from the rest of the human race."

Davenant switched off the microprojector that had been screening de la Garde's *Short History of Interplanetary Colonization*. He sighed. "He could have gone into more detail."

"He wasn't interested," said Falkenhorst. "He deals with what he considers the main line of history, the inner planets. Elsewhere he gives an economic analysis to show that nothing beyond the Belt will ever be important—not enough resources, too hard to colonize, the problem of survival won't leave any surplus energy."

"As a matter of fact," said Lyell, "the colony wouldn't have been possible at all if the American government hadn't quietly subsidized it—by such indirect means that the Church itself never knew about it. The Psychotechs foresaw that the attempt would exhaust and break up the organization on Earth. I've seen secret records that the Humanists made public."

"They really did get Machiavellian back in those days, didn't they?" murmured Yuan. "But seriously, there must be more information on Jupiter than this."

"Of course," said Lyell. "Plenty of it. But nothing coherent. Part of our task will be to get the whole picture as it is today, so you boys, at least, may as well start without preconceptions."

He took out a curved pipe and began loading it. "Yes, there's scattered information, but what nobody knows yet is the total cultural pattern. Just remember that man necessarily develops a different civilization in every environment if he stays long enough, and that what may shock you is

normal, perhaps necessary, on Ganymede. Also—the Order stays out of politics!”

Davenant reflected on what he had seen and heard. He had been on Earth but little, even though the Engineers did some work there. Their main interest was space. The planet of his birth had become a stranger to him.

But he knew the hectic commerce and gaiety which was Luna City; knew the stiff dignity, the high sense of order and discipline, and the respect for intellectual achievement that characterized Mars; was familiar with the patriarchal, somewhat violent clan life which was developing on Venus since the invention of the cheap mobile reclamation unit. But Ganymede would not be like anything he knew.

The ship, *Let There Be Light*, hummed and murmured. Stars blazed against blackness in the vision ports. She was a cruiser, one of the new models which could accelerate most of the way and reach even Jupiter in a couple of weeks.

There were only the six of them aboard, with a full cargo of equipment and supplies. That was not cutting it as fine as an ordinary spaceman would think. Even though only Lyell and Davenant had the full specialized knowledge required for a certificate, any Engineer could operate a spaceship alone if it had not been too drastically damaged.

Lyell puffed smoke and squinted through a mesh of crow-feet.

“One more thing might need emphasizing,” he said. “We’ll be there for a year, I imagine, and you’ll want recreation from time to time. I’m afraid you’ll have to do without it. One of the psychological mainstays of the Order’s power is the impression of lawfulness and restraint its men give.”

“We know that, Boss,” said Kruse, looking hurt.

“Yes, of course. Still, on an inner planet job a man does get leaves, he knows what amusements accord with local

customs, and he goes incog anyway. None of that will be true on Ganymede. I doubt if they have red lights of any sort, for instance, and no disguise will be good enough in so small a commune. On a planet where hedonism was considered normal, where everyone was expected as a matter of morals to indulge himself, we would. But if, as I suspect, the Jovians have a Puritan code, we'll have to go them one better."

"Oh, well." Kruse grinned. "I figured as much, and built up a reserve the last time I was in Luna City."

Davenant felt a certain wistful envy of the man. He himself was too shy and introverted, he knew, to make a decent roisterer. An occasional fling in a licensed rec house, beer and gambling and whatnot was about his speed. If he were rich—but Engineers didn't get rich. All the profits of the Order went back into the Order and its development. Personnel from cadet to coordinator drew small salaries and no bonuses. The rewards were intangible—prestige, comradeship, a sense of being important to man's highest and finest adventure.

A watch-change bell broke up the discussion. Some went to sleep, some to their posts. Only Kruse and Davenant remained in the little saloon. The Venusian drifted across to a locker—they were currently in free-fall orbit—and got two bulbs of beer.

"This ends my ration for today," he said. "Care to join me, Hall?"

"Sure." Davenant took one, put the tube in his mouth, and squeezed. The cool tingle of it was refreshing.

Kruse hooked a leg around a stanchion and hung across the table from him. "If I'm not getting too personal," he asked, "why did you join?"

"Eh? Oh!" Davenant felt himself reddening, for no good reason. That irritated him, but he liked the big Venusian. "The usual. They saw my school and psych records, offered

me an appointment, I took it. Isn't that what happens to everybody?"

"Yeah, sure. But you were only fourteen or fifteen then, not really capable of deciding such a thing. A lot of kids sign up because they think it's glamorous, and drop out after a couple of years. What made you stick?"

"What makes anybody stick? I was a poor boy. My father was one of the intellectual routineer class which was displaced by the Second Industrial Revolution, though he never joined the Humanists. He didn't like living off citizen's allowance and odd jobs—called it a handout. My people were Alaskans, with some of the pioneer tradition left in them. But his health was too frail for him to emigrate to Mars or Venus. I didn't want to go through that myself."

Davenant shrugged, not meeting Kruse's blue eyes. There had been other reasons—a girl, other women since then, even if he wasn't a successful chaser. Sometimes he wondered if a man ever really falls out of love. The pain stops, most of it, and presently a new love comes along. But isn't she merely added to the pantheon?

"Why do you ask?" he said.

"Oh, just getting acquainted." Kruse shrugged. "Me, I was offered the same, and my folks urged me to accept. Parents' consent is needed on Venus. The family is more important there than it's become in Western Earth. It'd be something for the clan to brag about, a member in the Engineers. So I did join and I'm not sorry, but I think I'll resign after this job is over."

Davenant felt *shocked*. "How come? Don't you like it?"

"Sure. But I'm pushing forty, and it's time I raised a family. The lucky girl can't see living on Luna, so I've got my eye on a valley in the Hellfires. Under the Development Act, I can homestead the whole place. It's just rock and sand now, but give me a few years and it'll be the sweetest little oasis you ever saw."

"There's a breakdown coming," said Davenant. "The Humanists didn't stay in power long, no, but they were only one symptom. You can see corruption and personal government are growing. You're better off belonging to an organization which is above such matters."

"Now you're just parroting what your trainers taught you," said Kruse. "It's probably true enough as far as Earth is concerned, but Venus is a big place. Have you ever thought that maybe the Order is wrong? That maybe by setting itself above the realities of politics it's cutting itself off from its own roots?"

Davenant gulped beer and tried to settle a suddenly chaotic mind. It was not merely that Kruse spoke heresy. The Order permitted, even encouraged independent thinking for the simple reason that a rigid brain was no good for its purposes. But the Venusian, what he had seen of him, had never given the impression of being an intellectual beyond the requirements of his work. A skilled technician, yes, a big, laughing, hard-fisted tosspot, a collector of improper limericks, but he had no business dealing in disquieting philosophies.

Davenant was not especially narrow. He read widely, enjoyed music and chess, liked to think of himself as a bit of a universalist. But he realized now with some dismay that his intellectually formative years might have been too bookish, too concentrated on one ideal and in one way of life. He had crossed millions of kilometers and seen strange landscapes, but had he ever looked into the soul of a man—even his own?

"Let's have another beer," he said hastily. "We can borrow from tomorrow's ration. How about some chess?"

CHAPTER 4

SEEN FROM SPACE, Ganymede was bleaker than Luna herself—seamed with mountains, pocked with craters, mottled dark and light over her sterile face. This far from the sun, her dayside was wrapped in dusk. Since she always faced Jupiter, the primary was gibbous or only a great scimitar while the sun was up, and at high noon a total eclipse threw blackness across the land.

As the cruiser approached, her radar picked up an object in orbit not far above the surface: metallic, to judge from the intensity of the returning signal.

"Odd," muttered Lyell. "I know the colonists broke up the old *American* and most of their other spaceships for the parts. I didn't know they'd established a satellite station."

He beamed a call, but there was no answer. Only the dry whisper of cosmic interference.

"Maybe a ship parked there?" suggested Yuan.

"Too big to be an ordinary ship. Well—let's come down the hard way, then."

It was a tricky job to ride a vessel as massive as the *Light* down a GCA beam, but Lyell managed it with hardly a bump.

When they were in their cradle, Davenant looked out and could not see much of X—just the spacefield, a radio mast, several buildings, and a cluster of other structures which were well distant. Most of it must be underground.

The sun was a tiny, blinding flame in a sky nearly black. The tremendous edge of Jupiter dominated heaven—amber, streaked with dull reds and blues and greens and browns, splotches which were storms that could have swallowed Earth whole. The planet was so big that it seemed to be

endlessly falling, about to crash ruinously on the broken face of its moon. Io was visible as a giant sliver to one side of the primary. The whole sky looked unnatural, like something seen in a dream.

A ring of hills shouldered starkly above the horizon, barely visible in the vague, cold, misty twilight under which the world seemed to lie. Davenant saw fields of snow that must be frozen ammonia, and part of the range looked as if it might be one enormous chunk of ice. The air was thin—nitrogen and argon, a wisp of methane and other gases.

Luna had been near home when the first men reached it; Mars had had some life, at least; Venus had been a wind-howling hell, but rich with promise. This place seemed to hold a perpetual despair. It was, somehow, the grimmest scene Davenant had ever experienced.

Trying to shake off his depression, he pointed to the nearer buildings—long, low, featureless boxes with an odd bluish shimmer.

"I wonder what those are made of?" he asked.

"Ice, I imagine," said Falkenhorst.

Davenant blinked. "You mean solid water?"

"Surely," said the Martian. "There's a lot of it on the Galilean moons. It's a pretty good insulator, can be worked with a blow-torch or cast into molds, and if you make your walls thick enough and insulate them on the inside, they'll do fine at these temperatures."

Davenant nodded. He should have realized that. His training, the whole history of space colonization emphasized that other worlds were not Earth, and that a whole new approach was needed for each one.

"I'll bet they use the Absolute scale habitually here," he said. "It'd be too much trouble always to speak of minus a hundred and some degrees Centigrade."

"You're getting the idea," said Falkenhorst.

There was no provision for taking a spaceship cradle underground, but a small trac appeared, drawing a long plastitube two meters in diameter out of a valve in one building. It gripped around the airlock, and Lyell led his crew through it. They were all in dress uniform and wore their carefully schooled dignity on their features.

Emerging at the farther end of the tube, they stepped into a room which struck them with chill. The Jovians must have habituated themselves to such temperatures, to conserve power. Davenant, for one, had to take conscious control of somatic reactions, and force his body to accept the conditions.

Ten guards were drawn up on either side of the entrance, an immobile line. They had the gangling, bulge-chested slenderness which was also characteristic of Martians—low gravity, low air pressure even inside the settlements—but this was exaggerated, for they were easily two meters tall. Under steel helmets, their faces were white rather than sun-darkened. Their uniform was a one-piece black cover-all fitting the muscular bodies closely, boots, a belt supporting pistol and pouch; their heads were shaven, and they stood like robots.

It took a second glance for Davenant to realize that they were identical.

He jammed the sudden cold in his mind back out of consciousness. Keep up the act, keep up the act. An Engineer is never surprised.

Two other men, were waiting beyond the guards. One wore the same black one-piece uniform, with a glittering silver star on the belt. But he had his hair. He was rather short and stocky, eyes gray and utterly cold, face harsh-scarred. The other man, long and thin and comparatively serene looking, wore a blond beard, though his skull was bare, and a black robe with a white cross on the breast. He held back, bowing silently, as the smaller man stepped forward and spoke.

"God with us! Welcome, gemmen. Had good trip?"

"Thank you, yes." Lyell inclined his gaunt gray head. "I am Captain Lyell of Archimedes Academy, in charge of this group."

"Cinc-Four Halleck." The dialect seemed to be a variant of rather archaic English, a curious blend of soft slurring and crisp, rapid delivery. The man gestured to his robed companion. "Angel-three Garson." Another bow from that one. "Can we do y'all a service?"

"You might show us to our quarters," Lyell said coolly.

"Baggage? Unloadin'?"

"The ship is not to be touched," said Lyell. "There are things in her which could be dangerous to one not familiar with details. If you will lend us a porter, one of us will show him our personal effects."

Halleck nodded and spoke briefly into a wrist-phone. As he stood looking over the visitors, he could almost be seen to freeze. His eyes strayed uncontrollably to Yuan and Yamagata. He jerked them away only to have them return. Davenant wondered why.

A gray-clad, hairless man entered from a side door. The first thing noticeable about him was his gigantic size and his four arms. The next, and somehow most lasting impression, was of the inhuman vacancy of his face.

"Porter, gemmen," said Halleck.

At a signal from Lyell, Davenant led the way back through the tube. The giant followed wordlessly, and said nothing when the small heap of handbags was pointed out to him—merely picked them up and trudged back. There was no reason why the Engineers should not have carried their own things, except the matter of dignity.

When Davenant returned, he found Lyell talking with Halleck and Falkenhorst with the angel, Garson, who was asking some shrewd questions about the propulsion of the

Light. Davenant recalled that the ion drive had still been experimental when Ganymede had been colonized.

"This way, please."

Halleck turned and led them out. A descending ramp wound into the body of the world. Davenant noticed that the identical guards were going before and after the group, and that their eyes were never still.

"We've assigned y'a suite in Sector Eight, border between Cinc an' Angel territory," Halleck said. "Y' can easily communicate with one service or t'other. Meals'll be brought there. If y'all'll gimme your preferences, I'll try to have 'em met, though we're not a rich colony."

"We don't ask for luxury," said Lyell. "Just remember that your dietary requirements may have changed slightly from ours."

The suite turned out to consist of six small bedrooms and a bath surrounding a larger common chamber. The furniture was simple, comfortable enough under low-gee conditions, but the whole place had a barren and empty look. After a moment's thought, Davenant traced that impression down to the completely unimaginative, inartistic appearance. Everything seemed to have been laid out with a ruler, and the lining plastic was drab gray. Oh, well.

Garson showed them the com-unit with which they could call up various offices when they wanted something, and gave them a collection of large-scale maps of city and satellite.

"Further reference works whenever y'all wish," he said. He had a meek way of speaking. "Imagine y'all want to get unpacked and rested. Call me when you wish a first conference."

"Cinc-one should'a met y'all himself, I know," added Halleck, though without any air of apology, "but you'll see him soon enough. We've little ceremony here. God with you, gemmen."

He saluted crisply and backed out the door. His guards followed him. The angel bowed and went out last.

"Well!" Kruse threw his bulk onto a low couch. "Charming hospitality!"

"Different mores," Lyell said absently. "That may have been their equivalent of a brass band and parade, for all I know. Don't go insisting on any special favors, boys. Pass all that through me." He frowned. "I'm afraid we've made a mistake right at the beginning."

"How so?" asked Falkenhorst.

"Bringing Yuan and Yamagata."

"What in space—" demanded Kruse. "What's wrong with 'em?" The two men spoken of retreated into expressionlessness.

"Nothing, of course," snapped Lyell. "But we should have remembered the idiotic race prejudice which was so important to the colony's founders. Apparently it's still present. Didn't you see how Halleck was reacting?"

"Race?" Kruse broke into a guffaw. "After some of the types they seem to've been breeding here?"

"Prejudices don't have to be logical or consistent," Lyell told him. "In fact, they usually aren't. It's sheer lucky chance that we didn't happen to bring a Negro Engineer." He glanced at Yuan and Yamagata. "I think you two boys could get by if we're discreet. A Mongoloid doesn't look that much different from a white man."

"A pink man, you mean." Yamagata grinned.

"It just points out how much we have to watch ourselves," said Lyell.

"Oh, well, if they get too offended they'll merely send us home," said Falkenhorst. "Let them freeze forever, then."

Lyell demurred. "This job is more important to the Order than you seem to realize. Not only the profit we stand to make, but this will be the first large-scale terraforming job we've had. The Mars and Venus projects were al-

ready well under way when the old corps was founded. We've handled big jobs, yes, but nothing of comparable magnitude. The value of this task in experience and prestige is inestimable. It'll go a long way toward getting us that monopoly of our kind of work which we need for power and safety."

Davenant, who had been doing some heavy thinking since his talk with Kruse, didn't quite like the tone of that. Was it so certain that the Order had a right to such power? He brooded over it while he unpacked.

Lyell called up the commissariat office and asked for dinner. It was brought by four-armed men, the same type as the porter, though not identical with him. The silence with which they served the meal was eerie. When Lyell asked one of them a question, he shook his head in an animal way and pointed to his throat.

"Either mute, or under orders not to speak," said Davenant. "I wonder why?" There was a coldness along his spine.

The food was mostly synthetic, not especially good, though some effort had been made to spice it. Kruse grimaced and reached for the decanter which experiment had shown to hold some alcoholic liquid.

"Go easy on that rotgut," warned Lyell. "Remember, our official doctrine is austerity."

Kruse shrugged. "It's awful, anyway. Lucky I stuck a few bottles of Scotch in my bag."

When a service bell brought the waiters back to clear off the dishes, Davenant wondered if X lacked machinery for such work, or if live service had the same ostentation value it had on Earth. He consulted the city maps and decided it was no machinery. Logical enough. A precarious colony on an inhuman world didn't have materials or labor to spare for making luxury robots.

The maps were highly detailed, and it took a good many of them to cover the whole three-dimensional warren. Daven-

ant gathered that this was the official level, where Cincs and Angels had their offices, and the upper echelons lived. Further down were the cells given to Sergeants, apparently the commoners who surely didn't have much sleeping space. Elsewhere were factories, laboratories, creches, assembly halls, and storerooms.

One sector of X was marked, *Cinc-one-four*, but otherwise left blank. The rulers didn't seem to publicize the layout of their quarters, perhaps for fear of envious comparisons.

"I get a general picture of an oligarchy as hard-boiled as any in history," remarked Lyell, after considering the maps. "Those guards, for instance—obviously they're exogenes from one cell."

"Would the Jovians know that technique?" wondered Falkenhorst.

"Oh yes," said Yuan. "It was used a good two hundred years ago by the old U.N. Inspectorate to create a corps of gifted secret service men. It's been public for more than half that time, though little applied. Identical heredity, identical training—the psychological effects are curious, for you get a completely devoted band of brothers. Then the four arms—that indicates the Jovians are well up on the newer methods of gene and chromosome manipulation. Either they got data from Earth or they developed the system independently, most likely the first since they have had some contact. I dare say the commoners, Sergeants, whatever you call them, are bred and trained and regarded as animals—specialized types. No, I can't say I like Jovian society!"

"That Angel—odd name! Garson seems a pretty decent sort," said Yamagata. "How about calling him and pumping him now?"

"I don't know what his sleeping hours are," said Lyell. "But we can, I suppose." He went over to the com.

A ringing doorbell some minutes later announced their

visitor. As Davenant opened the door, he heard a loud-speaker system filling the corridor with:

“—yes, the Lord is mighty, brethren, an’ His hand lies heavy. Rouse not the anger o’ the Lord, for he who’s cursed by Him is cursed indeed. Rather show that meekness and obedience which’re pleasin’ unto Him—”

Sermons, yet! As Davenant closed the door he was glad it was soundproof.

Garson’s expression was a peculiar mixture of timidity and eagerness. When he was offered a chair, he sat on the very edge, and he was given to starting at any sudden movement.

“How official are you?” asked Lyell. “If you can speak for the government, I’d like to get some questions straightened out at once.”

“We—” Garson fumbled for words. “My class is religious, y’ understand. Mercy—” He hesitated, seeming unsure how to address the guest. “Sir,” he finished. “We conduc’ services an’—intellectual activities, too. Engineering procedure is our province as far as y’all’re concerned, though we don’t make policy.”

“Good enough. You understand we are here only as a survey group, to find out if it will be possible at all to transform Ganymede and Callisto. It will take a good deal of work, a long time, to learn even that much, and we shall have to ask for help from your people.”

“Crews will—be assigned, sir,” replied Garson. “Equipment an’—” His voice trailed off and he combed his thin beard with nervous fingers.

“They will be under our direction, exclusively.”

“If y’ wish, sir. But—” The Angel paused again. “From what y’ already know o’ conditions here, sir, what—what hopes d’you have o’ success?”

“I would rather not say,” answered Lyell. “Not yet. Every world presents its own problem. How much do you know about earlier projects of this nature?”

"Very little, sir. I'd be, uh, grateful for what y' can tell me."

Lyell settled back for a lecture. "Well, then," he said. "Venus was made habitable by chemical treatment to get the poisons out of the atmosphere, by special bacteria strains which released oxygen from its compounds, and by hydrogen explosions to bring water to the surface. To mention only the most superficial aspects of a task which took more than a century. It is still going on as far as desert reclamation is concerned. Plant types were developed to fit the new conditions, and as the environment changes with time still other forms will be introduced. Animal life was brought from Earth; or rather, its reproductive cells were, with exogenesis on Venus to start the first generation.

"On Mars, now, the problem has been in many ways different. There were no poison gases, and there was a little oxygen and surface water, although not nearly enough for human life. Still it was a start. More oxygen was obtained by bacterial process, more water by drilling, but it was still necessary to import a great deal—"

"Where from, sir?" Garson asked eagerly. "The fuel requirements must'a been fantastic if—uh—from Earth."

Lyell smiled. "No. From Saturn. The rings are mostly ice, there are even enormous meteors, or small moons of ice. It took several years' work, and was tricky to give a number of big chunks enough of a push to fall sunward and make them hit Mars just where desired. But—well, it was practicable. Large scale electrolysis and other treatment for some of it.

"The whole task was costly and enormous, of course, but when millions of people with atomic energy and the resources of a whole planet, even a small one, behind them, bend all their efforts to a job, it gets done. Oh, yes, much carbon dioxide was also required, to give sufficient greenhouse effect at that distance from the sun.

"In spite of all this, Mars will always be a cold and arid world with a thin atmosphere. So the geneticists had to meet conditions halfway, by creating not only plants and lower animals, but even slightly modified human strains which can be comfortable in such an environment. And there are other complications, such as making up the gas which continually leaks into space. I tell you, Mars is a tough problem!

"It's being solved. On the other hand, no one would even try to give an atmosphere to Luna or Mercury. Our whole approach is different there, concentrating on things like more efficient airlocks and larger underground installations.

"The available materials and energy sources also determine a great deal. On Mercury or Luna, sun-power can be used directly or stored in capacitors. In the early days on Venus, the Hilsch tube was important, and wind power still is. On Mars, though, it was necessary to use atomic energy so extensively that its reserves are depleted and we must concentrate on the physics of low potential. We hope to help out when our solar-beam stations on Mercury are finished.

"But I freely predict that no one will ever found a real colony on, say, the moons of Uranus. There are no energy sources to speak of, no useful minerals, they're too far away for power beamed from Mercury. Not only is it not worthwhile, but it isn't a practical possibility. So you see, Ganymede and Callisto will have to be studied carefully before we can know what the chances are of making them habitable—or, indeed, doing anything with them."

Davenant's right shoulder itched. He longed to scratch it, but made himself sit impassively. Lyell's lecture was for a definite purpose—to impress, to gain a certain slight moral ascendancy. It wouldn't do to break up the act of mentor just to scratch. Inwardly, he squirmed.

"We've—ah—we've done well so far, sir," Garson said diffidently. "There're fifty thousand people in X alone,

besides smaller cities an' isolated outposts. I think there's good hope."

"Possibly," said Lyell, with a note of calculated skepticism. "But do you have decent ore deposits so we can get structural metals? How much water is there in all? How much of every type of compound? How available is the oxygen? I don't think biological techniques will get it out for you. I doubt if any bacterium can be made which won't die or spore up at these temperatures."

Yuan murmured, "There might be ways, even so. But I'd have to have some figures before knowing if I have a practical idea."

"What energy sources do you have?" Lyell persisted. "Can we tap internal heat, or isn't there enough? The sun is too far away to help much, even with power beaming. Offhand, I think the thing to do is sink shafts and start hydrogen-lithium fires down in them to warm up the body of the moon. Some of that energy could be tapped to make an outdoor lighting system. Then there is the problem of getting rid of the methane and ammonia."

"The surface area of Ganymede is something like eighty-five million square kilometers. You can see what a gigantic task we have. Interplanetary freight rates being what they are, it cannot be done at all unless most of the work and resources come from this world itself. Even if we take the job, the Engineers cannot supply the whole labor force. Most of it must be supplied from your own people, and can you spare so many? That calls for socio-economic analysis."

"In short, we are here now to see if you, yourselves, under our direction, can swing the job. Even the survey will require cooperation. Even for it, we may have to call on you for a great deal in the way of materials and manpower. We must have *carte blanche* to go anywhere and get any information. Are you willing to set that much at stake against the mere possibility that we can help you?"

"O' course," said Garson. "Y'd not 'a been asked ay'tall if we weren't. There are—uh—some facts which're—confidential, but the Engineers respect their clients' secrets, don't they?"

Lyell nodded. "If nothing else, we can show you some modern techniques," he said. "For instance, molar potential barriers to eliminate airlocks and all their clumsiness in fixed installations, more efficient food synthesis reactions, and so on."

Garson actually blushed. "Have you—uh—considered—the terms yet, sir?"

"The Abbey has already agreed with your representative on the flat rate for a survey. Payment for further work will depend on what we want and what you can afford. That can be negotiated later."

There was a little small talk then, but the Angel was clearly shy of strangers and glad when he found an excuse to leave. He set an hour for the next meeting, at which a formal commission would begin the real business, and made his good nights.

Lyell stared after him. "I wonder what he's afraid of," he muttered, eyes narrowing.

"Us, maybe," said Yamagata. "Strangers coming into a pathologically xenophobic culture—hmmm." He stopped. "I just had an idea. Think these people know Basic?"

"I doubt it," said Falkenhorst. "Why?"

"Hall"—Yamagata turned to Davenant, an odd look on his face—"you have your general unit handy?" He was speaking the new, semantically rigorous language now. "Want to check the wiring in this room?"

Magnetic tracing of circuits revealed what he had suspected: microphones and recorders behind the plastic facing of the walls.

Lyell's mouth drew tight. "That's a violation of—"

"Different mores, Chief!" Falkenhorst's gibe held a note of strain.

"We can make an official complaint," suggested Yuan.

"Set up a resonator and burn the damn things out!" cried Davenant. "Or keep a magnetic field to wipe the tapes, at least."

"Hell," grunted Kruse, "leave 'em alone, but give 'em something really interesting to record!"

"No—no!" Lyell shook his head. "None of that. Not yet, not till we know more of the situation. I'm afraid we've already given away much we can ill afford, but I'll have to think about it. Meanwhile, keep to English for ordinary purposes, switch to Basic when necessary, but watch your tongues every minute."

Davenant looked around the room. He had known the inanimate savagery of planets, but this was the first time he had ever encountered hostility from men. The walls seemed to move together and close in on him.

Ganymede spun twice around Jupiter, a period of slightly more than two weeks, while Lyell's men were only starting their task, learning the bare elements of Jovian society. Most of their work was with the Angels, studying maps and references in the library, conferring and asking questions. But they could hardly help acquiring unofficial information.

Garson, who seemed to have taken a fancy to Davenant, conducted him through the city. The factories and maintenance centers were fairly standard for a colony, though archaic in design and using an undue amount of human labor. That was performed by Sergeants under Angel supervisors. Watching a long assembly line of gray-clad, unpeaking men, Davenant felt a coldness in his stomach. He had never seen human beings so used.

"Why haven't you installed robot machinery?" he asked. "This could all be fully automatic."

Garson shrugged. "Large investment o' material an' labor in robots," he said, easier, t' use men trained from birth."

So! The commoners were part of the machinery. They didn't count for more than the lathes and furnaces they manned. Davenant had that fact driven home to him when he walked through the human robots' part of town—endless, monotonous cells, almost devoid of individuality, no privacy anywhere, always the conditioning by broadcast sermons and minute regulations of conduct. The faces which looked at him meekly were masks; humanness had been rubbed out.

Not many women were in sight, and those he saw were muffled in shapeless gray gowns and veils. They had their own assignments in such lighter work as food-making and product inspection. And they were breeders. Garson justified their status with Biblical quotations.

There was little family life. Children were taken young to the creches for conditioning. On the basis of psych tests, some were picked for Angel and some for Cinc, to be raised in those services and never told who their parents were.

The Angels were the priesthood, and spent their lives under a monastic rule which made the Abbey seem mild—though they were not celibate. They were also the intellectual and artistic class, the engineers, poets, scientists, and philosophers of sorts. They compiled the data Davenant was now studying, and served as administrative advisors.

In spite of the humility which was drilled into them, they seemed more human, more individual, than any other class on Ganymede. Fat jolly Jackson, small sardonic Hobart, earnest tongue-tied Garson—Davenant could get along with them.

As a group, the Angels were a power in the community, and had had their clashes with the Cincs. The Cincs, who were the rulers, had the upper hand, for Cincs of first and second grade were *ex officio* Archangels.

But sometimes the corps resisted them successfully. Garson told with relish the story of a few years ago, when Cinc-one had tried to seize property owned by the Angels.

They had refused to obey him, and had held out until a junta of his own subordinates had replaced him with a more reasonable man.

Davenant met the chief Cinc when the Engineers were invited to the Cinc area. Halleck conducted them, together with a troop of Hounds.

Lyell tried to draw Halleck out a little. "I take it these guards of yours are for show?"

"No." Halleck looked surprised. "Protection."

"From whom? The Sergeants?"

"Haw! The Sergeants know their place, I hope. A few publicly owned Hounds can keep them in order. But y' see, every Cinc above novice grade is entitled to his own corps o' guards, as many as he can support."

"I don't quite understand," Lyell said smoothly. "If the commoners aren't dangerous, why should a Cinc need a personal army?"

"The other Cincs' o' coursel" clipped Halleck. "God gives victory to the righteous, but we men can't know who that is. Many're called but few're chosen. So all got to have their chance."

Lyell did not press the matter, but he traded a glance with Falkenhorst.

Cinc territory was a change from the poverty elsewhere in X. The floors were carpeted, the walls and ceilings colorful with murals, the individual apartments spacious and luxuriously furnished. Davenant got the impression that each housed its own harem. Several other officers passed by, exchanging salutes with Halleck, and there was a flicker of hatred in their eyes. None had less than two bodyguards in tow, and each carried a side-arm.

A massive steel door was protected by machine-guns behind armor plating. Halleck strode up to meet the tall Hound who stood in front of the barricade.

"God with us!"

"Service to the Lord!"

"I bring Cinc-one's guests. Here's my pass."

The Hound studied it carefully. "Yes, Mercy. If you'll leave y'r men an' y'r pistol here—"

Halleck smiled sarcastically and submitted. Davenant did not like the swift competent hands which passed over him in search of weapons. But his resentment faded when he was let through the door. The reception hall was a blaze of color and crude magnificence.

A servant bowed low. Female, young and comely, she was not dressed in any long drab gown. Quite the opposite. Kruse opened his mouth in an admiring grin, but snapped it shut as he remembered where he was.

"I'll announce you, Mercy," the girl said. "Service to the Lord!"

Cinc-one Weller was short and rather stout, but the eyes in his broad red face were restless and cold. He greeted the Engineers with an ambiguous salute and waved them to chairs. Davenant was uneasily aware of the motionless guards standing against the wall.

"I trust y'r accommodations 're good?" Weller said. "Anything y' need?"

"Not just yet, Mercy," answered Lyell. "Before long, we'll be making our initial surveys and will want workers and equipment. But that can doubtless be arranged through the Angel corps."

"Course, course." Weller accepted a drink from a well-trained servant. "If y'all do need somethin' please ask fr it."

"Well, Mercy"—Lyell rubbed his chin—"there is one thing we lack, and that is information."

"Oh. Can't the Angels give y' all the facts?"

"About physical data, yes," said Lyell. "But we need a more detailed social analysis than anything that's been given

us. An important factor in deciding how much can be done here is the capability of the people themselves. For instance, it will be necessary to construct a great deal of automatic machinery. Frankly, Mercy, I'm disappointed that there isn't more already. Now the question is, can your particular culture stand the introduction of so much new technology?"

Weller's face darkened. For an instant, Davenant thought he was going to order his men to shoot the Engineers down.

He returned to a hard surface calm and replied judiciously, "I don't see why not. S'pose y' mean assembly line workers an' their like. What'll happen to 'em if their jobs 'er automatized? That's really not your business. We can build such machines, put 'em at your disposal. What we do with 'em afterward concerns us alone."

"Perhaps," said Lyell. "Though consider, Mercy, that human assembly lines simply cannot produce what will be needed at the rate it will be needed. So there will, at the very least, be an interim where your Sergeants have no place to work—except out in the field with us. And there they will, frankly, be of little use unless you recondition and educate them. At present, I have the impression that most of them don't have the effective intelligence to use complex machines." After a pause, he added maliciously, "Of course, Angels and Cincs could be assigned to our crews but that would also disrupt your social structure."

"Hm—yes—problem there," admitted Weller grudgingly. "It calls fr study. I'm sure a solution can be found."

"Another question," drawled Yamagata. "Is Callisto inhabited or is it not?"

"Why, no," said Halleck, when Weller failed to reply. "What made you think it was? We haven't expanded that much yet."

"There were references in books and conversation implying a small colony there," said Yamagata. "But nobody I asked would give me a straight answer."

Weller spoke almost genially, as if glad to leave an awkward subject. "Oh, I see. Small group o' settlers there from Earth, some twenty-five years ago. Came out t' escape troubles durin' the Humanist affair. They couldn't make a go of it alone, so they came here, and joined with us. All but forgotten now."

He thinks fast on his feet, observed Davenant. But he wouldn't be the chief in this nest of devils unless he did.

"If I may say so, Mercy," put in Lyell, "your culture is an odd blend of the communal and the highly individualistic. Sergeants are trained to absolute obedience, but most of your new works are carried out by individual Cincs, who patronize some gifted Angel or some new construction project or the like."

Davenant nodded to himself. He had noticed as much, and decided the motivation was a compounded desire for power and prestige.

Lyell went on. "So far that system has worked well enough, because almost everything you could name had to be done anyway—mines started, outlying settlements founded, machinery built. But it will take the coordinated effort of all your people to transform these moons. Do you think the members of the Cinc class can be trusted to work cooperatively?"

"I'll see they do." Weller forced a laugh. "Y' go a long way to criticize us."

"Only as far as I must, Mercy. It's not my business to judge the way you have chosen to order your affairs to date. But insofar as that affects my job, I have a duty to make suggestions."

"We don't have t' employ the Order," Weller said coldly. "We can do the job ourselves, y' know."

"As you wish, Mercy."

Lyell was poker faced, but it was clear enough that he had the whip hand. The Jovians were not capable of the

enterprise. They lacked the special skills and resources it called for. And as long as they were locked underground, dependent on a complex of machines and chemicals for the most elementary necessities of life, they could never amount to anything in Solar trade or politics.

The conversation at supper turned to the inner planets. Davenant noticed that Weller never lost a chance to needle Halleck—small personal remarks and slights which brought the Cinc-four's rage close to boiling over. It was not a comfortable party.

Back in their own suite, the Engineers dropped into Basic for the benefit of the recorders.

"I can't say I'm overly fond of our hosts," declared Yuan. "Mechanized common people, fear and hate and ambition the prime motives of the rulers. I wonder if we ought to do their job for them."

"You know our rule about local politics," said Lyell.

"Seems you were doing your share of politicking tonight, Chief," Yamagata said slyly.

"I've the authority to make suggestions," answered Lyell. "If they go unheeded, I can give a negative report which will make the Abbey drop the job. But that's all."

"There's something inhuman about the setup," declared Kruse. "People aren't robots. The Sergeant class simply can't be treated that way indefinitely. They'll either mutiny or degenerate to uselessness."

"I think—" Falkenhorst hesitated. "Yes, you're right, Torvald. But there must be some safety valve, some outlet for them. I'd like to know what it is."

That was discovered two Earth days later. Davenant was going through some maps in the library, checking resources of fissionables with Garson's help, when the Angel yawned and stretched and said:

"Might's well quit now. Holy time comin' up, an' there'll be no work fr forty-eight hours."

"A special service, do you mean?" asked Davenant, feeling the vague discomfort which mention of religious intimacies always gave him.

"Yes. Feast o' the Three Prophets. We have holy times once in a while, sev'rl times an Earth year." Garson hesitated. "Why don't y' come, Hall? You look like y' could use some fun."

Some people have their own ideas of fun! thought Davenant. But the prospect had a certain morbid interest. Doubtless it would be boring as a drill-mech. Nevertheless—

"Wouldn't people mind?" he asked. "I'm not a member of your Church, after all."

"Oh, no trouble. Stan' back to the rear at first. Later on y' can join in all y' want." Garson smiled shyly. "We might even convert you."

"Well—all right!" Davenant noted the time and place and went off to his supper.

The others of his band refused somewhat profanely to come near the service. They preferred Kruse's idea of wiping the recorders with a magnetic field and locking themselves in with some bottles.

Lyell approved, "If you want to go, Hall, it's not a bad notion. The more we can learn about these people, the better."

Davenant changed to a clean dress uniform and went down a series of ramps and corridors. As he neared the great assembly room, the crowd around him grew thick—commoners streaming in from all parts of the city, men and women and children mingled together. They were silent, but there was a curious eagerness on their faces.

The hall was a gigantic natural cavern which had been enlarged until it could accommodate the entire population of X. It was painted and tapestried into an explosion of color,

huge streaks and jags of green, purple, gold, blood-red swirling on the walls. There were no benches, so everyone stood, but the floor was softly textured.

At the farther end, rising out of semidarkness, was a sort of stage with an altar. All the Angels in X seemed gathered there, rank on rank of them like robed statues. The only Cinc in sight was Weller, who sat on the stage between his guards.

Davenant found a place against a wall. The gray-clad Sergeants who crowded around hardly seemed to notice the stranger. Their eyes were fixed with a curious greed on the stage, and they breathed heavily. Music was coming from somewhere, archaic syncopated stuff which caught at the pulse with a primitive force. Davenant wondered at the feeling of lightness and elation that seemed to be rising within him.

"O brethren—" It was all the Angels, a huge male chorus ringing like distant thunder between the ends of the cave. *"Praise ye the Lord, in Whom all are one. Thank ye the Lord for the gift of life and for His manifold mercies."*

Effective, thought Davenant. *I wonder why? I've heard better in Luna City.* But as the chorus rose and swelled, he felt an odd lump in his throat. The man beside him was weeping.

Organ tones pealed like the voice of Heaven.

The sermon began, from the lips of an elderly Angel who only yesterday had been discussing gas-diffusion processes with Davenant. It started quietly enough, solemn as the music, with the Angel reciting the virtues of humility and hard work. Davenant found it rather reasonable.

Then the tempo picked up.

"An' yet who're we, mis'erable wallowers in sin, that we should walk this world? We who're slothful, an' greedy, an' lustful, we who's so blackened that only the blood o' the Lamb can ever wash us clean? I say t' y' all, the Devil is

waitin'! On the Black Planet which is called Hell he waits f'r us, he's ready t' lick us down his hot gullet, down into the lake of eternal fire—you, an' you, an' you! Few are they who'll find mercy in the sight o' the Lord, an' great is the wailin' in Hell—"

People stamped their feet. Giant, dwarf, multiple-armed, tentacle-armed, the pure human majority, they jerked, and moaned, and swayed with the rhythm of the words. Music rose around them, a sinister harrying of notes gone wild, and the Angel roared abomination down on them.

"Amen! Amen! The Lord have mercy on me a sinner!"

Davenant's knees felt weak, his heart thick in his breast. He was doomed and done for, outcast, alone, every shame of his life was rising to mock him and he gasped with the pain of it. Everyone was groveling on the floor now, creeping toward the altar, wailing their miserable little sins to the world. And he, he alone was damned!

"Hallelujah!"

It took a minute before Davenant realized that the shout had been his own. That brought him up short. A word screamed in his brain, and he doubled up against the wall and grabbed for its support. *Supersonics!*

Or subsconics? He wasn't sure. He couldn't remember in the confusion that bawled around him. But he knew that inaudible sound waves in the right frequencies do strange things to the human nervous system. The take off of a rocket gives a man a moment of irrational dread. There are combinations of wave lengths which stimulate the thalamus, exalt the emotional response, while suppressing the action of the critical, reasoning forebrain.

It had been a standard part of psychotherapy for a long time. It was being used here on a giant scale!

Knowing it was a help. Davenant fought back toward sanity. He felt his heart pulsing with the words that rolled around him, he was frightened and joyous and enraged all

at once, but it could be controlled. He licked his lips and wondered how long he would have to hold out.

"Praise ye therefore the Lord, for His mercy endureth! Give thanks and rejoice that He made ye!"

Hang on, boy, hang on, stay where you are.

In the seething of the mob, it hardly seemed incongruous that the Angels should suddenly be tossing out plastibottles. One landed beside Davenant. He picked it up, unscrewed the cap, and tasted as the others were doing. It burned in his throat. A hundred and fifty proof at least!

The music rose with a triumphant surge and thunder. He saw the nearest man turn, grunting, and snatch in a curiously blind way at a woman. She struggled for a moment, as if against some dying fragment of convention, then fell into his arms. He fumbled at the sleazy material of her dress, lifting it as he forced her toward the floor.

So that's their safety valve!

A hand plucked at his. It felt hot, and wet with excitement. Turning, he saw another woman, pulling at him. Disordered hair streamed past a face which glistened with sweat and contorted with laughter.

"C'mon, honey," she said. "Le's go."

He shivered and stiffened himself. "No—no, thanks, he mumbled.

Arms were around his neck. Even in low-gravity, her weight was dragging him down. "Y're a new un," she said. "C'mon, have some fun. It's awright."

She felt soft and hot against him. Helplessly, he stared down the open neck of her dress. Her lips sought his, greedily. It was like an explosion inside him. He sank to his knees and she laughed and pushed her body against his.

Wildly, he wanted to accept, nobody would know, and—and—Glancing around, he saw that the floor was littered with couples and that the younger Angels were leaping off the stage to join the party. There was a tightness in his

throat and a hammering in his temples; he'd been a long time without a woman.

Nol

He pulled himself free, shuddering. "Damn it, I'm an Engineer!" he gasped, more to himself than to her.

"Wha's the matter?" she demanded insistently.

He thrust her away. "Nol" he said harshly. "Go find someone else—"

Ugliness crossed her face. "Y can't, huh?"

He wanted to show her otherwise, but only shook his head angrily. She laughed unpleasantly and moved off. It took him a full minute to recover his wits.

Davenant looked up at the stage then. Weller was rising to go. Either he had superhuman self-control or, more likely, there was a heterodyning vibrator mounted near his seat. Custom had apparently required his presence, but—

Suddenly he fell.

His guards swarmed around him. Peering into the shadows Davenant saw half a dozen men under one of the high columns. They were dressed as commoners, but stood aloof. He pushed closer, recklessly, and saw Halleck among them.

A machine-gun chattered from the wings. Other Hounds came into view, methodically mowing down Weller's guards. They were in the majority, they operated with smooth co-ordination, and the whole fight was over inside a minute. The survivors withdrew, bearing their wounded.

Halleck and his followers turned quietly and left the hall. Davenant made out the faces of at least two Cincs he had met. So several of them must have got together on this. A group conspiracy would be the only way, probably, to get past Weller's defenses. Now the junta would install a new Cinc-one and—

Few if any of the brawling crowd had noticed what went on. They were too busy with their own affairs.

Davenant felt oddly light-headed. It must be the aftermath

of the sonics. The only sensible thing to do was beat it back to the Engineers. He had no business mixing into this bloody mess which was Jovian politics, but his own impetus carried him along, his will gone.

Two men on the stage were looking down at the bodies which littered it. One wore Cinc uniform, one was an Angel. Both were high-ranking, to judge by their insignia.

Davenant got down on all fours and crawled toward the stage. The pairs and groups wallowing about him were cover of a sort. If he was noticed at all in the dim light he might be taken for a commoner. Or he might get a bullet in his skull.

Near the stage, he lay prone and called on his mental training. He had a degree of conscious control over the involuntary functions, he could drop the sensory barriers and heighten perceptions as some hysterics do without volition. Just enough to hear what was being said—

In Basic!

The shock of that turned his muscles rigid. For a moment, there was darkness before his eyes. It faded, and he heard the Angel speaking:

"So far, so good. But will Halleck be more manageable?"

"I've been his mentor since he was a child," answered the Cinc. "Consciously, of course, he distrusts me as much as does anyone else. But I've made it plain that I'm not after the highest rank, so he will listen to me, at least. And I know what buttons to push."

"We'll have to proceed cautiously. A whole culture can't be rushed into anything new." With a note of grim humor: the Angel added, "We ought to know that by now!"

"Of course, of course. But we're doing all right. We've come a long way since Callisto. Pass the word around—conference at 1800 tomorrow. Arrange it as an ostensible discussion of policy with regard to these Engineers. Which it will be, in a way, though we want only our people in on it."

"All right. I'll send you an official memorandum. Let's go."

They walked off the stage. It was a long time before Davenant gathered himself together enough to leave.

When he entered his quarters, Kruse looked up with a rather bleared expression. "What's the matter, Hall? Seen a ghost?"

Davenant drew a shaky breath. "Yes. In a way."

Lyell stood up. "What do you mean?"

"I mean—" Davenant looked at the floor, then up again to meet their eyes with a certain desperation. "I mean I've found out who really runs Ganymede."

"Oh. The service you went to? You mean the Angels are more powerful than they act?"

Davenant shook his head. "Cincs and Angels are played off—manipulated. It's the Psychotechs from Earth."

CHAPTER 5

HUBRIS, NEMESIS, ATE. So the old Greeks summed up the rise and doom and fall of men. It is a formula which has gone through all history.

Much partisan nonsense has been written about the Psychotechnic Institute. It was neither the only savior of a reeling civilization, nor the tyrant which strangled man's right to be an individual. It was a band of men and women who for generations strove toward a high ideal, wrought mightily, and at the last—as might have been foreseen—encountered problems they could not solve. Somewhat as the medieval Church nurtured Western civilization, the Institute was a kind of placenta for Technic society. In both cases, an out-grown matrix was becoming constrictive and had to be

broken, and in both cases the act of breaking threw men back temporarily to disorganization and unreason.

The tragic flaw in the character of Institute personnel was only that they were human.

Scientific method was first successfully applied to social processes in the nineteenth century, when statistics were used to accumulate and winnow data. The basic-theoretical approach was developed in the twentieth century along several lines of attack—games theory, communication theory, general semantics, the principle of last effort, and generalized epistemology.

The original Psychotechnic Institute eventually absorbed all similar groups. Devoting itself to study, it came up with some fundamental equations describing human relations. The approach was that of field dynamics. Its discoveries about the psychometrics of the individual were of even greater ultimate importance, but centuries would pass before those bore full fruit.

What counted around 1970 was a precise formulation of certain basic laws governing the action of *groups*. No one pretended that the science was perfect; it had to admit large probable errors. But it was immediately usable, and the world of 1970 badly needed a guide.

Governments had long been relying on experts. It was only natural for them to continue doing so. As time went on, the Institute's leaders foresaw the growth of their own power, but they did not snatch after it. It came to them of its own accord, because only they could formulate policies for a world still wounded and feverish, policies which had a reasonable hope of success.

And so, step by step, came the economic recovery and improvement of all Earth through: The strengthening of world government; the slow withering of nationalism; education which, for the first time in centuries really fitted the needs of the individual and of his society; the gradual de-

cline of population on an overcrowded planet; the effective conservation of natural resources; rational economics; sane penology; generally available psychiatric care; and critical thinking.

It was not easy. There were setbacks, interminable debates, deadly undercover struggles—but the foundation was being laid.

The reasons for the final breakdown of this progress were complex, but three main threads may be traced. First, there was a deep cultural resistance in a majority of Earth's population. As Asia became more and more the economic center of the world, this unwillingness gained power. The road was, after all, long and hard, and it involved the scrapping of traditions which had existed since prehuman times. In many ways it went against animal instinct, and peoples without the technological bias of the West were inclined to draw the line somewhere and stick by it.

Second, the bulk of humanity simply was not fitted to absorb the new attitudes. Cold rationality and a high degree of self-abnegation do not come naturally to ninety-nine percent of the race. Individual psychology suggested ways to get around this, but there was no way to recondition a billion and a half human creatures en masse.

Third, there was mass unemployment on a scale never seen before, as computers, automatons, and semi-volitional machines replaced men on one continent after another. Not only the unskilled laborer, but his highly trained brother and the routine intellectual—clerk, recorder, librarian, local administrator, laboratory assistant, the expert, some thousands of professions—was no longer needed.

The process took a long time to near completion, and there were many attempts to alleviate its effects, but nothing, not even the great emigration to Mars and Venus, was enough. At the nadir of the situation only some twenty-five percent of the adult population of Earth was even partially employed.

Of course, no one starved, a citizen's allowance was enough to assure living quite comfortably, but the genius class which could still work and get extra money for it was hated and envied. Yet the geniuses had to be paid, or not enough of them would have accepted the positions which still had to be filled by humans.

It is not good for a society when most of its citizens have no vested interest in its smooth operation. The atmosphere of restlessness and despair tainted even the leaders.

Out of all this rose Humanism, which amounted to a desire to restore a streamlined version of the entirely imaginary "good old days". The Institute was shocked by the rapidity with which the movement grew. It was made the more dangerous by the general availability of superdielectrics, accumulators of fantastic capacity which could be charged from almost anything; cheap, simple energy sources for vehicles and weapons.

The balance of military power was shifting away from central government and toward the small, fanatic group. It was no longer possible to enforce order.

The Institute had had its own secret machinations before this. There was, for instance, the inoculation of a precalculated percentage of cost free synthetic food supplements with chemical contraceptive, followed by specious public explanations of the falling birth rate. There was the quiet subversion of the most inflexible archaist organizations. There was much more, which had been deemed necessary but could not go through the process of democratic agreement.

The new situation was ugly. Anti-robot riots; the lynching of technicians and scientists; the election of intellectually corrupt representatives—lunacy was building up as rapidly and unnecessarily as—to quote a classic example—it did in the old world on Earth between World Wars II and III.

The Earth sections of the Union government were calling less and less on trained men, going back more and more to

rule of thumb. Something had to be done! And the field equations did not indicate a solution.

There is no reason to detail the increasingly frantic efforts of the Institute's leaders to stop the avalanche. Some of their methods were actually unlawful, and when this was exposed the results were evil. The naval mutiny, the Humanist Revolution and seizure of power, the withdrawal of Earth from the Solar Union—these are matters of record.

The Humanists soon found out, though, that they could not repeal history, could not abolish the technology on which men were now dependent. Mars and Venus backed the counter revolution. The shaky Regents were overthrown and the new government rejoined the Union—but the seeds of interplanetary rivalry and distrust had been sown.

"Tame" Psychotechnicians could not be dispensed with, but their powers were rigidly limited. The generations to come would be turbulent, one might call them the adolescence of Technic civilization—an age of trial and error for such men of good will as groped toward a new and better basis for living. An age of conflict and greed for the short-sighted majority. But an age with a peculiar hectic brilliance of its own.

Analogies to post-Reformation Europe are tempting, but should not be drawn too closely.

What is of interest now is that at the time of the Revolution some of the Institute chiefs and their followers decamped to save their own lives. They had managed to seize an ecological-unit spaceship—it was the old *Starshine*, in orbit around Earth after completing the third expedition to Neptune—and had taken it into outer space.

No one knew why they did not go to Mars or Venus, as many of their colleagues did, nor was it known what had become of them.

Mankind in general had too much else to think about to worry over a few hundred refugees.

CHAPTER 6

"POLITICS," Lyell said when Davenant told him what he had discovered. "We stay out of this."

"Even if there's a—danger?" asked Yuan. "If the Psychotechs get this system organized just the way they want, it could well become a menace to the status quo."

"As a scientist of sorts, you ought to be pretty sympathetic to the Psychotechs," retorted Lyell.

"Maybe, maybe. We need their skills. Could be Earth's made her biggest mistake to date in booting them out. On the other hand—I don't know." Yuan frowned unhappily.

"I think I follow you," said Yamagata. "Groups, organizations, tend to lose sight of their original purposes, don't they? The means to an end become an end in themselves. Look, oh, say at the Christian Church. It started with a noble ideal, maybe the noblest man has ever seen, a universal brotherhood of love. After a few centuries, it was burning people alive for disputing its authority."

"That took longer than you think," said Lyell. "But I won't quibble. It may well be that Psychotech people have become embittered and fanatical. Their connivance in political murder today suggests it. Nevertheless, we don't let on that we have any inkling they're here. We proceed as usual, report the facts secretly to the Abbey, and let the Coordinator and Council decide what to do. If the Engineers don't stay out of affairs such as this, they'll end up as exactly the same kind of power-grabbing, intriguing bunch of crooks. Our job is to keep the scientific spirit alive. To reform planets, not people."

"Of course," said Falkenhorst, "the Abbey will want more facts than just the bare statement that—"

"Yes, yes. Keep your eyes open. But don't go playing spy. You haven't the training or aptitude, and the Cincs are experts."

"So are the Psychotechs," observed Kruse. "You realize that everything we've said in Basic, fondly imagining no one understood it, is known to them."

"Uh-huh. From now on, we keep the wiper going permanently in here. Let them wonder why. Also, it's about time we started demonstrating a few things we can do. . . ."

The announcement that Weller was dead and that Halleck was the new Cinc-one came toward the end of the holy time. An added twenty-four hours of circus was proclaimed to celebrate the accession. The Sergeants took it stolidly; they must be used to such sudden changes of masters.

Davenant continued his fact-finding in the library, since he wanted to see which of the Angels normally there excused themselves to attend the special conference. It was a shock when Garson was among them. That fumbling, blushing, stammering nonentity?

On second thought, it fitted. The Psychotechs weren't interested in an outward show of power. They concentrated on getting into key subordinate positions—the men who gathered data and wrote reports, the men whose advice was valued by the policy makers. The Jovian rulers, a curiously innocent breed in spite of their mercilessness, could not be expected to know just how powerful the executive secretary of a committee was, for instance, especially if that man had the sense to be unobtrusive about it.

This also would explain why Garson had so casually accepted the Engineers' feats of instant comprehension and memorization during their studies. To him, that was the least part of mental training.

But had he, then, invited Davenant to the service with the intention of having him witness the assassination? If so, why?

While the Angel was absent the Engineer took the op-

portunity to look up the historical files. There wasn't much about the original settlers of Callisto. They had merely claimed to be adherents of the outlawed Technic Party who had tried to establish themselves on the satellite and had failed because there weren't enough skilled spacejacks among them.

They had joined the Ganymedeans under an agreement which gave them all Angel status, permitted familiar contracts to remain in force, and left their big ship and their own personal property. That must have taken shrewd negotiation, but of course their leaders had been experts. Some had soon been given Cinc rank, and the younger generation among them was being raised in the orthodox Jovian manner.

Still, Davenant was pretty sure that they arranged for their own children to be picked for special training, and for their women to get the more privileged jobs. There was no secret police here, for the society was too rigid to require one. A close-knit brand of conspirators could maintain itself without much trouble.

Now that he knew what to look for, Davenant could easily find the signs of their influence. There had been some radical changes quietly made in the past twenty-five years. The Sergeants were no longer undifferentiated mass, but had been divided into grades, of which the higher echelons got a respectable though strictly utilitarian education.

The newer outposts had been organized under different lines from X and from each other. One was staffed entirely by Sergeants who had a regular family life, another by experimental mutant types, still another by Angels, and all under the very eye of the Church. A diveristy of cultures was breeding which must in time clash with and destroy the Church's petrified overlordship. The terraforming project itself was probably a Psychotech idea.

So far, so good. Davenant had every sympathy with the

notion of undermining Jovian society. But he wasn't at all sure about the ultimate aims of its new, hidden masters.

Some three Earth days later, the Engineers went out into the field. They didn't bother unloading their ship, but jetted her directly to the camp site, a feat of piloting which must have made some eyes bulge.

A party of Angels and Sergeants, with a few Cinc bosses and their Hounds, arrived by motor sled to find camp already being established. It was a whirl of movement and action, with a score of swift sleek robot machines erecting shelters and workshops, guided only by men at the main control boards.

"Y're gonna drill here?" Garson asked timidly.

Lyell nodded. "I think this is a promising site for one of the H-Li burners. We'll take cores down to a depth of fifty kilometers and find out for certain."

"Fifty!" Garson gulped. "Won't a shaft that deep—y'll have to make it pretty wide, too—won't it cave in?"

"Not in this gravity and with this type of rock," said Lyell. "Anyway, it'll only be wide at the bottom, otherwise just broad enough to lower parts which our robots can assemble down there. It'll take longer to warm the surface with the fires burned that deep, but be far more economical in the long run. Also, right now we still have to find out just how much native heat there is at the satellite center and how available it is."

A self-operating 'dozer walked around a selected area, scooping away rubble with casual giant shrugs. A slim steel skeleton rose above it, and Davenant and Kruse hooked in the boring rig and a minimal nuclear engine. They could have done it faster if their Jovian subordinates had been trained for such work.

Falkenhorst set up his furnaces in one of the workshops and began turning out synthetic diamonds for drill bits.

Yamagata's laboratory worked overtime analyzing the sections brought up. Yuan pored over the results and announced that a biological approach to the atmosphere problem was not impossible.

"Of course we can't mutate from protoplasmic life," he said. "Theoretically we could make animals, but they'd have to have heat producing cells to keep from freezing solid, and we want unicellular organisms that can multiply like mad. Rather than wait till the satellite is warm enough, I'm going to have the Abbey labs turn out some different things, which can live here as conditions are, getting rid of the poisons and releasing oxygen as natural metabolic functions. Liquid ammonia in place of water, for instance."

"Y' mean y'all can *make* life?" Garson sounded shocked, and Davenant reflected what a good actor he was. The datum could hardly have been unknown to him, for synthetic virus antedated the Humanist Rebellion by more than a century and a half.

"Sure." Yuan peered at him from a stack of calculations. "Whole bacteria were assembled long ago. It was just a matter of reproducing and accelerating the chain of physiochemical reactions which led to the first life on Earth. Oparin had sketched that out as far back as 1930 or so. Nowadays we can tailor synthetic bacteria and protozoa to almost any requirements. The limiting factor is merely the extremes of temperature between which such complex reactions as make up life will go on." He smiled. "Nothing more than microscopic organisms have been made yet, and I see no reason why humans should ever be produced synthetically even if it is possible. Nature has a much more interesting way of achieving that result."

The Cinc who was with them looked doubtful. "It soun's blasphemous," he muttered. "Only God—"

"Oh, call it straight organic chemistry if you want to,"

snapped Yuan. "Just don't bother me now. I've got work to do."

The Cinc flushed darkly, and Davenant could almost read his thoughts—You damn slant-eyed—

Garson stammered a question which deftly turned the talk into safer channels.

"We'll have to set up an iron mine near here," declared Lyell. "You understand that our construction is only a portable testing rig, and that most of the terraforming materials will have to be manufactured on this world. According to your maps, there's a deposit not far off. . . . Let's assemble some workers and go take a look."

The look involved driving shafts kilometers into a mountain. Blasting was of little value in the tenuous atmosphere, and Davenant used atomic energy to melt rocks loose, after which the diggers lumbered monstrosly to clear away the rubbish.

"How d'you control the reaction?" inquired Garson. "I never thought anybody'd ever make atomic burners that small."

"Damping fields," said Davenant abstractedly. "Anti-radiation fields, too. It's the same development of wave mechanics as has produced the molar potential barrier and the frictionless wheeldrive. In principle, these gadgets tap some of the reaction itself through field baffles. Lead shielding is obsolete except for special purposes."

"Oh." Garson's eyes rested on Davenant. Behind the faceplate, his countenance was a mask. "So y' can damp, shut off a reaction from outside?"

"Of course. How else could we burn, say, hydrogen and lithium instead of just blowing them up?"

The team went on to another site. Lyell used the opportunity to go into space and check with instruments.

"A big ship there in a low orbit, all right," he said. "Must be the *Starshine*. She's cold as charity, too. No one aboard."

"Emergency exit for our Psychotech friends." guessed Kruse. "No point in leaving her there, rather than breaking her up for scrap unless she's fully equipped. So when they came to Callisto, they must have had Ganymede in mind all the time."

Yamagata nodded. "These people never did anything at random. When the debacle came, they must have figured their best chance to get back in the saddle lay through Jupiter. Mars and Venus have too much contact with Earth for them to operate secretly."

"But the people who came out here—" began Bavenant. "They knew they'd never live to see their plans mature. Why that tremendous sacrifice for a time long after they were dead?"

"People are that way," said Yuan.

"What worries me is their ultimate plans," said Falkenhorst. "Those here now must realize that they've little or no chance of persuading the inner planets to reinstate them by using sweet reasonableness, or even some obscure socioeconomic manipulation. And the Institute did advise war from time to time as the best solution. Like when they got the old U.N. to put down the Venusian nationalists by force. I have an uneasy notion they plan to make Jupiter a-Prussian state, and then under the guise of Jovian conquest . . . with modern weapons, it wouldn't be pretty, whether they won or lost."

Kruse said, "They always preached against war except as a last resort. The Venusian campaign was a small affair. I ought to know—my great-great-grandfather was a U.N. marine who fought there and settled down afterward."

"But attitudes change," declared Lyell. "The psychodynamic technics are only methods for attaining given ends. They say nothing about the desirability of any aim. If the Institute people have acquired an old-fashioned power hunger, they'll rationalize it to themselves, but they'll be as

dangerous as any would-be conqueror." He shrugged. "Out of our province, though."

The initial survey took a little over three months. Then the expedition returned to X to make preliminary evaluations of data and plan the attack on Callisto. Terraforming Ganymede certainly looked possible. The question still was whether or not Jovian society was able to avail itself of the possibility. The answer to that involved further sociological study.

"If the Psychotechs think it can be done, I'm inclined to agree with them and let it go at that," said Kruse. "They know this moon better than we ever will."

Lyell shook his head. "In the first place, we have to keep up the pretense of not realizing the true situation," he replied. "It could mean trouble if they found out that we do know. In the second place, the Abbey would want an independent opinion anyway. In the third place, how do you know they *want* the job done? Our trying and failing might be what they really have in mind. It could have a psychological impact, a disappointment and bitterness, which they could very well exploit."

Davenant felt again a chill of foreboding. He wasn't fitted for this atmosphere of unsureness and hostility and dark cross-currents. A wave of homesickness for the clean bare slopes of Luna and the comradeship of the Abbey nearly overwhelmed him.

He wondered what the Cinc spies thought of their suddenly blanked recorders. The natural interpretation would be that the Engineers had discovered the hidden instruments and had simply chosen this means to express indignation. But how natural was the Jovian mind?

He returned to the library. There was little he could do at present except soak up as many facts as possible, for

the Academy's experts to take from him later. And the long, quiet chamber was the only place in X he really liked.

Garson looked up from a projector as he came in. There was no one else present. "God with us," he said shyly.

Davenant nodded and sat down next to him. "What are you studying now?" he asked.

"I'm s'posed to be educating myself in metallurgic theory, so I can work better with your team. 'Fraid it's not my strong point."

Davenant looked at the projector. It had what seemed like an unnecessary number of controls. "Why those?" he asked, pointing.

"Oh, that's t' save spools. One tape can hold a lot o' diff'rent texts, same as one phone line can carry a lot of diff'rent messages. These buttons are t' unscramble, an' select the one I want."

"Hmmm—" Davenant hoped his excitement didn't show. "That's a novel idea. When did it come in?"

"Oh, 'bout fifteen, twen'y years ago. Why?"

"J-j-j—" Davenant swore at himself and brought his tongue under control. "I was just wondering."

But he knew now where the Psychotechs kept their secret records! Right here with all the others, safely scrambled in with a code modulation known only to the conspirators. Best place on Ganymede!

The Angel sighed and looked at him steadily. "You know, don't you?" he murmured—in Basic.

"Know?"—For an instant, Davenant failed to understand what Garson meant. Then shock held him rigid.

The Angel smiled. "Why bother, Hall? It sticks out ten kilometers. Ever since you started blanking those spy machines, and some of your questions, the way you react to key statements, almost the way you walk. You know who we are."

"You—I don't get it. What do you mean?"

"Never mind. This isn't a very safe place to discuss such things. Just tell the others what I've said, and quote me to the effect that we don't care. It was foreseen that a group of alert, intelligent outsiders, coming here especially to study this place, would most likely discover our secret. The probable reaction of your order has already been estimated and allowed for. I wanted you to see that religious ceremony and assassination, to realize more fully what a brutalized culture this is and how right that it should be taken over and changed."

The mask was off. There was no more hesitation, no more awkwardness in Garson. It was a mature and calmly assured man who spoke.

"I know we've been party to some nasty affairs, like the last change of dictators. We'll continue in that line for a while, because we must. Just remember that our ultimate aim is still what it always was—to establish sanity so firmly in all men that that sort of thing will be forgotten and impossible."

Davenant sat unmoving. Garson returned quietly to his book.

It might have been minutes later, or nearly an hour, when the tramp of boots rang in the corridor outside. Davenant glanced up from the screen which he had been mechanically studying, and saw the door fly open. A dozen Hounds made their entry. Long, low-gee jumps ranged them around the wall, with guns pointing inward. A black-clad Cinc-three followed them.

"Don't move," he said. "You're arrested."

"What?" Davenant leaped erect. Three staring muzzles followed him. "What in Sol—"

"Hands up!" snapped the Cinc. "Conspiracy 'gainst the Church's a killin' matter."

Davenant sucked in his breath and willed steadiness back

to his shaking form. His mind leaped with an unnatural clarity.

"You can't arrest me," he said. "I'm a Planetary Engineer. Our contract with your government, which has the force of a treaty, gives us immunity."

"Can't I, though?"

Davenant shrugged. A tiny germ of panic crawled deep in his skull, but his voice lifted coldly.

"The Order protects its own. If you molest me in any fashion, they'll hear of it at once on Luna. We have our methods of communication."

Sheer bluff, but he counted on the scientific illiteracy of the Cinc class, and the awe which his team's work in the field had produced. "How would you like to have your brain burned out from space?" he went on. "What defense have you against robot bombs sent clear from Luna? If you don't let me go back to my quarters you'll soon find out that the Order is not helpless."

For a moment the Cinc hesitated. "Don't do it!" screamed Garson. "There's women an' children here!"

That worked. The Cinc detailed three Hounds to escort Davenant back to his suite.

Four of the other Engineers were already there. Kruse showed up later, arrogantly demanding that the guards outside the door let him in. He had been set on by three Hounds down in the main power room, but he had also been involved in clan feuds on Venus as a youngster. From his tunic he extracted guns and passed them around.

"What brought it on?" groaned Yuan. "What's happened?"

"I've got a hunch," Davenant set up his testing rig and checked the room circuits again. "Yeah. Halleck's idea, I'll bet. He's not stupid. See this pip? That's a metallic mass in the adjoining suite which wasn't there before. When we started wiping his tapes, he must have set up an old-

fashioned groove-cutting mechanical recorder. He's heard everything!"

"And we thought we were safe, and didn't bother to speak Basic most of the time," mumbled Yuan. "He must be pretty damn sure of the situation. So now he's setting out to arrest all the Psychotechs on Ganymede, and us along with them."

"What will happen to us?" wondered Falkenhorst. Sweat beaded his face, but the voice held an iron calm. "Will they dare take action against members of the Order?"

"Probably," said Lyell in a thin tone. "We're safer for him dead—we know too much. He may call Hall's bluff and execute us officially. More likely fake an accident." He scowled. "What to do?"

Kruse shrugged. His face was taut and pale, but he spoke with a sharp note of laughter.

"We've got three guns," he said. "We're used to higher gravity than this. We can catch those sons of Hounds outside by surprise. Pick up whatever equipment here you think we'll need. The only thing for us is to break out of here!"

There was only a moment's hesitation, as they weighed the meaning. Lyell nodded. "I hate to do it, but . . . Let's go."

He, Kruse, and Yuan, the best shots, took the weapons. The rest loaded equipment on their backs. Kruse flattened himself against the door and opened it just enough to peer out, into the faces of three Hounds.

"Boo," he said.

The nearest guard scowled and reached for his gun. Kruse snapped three shots.

"Come on!" he yelled, and flung the door wide.

The Engineers burst out into the corridor, stumbling over the bodies. Davenant stooped to pick up a gun for himself, and heard the whine of a bullet cleaving the air

where he had stood. A corps of Hounds was trotting down toward them.

"Out of here!" roared Lyell.

They backed, laying down a curtain of fire. It seemed a miracle that there were no hits, but they were distant, moving targets. Davenant wasn't afraid now. He hadn't time to be. He burst around a corner, almost into the arms of another Jovian guard.

His fist leaped of itself, the blow shocked home and he saw the man lurch back with his face red. Coldly, Davenant kicked him in the belly, and behind the ear as he went down.

Run! His breath was raw in his throat as he fled with the others, down an endless labyrinth, always down, toward the garages. He didn't see the action behind him as the three gunners turned to fire back. Once Falkenhorst staggered, grabbing at a shoulder which was suddenly wet. Davenant threw an arm around the man's waist, and they struggled on together.

Now—the garage entrance. In the confusion, it was unwatched. The Engineers went through, closing the massive door and dogging it behind them. A couple of mechanics ran up to protest. Kruse waved his gun.

"Back, or you get it in the guts!" he snarled.

There was a long row of sleek small rockets, ready and waiting. Lyell entered the nearest.

"Kruse, Davenant, Yamagata, aft to the engines," he clipped. "The rest stay with me. Be ready to take over piloting if I don't last."

"I hope those mechs stay buffaloed." Kruse's teeth flashed white. "We've used up all our ammunition, you know."

His big form wriggled into the crowded engine room.

"Where the devil will we go to?" asked Yamagata. "This boat isn't interplanetary."

"I don't know. The Outlaws in the hills, I reckon, if we

can find them. What counts right now is getting clear of X."

The auxiliary motors purred, turning the rocket's wheels. It slipped down the corridor and up the airlock ramp. It was useful, having enemies indoctrinated out of all initiative. No one had thought to cut off the automatically opening valves.

As the boat emerged into dark bitterness, Lyell saw space-suited forms swarming across the ground.

"Not a chance to get to the *Light*," he said. "Stand by to lift."

The rockets flared, tossing the boat skyward. Lyell headed north, switched on the auto-pilot, and began scrambling into one of the space suits. The rest did the same. None was a particularly good fit—a suit should really be individually built—but they would do.

Stars glittered in the forward view-ports. Falkenhorst slumped with closed eyes, color drained from his face. Yuan studied the radar-scope. His voice floated back to the thrumming hotness of the engine room, over the intercom:

"Someone coming after us."

"Yes, I see him now. Police rocket, and this thing hasn't a gun to its name." Lyell's voice held a groan.

Davenant did not see what happened. He felt the sudden shock and thunder, felt the hull reel around him and drop like a murdered seraph. Air whistled through the hole amidships, and the unbalanced gyros howled.

"Hang on!" bellowed Kruse, slapping down his helmet. "Hang on and pray!"

They struck with a sundering crash which jerked Davenant's head almost off his neck. Darkness whirled before his eyes.

When he came out of it, Kruse was looking emptily through the engine room door.

"They're gone," he said. "It killed them."

Slowly, Davenant crawled from the ruin. The boat had come down in a long glide, smashing itself into a land of

bare mountains and reaching snowfields. The three men forward were dead.

Yamagata went out through the hole torn in the boat's waist and looked skyward. A distant red flare streaked south.

"They aren't landing," he said. "Be almost impossible to do in this country, and they'll be needed at home and won't figure on any survivors lasting long."

"Which we won't," Kruse answered dully.

"We can try!" Rebellion lifted in Davenant and brought his head erect. "We'll lay these men out as well as we can, and then—"

"Yes?" asked Kruse. "What then?"

"We start walking," said Davenant.

That was how it had started. Now Davenant and Kruse stepped and glided. Two dead men walking across the face of hell.

CHAPTER 7

THE GAUGES said that about thirty minutes of oxygen remained. If it had not been for Yamagata, Davenant and Kruse would have suffocated already. They could stretch out their lives by sitting still, but there was no point to that.

A ragged edge of hills cut across the face of Jupiter like teeth of blackness. Their shadows streamed enormous before them, hard and sharp over the broken ground. Outside the shadows, there was a rush of light from the primary, chill amber which sparkled frostily off solid ammonia fields and flashed from the ice glaciers in another sawbacked range. When Jupiter was close to full, its radiance was enough

for human color vision, though the hues had a dreamlike distortion.

Near the banded giant, no stars were visible, they were drowned out. When you looked away, you could see them over the sharply curving horizon. They glittered through the tenuous, unbreathable air with a cruel wintry brilliance.

Even carrying his own weight of suit, oxygen bottles, capacitors, and other equipment, a man was light when gravity was less than a fifth of Earth's. You learned walking all over again, the first time you were on a low-gee world—a long, flat glide which ate the kilometers.

You learned to gauge distances when thin air made an object seem closer than it was, while a near horizon tried to make it see farther. You learned to check every joint and valve and connection on your suit before venturing out, when the least failure could choke you, explode you, freeze you solid in minutes. And you learned to have death for a companion!

The minds of the two surviving Engineers had grown so dim with the steady slogging that when the gunshot came it almost killed them. Davenant saw a spurt of snow and chipped ice before his feet and stared at it in a dull kind of wonder. He didn't hear anything except the whisper of wind past his helmet, for the air was too lean. Another slug pocked the low bluff to his right.

"Down!" yelled Kruse. "They're shooting at us!"

He nose-dived for the ground, and a bullet whipped past the spot where he had stood. Davenant followed a movement of blind instinct. Ammonia-crystal snow feathered up to blind his face-plate, he pawed at it while his body tried to dig itself into rock.

Kruse touched helmets with him. "Radio silence, man! They may have a direction finder. We've got to speak by conduction. No, this way—" He led an awkward belly-crawl

toward the nearest of the little craters which scarred the valley floor.

Davenant shuddered. For a moment he was uncontrollably afraid, his muscles knotted immovably against the expected leaden blow. Then, the very condition of hysteria triggered reactions which had been built into his mind during his long training. Suddenly he was without fear, his body keyed to a high adrenal pitch, his thoughts like cold lightning at night. He slipped after Kruse and wallowed down into the fluffy snow which filled the crater.

The Venusian hunched low, snarling into the empty sky. "If they pin us here for another half hour, we're done," he said.

A black outline showed above a ridge of ice, just for a second before ducking down again.

"Cincs?" asked Kruse. "Have they tracked us down after all?"

Davenant considered. "No. If that were a Cinc, we'd be dead by now. He'd have an infrared 'scope on his rifle, and even with our heaters tuned down to where I'm glad I'm not a brass monkey, we'd show up like a bonfire against this temperature."

The big man blinked, a little surprised at Davenant's coolness. It would have surprised Davenant, too, if he had had time. He was fumbling with his pack, getting out the general unit which the discipline of years had made him carry from the wreck. General units were expensive, and Engineers were supposed to save money for the Order whenever it was humanly possible.

"Outlaws, then," said Kruse. "And how the devil are we going to convince them we're friendly?"

Slowly Davenant's thick-fingered gloves worked on the unit, plugging in jacks and turning dials. It ran off his own capacitors, and took its time about warming up in the Ganymedeian chill.

He answered Kruse abstractedly. "We're not friendly with the Outlaw, you know. We're only trying to establish contact out of desperation, and—" A flicker appeared on the screen. "Here we go!"

A man in the field, who might have to work hundreds of kilometers from camp, couldn't pack twenty different meters and detectors. He needed a single device, rugged and portable, which could be adjusted to perform twenty different functions.

Davenant had simply connected the thermopile with the galvanometer, blinkered the lens to provide sharp directionality, and come up with an infrared spotter. It wouldn't directly show men crouched behind rock and ice, but it would show rising currents of air, heated by their suits. Cautiously, he swept it around the horizon.

"Two," he said after a minute. "One's sitting over in back of that ridge, the other circling behind us. I think he wants to get a vantage point from the top of that bluff and shoot down at us. Now, any ideas?"

"Mmmm—yeah. Let's get the circler. His friend won't be able to see what happens. We can get up on the bluff fast and wait for him."

A few minutes later, the Outlaw—he could be no other—crept over a final rise and toward a position where he could look down into the valley. A large form sprang on him from a crag, pinioning him. Another leaped at the same time from the nearly impenetrable shadow of a cave, grabbed the leads from his capacitors, and yanked them out before he could send a cry for help.

The man struggled wildly. It was hard for Kruse to hold him, here where weight counted for so little. Davenant got out his pliers and unscrewed the short aerial of the Outlaw's helmet radio. Only then did he plug the capacitors back into the suit circuit.

Kruse's helmet was tight against his prisoner's. "We don't

want to cut off your juice permanently and freeze you," he said, "but we might have to unless you behave yourself. . . . Get his gun, Hall."

Davenant could not hear that, but he had already picked up the weapon. To his surprise he saw that it wasn't a rifle, after all, but some kind of bolt-action smooth-bore, obviously homemade, though it used percussion caps. He covered the Outlaw until Kruse got some wire and bound the man's ankles together. Then the Venusian took the gun and stood up.

"I'm going after the other fellow," he said.

"Isn't that—dangerous?" objected Davenant.

"Of course, but look at your oxy gauge. We haven't many minutes left, at the rate we've been using the stuff. And I've had stalking experience back home, which I doubt you have. See if you can talk this one over."

The tall figure slipped down the ridge and was lost to sight.

Davenant huddled beside the captive, touching helmets. He heard only hoarse breathing for awhile, and looked into a gaunt, hook-nosed face nearly hidden by long, tangled hair and beard. The suit, he noticed, was an old model, and bore signs of much handmade repair.

The Outlaw subsided a little. He could have thrown his arms around Davenant, but he could not have held the Engineer for long. He sat back with animal patience to wait a better chance.

"Who are ye?" he asked. His English was barbarously accented, but clear enough. "Be ye gardamn Cincs?"

"No. The Cincs were after us. We were looking for an Outlaw community where we can get help. We're men of the Planetary Engineers."

That conveyed nothing to the man, but he nodded grudgingly. "Ye're no Jovian, I see. Earth?"

"Only in a way. My Order exists apart from any planet.

We work for all. But the Cincs hunted us down, anyway." Davenant paused, decided a half-truth was his best bet. "We want revenge on them. Perhaps your people can help."

"Mebbe new Cinc trick." It was a savage growl, with a lifetime's bitterness in the words.

"We want to be shown to your village. Let us talk to your chief or whoever—"

"No! Die first."

Davenant smiled nastily. "I don't see any signs of motor transport," he said, "so you must have walked from your home. You must have at least enough oxy to get back on. If necessary, we'll take your bottles for ourselves and follow your trail. But we'd rather let you guide us."

"Not enough oxy. We got caches, ye never find, ye die too."

"At least," said Davenant mildly, "we'll die trying." He was faintly surprised at his own ruthlessness. But the Order came first. More persuasively he went on, "What harm can it do if you guide us? What could two men do against a whole village? We have news for your chief which will make him glad. You have nothing to lose."

The Outlaw lapsed into a sullen silence.

After awhile Kruse came back, prodding another man before him.

"I sneaked behind and got the drop on this'n," he explained. "Now what should we do?"

Davenant examined the weapon taken from the new captive. It was a sort of spring-steel crossbow shooting metal quarrels. In this gravity and air pressure, such a device would have plenty of range. It could easily pierce a suit of space armor and the man within it. The main drawback would be the low rate of fire.

His respect for the Outlaws went up another notch.

"First," he said, "we take these boys' spare oxy bottles for

ourselves. My air's getting thick. Then we talk them into guiding us, or if they won't we leave them here."

It took some persuasion before an agreement was reached, but then the trek got started. Once the men tried to lead them astray, but Kruse, who had spotted the faint signs of their earlier passage, forced them back onto the true trail.

It was a long walk, and Davenant felt weak with hunger toward its end. He thrust the awareness out of his mind and whipped his flagging body into new energy. Once they stopped at a carefully disguised cairn and took out some fresh oxygen containers. There must be a lot of caches spotted throughout this country.

That would explain how the Outlaw patrols managed to range so far.

Davenant wondered with a certain chill what would happen when they reached the village. He had heard stories about these barbarians which, even allowing for exaggeration by their enemies, were not reassuring.

CHAPTER 8

NEAR THE north pole of Ganymede, the Godwin Mountains rose steep and cragged, tormented black walls which shimmered darkly under the radiance of Jupiter. A monster system of glaciers capped them, spilling down gashed ravines and across the lower plateaus. The yellow light was cold on their slippery backs.

Kruse, Davenant, and their prisoners halted between two peaks which thrust above the ice and covered them with shadow. A slope fell away beneath them to a narrow, crater-like depression, and on it they could see the outlines of human figures.

"Let's go," muttered Kruse.

"No!" One of the captives spoke in a harsh whisper. "Services goin' on. Sentries 'd shoot us first, check later. We gotta wait."

Squinting against the chill unreal haze of Jupiter light, Davenant saw that the people below were drawn up in ranks, facing a block of native stone where half a dozen worshippers were going through ritual gestures. Poking his helmet aerial forward and tuning up his radio, he caught, faintly, a deep-voiced chant:

*God-home, God-home, hear our askin'.
See, we stand with sacrifice—*

Shocked, he looked southward, and up to the enormous face of the planet. It was at the full now, sprawling tremendously across heaven, the Red Spot like a single watching eye.

"Is *that* your god?" he breathed.

"God is in Jupe and Jupe is in God," answered the barbarian with a peculiar note of reverence in his voice.

O Zeus, could you know! Davenant imagined Olympian laughter ringing hoarsely through the mountains.

"They caught a man in the last raid on Y," said one of the prisoners. "Look!"

They could see a man struggling in the grip of four others. A tiny puff of freezing vapor came from him, he went limp, and was hurled up on the altar stone. Davenant retched.

Forcing his mind back toward an impersonal clarity, he wondered about the development of Outlaw culture. How long ago had their revolt and exodus taken place—eight years? That didn't seem like time enough for this much degeneration.

But then, Ganymede wasn't Earth. The psycho-social effect

of alien conditions had yet to be measured. Huddling, hiding, waging a doomed war for three or four generations, the hill men would rapidly have forgotten their intricate, highly specialized civilization. The barrenness and cold of the landscape would have entered their souls.

He turned over what little he had learned about them in X. A religious colony forced to alter its ways of living and thinking in order to survive, forced yet further by prophet-dictators whose "revelations" had involved radical social change and increased their own power. Yes, it would be unstable, it would have its Old Believers.

The introduction of controlled mutation had led to mutiny and civil war, the dissenters had been defeated and fled into the wilderness. There they had hidden, skulked, and raided lonely settlements. Without books, without leisure, they would rapidly have become barbarians. The stories about cannibalism and human sacrifice seemed justified, but Davenant tried hard not to think of them as the monsters they were considered to be. They were human beings, lonely and desperate and driven close to madness, but they had the same potential as anyone else.

Besides, he thought, it was pretty obvious that the Cincs had been pulling their punches in the war. A concerted effort could have wiped out the hillmen long ago, but an external enemy was too useful.

"Seems to be breaking up down there," observed Kruse.

They waited until the scene was deserted, then moved cautiously down the slope and across the open ice. One of the Outlaws spoke with a note of glee.

"Might's well put down yer gun. Ye're covered now."

Sweat trickled along Davenant's ribs. He tried to look into the farther shadows, but they were too dense.

A voice in his earphones said, "Stand where ye bel"

A quarrel chipping the glacier near his feet added emphasis. They halted and stood waiting, their hands aloft.

Three men came into view, weapons leveled. "That ye, Gil? Fooled 'em here, eh? Good going!"

"We—" Davenant licked his lips. They felt sandy. "We came here on purpose. We're not Cincs or Hounds. We're from Earth, and we want to see your chief."

There was a skeptical silence. One of the new arrivals picked up the dropped gun and crossbow and touched the Engineers suits.

"Not Cinc make," he grunted. "But they're clever devils."

"All we want—"

"I know, I know. Shuddup. Ye'll get yer chance—mebbe."

As Davenant walked up the farther ridge, with guns at his back, he saw half a dozen figures appear with—brooms, by space! He felt a mental wobbling until he realized they were carefully smoothing out footprints and all other trace of the recent crowd around the altar.

There was no path. Slipping and stumbling, groping through blindness of shadow and dazzled by Jupiter's radiance, the party made a slow way through the crags. It seemed a long while before they were halted by other sentries. There was a low-voiced colloquy, and then the two Engineers were herded toward a cave mouth, a great gullet of blackness in an overhanging cliff. A machine-gun nest was dug in just beyond.

The passage fell rapidly downward, a reaching gloom where flash beams were pale fingers and echoes sounded hollowly even in this ghost of an atmosphere. Davenant could make out enough branch tunnels to wonder how anyone ever found his way here. Like all small, rapidly cooling worlds, Ganymede was riddled with caves.

After another lengthy and silent walk, they found an air-lock door. It seemed to be from a spaceship. There was another defensive emplacement before it, and another discussion with the guards. At last they were sent into the lock chamber. The pump was old and rickety, it took a long

time to flush out Ganymede's air and replace it with a thin oxygen-rich mixture. Davenant's helmet was frosted over and blinded him.

"Awright. Through here—stop—take off yer suit."

Davenant and Kruse stripped down to the form-fitting coverall which was standard underpadding. Kruse was dirty and tired, skin drawn tight across jutting bones, a thick stubble of red beard on his jaws.

I suppose I look just as bad, thought Davenant.

There were several Outlaws about them, gaunt, undersized men in worn coveralls. Some of them wore ornaments—hammered copper rings in nose or ears. All carried daggers which seemed to have been beaten out of native iron. They were more interested in the captured airsuits than in the prisoners.

"How about seeing your chief?" asked Kruse.

"Take yer time," muttered someone, and spat.

Kruse bristled. "Look here," he snapped. "I told you we were from Earth. In fact, we're Planetary Engineers. You probably don't know what that means, but believe me, it's important. We have word for your chief which he'll be glad to hear, but if you don't treat us right the Order has means to make you do it."

That seemed to impress them a little. One of them traced a grimy finger over the suit, apparently impervious to the chill which was still on its exterior.

"Not Ganny make," he said. "Mebbe they be really from Earth." He spoke as a man at home might have spoken of Avalon.

"No weapons," said one of the two whom the Engineers had taken.

"Of course not," Davenant said loftily. "I tell you, we belong to the Order. Do you think we need to lug hand guns around?"

"Well—" A hill man scratched his tangled whiskers. "All right. Come along."

Two others fell in behind, with cocked crossbows. The rest trailed after, their eyes lit by a dull curiosity.

The caves and tunnels here had been little improved save that fluoros were strung to illuminate them. Davenant decided that a section of the caverns must simply have been blocked off, with airlocks installed here and there, heated, and ventilated. No system of tubes for that—there must be only a few power fans mounted near the oxygen renewal plant. The air felt dank and stagnant.

The populated section was a series of narrow tunnels in which shallow caves had been chipped or blasted. Ragged curtains served for doors. When one or two of these were drawn aside as someone came out, Davenant saw a pathetic bareness within, a few boxes or stones for furniture. The dwarfish, near-naked women and children who swarmed and chattered around the convoy seemed unnecessarily dirty. Behold the noble savage!

"Can't be more than a few thousand," muttered Kruse. "Is this all the Outlaws there are?"

"I suppose so," answered Davenant. "I heard in X that there were several such villages once, but that only one was believed still to survive. If the Cincs didn't get them, something went wrong with the air plant or the power or—"

His revulsion was becoming an enormous pity. They couldn't even surrender, these poor starveling troglodytes; X had no use for them except as a unifying, ineffectual enemy.

Further along, they passed a communal kitchen. Steam pipes from the nuclear plant had been laid to heat food which seemed to be mostly synthetics.

The passage debouched on a wide cavern at whose farther end was a real door, native iron. A clumsy idol of black stone loomed before it, and two men armed with modern rifles—presumably stolen—lounged nearby on guard. There

was a jabbering conference, and one of the sentries ducked inside.

Kruse switched to Basic to speak to Davenant. "Have you any idea what we're going to tell the grand high panjan-drum?" he asked.

"Depends on what he's like," said Davenant. "It had better be good though, or we'll end up in a stewpot."

The guardsman reappeared. "In," he grunted. As several pressed behind offering to cover the prisoners, he ordered, "No, just them two."

When the door clashed shut, Davenant had to struggle to suppress his astonishment. The chief seemed to own a suite, several rooms formed by plastiboard partitions. There were carpets on the floors, chairs and tables, a shelf of books. The man who stood before them was tall for an Outlaw, his long gray-shot hair and beard was neatly combed, his overall faded but clean. Three women, presumably wives, scuttled out of sight.

There was a silence. "From Earth?" asked the Outlaw ruler at last.

"Yes." Davenant moved forward.

A pistol leaped into the man's hand. "Easy," he warned.

"We don't intend violence," said Davenant. "We jumped your scouts because they attacked us, but spared their lives. All we're after is a chance to talk to you."

"Awright. I'm Roberts-John, boss o' Jupiter City. Come in an' siddown."

The Chief led the way to a sort of living room, found himself a chair, and clapped his hands. One of the women brought in a tray of water and synth-dough.

It was a shaking effort to nibble sedately at the food instead of wolfing it. The chief asked the Engineers their names and went on to some shrewd questions about the inner planets. Then he came to the point:

"Why're ye here?"

"There was—trouble with the Cincs," said Davenant. He was faintly surprised that he should take the lead, but Kruse was sitting back and saying nothing, eyes half shut with weariness. "We have to get in touch with the Abbey—with our Order, the Engineers. So we came looking for your people to help us."

"Lucky chance for ye," said Roberts-John. "We'd never 'a found the city 'thout our men to guide. It's well hid."

Davenant drew him out on that subject. He learned that the original mutineers had fled in some of the smaller spaceships, after wrecking others which might have been used for pursuit. The old *American* had long ago been broken up to help build X.

Now and then the Outlaw outposts had had to fight the Hounds of the Lord—the warrior corps which had since been recruited from exogenes—who had come in ground vehicles. But the confusion left after the mutiny, and the damage done by it, had given time enough to establish this village and hide it well. The nuclear power plant of the spaceship in which this colony's founder had arrived had been moved underground—compact and shielded as it had been, that had meant a heart breaking job to furnish energy. Likewise her chemical air renewer had been removed. Indeed, most of the vessel had been utilized. A food-synthesis unit had been taken along as well as other equipment.

Ice had been mined, some of it electrolyzed for oxygen. In general, the builders of Jupiter City had repeated the pattern which had made X, although on a smaller scale and under immensely greater difficulties. Raids had later furnished more materials, fuel for the atomic engine, tools, fabrics, weapons, and supplemental food.

This place radiated heat, but not enough to be detectable through the overlying rocks and glaciers. It contained plenty of metal, but scattered iron deposits confused magnetic locators. As for visible surface traces—Ganymede

was large, and the Godwin country was some of the wildest and most rugged on the satellite.

Davenant could fill in a good deal of history for himself. He had read how the first generation here had been skilled engineers, but because of the shortage of books, the impossibility of proper instruction, most of their knowledge had died with them. Hereditary monarchy had been inevitable—one family supported by the rest, with leisure to learn, by rote, the operation and servicing of the machinery on which life depended, and with an intelligence sharpened enough to make basic decisions. The rest merely obeyed orders and spent their lives in a dullness relieved only by work, fighting, and the orgies which followed victory.

They had their religion—which had been corrupted into sheer paganism—their taboos, a few songs and stories, their dimming traditions. Otherwise there was nothing.

"I'd like to see your power plant," said Davenant. "That sort of thing was my special job at home. Without expert care, it will sooner or later fail." A bribe.

Roberts-John seemed to know it was. "What d'ye want of us?" he demanded again. "S'posin' we 'greed t' help ye, what c'd we *do*?"

"That," said Davenant bleakly, "is what I am wondering."

CHAPTER 9

KRUSE spoke up then, and told of all that had been happening to the survey party of Engineers. Robert-John nodded, saying little. How much of it he really understood was a question.

Davenant felt a stinging in his eyes. Lyell, Falkenhorst, Yuan, Yamagata, they had all been so close and dear to him,

and now they lay dead in the snow. They sprawled frozen on the face of the moon, their burst eyes gaping sightlessly at Jupiter and the great wheel of stars. Their bodies were blocks of ice, their brains held only a hollow and everlasting darkness. Farewell, my brothers!

Davenant shoved such thought away. Time later to mourn. He was still alive, and he had a mission. He had eaten and drunk in this oddly civilized home of a barbarian king, and now he had to start planning.

"Ye can jine with us," suggested Roberts-John. "We can always use a tech. Mebbe when your friends come from Earth, ye can get in touch with 'em."

Kruse rubbed his chin. "How about that, Hall? I can't say I fancy turning cave dweller for the next one to five years, but it may be the only way."

Davenant shook his head. It did not occur to him that he had taken the leadership. But there it was again.

"Not good enough," he said. "The Cincs may destroy this nest at any time, or they may decide to abandon the terra-forming idea, which presumably originated with the Psychotechs. In which case we'll never get off this moon. It's more than us, Torvald, though God knows I don't want to play hero. The Abbey has to be told. How can the Abbey plan if it doesn't have the facts?"

Kruse gave him a sour grin. "All right, then. What do you plan on doing?"

"Let's first take a look at your power plant here, Chief Roberts," suggested Davenant. "I'm not sure I like those occasional flickers in the lighting."

Kruse showed a moment's surprise. He knew as well as the younger Engineer that the cause was nothing worse than a faulty turbogenerator. Clamping expressionlessness onto his face, he nodded and rose.

"I think Hall may be right," he said noncommittally.

Roberts-John looked alarmed, and led the way out and

through a descending series of tunnels. Davenant's general unit, adjusted to Geiger registry, showed more radiation than there ought to be, though not enough for real worry. Faulty shielding.

He traced that quickly. Some of the lead blocks in front of the reactor had slipped, perhaps in one of the frequent moonquakes caused by the tidal pull of Jupiter. Otherwise the power plant was in fairly good shape. It had been well constructed, and had been tended with care.

He shook his head dolefully and glanced at the row of meters, remote-control dials, and instruments. "Do you know what these are for?" he asked the Outlaw ruler.

"Some of 'em. When this here needle gets near th' red line, I pull out that there rod, an'—" The chief went on to reveal a scanty, barely adequate empirical knowledge of maintenance.

"I thought so." Davenant pointed to a gauge whose indicator was well past the red. It showed merely that the original slugs were sufficiently enriched with new isotopes to be worth removing and replacing. "How long has this been that way?"

"Long's I c'n remember. Ye don't think—"

"I do. The hypewangle isn't dreel-sprailing with the camits. Lucky for you that the effect builds up slowly, but I wouldn't give this thing another five years of life unless something's done. Look!" Davenant tapped a few buttons, emergency manual cutoff. Needles wobbled across the dials and the lights went out. The chief roared and sprang for him. Kruse held the frantic man back until Davenant had restored functioning.

"Don't *do* that!" Sweat drained from Roberts-John's face and he shook uncontrollably. "Don't do it!"

"I was only testing the hypostat," Davenant said mildly. "It doesn't fantangle as it should. Unless you let me make

some badly needed repairs, you'll be frozen to death in a few years."

"I—I—I—" Roberts-John' gulped. Mastering himself, he asked with a savage bark, "How d' I know ye're not a Cinc sent t' wreck th' whole town?"

"I'll be here, too," Davenant pointed out. "Give me a few days and I'll have this thing purring. . . ."

By the end of that time, though, Hall Davenant was close to being the absolute ruler of Jupiter City. The man who straightened out the reactor, fixed the electric generator running off it, and cannibalized a dozen dead helmet radios to produce half as many operating ones, inevitably would be.

Roberts-John was too proud to be obsequious, but too intelligent to resent a better man for the job than he was himself. Behind his mane and beard was a clever, queerly altruistic personality. Davenant found it rather embarrassing to turn down his offer of temporary wives. It wasn't morals so much as appearance and cleanliness. Kruse was not as fastidious.

The Venusian regarded him out of a grease-smudged face and said in the Basic they used here between themselves, "Nice going, But now what?"

"Now," said Davenant thoughtfully, "we'd better find a way to reach the *Starshine*."

"Huh?"

"Of course. Unless you have some scheme for recapturing the *Light* or grabbing X's one deep-space cruiser, it's the only craft in the Jovian System capable of reaching Luna. The Psychotechs didn't have a chance to escape with her. . . . How badly wrecked is that rocket we fled in?"

Kruse closed his eyes and summoned up eidetic memory. "Maybe it could be repaired," he said at last. "I don't think anything is too badly damaged. Of course, you're assuming the Jovians haven't salvaged it yet. . . . No. I see it now. The boat runs off chemical fuel and isn't designed to get far

from the surface. Even in perfect shape, it couldn't get up to the Starshine's orbit. Thrust's too low by a factor of—um, I'd say between one and a half and two."

Davenant slapped the shielding of the town's reactor. "This baby once ran a pretty good-sized spaceship. Lots of energy there."

"And I can just see our hosts letting us take it."

"Not at all. I was thinking of a power-beam."

"Huh? Nobody's ever run a rocket off a power-beam!"

"There's always a first time. Let me think, now. . . . How's this sound? When you get out there with your salvage party, scrap the whole drive system and replace it with a king-sized tank for water, a power-beam receiver, and an electrical hookup. The idea will be to boil water around superheated coils, blow it out the rear past an ionizing arc, and use a linac system to accelerate the ions still further. Essentially a crude version of the present-day space drive. The whole thing will run off a beam from here. Naturally, you'll have to give the boat a feed-back signal to keep the beam aimed right.

"That," said Kruse, "would make good continuity from some stereo serial, but you know as well as I do that it calls not only for construction from the ground up but for design—and we haven't much more than a slide rule in this place. I'm not Chief Scientist Young of the Junior Intergalactic Patrol."

"You are an Engineer," Davenant said quietly.

They got to work.

The job was not quite as fantastic as it sounded. They were aiming only to get off a small world with negligible air resistance, and not even to leave its gravity well entirely. The principles involved were familiar to both, the basic design, standard in such midget craft as the asteroid scooter.

There was a good deal of machinery from the Outlaw's original spaceship, stored away for ultimate use as scrap. The

colony had no projects calling for multielement vacuum tubes, astrogating robopilots, high-voltage arcs, or a hundred other parts.

Davenant's idea was easy to draw up, even to make some elementary calculations about. More than that, a Planetary Engineer had training for his profession such as had never been seen before. He didn't have to stew for weeks before seeing the answer to a problem.

His subconscious mind collaborated all the time.

In about two revolutions of Ganymede, the plans were ready. And the parts and tools which would be required were loaded up.

The main difficulty was testing. There just wouldn't be any way to get all the bugs out.

Whoever piloted that boat would have to hope it stayed in one piece for the few hours needed!

Kruse took out a gang of men, dragging sleds piled high with equipment and supplies. Davenant stayed behind to supervise the construction of a power-beamer.

When he told Roberts-John what he wanted, the chief exploded.

"Nol" he cried with horror.

"But—"

"Nol 'Twas bad enough taking so much of our stuff for fixing that boat."

Davenant had had to promise all sorts of benefits which the Order would supply in exchange. But Roberts-John still shook his head.

"We can't spare the men neither, not really," he said. "Somebody's got to watch the passes leading here." He tugged at his beard. "Now ye want to stick up a mast that'll yell to the Cincs where we are. *Uh-uh!*"

One bony hand fell to the gun at his waist.

Davenant braced himself. There was death here unless

he could talk over the chief. . . . Talk the whole Outlaw population over, in fact.

"It would be removed as soon as it had been used," he countered.

"S'pose a Cinc boat happens over before, huh?"

The Engineer took a deep breath. He'd rather expected this reaction. Now it was time to play his one lonely ace, and play it with a flourish.

"You've seen what I can do with what little you have here," he declared slowly. "That's a big ship we're aiming for, crammed with equipment." He was gambling that she had not been gutted, but the notion that the Psychotechs had kept her for emergency use argued that her holds were still pretty full. "How would you like it if we ended the Cinc menace? We could do it, you know."

Roberts-John goggled at him. It took a long time for Davenant to put the idea across. . . .

The beaming mast grew swiftly. It need only be a skeleton of spare girders welded together according to plans the Outlaw mechanics—after all, they were capable of maintaining something as intricate as an airsuit—could easily follow. The casting and controlling units took more work. Davenant almost forgot what sleep was like. He knew exactly how to build a rig sufficient for his purposes, but improvising the different parts and assembling them was a nightmarish task.

The caverns were in one white flame of excitement. They had known they were doomed, these people, had known their long struggle was hollow. The sudden prospect of an end to it made them all a little crazy.

Davenant dared not tell them what a fragile chain their newborn hopes hung from.

Kruse returned in two revolutions. "She's ready, as far as I can tell," he said. "It was mostly the bows that were wrecked—not too much repair to do actually. Rebuilding the motor was the tough part. Think coils made with a tolerance

of fifty millimeters are going to work? They tested better than I'd expected, but—"

"Of course, I'll have to pilot in a spacesuit. We didn't stop to seal the cabin and put in air units, but if she hangs together at all it ought to be possible to ride her."

"I'll pilot," said Davenant. "I know more about electronic systems than you do."

"Mmmm—you're risking your neck on a mighty thin chance. Toss you for it."

"They also serve who only stand and wait", Torvald. Roberts-John is determined to keep one of us a hostage. It won't be pleasant for that one if this fails."

Kruse grimaced. "All right. You're the pilot. You're younger, anyway, faster reactions, and this boat is going to need a lot of human handling to make up for its own deficiencies."

CHAPTER 10

SPACE WAS a great frosty darkness strewn with a million cold suns. The enormous crescent of Jupiter blotted the Milky Way, as if drinking a stream of stars. The sun was far and small and heartlessly brilliant.

Davenant's gauntleted hands were numb on the controls. Blast off had been automatic. No space vessel can be flown by a merely living creature and arrive where it wants to go. His part had been only to aim her nose in the precalculated direction, punch the firing button at the right time, and hold it down the proper number of minutes. When the abused gyros began to hunt, he had had to compensate with his free hand on the manual control wheel. That was all, but it was nearly enough to break him.

Now the jets were dead and he was falling upward, seeking an invisible object whose orbit had been computed roughly from eidetic memories of incomplete observation. If the calculations were too rough, he would eventually spatter himself over the cratered face of Ganymede. The rickety craft would not let him come down alive.

If he got outside the cone which his power-beam could reach, he would be helpless. He hadn't far to go—less than a thousand kilometers from the surface, a couple of hours' jaunt in an airboat on Earth—but space was cold and quiet and very large.

He waited. He thought of many things, in a dreamlike part of his mind remote from that which watched the radarscope. He was aware of being chilled and cramped, hungry and thirsty, dull with fatigue and strain, but it all seemed far away somehow.

There! A pip, just sticking over the nose-level! It grew as he stared, off to one side. He was going to pass it at an estimated hundred and fifty kilometers. He switched power back on, fought the wobbling gyros as they brought the boat's nose around. He had to aim, not where the ship was now, but where it was going to be when he got there. His only instruments were the radar, the clock, his eyes, and the mathematics drilled like reflexes into his brain.

Fire!

The ship was visible, a tiny splinter against heaven. Another computation. He'd pass it by some twenty kilometers, going much too fast—vector in this direction—fire, and hope his estimate hadn't become obsolete in the time needed to make it.

Fire!

Turn eighteen degrees.

Fire!

He passed within a kilometer, relative velocity something like fifty KPH. No use trying to maneuver this cranky wreck

any closer. He gauged speeds and distances, thankful that he'd done freefall work before, unbuckled himself, and stepped to one of the holes which gaped raggedly in the cabin. Then he jumped.

He didn't quite make it. Almost, he spun past in a long orbit which would have frozen him to death before it smashed against the satellite. But he was carrying an extra oxy bottle for that emergency. Its jet wasn't much as a reaction gun, but he rode it back to the *Starshine* thinking hysterically about witches on broomsticks. When his magnetic boot soles clamped to the great hull, he swayed for a long time in a faint.

Recovering, he looked around through blurred eyes. Ganymede's grim pock-marked face bulked tremendously over the edge of the ship, seeming to dwarf even Jupiter. Shuddering, he groped cautiously in search of an entrance.

The airlock cycled for him. Good ship! He patted the metal with a lunatic giggle. They built those long range fellows to last. They had to, with years spent on some of the outer planet expeditions.

It was utterly cold and dark inside. He floated through many levels, his flash beam a wan puddle of radiance in the smothering black, to find the engines. Still running, still running, at minimum output.

Good! Good! He turned them up, and air and light and warmth began slowly filling the empty hulk. When it was safe to take off his space suit, he looped himself to the nearest stanchion and slept the clock around in complete exhaustion.

When at last he awoke he inspected his prize. The food synthesizers were still in working order, but needed recharging with chemicals which were in the storerooms. He didn't bother, contenting himself with opening some plastis and gorging.

Fighting the sleepiness that followed, he searched for life-

boats. Yes, there were four, sweet little craft though somewhat obsolete. There was a complete laboratory for all phases of planetographic work, a machine shop, an electric shop, a wealth of spare parts. Davenant felt like wallowing in that splendor of tubes, wires, and optically perfect reflectors.

No, no! Down, boy. You've got work to do.

First, a lifeboat to fetch Kruse and some Outlaw assistants. It was a temptation to get just the Engineer, for the two of them could take this ship home. But Roberts-John was no fool. He'd hold them to their bargain at gun point if necessary. So—

How did you go about conquering X with an army which the Hounds could annihilate in half an hour?

It would have to be bluff, Davenant decided. With the help of the lifeboats, the Outlaws could move unsuspected almost to the gates of X, ready to take over if its garrison could be made to lay down their arms. To do this, he would have to—yes, build a damper field generator. Against it, the Jovians would have no defense, for they didn't realize its limitations. When the lights went out and the air began to grow cold and stagnant, they should be ready to talk business.

If they didn't capitulate?

Davenant shrugged. One worry at a time, please. . . .

CHAPTER 11

THEY MUST be mad with fear down in X. Davenant's thought of them rioting in the dark was gruesome, but he forced it out of his mind. He sat now in a lifeboat, hunched beside the radio. From time to time the auto-pilot fired jets to bring

the craft back as its orbit took it out of communication range. He had contacted the Jovians and they had sent for Halleck as ordered; now came the tough part.

"Hello, up there! Who're y'all? This's Cinc-one. Whatcha want?" Halleck's voice was vague and distorted, for the Jovians had only their capacitors now to furnish power, but Davenant could hear the rawness of terror in it. "What've y' done?"

"This is the Order of Planetary Engineers," said Davenant. "You were warned not to molest our men, and instead you murdered them. We've come to settle that account."

"I—I—Nol 'S a liel Accident—"

"Shut up. One of our spaceships has a damper field beamed on your city. As long as we keep it going, your power plants won't operate, and you'll die when your capacitors give out."

That was not true. There was no way to beam a damper field nor did it have much range. In point of fact, Kruse and an Outlaw gang had moved a boat with an improvised field generator nearly to the walls of X. But Davenant had acquired a fast education in diplomacy.

"That's the least of what we can do, so you'd better accept our terms without arguing."

"What y'—want?"

"Are any of those psychotechs you captured alive . . . ? Good! Fetch me Angel Garson. Fast!"

"But—"

"For your information, Angel Garson has just been made the temporary Cinc-one of Ganymede, so treat him with respect. I'll talk to him as soon as he's available. Jump to it!"

Davenant couldn't help feeling a little ridiculous. He was being so completely out of character. Not that he didn't have other weapons, but he hated the thought of bombing the city.

Another voice reached him.

"Hall? That you up there? My God, man"

"How'd they treat you?"

"Oh, I'm still alive. Drugs got my information out of me. They didn't have to use torture, and we were being kept as labor for a proposed penal colony. But how in all the hells—"

Davenant said in Basic, "Look, Garson. I'm speaking for the Engineers now. Somebody has to dictate terms to you wolves, and I guess we're elected. Do you think that given an allied military force, you could maintain a fresh government in X for a few months?"

"Y-y—yes." The Angel's swift poise was a measure of the man. Davenant felt humbled, had no relish for playing conqueror. Garson went on, "Knowing what'll happen if they don't obey your orders, I'm pretty sure the people will cooperate. I can institute a propaganda campaign, *if* I like your ideas."

"All right. Here's what I want." Davenant forced himself to snap it out. "Cincs and Hounds will be disarmed, but no revenge taken on them unless they break the new law. We can't afford to make them desperate. Outlaws will enter X and have police and administrative powers. Your Psychotechs can advise them, but their chief has the final word. I'm giving him strict orders to maintain the status quo till we send a real task force from Luna. So none of your tricks—because all the psychodynamic equations in the universe won't stop a damper field or a lithium shell.

"As soon as possible, an Engineer delegation will get to you and reorganize on a more permanent basis. What I anticipate is a fairly open society—as nearly as can be with these poor distorted people—working toward eventual human normalcy. The interim government will be a mixed commission of Engineers and Jovians. A strict constitution will be written,

and the Order will stand guard for a long time to let the new political habits take root.

"Meanwhile, terraforming will go on, the Order to be paid for that as well as for its administrative services. Once you've got a livable world, I don't think this type of occupation statute will be needed any more, but that's quite a ways in the future.

"I know your Institute group has its own plans; whether good or bad, I can't say. But you're only human and not to be trusted with absolute power. Some day, when this system is well up, you might decide to fight a war of conquest with Earth, and not even the Engineers can stand by and do nothing while that possibility exists.

"You'll be free to educate and propagandize openly, like everyone else. But the commission is going to be alert for any cabals, so don't figure on taking over from within again. That sound agreeable to you?"

"I—" Garson laughed shakily—"I suppose it has to. . . ."

There was some time required to get things established. Under the threat of the damper field, the Sergeants were cooperative enough, though rather bewildered. Davenant was well aware that the Psychotechs knew he was bluffing about an Engineer fleet out in space, but since their own lives would not be safe until the Outlaws had marched into garrison X, Garson's men had no choice but to work with him. After that, it would be too late for Cincs and Hounds and Institute people alike.

Considering what a long score they had to settle, the barbarians were remarkable well-behaved. Nevertheless, a few incidents made Davenant feel ill. But had he had any alternative?

Kruse voiced the real fear when the two were again alone, driving the *Light* back toward Luna.

"Do you think the Abbey will agree to all this?" he asked. "We've made an awful lot of commitments for them."

"I don't think they can do anything but follow out my promises, at least in a general way," said Davenant. "It's not only a matter of prestige and the ultimate safety of all mankind, but . . . how else are they going to get that terraforming contract?"

"And we've plunged the Order into politics to its ears," said Kruse.

"How much choice had we?"

"Damn little, I reckon. Still, it's interesting to speculate whether we'll be flayed alive or merely boiled in oil."

"Most likely cashiered," said Davenant.

He felt heartsick at the thought. For him, there was no other life.

His moody eyes searched the infinite heaven, looking for Earth.

EPILOGUE

THE COORDINATOR of the Order of Planetary Engineers was old, but the eyes in his seamed face were still brilliant and he spoke with a young man's resonance. As he sat behind the great desk, a window in the tower framed his white hair with stars.

Send him in," he ordered.

"Yes, sir."

The guard, unarmed but husky, went out, to come back with the prisoner. A nod from the chief dismissed him. There was a long silence.

"So," said the Coordinator at last, "you've been playing, politics, have you?"

The prisoner bit his lip. "You have my report, sir," he answered.

"And you've presumably had instruction in the rules."

"Sir, there are historical precedents—"

"The Council and myself are empowered to draw conclusions from them," said the Coordinator frostily. "Not a wet-eared tech. Besides all the excuses in your report, have you anything to say for yourself?"

Bitterness lashed back. "Sir, it was a matter of saving lives. Also, if I hadn't done what I did, we wouldn't have the contract now. The rules also say something about men in the field exercising independent judgment, don't they? A job is more than a problem in machinery and natural resources. People are involved, too, and they're the only reason the work is being done at all."

"Somewhat emotional," murmured the Coordinator, "but not without a certain spirit." He ruffled the papers before him. "I've been looking at your psych record. Promising. You can be trusted with further education."

"Sir?"

"Rules are crutches, son." The Coordinator leaned back in his chair. "Go on, sit down. I won't bite you. Not very hard, anyway. As I was saying, rules are valuable for people whose power of really efficient independent thought is limited to the mechanics of their profession. We've got to have regulations. But they don't cover every possible case, and the man who can break them when necessary and get his assignment finished because of that violation, is a man we need."

"You did a hell of a good job out there. Officially, now, you're going to be sent in disgrace to Venus to do some low-grade manual labor. That sentence is for three years. Pretty stiff, eh? But actually, son, you're going to school—a little school we've got hidden away for future members of the Council."

"I—I—"

"Don't try to talk," said the Coordinator. "Right now, it

makes you look too much like a fish. Son, the present system has been in effect for a long time. The founders knew that the Order had to preserve the appearance of staying out of politics, of being above all local quarrels, if it was to accomplish its mission. They also knew that it would not always be possible to remain aloof. As you just said, jobs also involve people. So from time to time we've stepped in, as quietly and with as great a show of reluctance as possible. The rules keep us from getting too deeply committed to local, temporary affairs. The rule breakers keep us operating.

"If your own violation had been botched, you *would* be on your way to a labor camp—unless you preferred a dishonorable discharge. As it is . . . well, after a decent interval you'll be skippering a crew of your own, and later you'll be elected to the Council. Maybe you're going to end up behind this desk. We'll see."

He grinned. "All right, consider yourself properly dressed down, and put on a hangdog look. You'll be on your way to-night. Good luck!"

They clasped hands. The prisoner wheeled and stepped smartly to the door. It opened for him and he was gone.

Coordinator Hall Davenant sighed, an old man's envious sigh. Memory ran back over a waste of years, to a night when he had walked across the snows of Ganymede. It had not even been a dream, then, that he would sit behind this desk, but if it had occurred to him he would hardly have been able to wait.

And now he had it, his highest ambition lay in his hands for him to do with as he would. But men were walking across the snows of Pluto while he sat here.

Some day the Solar System wouldn't be big enough for them.

Briefly, he looked out to the cold challenge of the stars. Then he returned to his work.