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SCIENCE-FICTION

A STREET & SMITH PUBLICATION

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METHUSELAH'S CHILDREN

by Robert Heinlein

JULY • 1941

"I don't care how lucky you are, there's one *CHANCE* you *dare not* take!"

"BEFORE I tell you what it is, let me say this: In twenty years of handling salesmen, it's the No. 1 Jonah. I know. Because I once took the chance myself . . . and lost. Let me give you the picture . . .

"For years we had been trying to get a crack at some of the immense and profitable Apex business—without success . . . couldn't even get in.

"Then one day Fate dumped me down in a coast-to-coast plane in a seat right alongside Apex's president.

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"I couldn't understand why then, and I never knew until a chance remark I overheard months afterward revealed what had irritated him. Know what it was? My breath. It killed my chances cold . . . just as it can kill so many other men's chances.

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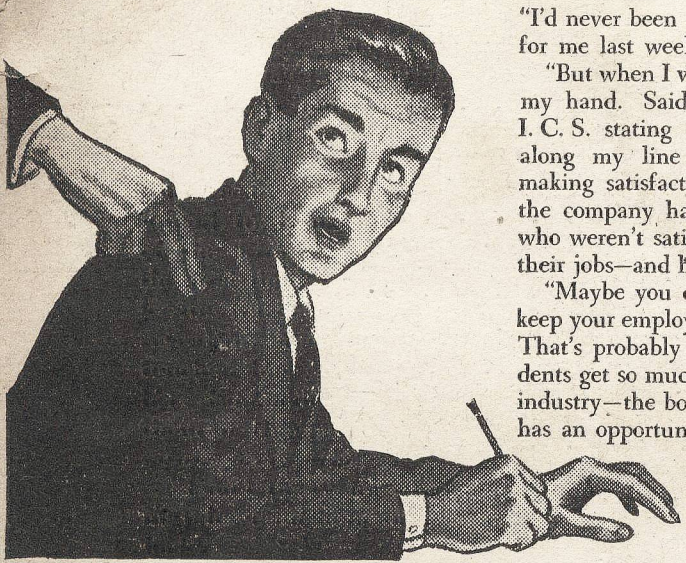

"I'd never been in the boss' office—'til he sent for me last week. Mister, I was scared stiff!

"But when I went in, he stood up and shook my hand. Said he'd had a letter from the I. C. S. stating I had enrolled for a Course along my line of work, and that I was making satisfactory progress. He added that the company had room at the top, for men who weren't satisfied with just 'getting by' on their jobs—and he meant it!

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COVER BY ROGERS

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"WE HAVE WITH US—"

THE full-fledged rocket plane we do not have yet, but from various technical articles the interesting fact appears that we have with us already the semi-rocket-driven plane. It's not at all the type pictured by the science-fiction enthusiast, not yet, at least, and, in fact, makes account of an effect overlooked by most rocket enthusiasts. Fact is, it makes use of so tricky an effect, that most engineers will willingly jump in with both feet and yell, "Impossible!"

It is, to wit, that a gasoline engine's radiator can be used to help push the plane along. In a plane employing a liquid-cooled engine of 2,000 horsepower, making upward of 450 miles per hour, the radiator, far from causing drag and slowing the plane, can be made to boost it along another 10 to 15 miles per hour.

Another item that is beginning to reverse all sound engineering doctrine with respect to gasoline engines has to do with the exhaust. Planes don't use mufflers for three reasons. First, the muffler is heavy. Second, it increases the back pressure on the exhaust, thus making the engine less efficient. Third, it isn't much use to cut out the engine's comparative pur—a well-tuned airplane engine's various valves, connecting rods, et cetera "pur" like a threshing machine running overtime if you could hear them, anyway—while the propeller tips are slicing noisy holes in the air, running somewhere above the speed of sound. Hence, no mufflers.

But now they're thinking very seriously of putting not merely a muffler, but an exhaust choke on the engines of high-power, high-speed pursuit ships with the prime intent of running up the back pressure.

It works this way: with engines and exhaust lines of present design, a ship flying only 400 miles an hour can get an added 10 to 12 miles an hour speed by simply jetting the hot, heavy, and fast-moving exhaust gases toward the rear.

That's important, extremely important in a fighting ship. In the first place, it represents pure and unadulterated gain; the energy used is that ordinarily wasted out as hot exhaust gases. Hence the increase in speed comes at no increase in weight of ships, *or weight of additional fuel.*

A rocket jet being tested on a trial stand exerts a thrust of 1,000 pounds, throws out gases, and gets nowhere—unless someone miscalculated badly in building the test rig. Hence that rocket jet is doing no useful work. The same rocket jet, mounted on a plane flying 400 miles an hour is delivering slightly more than 1,000 horsepower—and is perfectly capable of doing 1,250 horsepower at 500 miles an hour. The effective power of a rocket jet increases with speed of motion.

Because of that principle, slow-flying planes, heavy bombers and transports, gain little or nothing from rocket effects. Pursuits, particularly the fastest of them, gain heavily, attaining still more speed, because the efficiency of the rocket principle mounts rapidly.

Propeller efficiences decrease at extreme speeds; the propulsion effect of exhaust jets increase. Suppose we redesigned our manifolds, and put an exhaust choke with a by-pass arrangement in a high-speed pursuit. At

the take-off, where rockets are bad, but propellers are good, we'd by-pass the exhaust, take off with a roar of wide-open engine and thundering prop, and start climbing. Come 400 miles an hour, though, close the by-pass and see what happens. Now the rocket is efficient; the increased back pressure cuts down the power of the engine per se from, let's say, 2,000 horsepower to about 1,200. But the prop was getting a little mushy what with high forward speed and high spinning velocity, too. The exhaust, though, is really going to work at this speed. The exhaust choke is, actually, a carefully designed rocket choke, wherein the hot, compressed gases are expanded swiftly to cooler, fast-moving rocket-jet blasts. Here the lost 800 horsepower is recovered—and in addition, a lot of the heat energy ordinarily wasted by the gasoline engine at its best is reconverted to thrust. The total effective power of the combination of engine plus jets is greater by a very major percentage than the engine alone, would be.

The secret of the radiator that has a drag in the unexpected direction —forward—is another adaptation of the rocket principle, but a more involved one. Essentially, a rocket takes a mass of gas, heats and expands it in some type of chamber, and discharges it through a jet so designed as to convert the heat and pressure energy into kinetic energy of fast motion.

The radiator rocket does that, too, but with modifications. It takes outside air from in front, in the more or less usual fashion, and leads it, via a duct, into the radiator chamber proper. In entering the duct system, the air is slowed down, and consequently its pressure is increased. When the air is conducted into the radiator chamber, the conditions of a rocket "combustion" chamber are fulfilled; the temperature and pressure are raised. Discharged backward through a duct designed like a rocket nozzle, the air leaves the plane moving *faster* than when it entered. Action equals reaction; the plane moves faster for having speeded up the air.

True rocket planes are not practicable below super-sonic speeds. But there is, definitely in sight, the upper limit of speed for planes of conventional design. When the rocket plane does come in, it will not use compressed or liquid oxygen, however. That—and associated storage apparatus—is heavy, costly, and dangerous. It's also hard to get and transport to emergency landing fields. What will probably be used will be a rocket burning gasoline and air compressed from the local atmosphere. A portion of the hot, compressed gases of combustion can be bled off and used to power a supercharging turbine, a far more efficient method than carrying a few tons of liquid-air tanks and liquid air around. Such a plane, at speeds about 700 miles an hour, would be more efficient than any internal combustion engine-powered ship.

And—authors, please note!—if the rockets are properly, efficiently designed, the exhaust from them will make a minimum of noise, a minimum of fuss, and be just as cool as they can possibly get them. They would *not* be blazing streamers of fire. Witness a locomotive; when it starts from the station, it makes a terrific ado with explosive *schuff-schuff* noises. It is also excedingly inefficient at that point. When that same locomotive gets rolling, it mumbles along with a soft *shug-a-tum-shug-a-tum* sound —and beautiful efficiency. Noise is, except in automobile horns, public-address systems, and politicians, a waste of effort.

THE EDITOR.

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YOUR *Charm*

Methuselah's Children

By Robert Heinlein

A tale of an epic exodus, when the long-lived members of the Families fled the hatred of the normal people of all Earth. First of three parts.

Illustrated by H. Rogers

"Mary Risling, you're a fool! Why *won't* you marry him?"

The comely young woman addressed glanced over the total of her losses before replying and entered the figure on a voucher in her credit book. "It wouldn't be suitable. Too much difference in age." She tore out the voucher and handed it to her companion, adding, "I should know

better than to gamble with you, Ventura. Sometimes I think you are a sensitive."

"Sensitive—nonsense! You're trying to change the subject. You must be thirty, or nearly. Bork can't be much over forty *and* he's a plus-citizen."

Mary Risling gave Ventura's cheek a little pat. "You marry him, Ven."

"Wouldn't I, though!"

"I go now. Service!"

"Service." Ventura bit her lip as she watched the door close down behind Mary Risling. She was very curious to know why Mary objected to Bork Vanning and equally curious as to where she was going, but the custom of privacy prevented her from asking.

MARY RISLING had no intention of permitting anyone to know where she was going. She dropped down the lift tube outside Ventura's apartment, claimed her speedy little ground car from the attending automaton in the basement and set the control combination for North Shore. The car slid up the ramp, waited until the traffic control signaled a predicted break in traffic, and joined the high-speed northbound stream. Mary Risling settled back for a little nap. Relaxed mind and controlled emotions—sleep came at once.

She woke just before the signal from the car which would have called her. She glanced out. It was dark; Lake Michigan was not visible, but she knew where she was. She signaled the traffic control ahead; it cut her out of the stream of vehicles and reduced the speed of her car, then rang the alarm which notified her to resume local control. Before doing so she reached into the storage compartment on the instrument board and fumbled, apparently purposelessly.

But the registration number which the traffic control automatically photographed as she left the controlway, was not the number in which the car was registered.

She followed the side road for several miles at a speed high even for a Camden speedster, turned into a narrow country road which ran down near the lake shore, and stopped.

She waited, lights out, sideport open.

To the south the ubiquitous glow of sprawling Chicago made a false aurora. Behind her was the muted whine of the controlway. But the shore was silent, save for the little noises of the timid things. She reached again into the storage compartment, snapped something, and the back of the speed dial glowed, revealing another dial beyond it. She studied it and made adjustments.

Having assured herself as well as her equipment permitted that there was neither scanner nor any moving mass near her, she closed the sideport and started the motor.

Had there been a bystander he would have been startled to observe what appeared to be a standard Camden rise off the ground as easily as a skycar. He would not have had long to wonder—the car moved out over the lake, dropped down to the water and sank beneath it.

When the car was a quarter of a mile offshore and fifty feet down she called a station. "Answer," said a voice.

"'Life is short—'"

"'—but the years are long.'"

"Not," she denied, "'while the evil days come not.'"

"I wonder," the voice answered

conversationally. "I've scanned you, Mary. Come on in."

"Who is it? Tommy?"

"No—Cecil Hedrick. Are you cast loose?"

"Yes. Take over."

SEVENTEEN MINUTES later the car rose up to the surface of a small pool of water, a pool that occupied much of the floor of an artificial cavern. When the car was beached Mary Risling got out, greeted the guards casually and proceeded through a tunnel into another and larger room. It was equipped with seats and comfortably filled with men and women, fifty or sixty in all. She chatted for a few minutes, then, when the telechronometer announced midnight zone six time, she walked to a rostrum at the far end of the room and mounted it. Talking stopped.

She glanced over the crowd. "I am," she stated, "one hundred and eighty-three years old. Is there anyone here who is older?"

She waited. No one spoke up. After a decent interval she continued. "In accordance with our customs, I declare this meeting opened. Will you select a moderator?" She paused again, but no nominations were forthcoming. A voice from the back of the hall said, "Go ahead, Mary."

"Very well," she answered and continued as chairman.

The indifference as to who should preside characterized the entire meeting. There was an air of leisure, a lack of tension, among these people which made formal parliamentary procedure unnecessary. The chairwoman's duties were largely those of sorting out with a nod or a glance who should speak first if two should happen to start at once.

"We are met as usual," she stated briefly, "to discuss our welfare and that of our sisters and brothers. Does any Family representative have a message from his Family. Or does anyone care to speak for himself?"

A man caught her eye and commenced, "Ira Weatheral, speaking for the Johnson Family. We've met nearly two months early. The trustees must have had a reason. Let's have it."

She nodded and turned to a prim little man in the forefront of the group. "If you will, please."

He stood up and bowed slightly to her. He lacked grace, but had courtliness, which was made almost ridiculous by the awkward cut of his kilt and his skinny legs protruding therefrom. The blackness of his hair and the firm healthy quality of his skin testified that he was a man still in his prime, but his manner would have suited an elderly civil servant.

"Justin Foote," he said precisely; "reporting for the trustees. It has been eleven years since the Families decided on the experiment of letting the general public know that there were, living among them, persons who possessed a probable life expectancy far in excess of that anticipated by the average man, as well as other persons who had proved the scientific truth of such expectation by having lived more than twice the normal life span of human beings."

He spoke without notes but gave the impression of reading aloud a previously prepared methodical report. Though he began by summing up facts known to all of them, no one hurried him nor interrupted.

"In deciding to reverse the previous and long-standing policy of silence and concealment as to the peculiar aspect in which we differ from the balance of the human race,

the Families were motivated by several considerations. The reason for adopting the policy in the first place should be noted:

"The first offspring resulting from unions assisted by the Howard Foundation were born in 1875. They aroused no comment, for they were in no way remarkable. The Foundation was an openly chartered nonprofit corporation—"

On March 17, 1874, Ira Johnson, medical student, sat in the law offices of Deems, Wingate, Alden & Deems and listened to an unusual proposition. After a time he interrupted the senior partner to say, "Do I understand that you are trying to *hire* me to marry one of these women?"

The solicitor clucked disapprovingly. "Please, Mr. Johnson—not at all. Such an act would be clearly against public policy. We are simply informing you, as administrators of a trust, that should you marry one of these young ladies it would then be our pleasant duty to endow the union in the amount mentioned and, thereafter, to endow each child of such union according to the scale here set forth. There is no contract involved, nor proposition as you termed it, nor do we urge any course of action on you."

He scowled and shuffled his feet. "What's it all about? Why?"

"That is the business of the Foundation. One might say that it is because we approve of your grandparents."

"You have discussed me with them?" Johnson felt somewhat annoyed. The old skinflints! If any one of them had died at a reasonable age, he would not need to worry about the money to finish medical school.

"We have talked with them, yes. But not about you."

Young Johnson wrote seven letters that night before he found the right words in which to cool off the relationship between himself and the girl back home. He was glad that he had never actually committed himself—it would have been awkward. When he did marry it seemed a curious coincidence that his wife, as well as himself, had four living and active grandparents.

"The Foundation was an openly chartered nonprofit corporation," Foote continued, "and its avowed purpose of encouraging births among persons of sound American stock was consonant with the customs of the period. By the simple expedient of being close-mouthed about the true purpose of the Foundation no unusual methods of concealment were necessary until late in the period loosely referred to as the 'Crazy Years'—"

Selected headlines April to June 1959:

CALIFORNIA RAISES VOTING AGE TO FORTY-ONE

Rioting on Berkley Campus

N. Y. YOUTH MEET DEMANDS UPPER LIMIT ON FRANCHISE

COURT ORDERS SALE OF STATEHOUSE

Colorado Supreme Bench Rules Old Age Pension a Lien on All Public Property

U. S. RETURNS TO GOLD STANDARD: PEGGED RATIO 207 TO ONE

EARTH-EATING FAD MOVES WEST: CHICAGO PARSON EATS CLAY SANDWICH IN PULPIT

"Back to Simple Things," He Advises Flock

SUICIDE INDEX UP NINTH SUCCESSIVE YEAR

"—the 'Crazy Years.' The trustees of that time decided—correctly, we now believe—that any minority during that period of semantic disorientation and mass hysteria was a probable target for persecution, discriminatory legislation, and, even, mob violence. Furthermore, the disturbed financial condition of the country, and in particular the forced exchange of trust securities for government warrants, threatened the stability of the trust.

"Two courses of action were adopted: The assets of the Foundation were converted into real wealth and distributed widely among the members of the Families to be held in trust by them as owners-of-record. And the so-called 'Masquerade' was adopted as a permanent policy. Means were found to simulate the death of any member of the Families who lived to a socially embarrassing age and to provide him with a new *persona* in another part of the country.

"The wisdom of this course of action, though irksome to some, became apparent at the Interregnum of the Prophets. The Families at the beginning of the reign of the First Prophet had ninety-seven percent of their members with publicly avowed ages of less than fifty years. The close public registration inforced by the secret police of the Prophets made changes of public identity difficult, although a few were accomplished with the aid of the revolutionary Cabal.

"Thus, a combination of luck and foresight saved our secret from public disclosure. It was well—we may be sure that things would have gone harshly during that time for any group possessing a prize that lay beyond the power of the Prophet to confiscate.

"The Families took no part as such in the events leading up to the Second American Revolution, but many members participated and served with credit in the Cabal and in the fighting which preceded the fall of New Jerusalem. We took advantage of the short period of reorganization which followed to readjust the ages of our kin who had grown conspicuously old. In this we were aided by certain members of the Families who, as members of the Cabal, held key posts in the Reconstruction.

"It was argued by many at the Family meeting of 2075, the year of the Covenant, that we should reveal ourselves then, since civil liberty was re-established firmly, but few agreed. Perhaps we had acquired the habit of secrecy and caution. But the renascence of culture in the ensuing fifty years, the growth of tolerance and good manners, the semantically sound orientation of education, the increased respect for the custom of privacy and the dignity of the individual—all these things led us to believe that the time had at last come when it would be safe for us to reveal ourselves and take our place as an unusual but none the less respected minority in society.

"THERE WERE compelling reasons. Increasing numbers of us were finding the 'Masquerade' socially intol-

erable in a new and better society. Not only was it emotionally disturbing to pull up roots and seek a new social matrix every few years, but also it grated to have to live a lie in society where frank honesty and fair dealing were habitual with the great majority. Besides that the Families as a group had learned many things and accomplished many researches which would be of great benefit to our poor short-lived brethren. We needed freedom to help them.

"These and similar reasons were subject to argument. But the resumption of the custom of positive physical identification made the 'Masquerade' almost untenable. None but the psychopathic objected to the practice under the new orientation—we dared not object. Eleven years ago we decided on the experiment of letting volunteers up to ten percent of the total of the Families reveal themselves for what they were and observe the consequences, while maintaining the secret of the Families' organization.

"The results were regrettably different from our expectations."

He stopped as if through speaking. The silence had persisted for a moment when a solidly built man of medium height spoke up. His hair was slightly grizzled, an unusual thing in that assembly, and his face looked space tanned. Mary Risling had noticed him when she came in and had wondered who he was—his live face and the gusto with which he laughed had interested her. But any member might attend the Families' conclaves; she had thought no more about it.

"Speak up, Bud," he said. "What's your report?"

Foote turned to the chairwoman. "It is appropriate that our first psychometrician give the balance of the report. My remarks were prefatory."

"For the love o'—" It was the grizzled stranger again. "Bud, do you mean to stand there and tell us that all you had to say were things we knew already?"

"Yes," admitted Foote. "My name is Justin Foote, not Bud."

Mary Risling thought it time to intervene. "Brother," she said, addressing the stranger, "since you are speaking to the Families, will you please name yourself? I am sorry to say that I do not recognize you."

"Sure, Sister. Lazarus Long, speaking for myself."

She shook her head. "I don't place it."

"Sorry. It was a name I took at the time of the First Prophet. It tickled me. I was christened Woodrow Wilson Smith."

"How old are you?"

"Eh? Why, I haven't figured it lately. Two hun . . . no, two hundred and thirteen years. That's right, two hundred and thirteen."

She looked as if she would like to have questioned him further but she contained herself. His reply had caused him to be the center of attention of everyone in the room.

"Did you hear me inquire for anyone older than myself?"

"Yes—but, shucks, Sister, you were doing all right. I ain't attended a meeting of the Families in over a century. Been some changes."

"I'll ask you to carry on from here." She started to leave the platform.

"Oh, no!" he protested. But she was off the platform and seeking a seat. He looked around, shrugged, and gave in.

Sprawling one hip over a corner of the speaker's table he announced, "All right. Let's get on with it. Who's next?"

RALPH SCHULTZ of the Schultz Family did not look like a psychometrician. He was neither shy nor preoccupied. He had a flat underemphasized way of making his statements that carried assurance. "I was part of the group that proposed the end of the 'Masquerade,'" he said. "I was wrong. I believed that any person brought up under modern conditions of education could evaluate any data without excessive emotional disturbance. I was aware that there would be many who would regret that they were not members of our genes group—everybody that enjoys life would like to live a long time. But I felt that the marked success in eliminating racial frictions gave us a type-form process which would enable us to live peacefully with the short-lived.

"I was wrong.

"The Negro hated and envied the white man as long as the white man enjoyed privileges forbidden the Negro by reason of his color. It was a normal, sane reaction. When discrimination was removed, the problem was solved and cultural assimilation became possible. There is a similar tendency on the part of the short-lived to envy the long-lived. We assumed that it could easily be rationalized out of existence once the short-lived were made to realize that we owe our peculiarity to our genes —a fortunate choice in grandfathers, as it were. We were mistaken.

"We showed them the greatest boon it is possible for man to imagine, then we told them that it could not possibly be for them! Psychologically, it was an unsolvable dilemma. They rejected the answer. They refused to believe it. The envy turns to hate, with an emotional conviction that we are depriving them of their rights, deliberately, maliciously.

"That tide of hate approaches a crisis which threatens the welfare and even the lives of our revealed brethren, and indirectly jeopardizes every member of the Families."

They took it calmly, with the unhurried habit of years. Presently a female delegate indicated that she wished to speak. "Eve Barstow, for the Cooper Family. Ralph Schultz, I am a hundred and nineteen years old, older, I believe, than yourself. I do not have your talent for mathematics and human behavior, but I have known a lot of people. People are inherently good and gentle and kind. Oh, they have their weaknesses, certainly, but most of them are decent enough if you give them half a chance. I cannot believe that they would hate me and destroy me simply because I have lived a long time. What have you to go on? You admit one mistake; why not two?"

Schultz smoothed his kilt thoughtfully. "That deserves a careful reply," he mused. "All that Eve has said is true—for individuals. But mass psychology is not a simple summation of individual psychology. That is an observed fact and a prime datum of psychodynamics. Eve will probably never be in danger from her own friends and neighbors. But she *is* in danger from mine, and I from hers. As for my prediction, some of you are familiar with the law of psychological trends. It is a power law of the same type-form as yeast-cell growth. The conditions under which a trend grows are rarely controlled and are affected by topological factors such as communication, population density, and relative importance of the issue in terms of individual motivation. Furthermore, the trend may be masked, particularly in the early stages, by di-

"Tell your Director that Administrator Ford wants to talk to him—now!"

vergent trends. The problem of eliminating the latter is acute, as the data are never complete and involve vector addition of variable quantities in abstract continua of many dimensions. Ten or twelve dimensions are not unusual. Psychology is not an exact science.

"In this case the trend was masked beyond our ability to sort it out for the first seven years. We suspected but we dared not predict. A year ago we were reasonably sure, but we had hopes that the recent advances in colloidal theory would provide a solution which would reverse the trend. Nelson's work in symbiotics, with particular reference to intestinal flora and the opening of new frontiers on the trans-Jovian planets, were other encouraging factors.

"Our hopes were premature. The trend appears to have doubled in the past thirty-seven days, and the rate is accelerated. I fear an outbreak at any time!"

"WELL, folks," Lazarus Long said easily, "what do you propose to do about it?"

But there were as many opinions on that point as there were persons present. Contrary to custom, the trustees had submitted no plan of action. When they had discussed the matter for more than two hours Lazarus Long held up his hand. "We aren't getting anywhere," he stated. "And it looks like we won't get anywhere tonight. Let's take a look at it, leaving out the details and hitting the high spots.

"We can"—he ticked them off on his fingers—"do nothing, sit tight, and see what happens.

"We can junk the 'Masquerade' entirely, reveal ourselves in our full

numbers, and demand our rights politically.

"We can sit tight on the surface and use our organization to protect our revealed brethren, maybe haul 'em back into the 'Masquerade.'

"We can reveal ourselves and ask for a place to colonize where we can live by ourselves.

"That seems to be about the size of it," he continued. "I suggest that those of similar point of view get together, work out their differences, and submit plans to the Families. If any of you don't hold any of the opinions I have stated, then you'd better get together and find out what it is you do think. Now, unless somebody wants to talk again, I'm going to declare this lodge recessed until midnight tomorrow night. How about it?"

No one spoke up. Long's slightly streamlined version of parliamentary procedure had most of them a little startled. They were in the habit of a leisurely discussion of any issue without ever voting on it until it became evident that one point of view was unanimous. Doing things in a hurry they were not used to.

But the man's personality was dynamic, his years impressive, his slightly archaic speech intriguing. None disputed him.

"O. K.," said Long, clapping his hands smartly together. "Church is out till tomorrow night." He stepped down from the rostrum.

Mary Risling sought him out. "I would like to know you better," she said, looking levelly at him.

"Sure. Why not?"

"Are you staying for discussion?"

"No."

"Could you come home with me?"

"Like to. I've no pressing business anywhere."

"Come then." She led him out through the tunnel to the cavern containing the subterranean pool connecting with Lake Michigan. He appeared surprised at the pseudo-Camden auto, but said nothing until they were submerged.

"Nice little car you've got here."

"Yes."

"Seems to have some unusual features."

She smiled. "It does indeed. Among others, if anyone tries to investigate it, it blows up—quite thoroughly."

He nodded approval.

When they reached her apartment she saw to it that tobacco and drink were in easy reach of him, then went to her retiring room and threw off her travel kit. She substituted a soft loose robe which made her look smaller and still younger, and joined him. He struck a cigarette and handed it to her.

"Lazarus," she said, "you reassure me."

"How?"

"You know that I have passed our normal life expectancy. I have been resigned to death for the last ten years. Yet there you sit—much older than I."

He sat up. "*You* expecting to die? Good heavens, girl— You look good for another century!"

She raised a hand in a tired gesture. "Don't joke with me. You know appearance has nothing to do with it. Lazarus, I don't *want* to die!"

"Wait a minute. I wasn't joking. But I'm not up on the latest dodges. You heard me say that I had not attended a get-together for more than a century. As a matter of fact I've been completely out of touch with the Families the whole time."

"Really? May I ask why?"

"It's a long story and a dull one. What it amounts to is that I got bored with them. I used to be on

the council. But they got stuffy and set in their ways—for my taste. I wandered off. I don't suppose I've spent two years on Earth since the Covenant was signed."

Her eyes lit up. "Oh, I'd like to hear about it! I've never been out in deep space. Just Luna City—once."

"Sure," he agreed. "Sometime. But I want to hear more about this matter of your appearance. Girl, you sure don't look your age."

"Oh, yes. I can't tell you much. Technical matters, out of my field. Has to do with symbiosis and gland therapy and several other things. But what it adds up to is that senility has been postponed for members of the Families." She was silent for a moment. "We had hopes once that we were getting close to the secret of immortality itself, but we were wrong. It simply postponed senility, and shortened it. About ninety days from the first symptoms to natural death." She shivered. "Of course, most of our cousins don't wait. A couple of weeks to make sure of the diagnoses, then euthanasia."

The hell you say! Euthanasia eh? Well, I won't go that easy. When the Old Boy comes to get me, he'll have to drag me—and I'll be kicking and gouging eyes every step of the way!"

She gave him a lopsided smile. "That's good talk to hear. It does me good. You know, Lazarus, I wouldn't let down my guards this way with anyone younger than myself. But you give me courage."

"That's the way to talk. We'll outlast the lot of 'em. But about the meeting tonight—does this chap Ralph Schultz know what he's talking about?"

"I expect he does. His grandfather was a brilliant man and so was his father."

"You know him then?"

"Slightly. He is one of my grandchildren."

"That's amusing. He looks older than you do."

"Ralph found it convenient to arrest his growth at about forty, that's all. His father was my twenty-seventh child. Ralph must be—let me see—oh, eighty or ninety years younger than I am at least. At that, he is older than some of my children."

"You've done well by the Families." He added, "Supposing Ralph is correct, what course of action do you favor?"

"What do *you* favor?"

"Me? Why, none. Mary, if there is any one thing I have learned in the past couple of hundred years, it's this: These things *pass*. Wars and depressions and Prophets and Covenants—they pass. The trick is to stay alive through them."

She nodded thoughtfully. "I think you are right."

"Sure I'm right. It takes a hundred years or so to realize just how *good* life is." He stood up and stretched. "Right now some sleep would be in order."

When Mary had come out and sat down, she had broken the beam controlling the inside lighting and the shutters. They had been sitting to all appearance under the stars. As Long leaned back in stretching, his eye rested on a constellation. "Odd," he observed, "Orion seems to have a fourth star in his belt."

She followed his gaze. "That must be the big ship for the Second Centauri Expedition. Watch and see if you can see it move."

"You couldn't tell without instruments."

"I suppose not," she agreed.

"Clever of them to build it out in space, isn't it?"

"No other way to do it. It's too big to assemble on Earth."

MARY RISLING was up at her usual hour the next day. Long still slept. She ducked into her 'fresher, showered and massaged, and swallowed a grain of benzedrine surrogate to compensate for the short night. Then she corrected an oversight of the night before—she had failed to obtain her phone calls. She pressed the REPORT button under the view screen. The machine reeled off three or four calls of no importance, and which she promptly forgot, then she recognized the voice of Bork Vanning. "Hello, Mary," he began, "this is Bork, calling at twenty-one o'clock. I expect to stop in to see you at ten o'clock tomorrow morning. A dip in the lake and lunch somewhere. It's a date—unless I hear from you. 'By now. Service."

"Service," she muttered in automatic reflex to the unhearing instrument. Drat the man! He wouldn't take no for an answer. Mary Risling, she told herself, you're slipping. He's a quarter your age and yet you can't seem to handle him. Bother!

She glanced at the teletime. Too late to call him. He'd be here any minute.

WHEN LAZARUS retired to the chamber his hostess had indicated as his for the night, he stepped out of his kilt and chucked it toward the wardrobe. He glanced at the blaster thus disclosed, strapped firmly to his left thigh, and at the knife on the other. He grinned somewhat shamefacedly. It was difficult for a man of his habits to get used to the amenities of civilization. Nevertheless, when he stepped out of the 'fresher, he placed both weapons where he could reach them handily, before sprawling his lean body on the cushion.

He woke up with a weapon in each hand. He quickly allocated himself, relaxed, and looked around to see what had roused him. Everything was in order, but there was a dull murmur of voices from the air duct. That was it, he now recalled. Poor soundproofing—apparently Mary was entertaining callers.

Being wide awake he refreshed himself, strapped on his little friends, resumed his kilt, and went looking for his hostess. As the last door separating him from the lounge slid noiselessly up, the sound of voices became quite loud, and quite interesting. The door was out of direct sight of the lounge room; he stopped, himself still out of sight, and listened shamelessly.

Eavesdropping had saved his skin on at least three occasions; he did it whenever he could. He rather enjoyed it.

A man was saying: "Mary, you are completely unreasonable! You admit that you like me, and that an alliance with me would be advantageous. Why *won't* you marry me?"

"I've told you. Age difference."

"But that's nonsense. What do you want? Adolescent romance? I admit I'm not as young as you are, but I'm not old, either."

He did not like this chap, Lazarus decided. Sulky voice.

The voice resumed: "Anyhow, I've got an answer to that objection. I wonder if I dare tell you—"

"Please yourself."

"Well, I will! I know I can trust you. It will be public knowledge in a few days anyhow. Mary, I won't grow old on you!"

"What do you mean?" Lazarus

thought her voice sounded sharply suspicious.

"I'll tell you. You know these old jonnies? The ones that call themselves the Howard Families?"

"I've heard of them, of course. But they are fakes."

"Oh, no, they're not! I *know*. The Administration has investigated them carefully and some of them are well over a hundred years old—and still young!"

"That's hard to believe."

"It's true nevertheless."

"How do they do it?"

"That's what I am getting at. They claim that they are that way simply because they come of long-lived stock—simple heredity. But that's ridiculous and the Administration knows it. They've got the secret of staying young."

"Well?"

"This is the part that is still confidential. Without any excitement or public notice, they are to be picked up and questioned. We'll get the secret."

She spoke slowly in different tones. "It would be nice if everyone could live a long time."

"Huh? Yes, I suppose so. In any case you and I will have the secret. Think of it, Mary—a hundred years of happy marriage."

"WAIT a minute. Wouldn't everybody have the secret?"

"Well, perhaps not everybody. Population pressure can be a pretty unwieldy problem. It may be necessary to restrict it to essential personnel—and their mates. But you and I will have it, Mary."

"You mean I'll have it if I marry you."

"Well . . . that's a nasty way to put it, Mary. Of course, I'd try to help you in any case—I love you. But it would be simple if you married me. Will you?"

"Let's let that matter rest for the moment. How do you propose to get the secret out of them?"

Lazarus could envision his wise nod. "They'll talk. They'll talk!"

"Do you mean to say you'd send them to Coventry if they didn't?"

"Coventry! Hm-m-m! You don't understand the situation at all. This isn't any minor social offense. What they have done to us amounts to treason against the entire human race. We'll use means! Some of the things the Prophets taught us—if they won't co-operate."

"Do you mean that? Truly? Why, that's against the *Covenant!*"

"Covenant be damned! This is a matter of life and death—literally! You can't legislate about the basic issues that men live by—not when it comes to something they will fight to the death for. And that is what this is. These . . . these dog-in-the-manger scoundrels are trying to keep life itself from us. Do you think we'll stand on custom in an extremity like that?"

"Do you really think the Council will violate the Covenant?" Her tone was incredulous, horrified.

"Think so? The Action-in-Council was recorded last night. The Administrator was authorized to use full expediency."

Lazarus waited through a long pause. Then Mary spoke again, "Bork—"

"Yes, my dear?"

"Bork, you've got to do something about this. You've got to stop it."

"Stop it? You don't know what you are saying. I couldn't. Besides, I wouldn't if I could."

"But you must. You must convince the Council. They're making a mistake, a tragic mistake. There is nothing to be gained by trying to

coerce those poor people. *There is no secret!*"

"What? Now you're getting excited, my dear. You are setting your judgment up against some of the best and wisest men on the planet. Believe me, they know what they are doing. They don't relish using harsh methods any more than you do, but it's in the interest of the general welfare. Look—I'm sorry I ever brought it up. Naturally you are soft and gentle and warmhearted and I love you for it. Why not marry me and not bother your head about matters of public policy?"

"Marry you? Never!"

"Aw, Mary—you're upset. Give me just one good reason why not."

"I'll tell you why! Because I'm too old for you! Because I'm one of those people you want to persecute!"

There was another pause. "Mary, you're not well."

"Not well, am I? I'm as well as a person can be at my age. Listen to me, you fool! I have grandsons twice your age. I was here when the First Prophet took over the country. I was here when Harriman launched the first Moon rocket. You weren't even a squalling brat—your *grandparents* hadn't even met, when I was a woman grown and married. And you stand there and glibly propose to push around, even to torture, me and my kind. Marry you! I'd rather marry one of my own grandchildren!"

Lazarus shifted his weight, and hitched at his belt. You can depend on a woman, he reflected, to blow her top at the wrong moment. He expected immediate trouble.

But none came then. Vanning's voice was cool, the tones of the efficient executive, used to emergencies, replaced those of thwarted passion. "Take it easy, Mary. Sit down, I'll look after you. I want you to take a sedative. Then I'll get hold of the best psychotechnician in town . . . in the country. You'll be all right."

"Get away from me! Take your hands away from me!"

LAZARUS stepped out into the room. He indicated Vanning with his blaster. "This monkey causing you some trouble, Sis?"

Vanning snapped his head around. "Who are you?" he demanded indignantly. "What are you doing here?"

Lazarus still addressed Mary. "Say the word, Sis, and I'll cut him up into pieces small enough to hide."

"No, Lazarus," she answered in tones that were entirely composed. "Thanks just the same. Better put away your gun. I wouldn't want anything like that to happen."

"O. K." He complied with the request but continued to let his hand rest on the grip.

"Who are you?" repeated Vanning. "What's the meaning of this intrusion?"

"I was just going to ask you that, Bud," Lazarus said mildly, "but we'll let it ride. I'm another one of those old jonnies you're looking for —like Mary here."

Vanning looked at him keenly. "I wonder—" he said. He looked back to Mary. "It's not possible, it's preposterous. Still—it won't hurt to investigate your story. I've plenty to arrest you on, anyway. I've never seen a clearer case of a social atavism." He moved toward the visiphone.

"Better get away from that phone, Bud." Then, in an aside to Mary, Lazarus added, "I won't touch my gun, Sis. I'll use my knife."

Vanning stopped. "Very well," he said in annoyed tones, "don't touch that vibroblade. I won't call from here."

"It ain't a vibroblade. It's steel. Messy."

Vanning turned to Mary Risling. "I'm leaving. If you are wise, you will come with me." She shook her head. Vanning turned to Lazarus Long. "As for you, sir, your primitive manners have led you into serious trouble. You will be arrested shortly."

Lazarus glanced up at the ceiling shutters. "Reminds me of a patron in Venusburg that wanted to have me arrested."

"Well?"

"I outlived him quite a piece."

Vanning looked baffled, but kept silent. He walked into the outer door so suddenly that it hardly had time to clear the end of his nose.

"Hardest man to convince I ever encountered," remarked Lazarus meditatively as the door snapped down. "I'll bet he never used an unsterilized spoon in his life."

Mary looked at his face for a moment and then giggled. He turned to her. "Glad to see you feeling so perky, Mary. I kinda thought you were upset myself."

"Perhaps. But I didn't know you were listening. I had to improvise as I went along."

"Did I queer it?"

"No. I'm glad you were there—thanks. But we will have to move a little faster."

"Yes, I suppose so. There'll be a proctor looking for me any minute now. You, too, maybe."

"That's what I mean. We must get out of here."

She cut down her preparations for departure to bare minutes. But when they stepped out into the foyer of that level they found a man just leaving the lift whose brassard and hypo kit proclaimed him a proctor. "Service," he said. "I'm looking for a citizen in company with Citizen Mary Risling. Could you direct me?"

"Sure," said Lazarus, "she lives right down there." He pointed toward the extreme end of the corridor. The peace officer looked in the direction indicated; Lazarus tapped him thoughtfully on the back of his head, a little to the left, with the barrel of his blaster, and eased him down as he slumped to the deck.

The man was large; Mary helped Lazarus wrestle the awkward burden into her apartment. He knelt over the official, pawed through his hypo kit, selected a loaded needle, and gave him an injection. "There," he observed. "That'll keep him sleepy for a few hours."

After replacing the needle he considered the hypo kit momentarily, then detached it from the official's belt. "We might need this," he decided. "Anyhow, it won't hurt to take it." As an afterthought, he removed the proctor's brassard and placed it, too, in his pouch.

They left the apartment for the second time and went to the parking level. He noticed as they rolled up to traffic level that she had set the North Shore combination. "Where are we going?" he asked.

"The Families' Seat. No place else to go where we won't be checked on. But we will have to lie quiet somewhere until dark."

Once the car was on the beam headed north, Mary asked to be excused and caught a few minutes sleep. Lazarus watched the scenery for a few miles, then nodded himself.

THEY were awakened by two things, the incessant ringing of the general alarm inside the car and the slowing and stopping of the speedster itself. Mary reached up and shut off the alarm. "All cars resume local control," intoned a voice.

"Proceed at speed twenty to the nearest traffic control for inspection. All cars resume local control. Proceed at—"

She shut that off. "Well, that's us," said Lazarus cheerfully. "Got any ideas?"

Instead of answering she peered out and studied the controlway. The flexosteel barrier separating them from the adjacent local control strip was about a hundred yards to their right but no changeover ramp broke its length for at least a mile —and that, naturally, was under the eye of its associated traffic tower.

She started the car again and zigzagged toward the barrier through the stopped or slowly moving traffic. As she neared the barrier the car surged and lifted, clearing its top by a negligible margin. She set it down rolling on the far side.

A car was approaching from the south. It was cruising at not more than a bare ninety but the driver was not fully alert—he had no reason to expect another vehicle to appear suddenly from nowhere on a clear road.

Mary was forced to take the unavoidable crossover in a slashing S-curve. The car slewed and reared up on its hind wheel, breaking momentarily the stabilizing grip of its gyros. There was a teeth-shivering grind of herculene against glass as the rear wheel fought for traction.

Lazarus finally let his jaw muscles relax and breathed out gustily. "*Whew!*" he sighed. "I hope we won't have to do *that* again."

She looked at him, grinning. "What's the trouble? Do women drivers make you nervous?"

"No. Oh, no, not that at all. I just wish," he explained, "that you could warn me when something like that is about to happen."

"Didn't have time," she said. "Just what to do now," she went on, switching the subject, "is not quite clear to me. It's going to be difficult to hide out until dark."

"Why wait until dark?" he asked. "Why not just bounce over to the lake in this Dick Dare contraption of yours and let it swim us home?"

"I don't like to," she said, frowning. "I had to expose enough when I took that fence back there. If we are seen taking the car under water some smart boy is going to deduce a subterranean hideout somewhere near the lake and start fishing for it with a klystron beam."

"Isn't the Seat shielded?"

"Of course. But the scrambling on anything that big can be interpreted almost as readily as direct data *if* they know what they are looking for."

"Well," he said with deliberation, "I don't want to lead any nosy proctors to the Seat, but I don't want to be picked up right now, either."

"Wait a minute," she said, "I want to try something." Controlling with one hand, she used the other to operate the communicator resonant to the Seat.

"Answer," the voice said.

"Life is short—" They completed the formula.

"Listen," she said. "I'm in trouble. Get a fix on me."

"O. K."

"Is there a submersible in the pool?" On being told that there was she explained hurriedly what she wanted done. She stopped once to ask Lazarus if he could swim. "That's all," she said at last, "but move! We are short on minutes."

She brought the car to rest in a clump of shrub trees near the abandoned road she had used on other occasions. The lake lay at their feet, just beyond a low bluff. The trees

offered poor cover for the car but the beach offered none. Nevertheless, they had hopes that pursuit had been shaken off; they had left the local control strip at a time when they had it to themselves and had seen no sign of others after entering the old road.

Mary was about to strike a cigarette when the communicator spoke. "O. K., Mary. It's right in front of you. Acknowledge."

"O. K.," she agreed, "thanks." She was turning to Lazarus when he touched her arm.

"Look behind us."

A helicopter was just landing less than a hundred yards behind them. Three figures burst out of it as it touched. They could see their brassards.

She opened the door of the car and threw off her gown with one motion. Pausing a split instant outside she thrust the clothing back into the car and tore a stud loose from the instrument board. "Come on!"

Lazarus zipped the band of his kilt and literally ran out of it as he followed her to the bluff. She went dancing down it. He followed with a little more caution, swearing at the sharp rocks. He was almost caught by the blast as the car exploded, but the bluff saved him.

They hit the water together.

THE LOCK in the submersible was only big enough for one at a time; Lazarus shoved her in ahead of him and tried to slap her for resisting. He discovered that slapping will not work under water. Then he spent an interminable time—or so it seemed to him—wondering whether or not water really could be breathed. "What's a fish got that I ain't got?" he was telling himself, when the outer latch moved under his hand and he found himself able to enter.

Eleven seconds to blow the lock clear of water and he had an opportunity to see what damage, if any, had been done his blaster.

Mary spoke urgently to the pilot of the craft. "Listen to me—there are three proctors back there with a helix. My car blew up in their faces just as we took to the water, and I am hoping that it confused them enough so that they failed to see what happened to us. They may all be injured or dead from the blast. But if they aren't, there may be a smart boy in the crowd who will figure out that there was just one place for us to go—under water. We've got to be away from here before it occurs to him to use the helicopter to look for us."

"It's a losing race," the skipper complained, slapping his controls as he spoke. "That means I've got to get outside and stay outside the circle of total reflection—and he can gain altitude a damn sight faster than I can push this junk through water." But the craft lunged forward reassuringly.

Mary considered whether or not to call the Families' Seat via the submersible's communicator. She decided not to. In the present emergency, with police officers actively seeking them, a moving center of radiation from below the surface of Lake Michigan might be noticed, investigated, located, and thereby compromise the secret of their headquarters. No, she must wait till they landed. But she urged the craft through the water with will.

By the time they surfaced in the hidden pool she had decided against any physiomechanical method of communication, even the carefully shielded communicator at the Seat.

She hoped that she would find a sensitive ready and available among the Family dependents cared for at the Seat.

Among the healthy normal members of the Families it was unusual to find a person sensitive to telepathy. But the very sort of selected breeding which had produced the long-lived group had inevitably produced an abnormally high percentage of defectives, especially in the second and third generations, before sufficient data had been accumulated to permit elimination of defective germ plasm. The Families had their "God's Innocents," their spoiled clay, their broken shards.

But nearly one out of twenty of these helpless charges were telepathic sensitives. They made up in part for the lack of that wild talent in their healthy cousins.

Some of them were cared for in a sanctuary at the Seat. Mary went straight there as soon as they disembarked, Lazarus Long at her heels. She braced the matron. "Where's Little Stephen? I need him."

"*Sh,*" the matron admonished her, "rest hour. You can't see him."

"I've got to see him, Janice," Mary insisted. "This is important. I've got to get a message out to the Families—at once."

The matron set her hands firmly on her hips. "Then take it to the communication center. You can't come here disturbing my children at all hours. I won't have it."

"I can't, Janice. I don't dare. Don't hamper me, please! Take me to Stephen."

"It wouldn't do you any good if I did. Little Stephen has had one of his bad spells today."

"Then take me to the strongest sensitive who can possibly work. Quick, Janice—the safety of every member may depend on it."

"Did the trustees send you?"

"No, no, no! There is no time to consult them."

The matron looked dubious. Lazarus was trying to recall how long it had been since he had socked a lady when she gave in. "All right—you can see Billy, but I shouldn't let you. Mind you, don't tire him out." She turned and led them down the passage past a succession of cheerful comfortable rooms and on into one of them. Lazarus looked at the thing in the bed and looked away again.

The matron busied herself at a cupboard and returned with a needle.

"Does he work under a hypnotic?" asked Lazarus.

"No," the matron responded briefly, "he requires a stimulant to become aware of us at all." She cleaned an inch of skin on the arm of the gross figure and made the injection. "Go ahead," she said to Mary, and relapsed into thin-lipped silence.

SHORTLY the figure on the bed stirred, its eyes rolled, then seemed to track. It grinned loosely. "Aunt Mary!" it said. "Oooo—did you bring Billy Boy something?"

"No," she denied gently. "No, not this time. Aunt Mary was in too much of a hurry. But I won't forget you—I'll get you something. Will that do?"

"All right," it said docilely but without animation.

"That's a good boy." She reached out and tousled its hair. Lazarus looked away again. "Now will you do something for Aunt Mary? A big favor?"

"Sure."

"Can you hear your friends?"

"Oh, sure."

"All of them?"

"Uh-huh. Mostly they don't say anything," he added.

"Call to them."

There was an interval of silence. "They heard me."

"Fine! Now listen carefully, Billy Boy: All the Families—urgent warning! Elder Mary Risling speaking. Under an Action-in-Council the Administrator is about to arrest every revealed member. Full expediency has been authorized and it is my sober judgment that extreme coercion will be used to try to obtain from any cousin arrested the so-called secret of our long life. They intend to re-institute the methods of the Prophet's Inquisitor. It is the first duty of every one of us to locate, warn, and give hiding to the revealed members—" Lazarus touched her arm and whispered to her. She nodded. "—and to rescue them if they are arrested, *by any means necessary!*

"Don't delay for anything. You may have an hour or two, if we are lucky."

She stopped and spoke in a different voice. "Did they hear us, Billy Boy?"

"Sure."

"Are they telling their folks?"

"Uh-huh. All but Jimmie-the-Horse. He's mad at me," it added confidentially.

"Jimmie-the-Horse? Where is he?"

"Oh, where he lives."

"In Montreal," put in the matron. "Don't worry—there are two other sensitives there. Your message got through. Are you finished?"

"Yes. Yes, I suppose so."

"Then get out, please. I suppose you had to send it, but get out now. I want to give him the antidote."

Lazarus Long let Mary depart for the office of the Resident Secretary without offering to accompany her. He felt that her report there was none of his business, and, besides, he had an immediate matter that he wished to attend to. He retraced his steps, seeking a man who was not obviously busy. The guards in the poolroom were the first he found.

"Service—" he began.

"Service to you," answered the guard addressed. "Looking for someone?"

"In a way, yes," said Lazarus. "Say, Bud, do you know of anybody around here who could lend me a kilt?"

"That ought not to be too difficult," the guard answered agreeably. "Take over, Dick," he called out. "Back in a minute." He conducted Lazarus to his quarters and supplied him with the item requested. The kilt was a little too long but it comforted Lazarus. A loin strap was all right in its way, he reflected, but it reminded him of Venus—he never liked Venus. Dammit all, a man liked to be *dressed.*

"Thanks a lot, Bud," he acknowledged. "By the way, what's your name?"

"Edmund Hardy, of the Foote Family."

"That so? What's your line?"

"Charles Hardy and Evelyn Foote. Edward Hardy-Alice Johnson and Terence Briggs-Eleanor Weatheral. Oliver—"

"That's enough. I sorta thought so. You're one of my great-great-grandsons."

"Why, that's interesting," commented Hardy agreeably. "Gives us a sixteenth of kinship, doesn't it—not counting convergence. May I ask your name?"

"Lazarus Long."

Hardy shook his head. "Some mistake. Not in my line."

"Try Woodrow Wilson Smith. It was the one I started with."

"Oh, that one! Yes, surely. But I thought you were . . . uh—"

"Dead? Well, I ain't."

"Oh, no, I didn't mean that at all," protested Hardy, blushing freely. Then changing the subject hastily he added, "I'm glad to have run across you, Granther. I've always wanted to hear the straight of the story about the Families' Meeting in 2012."

"That was before you were born, Ed," said Lazarus gruffly, "and don't call me 'Granther.'"

"Sorry, sir—I mean sorry, Lazarus. Is there any other service I can do you?"

"'Sall right. I shouldn't have gotten shirty. No, nothing at all, Ed. Wait a second—is there a newsbox around somewhere?"

"Why, yes. In the library, just as you come into the bachelor quarters."

"Thanks again."

Lazarus found the library unoccupied except for a man who looked to be about the same age as Lazarus—that is to say, the age suggested by his appearance, not his two centuries of record. The resemblance stopped there, for the stranger was slight in build, mild in feature, and was topped off with thin, finespun, carroty hair rather than a grizzled wiry bush such as Lazarus wore.

He was bending over the newsreceptor, his eyes pressed against the microfilm viewer.

Lazarus cleared his throat loudly and said, "Howdy."

The man jerked his head and exclaimed, "Oh! Sorry—I was startled. Do y' a service?"

"I was looking for the newsbox. Mind if we throw it on the screen?"

"Not at all." The other man stood up, pressed the button to rewind the film, and reset the box to project on the screen. "Any particular subject?"

"I wanted to see," said Lazarus, "if there was any news about us—the Families."

"I've been watching for that myself," he was answered. "Perhaps we had better use the soundtrack and let it hunt."

"O. K.," Lazarus agreed, stepping to the receptor and changing the selector to audio. "What's the code word?"

"Methuselah."

LAZARUS punched the keys. The machine chattered and whined as scanned and rejected track sped through it, then the film slowed down with a triumphant click. "The DAILY DATA," it announced, "The only Midwest news service subscribing to every major grid *and* private photophone to Luna City. Lincoln, Nebraska—Savant denounces oldsters. Dr. Witwel Oscarsen, President Emeritus of Bryan Lyceum, in a stereocast this forenoon, called for official reconsideration of the status of the kin group calling themselves the Howard Families. 'It is proved,' he said, 'that these people have solved the age-old problem of extending, perhaps indefinitely, the span of human life. For that they are to be commended; it is a worthy and potentially fruitful work. But their allegation that their solution is no more than hereditary predisposition defies common sense. Our modern knowledge of the established laws of genetics enables us to deduce with exactness that they are withholding from the general public some technique or techniques whereby they accomplish their results.

"It is contrary to our customs to permit scientific knowledge to be held as a monopoly for the few. When withholding such knowledge strikes at life itself, the action becomes treason to the race. As a citizen, I call on the Administration to act in this matter and to remind them that the situation is not one which could possibly have been foreseen by the wise men who drew up the Covenant and codified our basic customs. Since any custom is a man-made and, therefore, finite attempt to describe an infinity of relationships, it therefore follows that every custom necessarily admits of exceptions. To be bound by them in the face of new—"

Lazarus pressed down the SUSPEND button. "Had enough of that guy?"

"Yes. I had read it before you came in." He clucked sadly. "I've rarely heard such complete lack of semantic rigor. It surprises me—Dr. Oscarsen has done sound work in the past."

"Reached his dotage," Lazarus said tersely. "Wants what he wants when he wants it, and thinks that constitutes a natural law."

The machine hummed and clicked as it hunted for the code-word combination, and again spoke up, "The DAILY DATA, the only midwest news—"

"Can't we scramble that commercial?" suggested Lazarus.

His companion peered at the control panel. "Doesn't seem to be equipped for it."

"—Ensenada, Baja California. Jeffers and Lucy Weatheral today asked for special proctor protection, alleging that a group of citizens broke into their beachside home, submitted them to personal indignity and committed other asocial uncustomary acts. The Weatherals are self-described as members of the notorious Howard Families and claimed that the incident could be traced to that supposed fact. The department provost has taken the matter under advisement. A mass meeting has been announced for tonight which will stereocast—"

The item concluded. The second man turned to Lazarus. "Cousin, did we hear what we thought we did? That is the first case of asocial group violence in more than twenty years, yet they reported it like a breakdown in a weather integrator."

"Not quite," Lazarus answered grimly, "the connotations on the words used in describing us were loaded."

"Yes, true, but loaded cleverly. I doubt if there was a word in the dispatch with an emotional index higher than one point five. The newscasters are allowed two zero, you know."

"You a psychometrician?"

"Not exactly. I should have introduced myself. I'm Andrew Jackson Libbey."

"Lazarus Long."

"I know. I was at the meeting last night."

"LIBBEY . . . Libbey," Lazarus remarked meditatively. "Don't seem to place it in the Families. Seems familiar, though."

"My case is a little like yours—"

"Changed it during the Interregnum, eh?"

"Yes and no. I was born after the Second Revolution. But my people had been converted to the New Crusade and had broken with the Families. I was a grown man before I knew that I was a Member."

"The deuce you say! That's interesting—how did you come to be

located . . . if you don't mind my asking."

"Well, you see I was in the navy and one of my superior officers—"

"Got it! Got it!" Lazarus poked a lean finger at him. "I *thought* you were a spaceman. You're Slipstick Libbey, the calculator."

Libbey smiled sheepishly. "I have been called that."

"Sure, sure. The last can I piloted was equipped with your paragravitic rectifier. And the control bank used your fractional differential on the steering jets. But I installed that myself—kinda borrowed your patent."

Libbey seemed quite unperturbed at the theft. His face lit up. "You are interested in symbolic logic?"

"Only pragmatically. But look, I put a modification on your gadget that derives from the rejected alternatives in your thirteenth equation. It helps like this: Suppose you are cruising in a field of density x with a n-order gradient normal to your course and you want to set your optimum course for projected point of rendezvous capital A using automatic selection the whole way, then—" They drifted entirely away from Basic English insofar as the earthbound layman is concerned. The newsbox continued to hunt beside them. Three times it spoke up; each time Libbey absent-mindedly touched the rejection switch.

"I see your point," he said at last. "I had considered a somewhat similar modification but concluded that it was not commercially needed except, possibly, for enthusiasts such as yourself. But your solution would be cheaper than mine."

"How do you figure that?"

"Why, it's obvious from the data. Your device contains sixty-two moving parts requiring a total of, uh, . . . five thousand two hundred and eleven operations in manufacture, whereas mine—"

Lazarus interrupted. "Andy," he inquired, "does your head ever ache?"

Libbey looked sheepish again. "There's nothing abnormal about my talent," he protested. "It is theoretically possible to develop it in any normal person."

"Never mind," said Lazarus. "In any case, I'm glad to have fallen in with you. I heard stories about you way back when you were a kid. You were in the C. C. C., weren't you?"

Libbey nodded. "Earth-Mars Spot 3."

"Yeah, that was it—chap on Mars gimme the yarn. Trader at Drywater. I knew your maternal grandfather, too. Stiff-necked old coot."

"I suppose he was."

"He was, all right. I had quite a set-to with him at the Meeting in 2012. You know, Andy, I don't forget much, but sometimes I have a hard time trying to recollect things, especially this past century."

"Inescapable mathematical necessity," said Libbey.

"Huh? How?"

"Life experience is linearly additive, but the correlation of memory impressions is an unlimited expansion. If mankind lived as long as a thousand years, it would be necessary to invent some totally different method of memory association in order to be effectively time-binding. A man would otherwise flounder helplessly in the diversity of his own knowledge, unable to evaluate. Insanity, or feeble-mindedness."

"That so?" Lazarus' face was quite grave. "Then we had better get busy on it."

"Oh, it's quite possible of solution."

"Let's work on it. We may need it."

The newsbox again demanded attention, this time insistently. "Hark to the data! The High Council suspends the Covenant! Under the Emergency-Situation clause of the Covenant an unprecedented Action-in-Council was announced today directing the Administrator to detain and question all members of the so-called Howard Families—*by any means expedient!* The Administrator directs that the following statement be released by all licensed news outlets: (I quote.) 'The suspension of Covenant guarantees applies only to the group known as the Howard Families except that government agents are empowered to act as circumstances require to apprehend speedily the persons affected by the Action-in-Council. Citizens are urged to bear with tolerance any minor inconvenience this may cause them; your right of privacy will be respected in every way possible; your right of free movement may be interrupted temporarily, but full economic restitution will be made.'

"Now, Friends and Citizens, what does this mean?—to you and you and also you! The DAILY DATA brings you your popular commentator, Albert Reifsnider—"

"Service, Citizens! There is no cause for alarm. To the average free citizen, this emergency will be somewhat less troublesome than a low-pressure minimum too big for the weather machines. Take it easy! Relax! Help the proctors when requested and tend to your private affairs. If inconvenienced, don't stand on precedent—co-operate with Service!

"That is what it means today. What does it mean tomorrow and the day after that? Next year? It means that your public servants have at last taken a drastic step to obtain for you the boon of a longer and happier life! Don't get your hopes too set on it—but it looks like the dawn of a new day—"

Long raised an inquiring eyebrow at Libbey, then switched it off. "I suppose *that*," Libbey said bitterly, "is an example of 'factual detachment in news reporting.' "

Lazarus opened his pouch and struck a cigarette before replying. "Take it easy, Andy. There're bad times and good times. We're overdue for bad times. People are on the march again—this time at us."

THE BURROW known as the Seat became very crowded as the day wore on. Members kept trickling in, arriving by the tunnels from downstate and from Indiana. A considerable number poured in immediately after dark via the underwater route—safe at night, hazardous in daylight. The usual conference room was much too small to handle the crowd; the resident staff cleared the largest room available, the refectory, and removed the partitions separating it from the main lounge.

At midnight Lazarus climbed up onto the temporary rostrum. "O. K.," he announced, "those down in front sit down on the floor and give the rest a chance. I was born in 1912. Anybody older?

"All right, who's your chairman? Do I hear a name?"

Three names were proposed. Before a fourth could be offered, the last man mentioned got to his feet. "Axel Johnson, of the Johnson Family," he identified himself. "This is no time for Family politics. I want my name withdrawn and I ask that the others do likewise. Lazarus cut through the fog last night; let him stay where he is."

The other nominations were

promptly withdrawn, no further were offered. Lazarus spoke up again. "All right, if that's what you want. Before we get down to the arguing, I want a report from the Chief Trustee. How about it, Zack? Any of our kinfolk get nabbed?"

Zaccur Barstow was too well known to need to announce himself. He said simply, "Speaking for the trustees. The report is incomplete. We have no certain knowledge that any cousin has been arrested as yet. Of the nine thousand two hundred and eighty-five revealed Members, nine thousand one hundred and six had been reported, when I left the Communication Center twenty minutes ago, as having reached some place of concealment, either Family strongholds such as this, or the homes of unrevealed cousins. Mary Risling's warning was remarkably successful in view of the narrow margin of time between its dispatch and the execution of the Action-in-Council. Of the unreported balance some at least must have missed immediate arrest by being away from their usual habitat and have been warned by the newscast. We can expect most of them to trickle into safety in the course of the next few days. Others must now be under cover, but unreported, since communication is now limited to sensitives or to slow indirect means."

"Any reasonable chance that all of them will make it home safe?" asked Lazarus.

"Absolutely none."

"Why?"

"Because three of them were known to be on public conveyances between here and the Moon, and traveling under their revealed identities. Others may be presumed to have been caught in similar inescapable predicaments."

"Question:" A short cocky little man near the front stood up and pointed his finger at the Chief Trustee. "Were all those Members now in jeopardy protected by hypnotic injunction?"

"No. There was no—"

"I demand to know why not!"

"Shut up!" bellowed Lazarus. "Nobody's on trial here, and nobody's going to be. No time to waste on spilled milk. Go ahead, Zack."

"Very well. But I will answer the question to this extent—everyone knows that the proposal to protect our secrets by hypnotic treatment was voted down at the Meeting which relaxed the 'Masquerade.' I seem to recall that the cousin now objecting helped then to vote it down."

"That is not true! And I insist that—"

"Pipe down!" Lazarus glared at the interrupter, then looked him over carefully. "You strike me as being a clear proof that the Foundation should 'a' bred for brains instead of age." Lazarus looked around at the assemblage. "If this happens again, I propose to gag him with his own teeth. I assume that he will object. Is my ruling sustained?"

There was a murmur of approval. Zaccur Barstow continued, "On the advice of Ralph Schultz the trustees have been proceeding quietly for the past three months to persuade revealed Members to undergo hypnotic instruction. We were largely successful." He paused.

"Make it march, Zack," urged Lazarus. "Are we covered, or aren't we?"

"We are *not*. Two of our cousins certain to be apprehended are not protected against questioning."

Lazarus shrugged his shoulders. "That tears it. Kinfolk, the show's

over. One shot in the arm of babble juice and the 'Masquerade' is done for. It's a new situation—or will be in a few hours. What do you propose to do about it?"

In the control cabin of the Antipodes Rocket, South Flight, the communrecorder hummed to itself, then went *spung!* and stuck out the tab of the message like an impudent tongue. The co-captain rocked forward on his gymbals, reaching for the tab. He pulled out the sheet, tore it free on the serrated lip, and read it casually.

His offhand manner dropped away from him. "For the love o' Pete, skipper, take a scan at this!"

" 'Smatter?"

"Read it!"

The captain did so, and whistled. "Well, I'll be a monkey's uncle. Wha' d'they think we are—proctors? I've never arrested anybody. I don't believe I've ever *seen* anybody arrested. How do we go about it?"

"I bow to your superior authority—gladly."

"That so?" said the captain in nettled tones. "Well, now that you're through bowing you can just tool aft and make the arrest."

"Huh? That's not what I meant. You're the guy with the authority—rule book, page umpteen. I'll relieve you at the conn."

"You don't get me. I'm delegating you the necessary authority. Carry out your orders."

"Why, shucks, Al, I didn't stamp in for anything like—"

"Carry out your orders!"

"Aye, aye, sir!"

The co-captain let himself into the passenger compartment and identified by seat check the passenger mentioned in the message. He stepped up to him and said quietly, "Service. There has been some sort of a clerical error. May I check your ticket?"

"Why, certainly," the man agreed affably. He reached for his pouch.

"Would you mind stepping back to the reserve stateroom? Then we can both sit down."

"Not at all." The passenger followed the officer, a puzzled look on his face.

Once inside the compartment the ship's officer asked his passenger to sit down, then checked himself. "Stupid of me," he exclaimed. "I've left my lists in the control room. Will you wait for me here?"

The door slid down behind him as he left the room. Over the muted rush of the jets the passenger heard an unexpected, an unnecessary click. Suddenly alert, he sprang to the door and tried it. It was locked.

Two proctors came for him at Melbourne. As they led him through the port he could hear comments from the curious and surprisingly unfriendly crowd. "There's one of the laddies, now!" "Him? Lumme, he's not *old*." "What price monkey glands?" "Don't *stare*, Herbert." "Why not? Not half bad enough for him."

They took him to the private office of the Chief Provost, who invited him to sit down with formal civility. "Now then, sir," the Provost began in accents retaining a slight local twang, "if you will help us out by letting the orderly make a slight injection in your arm—"

"For what purpose?"

"You want to be socially co-operative, I'm sure. It won't hurt you."

"I insist on explanation. What's the meaning of this? I am a citizen of the United States."

"So you are, but the Federation gives concurrent jurisdiction in any member state. Now then, *if* you please."

Lazarus grinned. "I'm going out, though, son."

"I refuse. I insist on my civil prerogatives."

The Provost looked unhappy. "Grab him, boys."

It took four men to hold him steady enough to permit his arm being sterilized and the needle inserted. His jaw set and a look of sudden pain came into his face—even before the needle touched him.

The Provost waited the necessary time for the neo-scopolamine to take effect. The prisoner sat quietly, listlessly, but his breathing was labored. Presently the Provost gently rolled back one of the man's eyelids, then said, "He should be ready—he doesn't weigh over ten stone. Let's have that list of questions."

A deputy handed them to him. He began: "Horace Foote, do you hear me?"

The man's lips twitched, he seemed about to speak. His mouth opened and blood gushed over his chest.

The Provost exploded a wordless bellow and jumped to the prisoner's side. He raised the man's head and made a hasty examination. "Get the surgeon! Get hemostats—fibrinogen! Move! He's bitten his tongue half out of his head."

THE CAPTAIN of the Luna City Shuttle *Moonbeam* scowled at the message his orderly had placed in his hand. "What sort of child's play is this?" He glared past the orderly at his third officer. "Will you tell me that, mister?" The third officer studied the overhead. The captain held the flimsy at arm's length better to accommodate eyes more used to deep space and reread aloud the latter part:

"'—recent development makes it imperative that subject persons be

prevented from doing themselves injury. You are advised and directed to take action to render them unconscious without warning them.' What do they think I am running here? Coventry? Telling *me* in *my* ship what I must do with my passengers. I won't do it—so help me, I won't! There's no rule requiring me to . . . is there, mister?"

The third officer was still interested in the structure of the ship.

The captain stopped his pacing suddenly. "Purser! *Purser!* Why is that man never around when I want him?"

"I'm here, captain."

"About time—"

"I've been here all along."

"Don't argue with me. Here—attend to this." He shoved the dispatch at the functionary.

With the collaboration of a ship fitter and the medical officer a slight modification was accomplished in the air conditioning of two locked cabins. An odorless, nonlethal gas was involved—ordinary sleepy gas—and two worried passengers sloughed off their troubles for the time and took refuge in dreamless sleep.

"ANOTHER report, sir."

"Leave it," said the Administrator in a tired voice.

"Citizen Bork Vanning presents his compliments and requests an interview."

The Administrator pressed his lips together. "You may tell Citizen Vanning that I am occupied. If he seems reluctant to accept that as an answer, you may add that he has no official standing in this office."

"Yes, sir."

When he was alone, the Administrator picked up the report. His eye automatically noted and disregarded the official heading, date line, and file number. "Synopsis of interview with conditionally proscribed Citizen Arthur Risling, full transcript attached. Conditions of interview: Subject received normal dosage of neo-sco., having previously experienced unmeasured exposure to gaseous hypnotal. Antidote—" How in the devil could you cure underlings of this damned habit of unnecessary wordiness? Was there something in the soul of a career civil servant that demanded red tape? His eye skipped down. "—stated that his name was Arthur Risling, of the Foote Family, gave his age as one hundred and thirty-seven years. (Subject's apparent age is not in excess of forty-five years; see biophysical report attached.) Subject admitted that he was a member of the Howard Families. He estimated that the Families contained in small excess of one hundred thousand members. He was asked to correct this, and it was suggested to him that the correct number was nearer ten thousand. He emphatically reaffirmed his original statement." The Administrator went back and reread the sentence, sat for a moment before going on.

"He referred to something called the 'Masquerade.' His statements concerning it were confused and difficult to correlate, but the meaning appeared to be—semanto-analysis attached—that a systematic subterfuge has been maintained by his kin group whereby the public has been kept in ignorance of their actual ages."

The Administrator skimmed rapidly on down the report. All this was interesting and important, but not the key point. He searched for it. "—persisted in his statement that his long life was the direct result of his ancestry and had no other cause. Admitted that artificial means had been used to preserve his

youthful appearance, but maintained strongly that his life expectancy was inherent, not acquired. It was suggested to him that his elder relatives had subjected him to treatment in his youth, which extended his life span. Admitted the possibility. On being pressed for the names of persons who might have performed, or be performing, such treatment, he returned to his original statement that no such treatment existed.

"He gave the names (surprise association procedure) and in some cases the addresses of nearly two hundred persons, members of his kin group, not previously identified as such in public record. (List attached.) His strength ebbed under this arduous technique; he sank into full apathy and could not be roused by any stimuli within the limit of his estimated tolerance.

"Conclusion under expedited analysis, Kelley-Holmes approximation method: Subject does not possess and does not believe in the search object. Does not recollect experiencing search object, but is mistaken. Knowledge of search object is limited to a very small group, less than twenty. A member of this group will be located in not more than a three-level elimination search. (Probability of unity, subject to topological assumption of uniform density of social-space field. Note: assumption cannot be verified by present data, but may be considered as valid, if social-space is inclosed by the physical limits of the Western Federation.) Estimated time required for search, seventy-one hours plus or minus twenty-two hours. Estimate not vouched for by Bureau in charge."

The Administrator added the report to the stack on his old-fashioned untidy control desk. The dumb fools! Not to recognize a negative report when they saw one—yet they called themselves *psychographers!*

He rested his elbows on the edge of the horseshoe and buried his face in his hands.

LAZARUS RAPPED on the table beside him, using the butt of his blaster for a gavel. "Don't interrupt the speaker," he boomed. "Go ahead," he added, "and cut it short."

Bertram Hardy resumed. "I have said and I will say again, these mayflies we see around us have no rights that we of the Families are bound to respect. We should deal with them with stealth, with cunning, with guile, and, eventually as we consolidate our position, with force. We are no more obligated to respect their welfare than a hunter is obligated to shout a warning to his quarry." There was a shout from the rear of the hall:

"And we don't like hunters, either!"

Lazarus banged the table again and tried to spot the shouter. Hardy went steadily on. "The so-called human race has split into two phyla; it is time we admitted it. *Homo vivans* and *Homo moriturus. Homo* —KAPUT! With the great lizards, the sabertooth, the bison, their day is done. We would no more mix our living blood with theirs than we would attempt to breed with the higher apes. I say to temporize with them, tell them any tale, assure them we will bathe them in the fountain of youth—gain time, so that when these two mutually antipathetic races join battle, *as they inevitably must,* the victory will be ours!"

There was no applause, but Lazarus could see doubt and indetermination in many of their faces. It was contrary to the thought habits of years of gentle living, but it had a ring of destiny about it. Lazarus

did not believe in destiny. He believed in— Well, let it pass. But he wondered how Brother Hardy would look with both arms broken.

Eve Barstow answered him. "If that is what Bertram means by the survival of the fittest, I'll go live with the asocials in Coventry," she remarked with a bitterness unhabitual. "However, he has proposed a plan; I must propose another if I am to offset his. I will have none of any plan which would have us live at the expense of our poor transient neighbor. Furthermore, it is evident that our mere presence, the simple existence of our rich heritage of life, is damaging to his spirit. In the face of our longer years, our richer opportunities, no effort seems worth while to him, save a hopeless struggle to escape his appointed death. Our presence saps his strength, ruins his judgment, fills him with the panic fear of death.

"I propose a plan. Let us disclose ourselves, tell all the truth, and ask for our share of the Earth, some little corner where we may grow up apart. If our poor friends wish to surround it with a great barrier like Coventry, well and good—it is better that we never meet face to face."

Some of the expressions of doubt changed to approval. Ralph Schultz stood up. "Without prejudice to the basic plan, it is necessary for me to advise you that it is my professional opinion that the psychological insulation proposed by Eve could not be accomplished on this planet. Under modern technology and communication, the association is too close. We might just as well sit down at their tables. They could not put us out of their minds."

"Then let us move to another planet!" Eve Barstow answered.

"Where?" demanded Hardy. "Venus? I'd as soon live in a steam bath. Mars? A worn-out world in no way fitted to our culture."

"We could rebuild it," she persisted.

"Not in your lifetime nor mine. No, my dear Eve, your maternal solicitude is poetically beautiful, but there is but one planet in this system fit for a civilized man—we're standing on it."

Something seemed to ring a response in Lazarus' brain, but it escaped. Something that he had heard or said just a day or two ago—or was it recently? Somehow it seemed to be associated with his first trip out into space well over a century before. Thunderation! It was annoying to have his memory slip its clutch like that—

Then he had it—spaceship! The interstellar ship they were putting the finishing touches on out there between Earth and Luna. "Folks," he said, "before we drop this matter of finding another planet to take for ourselves, let's consider all the angles." He paused until he was sure of their attention. "Did you ever stop to think that not all the planets swing around this one Sun?"

Zaccur Barstow broke the silence. "Lazarus," he asked, "are you making a serious suggestion?"

"Dead serious."

"Perhaps you had better elucidate. It doesn't sound so."

"I will." He turned his eyes back to the mass. "There's a spaceship hanging out there in the sky, a roomy thing, and built to make the long jumps from star to star. Why don't we take it and go looking for our own piece of real estate?"

Bertram Hardy was the first to recover. "I don't know whether our chairman is lightening the gloom with a jest again or not, but, assuming that he is serious, I will answer

him. My objection to Mars applies to this scheme many times over. I believe that the hardy explorers who actually intend chancing their lives and their childrens' in that ship hope to make the trip out in about a century. I don't care to spend a century shut up in a steel tank—nor do I expect to live that much longer."

"Wait a minute," Lazarus asked. "Where's Andy Libbey?"

"Here," Libbey answered him, standing up in the crowd.

"Come on down front. Look here, Slipstick, did you have anything to do with designing the Centauri Expedition Ship?"

"No. Neither this one nor the first one."

Lazarus turned back to the crowd. "That settles it. If that ship out there didn't have Slipstick's finger in the design of the drive, then it isn't as fast as she could be—not by a good big coefficient. Slipstick, you better get busy on the problem, son. We're likely to need a solution."

"But Lazarus, you mustn't assume that—"

"Aren't there some theoretical possibilities?"

"Yes, certainly, but—"

"Then get that carrot top of yours busy on it."

"Well—all right." Libbey blushed as pink as his hair.

"Just a minute, Lazarus." It was Zaccur Barstow. "I am interested in this proposal. Even if Brother Libbey is unable to find a faster means of propulsion—frankly, it seems to me unlikely that he will; I know a little something of field mechanics myself—I don't think we should be too disturbed at the thought of a century-long trip. By availing ourselves of cold-rest and manning the ship in shifts, it should be possible, for most of us, at least, to complete at least one hop. There is an appropriateness to the idea of the long-lived exploring the stars. There seem to be insuperable objections to every other way out of our dilemma. It is entirely possible that there is no other solution which does not include our own extermination."

The solemnity with which he spoke the last sentence seemed to settle into the company like damp chill. To most of them the problem, so recently posed, had not yet taken on the substance of reality. To hear their senior trustee speak gravely of the possibility that their line might be exterminated—hunted down and destroyed—was to waken in each the cold fear of personal death. And they were more than common fond of living.

A messenger entered and whispered to Zaccur Barstow. The trustee looked startled and appeared to ask that the message be repeated. He then crooked a finger to Lazarus Long, and, grasping him by the shoulder to draw their heads close together, whispered urgently in his ear. Long repeated Barstow's initial expression.

Barstow hurried out, the messenger tagging at his rear.

Lazarus turned back to the meeting. "We'll take a recess," he announced. "Time for a smoke and a stretch."

"What's up?" someone called.

"Well," Lazarus drawled, "it seems the Administrator wants to talk to Zack Barstow right away. Asked for him by name—*and he called over our private, Family circuit!*"

Zaccur Barstow consciously repressed his emotions and brought his faculties under discipline as he entered the communication cell.

Slayton Ford, Administrator for the Council and under the Covenant

of the Western Federation, approached the interview with much the same uneasy, labored feeling suffered by Barstow. Ford did not underrate himself; he was aware of his own superior ability and broad experience, but this was a different thing. What would a man be like who had lived more than two ordinary lifetimes?—worse than that, who had had four or five times as long an *adult* life as Ford himself? He reminded himself that his own way of looking at things had changed and changed again since his boyhood, and that the boy he had been would be no match in dealing with the man he had become. What, then, of a man like Barstow? How could Ford estimate his ability, his standards of evaluation, the possible resources behind him, his motives and intentions?

But he was firmly resolved on one point: He did not propose to sell Manhattan Island for twenty-four dollars and a case of whiskey!

He studied the face of the senior trustee as it built up in the screen. A good face and strong—it would be useless to attempt gross intimidation with this man. Furthermore, the man looked young, younger than Ford himself—the image of his stern, implacable grandfather withdrew in Ford's mind and ceased to bother him. His tension relaxed in part.

"You are Citizen Zaccur Barstow?"

"Yes, Mr. Administrator."

"You are chief executive of the Howard Families?" It was as much a statement as a question.

"I am at present Speaker Trustee of our Families' Foundation. I am responsible *to* my cousins rather than in authority *over* them."

Ford brushed the difference aside. "I assume that your position gives you maximum influence in your group. It is not possible for me to discuss issues with a hundred thousand people."

Barstow was less disconcerted by the discovery that the Administration knew their carefully guarded secret of their true strength than he would have been had he not already suffered the shock of learning that the Administrator had located the Families' Seat, and even knew how to tap into their private communication circuits. His able mind rapidly ran over the implied probabilities behind this new datum and tried to reconstruct the background. It was certain that one Member, at least, had been surprised and forced to talk. It was a high probability, nearing certainty, that the information obtained from the first Member to crack had led the Federation agents to many clandestine Members.

It was, therefore, extremely probable that the Administrator possessed every important datum concerning the Families. Consequently only the truth would serve in this encounter. However, he cautioned himself, do not volunteer new data until and unless the deduction is fully confirmed.

"What is it you wish to discuss with me?" he inquired.

"The policy of the Administration toward your kin group. The welfare of yourself and your relatives."

"Is there anything that we can discuss? A public policy has been announced which gives you full authority to deal with us as you see fit in an attempt to wring from us a secret that we do not possess. Is there anything we *can* do but to pray for mercy?"

"Please"—Ford gestured his dissent from the approach—"is it necessary that you fence with me? We have a problem, the two of us. Can't we discuss it openly and try to reach a satisfactory solution?"

BARSTOW nodded slowly. "I would like to—and I believe that you would like to, too. But the problem is predicated on a false assumption, that we, the Howard Families, know how to increase greatly the span of human life. We don't."

"Suppose I tell you that I, too, am aware that there is no such secret?"

"I would like to believe you," Barstow answered soberly, "but it seems inconsistent with the persecution and loss of civil guarantees suffered by my people in the past few hours."

Ford made a wry face. "I see your viewpoint. You are obliged to mistrust me. And yet I am minded of an anecdote, dating back to the early Republic. A theologian was asked to reconcile the doctrine of Divine mercy with the doctrine of infant damnation. 'The Almighty,' he explained, 'finds it necessary to do things in His official and public capacity which in His private and personal capacity He deplores.' "

Barstow smiled in spite of himself. "I see the analogy," he conceded, "and would like to believe that it is pertinent." He waited for a moment.

"You keep in touch with political developments? I would guess that you do; your position would seem to require it." Barstow nodded; Ford went on to explain what he meant:

Ford had remained Administrator through four Councils, but his influence, his ability to command the support of a strong majority for his policies, had been steadily declining. A preoccupation of the electorate on any one issue to the exclusion of all others has always had, historically, the effect of corrupting civic morals; public representatives of broad viewpoint, mature wisdom, and judicial temperament are displaced by fanatics and by scalawags willing to beat the drum for the popular issue—little men.

After a long, steady improvement under favorable conditions, beginning with the signing of the Covenant and culminating in the early part of Ford's administration, the art of social administration had undergone another such setback trend. Ford was faced by a Council a minority of which was fanatical in its desire to obtain the "secret" and by a bloc among his own habitual supporters who disagreed with him with respect to the Howard Families.

He acceded to the Action-in-Council for two reasons, although personally opposed to it: Had he refused its mandate and forced the matter to a vote of confidence, he was quite certain that he would have lost the vote and have been obliged to resign—and he had no faith, none whatsoever, in the judgment, administrative ability, and motives of his probable successor, the leader of the minority.

In addition to that, he wanted the conflict between the short-lived and the Families settled—he wanted it to cease being an open sore on the civic body.

WHEN he had concluded his apologia, Ford again asked Barstow to suggest a solution. Barstow was inclined to believe in Ford's good faith. In one respect, at least, Barstow was a wise man—he knew that another man could be opposed to him and yet not be a villain.

Barstow suggested a campaign to convince the public that there was no secret. Ford answered, "Ask yourself: Will it work?"

"No," agreed Barstow, "I suggested it in order to dispose of it."

"Furthermore," Ford pursued the matter, "I would not consider it a solution even if it would work. The

people—even my trusted assistants —are clinging to their belief in a mythical fountain of youth because the alternative is too bitter to consider. Can you visualize what it would mean to them? To believe the truth?"

"Go on."

"Death has been tolerable to men because Death has been the Great Democrat, playing no favorites, treating all alike. Oh, there were accidents and sudden death, certainly, but that which is unexpected cannot be a cause for apprehension. But now Death plays favorites—

"Zaccur Barstow, can you realize in your heart the bitter, bitter jealousy of the ordinary man of—say fifty, who looks on one of your sort? Fifty years he has lived, twenty of them he was a child; he is well past thirty before he has learned his art or profession. He is forty before he has established himself, before his voice is listened to with respect. For the last ten years of his fifty he has amounted to something.

"And now, when he has reached his goal, what is the prize?

"His eyes are failing him, his bright young strength is gone, his heart and wind are 'not what they used to be.' He is not senile yet—but he has felt the chill of the first frost. He knows what is in store for him. He knows—he knows!

"But it was inevitable, and each man learned to be resigned to it.

"Now you come along. You shame him in his weakness, you humble him before his children. He dare not plan for the future; you blithely undertake plans that will not mature for fifty years—for a hundred. No matter what success he has achieved, what excellence he has attained, you will catch up with him, pass him—outlive him. In his weakness you are *kind* to him.

"Is it any wonder that he hates you?"

Barstow raised his head wearily. "Do *you* hate me, Slayton Ford?"

"No. No, I do not hate you. I cannot afford to hate. But I can tell you this," he added suddenly, "had there been a secret, I would have had it out of you if I had to tear you apart!"

"Yes. I see that." He paused as if thinking, and resumed. "There is little we of the Families can do. We did not plan it this way; it was planned for us. But there is one thing we can offer."

Barstow told him.

Ford shook his head. "Physically what you suggest is feasible, and I have no doubt it would greatly extend the life span of the race. But even if the women were willing to accept the germ plasm of your men for their children—mind you, I do not say that they would—it would be psychic death to the men. There would be a wave of frustrated hysteria that would split the race to ruin. No, no matter what we might wish for, the customs are what they are—we cannot breed men like animals. They will not stand for it."

"I knew it," agreed Barstow, "but it was all we have to offer—a half share in our heritage through artificial impregnation."

"Yes. I suppose I should thank you—but I feel no thanks and I won't. But let us be practical. Individually you old ones are doubtless honorable, lovable men. As a group you are as dangerous to my people as a return of lepers or typhoid carriers. You must be quarantined. How?"

"A segregated colony? Some place remote and insular that would be a Coventry of our own? Madagascar, perhaps? Or we might take

the British Islands and spread from there into Europe. We could recivilize it."

Ford shook his head. "No. That would simply leave the problem for my grandchildren to solve. By their time you and yours would have grown in strength; you might defeat us. No, Zaccur Barstow, you and your kin must leave this planet entirely!"

Barstow had avoided the conclusion as long as he could, while knowing in his heart that Ford would have reached it as inescapably as had the Meeting. "Where are we to go?" he asked.

"Take your choice of the Solar System. Anywhere you like."

"But where? We would not choose to go to Venus, but even if we did, would they accept us there? The Venusians won't accept dictation from Earth; that was settled in 2020. They now accept immigrants since the Four-Planets Agreement, but would they accept a hundred thousand which Earth found too dangerous to keep? I doubt it."

"And I doubt it, too," agreed Ford. "Better pick another planet."

"But what planet? There is no other planet in the System suitable to a high human culture. They are all too small or worn out. It would take colossal effort and all our modern technique to make one of them habitable."

"Make it habitable, then. We will be generous with help."

"I believe you. But is this any more of a solution in the long run than giving us a reservation on Earth? Do you propose to put a stop to interplanetary travel?"

Ford sat up suddenly. "So? I see your thought. I had not followed it through to that point, but let's face it. Why not? Would it not be better to give up space travel entirely rather than let this situation degenerate into an open war? It was done once before—"

"When the Venusians threw off their absentee landlords. Yes, so it was. But now Luna City is rebuilt and ten times the tonnage moves through the skies."

Ford turned it over and over in his mind, searching for an answer. Barstow was right; the clock of history could not be stopped by edict. Space travel might be interrupted again, but it would be resumed. One generation, two generations, three—what difference did it make? Ancient Japan had tried such a solution; the foreign devils came sailing in despite them. The hardier culture displaces the weaker; it is an observed natural law.

That left him with the one answer that he did not want to accept, but he had sufficient toughness of mind to accept it when no alternative appeared.

He was already making his plans, Barstow's presence in the screen forgotten. Now that he knew the location of the headquarters of the Howard Families, his proctors would be able to reduce it in an hour—perhaps two, unless they had defenses which he could not anticipate. No matter, it was simply a question of time. From the persons arrested there he should be able to locate every one of their hundred thousand members. He would need many more than the local psychotechnicians to interview a large group quickly—he made a mental note to have an ample reserve moved to the Chicago area. But with luck, the whole matter should be cleared up in twenty-four hours—forty-eight at the outside.

The only matter as yet unsettled in his mind was the question of whether simply to sterilize all members of the Howard Families or to

kill them outright. Either solution would do, but which was the more humane?

Ford was aware that his drastic solution would be the end of his political career—he would leave office in disgrace, perhaps to go to Coventry, but he literally gave the matter no thought. He was so constituted as to be unable to weigh his personal welfare against his concept of his duty.

BARSTOW was unable to follow Ford's thoughts, but he could sense from the man's manner that he had reached a decision. Barstow could guess shrewdly how bad that decision must be for his kin. Now was the time, he thought, to play his one small, lonely trump.

"Mr. Administrator—"

"Eh? Oh—sorry! I was preoccupied." He was more than that; he was embarrassed to be recalled from his brown study and to find himself confronted by a man he had just condemned to death. He gathered formality about him like a robe. "I thank you, Zaccur Barstow, for talking with me. I am sorry that—"

"Mr. Administrator!"

"Yes?"

"I propose that you move us out of the Solar System entirely."

"What? How could *that* be accomplished?"

Barstow spoke rapidly, persuasively, explaining the half-conceived scheme of Lazarus Long, working out some details as he went along, skipping over the obstacles and emphasizing the advantages.

"It might work," Ford said at last and slowly. "There are difficulties which you have not mentioned, political difficulties and a terrible hazard of time. Still, it might." He stood up. "Go back to your people. Don't spring this on them just yet. I'll talk with you later."

Barstow went back toward the place of assembly wondering what he could tell the Members. They would demand a full report; theoretically he had no right to refuse it. But he was strongly inclined to cooperate with the Administrator as long as there was a chance of a favorable outcome. Suddenly making up his mind, he checked his steps, went to his office, and sent for Lazarus.

"Howdy, Zack," Long said when he came in. "How'd the palaver go?"

"Good and bad," said Barstow. "Listen—" He gave him a brief, accurate resumé. "Can you go back in there and tell them something which will hold them?"

"Hm-m-m. Reckon so."

"Then do it and come back."

They did not want to keep quiet and they did not want to adjourn the meeting. They did not wish to accept Lazarus' statement that they would have to wait. "Where is Zaccur?" "We insist on a report!" "Why all this mystification?"

Lazarus shut them up with a roar not usually heard in polite company. "Listen to me, you damned idiots! He'll talk to you when he's ready—don't joggle his elbow. He knows what he's doing."

A man stood up near the back. "I'm going home!"

"Do that," Lazarus urged sweetly. "Give my love to the proctors."

The man looked startled and sat down.

"Anybody else want to go home?" asked Lazarus. "Don't let me stop you—but it's time you bird-brained dopes realize that you have been outlawed. The only thing that stands between you and the proctors is Zack Barstow's ability to talk sweet to the Administrator!

"Do as you like. The meeting's adjourned."

"Look, Zack," said Lazarus a few minutes later, "let's get this straight. Ford is going to use his extraordinary powers to help us glom onto the big ship and make a getaway. Is that right?"

"He's practically committed to it."

"Hm-m-m. He'll have to do this while pretending to the Council that everything he does is just a necessary step in squeezing the 'secret' out of us—he's goin' to double-cross 'em. That right?"

"I hadn't thought that far about it. I—"

"But it's true, isn't it?"

"Well—yes, it's true."

"O. K. Now, is our boy Ford bright enough to realize what he is letting himself in for and tough enough to go through with it?"

Barstow reviewed what he knew of Ford rapidly in his mind and added to it his own direct impressions from the interview. "Yes," he decided, "he knows and he's made up his mind to it."

"All right. Now, how about you, pal? Are you up to it, too?" Lazarus' voice was accusing.

"*Me?* What do you mean?"

"You're planning on double-crossing your crowd, too, aren't you? Have you got the guts to go through with it when the going gets tough?"

"I don't understand you, Lazarus," Barstow answered in tones showing puzzlement and worry, but not anger. "I'm not planning to deceive anyone—at least, no member of the Families."

"Then you had better look over your cards again," Lazarus continued remorselessly. "Your half of the deal is to see to it that every man, woman, and child in the Families takes part in this proposed exodus. Do you expect to be able to sell the idea to each one individually and get that many people to do *anything* unanimously? Shucks, you couldn't even get 'em to whistle 'Yankee Doodle' unanimously."

"But they will *have* to agree," protested Barstow. "There is no alternative. We either emigrate, or they hunt us down and exterminate us. Ford will do it. I *know*."

"Then why didn't you walk right into the meeting and tell 'em that? Why did you send me in to give 'em a stall?"

Barstow rubbed a hand over his eyes. "I don't know."

"I'll tell you why," continued Lazarus. "You think better with your hunches than most men do with the tops of their minds. You sent me in there to tell 'em a tale because you damn well knew that the truth wouldn't serve. If you told 'em it was get out or get killed, some of 'em would get panicky and some of 'em would get stubborn. And some old-woman-in-kilts would decide to go home and stand on his Covenant rights. Then he'd spill the whole scheme before it ever dawned on him that the government was playing for keeps. That's right, isn't it?"

Barstow shrugged his shoulders and laughed, but the laugh was not merry. "You're right. I didn't have it all figured out ahead of time, but you're absolutely right."

"But you did have it figured out," Lazarus reassured him. "You had the right answers, didn't you? I tell you, I like your hunches, Zack—that's why I'm stringing along. All right—you and Ford are planning to put over a whizzer on every manjack on the globe—I'm asking you: *Have you got the guts to see it through?*"

TO BE CONTINUED.

IN TIMES TO COME

NAT SCHACHNER and his agile-minded space-lawyer, Kerry Dale, will be with us again next month. It's a question of "Jurisdiction" that bothers Old Fireball Kenton, his pet hate Jericho Foote—and brings a solid cash return to Mr. Kerry Dale. It's surprising, what complicated aspects the problems of mining and mining law can evoke. Even a hard-working, ambitious crook can't make a dishonest living without being an astronomer, a lawyer, and an astragator as well as a mining engineer. Somehow, the old familiar plotting, murder and sabotage don't solve all the problems in the neat, if bloody way—

Also next month is Part II of "Methuselah's Children"—and one of the most unusual suggestions yet made in science-fiction, I think, as to the character and behavior-patterns of an alien race. The Jockaira people are a gentle, friendly, generous and highly civilized race—ideal neighbors for the exiles from Earth.

That's what *they* think! Heinlein's got an answer for that one; it's best described as being on the "blue willies" order. THE EDITOR.

ANALYTICAL LABORATORY

The Lab this month went somewhat lopsided in appearance, numerically, that is, but the reader-letters reactions indicate a slightly different aspect. On one point, nearly everyone was agreed; the first two places went to "Universe" and "Solution Unsatisfactory" in nearly every letter (and the votes of those who spoke to me personally). "Stolen Dormouse" took a pretty consistent third place. From that point on, confusion reigned—the votes scattered the order almost anyway and every way. Numerically, however:

Place	Story	Author	Points
1.	Universe	Robert Heinlein	1.3
2.	Solution Unsatisfactory	Anson MacDonald	1.9
3.	Stolen Dormouse	L. Sprague de Camp	3.1
4.	Liar!	Isaac Asimov	3.25
5.	Jay Score	Eric Frank Russell	4.00
6.	Subcruiser	Harry Walton	4.80

I list six stories this time partly out of mathematical interest. "Solution Unsatisfactory" rates 1.9—almost exactly 2, which would be the result if an absolutely unanimous second-place vote had been cast. But "Jay Score," in fifth place, rates exactly 4, and "Subcruiser," sixth, almost 5.0. In other words, the average vote was to put these two stories in fourth and fifth places! THE EDITOR.

SPACESHIP IN A FLASK

By Clifford D. Simak

If a man's sharp enough in his observation, and quick enough with his wits—even a spaceship of sand in a bottle of glass can take him a long way—

Illustrated by Kramer

Old Eli was plastered when I found him in the Sun Spot, one of the many disreputable dives situated against the walls of the domed city of New Chicago on the Twilight Belt of Mercury.

I had been afraid of that. As soon as I had heard the old Sunwarder was in town, I had set out to track him down by checking all the joints. The Sun Spot was the thirty-third.

Eli always was good for a story—the kind of a story the Solar Press ate up. No one in New Chicago believed a word he said, especially that yarn about being a couple of hundred years old. Some of the stuff he told about the Sunward side might be true, for few men ventured there, but the story about his age was just too much to swallow.

Most of his tales were alcoholic. He had to have a bit of glow to do much talking. But this time I saw he was pretty far gone.

He regarded me across the table with bleary eyes.

"I was a-comin' to see you, son," he cackled. "Kept thinkin' all the time, 'I gotta go see Sherm.'" He shoved the bottle at me. "Grab yourself a snort, son."

I shook my head. "Can't. Doctor's orders. Got a lousy stomach."

He guffawed in minor key and pounded the table in drunken mirth.

"I remember now. Doggone if I don't. Always taking pills or something, ain't you?"

"Capsules," I said, icily. I can't appreciate jokes about my stomach.

"Don't need water nor nothin' to wash them down," he went on. "Just pop them into your mouth and swallow. Funniest danged thing I ever see. Me, I never took a pill without a heap of gaggin'."

He hoisted the bottle and let it gurgle.

"What did you do this trip?" I asked.

"Not much of nothin'," said Eli. "Couldn't find a thing. This danged planet is gettin' too crowded. Too many prospectors runnin' around. Bumped into a feller out there, I did. First time that has ever happened. Don't like it. Have to go out to Pluto where a man's got elbow room."

He wrestled the bottle again and wiped his whiskers.

"Wouldn't have come in at all 'cept I had to bring doc some of them salts of his."

"What salts are those?" I asked.

"What! Ain't I ever told you about them salts. Doc buys them off of me. Danged if I know why. Don't seem to be good for nothin'."

He reached into a bulging coat pocket, pulled forth a canvas bag and slung it on the table.

"Take a look," he urged. "Maybe you can tell me what it is. Doc pays me good for it. Takes good care of me, too. Caught the fever out on Venus, long time ago. He gives me injections to fight it off."

Eli stumbled a little over 'injections' but finally made it.

"Who is this doc?" I asked quietly, afraid I'd scare him into silence. "One of the doctors here in town?"

"Nope. The big doc. The feller out at the sanitarium."

"Dr. Vincent?"

"That's the one," said Eli. "Used to sell them to Dr. Anderson and Dr. Brown, too."

I let that pass. It was just another one of old Eli's tales. Both Anderson and Brown had been dead these many years, Anderson before Eli was born.

I OPENED the bag and poured part of its contents into one hand. Tiny, shining crystals winked, reflecting the lights above the bar.

"Took some to a chemist once," said Eli, "but he said it wasn't nothin'. Not valuable at least. Some peculiar combin . . . combi—"

"Combination."

"That's it. I didn't tell him about doc. Didn't tell him nothin'. Thought maybe I'd made a find and could cash in on it. Thought maybe doc was takin' me for a ride. But the chemist said it wasn't worth a thing. Offered to sell him some but he didn't want any. Out of his line, he said."

"Maybe you'd let me have some. Just a sample," I suggested, still afraid of scaring him off. For I sensed, even then, that he was telling me something he shouldn't tell.

He waved a generous hand.

"Take some. Take a lot. Take all you want."

I felt in my pockets.

"I haven't anything to put it in," I said.

He cackled at me, hoisting the bottle.

"Fill up a couple of them pills of yours. Dump out the stuff that's in them. Won't do you any good. Likker's the only thing for a touchy stomach."

"Good idea," I said, grinning at him.

I pulled three of the capsules apart, spilled out the powders, refilled them with the salts and carefully placed them in my vest pocket. The bag I shoved back across the table.

"Where do you find this stuff?" I asked.

Eli wagged a shaky finger.

"Secret," he whispered, huskily.

His eyes, I saw, were blearier than ever. He wabbled even as he sat. But his hand snaked out with what amounted to instinct to cuddle the bottle.

"Good drinkin' likker," he mumbled. "Good for the stomach—"

His head drooped and rested on the table. The bottle tipped and the little remaining liquor splashed onto the floor.

"Well, I'll be damned," I said to the man behind the bar.

"Soon as he sobers up," the man told me, "he'll light out for Sunward. Been going there for years. Queer old duck. Figure there's anything to him claiming he's a couple hundred years old?"

"Not a chance," I told him.

He held a glass up to the light, blew on it, polished it with a cloth until it shone.

"A bunch of the boys had him yarning good just before you came in. Marty Berg was setting them up."

"About this time Marty always sets them up," I told him. "Election day is getting close."

I started to go and then turned back and laid a coin on the bar.

"When he wakes up give him a drink on me," I said. "He'll need one then. I'll try to catch him again before he hits for Sunward."

But I didn't catch him again.

Twenty-four hours later they found old Eli's body in the badlands just west of the city's port. He had been killed by three vicious knife thrusts. The police said he had been dead twelve or eighteen hours.

MARTY BERG was one of those men who can't go back to Earth. Just what the trouble was no one knew and no one cared to ask. It might have been any number of things, for Marty's talents are varied.

As a ward heeler in the North Wall precinct, he always delivered the vote. The methods he used were never questioned. What he got out of it no one really cared, for New Chicago had not as yet developed civic consciousness.

When he came into my office I gave him the glad hand, for he was a news source. More than once he'd

tipped me off on political shenanigans.

"What's the news on Eli?" he asked.

"None at all," I told him. "The police are baffled."

Marty wagged his head. "Too bad. I hope they catch the guy."

"What can I do for you, Marty?"

"Just a little favor," said Marty. "I hear you're going to Earth for a bit of vacation—"

"In a day or two," I said. "It'll be good to see Earth again. A man sort of misses—"

And there I stopped, remembering about Marty not being able to go back.

But he didn't seem to notice.

"You remember Chesty Lewis? The bird they hooked for forgery?"

"Sure, I met him a couple of times. The cops back in New York used to run him in every now and then."

"He's out again," said Marty, "and I'd like to send him a little gift. Just a remembrance from an old pal. I thought maybe you'd take it along and hand it to him. I'd mail it but the mail rates—"

I could understand that. The mail rates *were* high.

Marty hauled a package from his pocket and set it on the desk.

I picked it up and shook it. "Listen, Marty, you wouldn't be getting me into trouble, would you?"

He spread his hands. "Why should I be getting a friend of mine into any trouble? It's just to save the mailing costs I'm doing this. I'll tell you what it is. Just one of those sand flasks with different colored sands made into a pretty picture. A picture of a spaceship, this one is. A white ship out in space, with red sand like blasts shooting from the rockets—"

"Forget it, Marty," I said. "I just wondered. Sure, I'll take it."

"Chesty will be nuts about it," said Marty. "He always did like pretty things."

FLOYD DUNCAN, veteran chief of the New Chicago office of the Solar Bureau of Investigation, was the first to find the clue in old Eli's murder and when he found it he didn't believe it.

He growled at me when I came into his hangout, but I kidded him along and pretty soon he softened up.

"This case has got me down," he growled.

"No clues?" I asked.

"Hell, yes," he said. "I got a clue but it's worse than not having one because it can't be right."

"What's wrong with it?"

"About one hundred years," he said, rustling papers on his desk and trying to act ferocious.

"You're all haywire," I said. "Years haven't anything to do with clues."

"You ever heard of Dr. Jennings Anderson?" he asked me.

"The chap who built the sanitarium out on Sunward?"

"That's the fellow. Built it one hundred fifty years ago. Doc was all of fifty then, himself. Put every dime he had in it. Thought he could cure the space dopes. For that matter the sanitarium is still trying to cure them, but not getting very far."

I nodded, remembering Anderson's story. The sanitarium out on the Sunward side still stood as a monument to his hopes and humanitarianism. Recognizing the space disease, which regularly struck down the men who roamed the trails between the planets, as a challenge to his knowledge and his love of humankind, he had constructed the sanitarium, had tried to cure the

stricken spacemen by use of the radiations which slashed out from the Sun.

Duncan rattled some more papers and then went on. "Anderson died over one hundred years ago. He's buried out there at the sanitarium. Folks back on Earth subscribed a pile of money to put up the shaft over his grave. Had to use zero metal. Only thing that will stand up in the radiations."

I watched Duncan narrowly, wondering what he was getting at. He was right about Doc Anderson being dead, for I had seen the shaft myself, with his name inscribed on it.

"We found a brand-new dollar bill on old Eli," said Duncan. "We checked for fingerprints. Found a lot of them. Money picks prints up fast, you know. We checked all the prints and they all check out to nothing—all except one."

He ran blunt fingers through his iron-gray hair.

"The one print," he told me, "is that of old Doc Anderson!"

"But, look," I blurted, "that can't be right!"

"Of course it can't be right," he said. "That's what worries me."

BACK in my apartment I opened up the package Marty had given me and got the surprise of my life. For once, Marty had told the truth. The thing in the package really was a sand flask, one of those things the gift shops sell to tourists. Made of brilliant Mercutian sands, some of them are really bits of art.

The one I took out of the package wasn't any piece of art, but it was a fair enough piece of work. I put it on a table and looked at it, wondering why Marty would be sending something like that to an egg like Chesty.

And the more I looked at it, the stronger grew the hunch that there was something wrong. Somewhere something didn't tie together. This business of sending a sand flask to Chesty Lewis somehow didn't click.

So I wrapped it up again and hid it in my dresser drawer. Then I went out and hunted through the shops until I found one just like it. I bought that one and wrapped it up and put it in the mails, addressing it to Chesty in care of a boardinghouse that I knew could get in touch with him.

Why I did a thing like that I can't explain, even to this day. It was just a hunch, one of those unaccountable sixth senses that newsmen sometimes acquire. The whole deal had a phony ring, had put me on my guard.

Back in the apartment once again, I closed the blinds, turned off the lights and tried to go to sleep.

I was dog-tired, but I had a lot of trouble dropping off. My mind kept buzzing round.

I thought about old Eli and the new dollar bill with the one-hundred-year-old fingerprints upon it. I thought about Marty Berg sending a sand flask to Chesty Lewis and wondered if what I had just done would make any difference. I wondered about Doc Anderson, dead these hundred years or more, resting under the stele of zero metal.

Finally I did go to sleep, only to be wakened a short time later with severe stomach pains. Groping blindly on the bedside table I found a couple of capsules, swallowed them and waited for the pain to ease.

It was hours later when I finally awoke.

All sign of stomach distress was gone. I felt a good ten years younger, I told myself, lying there, reluctant to get up. It's wonderful what a good long sleep will do.

Squaring off in front of the mirror after plugging in my razor, I noticed something funny about the face that stared back at me.

I leaned closer to the glass, trying to figure out what could be wrong. The image that stared back at me was me all right, but it had a different look. There weren't nearly so many wrinkles and the baggy cheeks had filled up a little bit, and there was a slight flush of color in them.

But that wasn't all.

The streak of gray on the left side of my head was gone! The hair was coal-black!

Alarmed, I rumpled my hair, searching for gray ones. There weren't any.

It wasn't until then I remembered the capsules.

A frantic search of the vest pocket where I had placed the ones filled with old Eli's salts failed to locate them.

There was just one explanation. Absent-mindedly I had fished them out of the pocket, put them with the others on the bedside table.

Could it be that I had taken one of them when I had awakened? And if I had, would that account for the filled out cheeks, the disappearance of the gray streak?

I sat down, flabbergasted.

I remembered old Eli had told me he sold those salts to Dr. Vincent out at the Sunward sanitarium.

Back at my shaving once again, I knew there was just one thing to do. I had to see Dr. Vincent right away.

And when I went to see him I would carry a short steel bar. One that would fit my coat pocket. There would be a use for it.

SEEING Dr. Vincent was easier said than done. Few people saw him. Both he and his predecessor, Dr. Brown, were noted for their reluctance to appear in public. Too engrossed in their work, they had always said.

Anderson, Brown and Vincent, three strange men. Anderson under the stele that rose before the sanitarium entrance. Brown, undoubtedly dead, but with his later life, after he had left the sanitarium, shrouded in mystery. Vincent, present head of the institution, practically unknown to the medical profession except by reputation.

Three men who had dedicated their lives to finding a cure for the space sickness. Men who, so far, had failed. To them, from all the far corners of the Solar System came the space dopes, the men stricken by the dread disease which even now spelled the swift doom of all on whom it fastened. Not so swiftly now, perhaps, but nevertheless certain.

For the sanitarium had made some progress. By its treatment with radiations it could ease the pain, could slow up the ravages, give each victim a few more months to live, an easier death. But that was all. The space sickness still was fatal. There was no cure.

I had visited the sanitarium only once before—when I first had come to New Chicago. The New York office had wanted a feature story about the place and I had gotten it, but not from Dr. Vincent. I had not, in fact, seen Dr. Vincent. The soft-voiced robot secretary, had told me he was very busy. An equally soft-voiced robot attendant had taken me in tow, had shown me the building, explained its workings, discussed learnedly the work of Dr. Vincent. It was a good story.

Practically all the attendants, I knew, were robots.

"We do not make mistakes," the

soft-voiced metal-man had told me. "Here, where mistakes are fatal, we are better than a human being."

Which sounded like a good explanation, but left one sort of hanging in the air.

This time, as the time before, I had no trouble getting to the secretary who guarded Vincent's office. And this time, as the time before, I got the same answer.

"Dr. Vincent is very busy. What is it you want?"

I leaned closer, across the desk, cutting off access to the row of call buttons.

"It's a matter of life and death," I said and even as I spoke I yanked the short steel bar out of my pocket and struck.

I put everything I had into that blow and I knew just where to hit, right between the robot's gleaming eyes.

The one blow was enough. It dented in the heavy metal, smashed the delicate mechanism. The robot slid off the chair, clanged onto the floor.

FOR LONG SECONDS I stood there, hoping against hope that the walls were soundproofed. They must have been, for there was no scurry of feet outside, no sound from Vincent's inner office.

Walking softly, thanking my stars the doors did not boast newfangled locks but the simple latches of the day when the sanitarium had been built, I locked the outer door, then strode across the room and twisted the knob to Vincent's office. It turned in my hand and I stepped inside.

A man sat at a desk directly opposite the door. A man well past middle age, with snow-white hair. He was busy and did not look up when I came in. If he had heard me at all, he probably thought I was the secretary.

"Dr. Anderson?" I asked.

"Why, yes. What can I—"

And then he jerked his head up and stared at me.

I laughed at him softly.

"I thought so," I said.

Muscles jerked around his jaws, as if he were trying to keep his teeth from chattering.

"Who are you?" he asked hoarsely.

"A friend of old Eli's," I told him.

"He sent you?"

"No, he didn't send me. Eli is dead."

He started out of his chair at that. "What's that you say? Old Eli is dead? Are you certain!"

"The news," I told him, "has been in the papers. The radio carried it."

"I get no papers," he said. "I have no time to read them. The radio over there," he jerked his head toward an old set in the corner, "hasn't been turned on for months."

"It is the truth," I said. "Murdered. And the salts were stolen."

The man behind the desk went pale.

"The salts stolen!"

"Someone," I said, "who guessed what they were."

He sat down slowly, as if every ounce of strength had drained from his body. Huddled behind his desk he looked an old, old man.

"You've been afraid of this for years," I said.

He nodded dumbly.

Silence hung between us, a long and empty silence and looking at the man, I felt sorry for him.

"Afraid of it," he said, "for two reasons. But I guess it doesn't matter any more. I've failed. There is no cure. There was just one hope left and that has failed—"

I paced swiftly across the room.

"Look," I shot at him, "are you

actually admitting that you are Dr. Anderson?"

He looked at me. "Why not?"

I stammered a little. "I thought you would put up a fight."

"There's no use of fighting any more," he said. "Two hundred years is too long for any man to live. Especially when he fails year after year at the goal he has set himself."

"Dr. Anderson," I said, half speaking to myself, half to him. Dr. Brown and now Dr. Vincent."

He smiled faintly. "All three of them. It was easily arranged. I built the sanitarium, I owned it. I was accountable to no one. I named my successor and my successor named his successor. Why should the world wonder? The men who were named were men from the laboratory in this place. Obscure men, of course, but men familiar with the work."

He smiled wanly at me. "Clever?"

"But the staff?" I asked.

"Except at first, there has been none. Just myself and the patients and the robots. The robots don't talk, the patients die."

He drummed his fingers on the desk. "And who are you?"

I took a long breath. "Sherm Marshall of the Solar Press."

"And you want a story?"

I nodded, fearful of what would happen next.

And the thing that happened was the last thing I expected.

"Sit down," he said. "Since you are here, you may as well know what has been going on."

"That's swell of you, doctor," I said, waiting for the lightning to strike.

No lightning struck.

"Have you ever kept a thing bottled up inside yourself so long you wanted to shriek?" he asked. "Have you ever ached to tell something that you knew and still you couldn't tell it?"

I nodded.

"That's me," said Dr. Anderson.

He sat silent so long I thought he had forgotten me, but finally he went on.

"I CAME HERE with a theory that the radiations thrown out by the Sun, properly screened for selectivity, would have a curative effect upon the victims of space sickness. It worked, to an extent. It alleviated the malady, but it was not a cure. It didn't go far enough. It gave a few added months, in some cases a few added years, of life, but that was all. I knew that I had failed.

It was about the time I came to this realization that old Eli stumbled in. His car had broken down, his spacesuit was down to the last half-hour of oxygen. With him he had some peculiar salts—a queer earth such as he had never seen before. He had only a sample. I offered to analyze it for him and he left it. Quite by accident I discovered its properties.

"At about the time a very close friend of mine was brought here with the sickness. It was then that the full force of my failure was brought home to me. I knew my friend would die despite all that I could do. But he had hopes that I could save him—and that only made it worse."

He stopped and stared at something on the opposite wall, but there was nothing there.

So I reminded him: "These salts of Eli's. They prolonged life?"

It was as if something had struck him with a whip. He started and then settled back.

"Yes, they do," he said. "The extent of their possibilities I cannot

say. I can tell you roughly what they do, but I don't understand just how—

"Perhaps we had better start at the beginning.

"If one is too accept the hypothesis that death is the result of the final hydrolysis of the proteins in the protoplasm, then it would seem reasonable that anything which would arrest hydrolysis or would catalyze resynthesis of the proteins would hold death at bay.

"The salts apparently do this, but whether they merely arrest the process of hydrolysis, preventing one from growing older, or whether they completely resynthesize a portion of the original proteins contained in the protoplasm I cannot even guess.

"If resynthesis actually does occur, then one might speculate upon the possibility that a larger dosage, by resynthesizing all or nearly all of the proteins would cause a man to grow younger instead of merely stopping him from growing older."

He smiled. "I never experimented. I was satisfied with arresting old age."

I didn't say a thing. I almost held my breath. It seemed incredible the man could be sitting there, telling me that story. There was something wrong. Either he was wacky or I was batty—or maybe both.

I wanted to pinch myself to make sure it wasn't all a dream, because, if it wasn't, here was the biggest story the world had ever read.

Here was the sort of thing Ponce de Leon, the old Earth explorer, had dreamed about. Here, in hard truth, was an age-old myth that had echoed down the world for ages.

He was quiet so long that I finally spoke. "So you took some of the salts. Possibly so you could continue your work?"

"That's it," he said. "I talked it over with my friend, the one who expected me to help him—the one I knew I couldn't help.

"He understood and agreed to do his part. I was to prolong my life so I could continue with my work. He was to continue his so I could use him as a subject for experiments. It wasn't an easy decision for him to make, for it meant years of torturing illness. The salts seemed to help him to some extent, perhaps repairing some of the ravages of the disease and for a while we thought they might be the cure. But they failed us, too. He lived—it's true—but he wasn't cured."

"But why was it necessary to continue his life?" I asked. "Necessary for the experiments, I mean. Certainly you had plenty of other patients to experiment upon."

"They died too fast," said Anderson. "A few months, a few years at the most. I needed long range observation."

He matched fingertips, speaking solwly, as if choosing his words with care.

"PERHAPS you wonder why I did not pass my work along, why I did not select someone else and train them so they could pick up where I left off. Maybe that would have been the best. I've often blamed myself for not doing it instead of this. But my research had become an obsession. It wasn't all pride or scientific ardor. There was the human angle to it, too. No man could have seen those poor devils, doomed, without a single chance, and not wanted to do something for them. They weren't just patients. They were human beings, crying for someone to do something—and no one had. I tried to—God knows how I tried.

"I was afraid, you see, that someone else, no matter how carefully selected, might not be able to carry on with the singleness of purpose that seemed necessary—that somewhere along the way they might falter, might get sick of the job. That couldn't be, that was the one thing that simply could not happen. Someone at least had to keep on trying to help those men for whom there was no help."

"So you killed yourself off," I said. "You let yourself be buried. You saw the stele erected in your honor. You became Dr. Brown and later Dr. Vincent. And yet, when I called you Dr. Anderson you answered."

"I've always been Anderson," he said. "The robots, of course, call me by the name I go by at the moment, but my friend who has stood by be all these years always calls me Anderson."

He grimaced. "He never could get used to my other names."

"And Eli?"

"Eli was easy to manage. I made him believe he had a malignant ailment, cautioned him he must come here at regular intervals for injections. The injections, of course, were his own salts. They have to be taken at intervals. After a time the hydrolysis would reach a point where it was necessary to set the catalytic action back to work again.

He rose from the desk and paced up and down the room.

"But now Eli is dead. And I have failed. And someone else knows about the salts."

He stopped in front of me.

"Do you realize what the knowledge of the salts will do the Solar System?" he demanded. "Can you see what I have feared all these years?"

"What are you talking about?" I asked. "The salts would be the greatest blessing the world has ever known—"

He stared at me.

"Greatest blessing, did you say?" he whispered.

His fists clenched and unclenched by his side.

"They would be the greatest curse that could fall on mankind. Can you see what men would do to get them? No crime too foul, no treachery too great. Can you imagine what those in power would charge for them? Charge in money and service and power? The man who had them would rule the Solar System, for he could hold forth or withdraw the hope of eternal youth, of eternal life.

"Can you even remotely imagine

the economic consequences? Men beggaring themselves for a few more years of life. Life insurance companies crashing as the people grabbed at the hope of living forever. For if a man is to live forever why bother with insurance? And when the insurance companies crashed they would drag others with them—companies that hold their paper—and other companies that— But why go on. Surely you must see.

"Envision the wars that might result. The mad hunt for the magic salts—"

"Wait a minute," I shouted at him. "You're forgetting that the man who killed Eli probably didn't find out where Eli got the salts. He stole the salts that Eli had, but he probably doesn't know—"

"That makes no difference," said Anderson. "No difference at all. Once the System knows such salts exist all hell will break wide open. Mercury will be swamped with men looking for them—"

He stopped his tirade, walked around the desk and sat down.

"I hope you've enjoyed my story, Mr. Marshall."

I gulped at that one. "Enjoyed it! Why, it's the greatest story the System's ever known. They'll give it headlines two feet high. They'll spread it—"

I stopped because I didn't like the look that had crept into his eyes.

"You realize, of course, Mr. Marshall, that you shall never print it."

"Never print it," I yelped. "What did you tell it to me for?"

"I took advantage of you," said Anderson. "I had to tell it to someone. I've had it corked up in me too long. And I needed time."

I gulped again. "Time—"

He nodded. "Time for the robots to take certain measures. By this time they have discovered something is wrong. They are quick at things like that."

He seemed to be laughing at me.

"You'll never leave this place alive," he said.

WE SAT THERE looking at one another. He was smiling. I don't know how I looked. I was mad and plenty scared.

"Don't misunderstand me," he said. "We mustn't be dramatic. I don't mean I am going to kill you. I mean that you will never leave this place. If you try you'll most assuredly be killed. You see, I can't let you go. Not knowing what you know."

"You dirty—" but he stopped me.

"You asked for it," he said.

A door back of the desk opened softly and a ray of light slashed into the room. Through the door I caught the glimpse of a laboratory.

A tall, gaunt man stood in the doorway. His face was pallid above the black lounging robe he wore.

"Anderson—" he began excitedly.

"Why, Ernie," said Anderson. "I didn't expect to see you. We have a guest. Mr. Sherman Marshall. He's staying for a while"—he cast me a sidelong look—"for quite a while," he finished.

"I am glad to know you," Ernie said to me. "Do you, by chance, play whist? Anderson is no good at it. Claims it is old-fashioned—absolutely primitive."

"I don't know a thing about it," I said, "but I'm handy with cards."

"Of course," said Anderson to me, "you must have guessed that Ernie is my partner in crime. Not quite as old as I am but almost. Ernie Hitchcock. Once one of the best captains that ever flew in space."

"I came to tell you," said Hitchcock, speaking to Anderson with the old urgency in his voice, "that there has been a reaction. The kind we were hoping for. I made sure before—"

Anderson's hands grasped at the table.

"A reaction—" he choked. "You mean it . . . really . . . what we were looking for?"

Hitchcock nodded.

Anderson turned to me. "You will excuse us?"

I nodded, not knowing what to say. I was trying to make head and tail of what had happened. What did the tall, gaunt man mean by reaction? Could it mean that a cure had been found, after all these years, for the space sickness? Did it mean that Dr. Anderson, at the moment all seemed lost, had triumphed in this search that had stretched over three lifetimes?

The two went out the door, into the laboratory and I watched them go. Minutes dragged by. I got up and paced around the room. I stared at the book in the shelves, but there was nothing to interest me, mostly medical works.

Knowing it wouldn't do me any good, I went to the door leading into the room where I'd bashed the robot on the head. I opened it and there squarely in front of it, stood a robot with his arms folded across his chest. He looked as if he were just waiting for me to make a break. He said nothing and I said nothing. I simply shut the door.

The radio caught my attention and I wondered if it would work. Anderson had said it hadn't been tuned in for months. Radio reception usually is almost impossible here, but with the new broadcast units put in at New Chicago in the last few months it should be halfway decent, I thought.

I turned it on and the set lighted up and hummed. Swiftly I spun the dial to the New Chicago wave length and the voice of Jimmy Doyle, newscaster, blared out, somewhat disrupted by static, but still intelligible.

Jimmy was just starting his broadcast and what he had to say held me rooted to the spot—

"—still searching for Sherman Marshall, wanted for the murder of Eli Lawrence. A warrant was issued for Marshall's arrest ten hours ago when a canvas bag belonging to the murdered man was found in an alley near the North Wall. Marshall's fingerprints, the police say, were found upon it. A bartender at the Sun Spot, a night club—"

There was a lot more to it, and I listened, but it didn't mean much. The things that mattered were my fingerprints upon the canvas bag in which old Eli had carried his salts and the story the bartender at the Sun Spot had told the police.

Back at New Chicago the cops were in full cry. Intent to hang the murder on someone. Anxious to make a showing because election was near.

And with those fingerprints and the bartender's story it wouldn't be so hard to hang it on me.

Numbly I reached out and snapped off the radio. Covering trials, both in New Chicago and back on Earth, I often had tried to put myself in the defendant's place, had tried to imagine what he was thinking, how he felt.

And now I knew!

I was safe, I knew, for a while, for no one would think of looking for me here. Perhaps even if they did come looking they wouldn't find

me, for Anderson would want to keep me hidden. It would be to his interest to keep me where I couldn't talk.

I thought back over the events immediately preceding and following Eli's death—and I suddenly remembered the sand flask hidden in my dresser drawer. The sand flask with the white spaceship!

THE DOOR to the laboratory opened and Anderson entered the room. He was all smiles and he almost beamed at me.

"I have been thinking," he said. "Perhaps I can let you go."

"What's that?" I yelped.

"I said I was thinking I needn't keep you here."

"But, doc," I protested, "I really want to stay. I think—"

And then I saw it wasn't any good. If he was ready to let me leave, he would be no protection if I stayed.

"But why this sudden switch?" I demanded. "If you let me go, I'll publish the story. Sure as hell, I will."

"I don't think you will," he said. "Because I am trading you another story for it. A bigger story—"

"The cure? You've found the cure?"

He nodded. "There had seemed just one thing left to do. A very dangerous thing and with slight chance of success. If that failed, we feared that we were done. We had then explored every possibility. We had come to the end.

"We tried and failed—or so it seemed. But what had seemed failure was really success. The reaction was slower than we thought, took longer to manifest itself. We know now that we can cure the space sickness."

He was staring at the wall again and there still was nothing there—

"It will take some time," he finally said. "A little time to perfect the method. But I still have a little time . . . a little time . . . enough —"

"But, doctor," I yelled at him, "you must have some salts. You certainly didn't use all that Eli brought you. There is no need to talk of time."

He turned tired eyes to me.

"Yes, I have some salts," he said. "Let me show you—"

He rose and went through the laboratory. I followed him.

From a cabinet above a sink he lifted down a box and opened it.

Inside I saw the crystals.

"Look," said Anderson.

He upended the box, dumped the salts into the sink, reached out and turned the tap. In silence we watched the water wash them down the drain.

"Try and tell that story now," he said. "You'll be laughed out of your profession. There is no evidence. I am the only evidence and I will soon be dead.

"I've waited for this day—for the day when I could pour them down the drain. I've done what I set out to do. I've taken the terror out of space. I've answered the prayers I have seen in the eyes of dying men. No one, even if they knew, and believed, my story, could say now that I had been wrong in doing what I did."

"You forget just one thing, doctor."

"What is that?"

"There still is evidence. Someone stole some salts from Eli."

He blanched at that. I knew he would. In the triumph of the moment he had forgotten it. His hand shook as he put back the box, turned off the water.

And in that instant, I think, I realized what he stood for. I could envision those long lonely years. Facing failure every year, despairing of ever doing what need be done. Keeping within his brain a knowledge that would have brought him greater glory than any man had ever had and yet keeping silent because he knew what his secret would do to the people of the System.

"Look, doctor," I said.

"Yes?"

"About those salts that Eli had. You needn't worry. I know where they are."

"You know where they are?"

"Yes, but I didn't until a minute ago."

He didn't ask the question, but I answered it.

"I'll do what's necessary," I said.

Silently he held out his hand to me.

I KNEW where those salts were, all right. But the problem was to reach them.

I knew, too, who had murdered Eli. But there was no way to prove it. The salts would have furnished the proof, but it was doubtful if any court, any jury would have believed my story. And using them as evidence would have told the world, would have broken faith with Dr. Jennings Anderson.

My first job was to get them.

How I did it I still don't clearly remember. I remember that I came into the west port of the city with a jam of other cars, gambling on the belief the police would be watching outgoing cars, would pay little attention to incoming ones.

Once inside I ran the car into a side street, ducked it into an alley and abandoned it. I remember dodging up alleys, hiding in recessed doorways to avoid passers-by, working nearer and nearer to my apartment house.

Getting into the house was simpler than I thought.

Plain-clothes men were watching the place, but their watch had eased up a bit. After all, what murderer would be crazy enough to come back to a place he knew was being watched?

I waited my chance and took it. I met one man in the hall, but turned to one of the doors, fumbling in my pocket as if for a key, shielding my face from him until he was past.

My own room was unguarded. Probably they figured that it was

impossible for me to slip into the building, so why guard the room?

The place had been ransacked, but nothing, apparently, had been taken.

Swiftly I went to the dresser in the bedroom, pulled out the drawer, lifted out the sand flask. With trembling fingers I pried out the cork, shook out the contents.

There was no mistaking the appearance of the white sand. It wasn't white sand—it was the crystals Eli had shown me at the Sun Spot.

What was it Anderson had said—*"if resynthesis actually does occur a man would grow younger—"*

I hesitated for a moment, but only for a moment. Then I scooped up some of the crystals, put them in my mouth and swallowed. They went down hard—like sand. But they went down. I took some more, just to make sure. I had no way of knowing how many I should take. Then I washed the rest down the bathroom drain.

After that I sat down to wait. I knew it was a dangerous thing to do, but probably it was as safe there in my room as any other place.

Four hours later I walked out of the apartment house, through the lobby, right past Floyd Duncan, SBI chief. He didn't know me. For that matter I hardly knew myself. To all appearances, I was a youth of no more than twenty years.

THE NEWSBOYS began screaming an extra as I neared the Martian *Times* building in Sandebar. I stopped to listen to their shouts.

"Extra!" they bellowed. "Marty Berg Guilty. Marty Berg Guilty of Eli Lawrence Murder."

I shrugged my shoulders. It had taken Duncan plenty of time to crack that one. I grinned as I remembered him sitting in the apartment lobby, never blinking an eyelash as I sauntered past.

In the newsroom I walked up to the city editor's desk.

"What do you want?" a hard-boiled guy barked at me.

"I thought you might need a man."

"Can you write?"

I nodded.

"Experience?"

I rattled off the story I had all fixed up.

"What the hell are you doing on Mars?" he demanded. "This isn't any fit place for a man to live."

"Bumming around," I told him. "Seeing the System."

He made doodles on a sheet of paper.

"I'll try you out," he said. "I like your looks. Remind me of someone. Someone I met." He shook his head. "Can't place him."

But I had placed him. He was Herb North. I'd met him once, years before, at a press convention. We'd gone on a bat together.

"Ever hear of a guy named Chesty Lewis?" he asked.

"Read about him. New York gangster, isn't he?"

"He used to be in New York," said North, "but he lammed out here a few months ago. He's coming up for trial this morning. That will be your first job. Funny case. Seems he took an old bird for about a billion bucks. Told the old sucker he had some stuff that would make him young again. But it didn't and so—we have a trial."

I nodded. I knew all about it.

Chesty Lewis had sold Andrew J. Rasmussen, Mars utility magnate, a small bottle of white sand—the kind that comes in those picture flasks they sell to tourists out on Mercury.

THE END

THE SEESAW

By A. E. van Vogt

Action and reaction must be equal—even in Time. And one man, if he's hurled far enough, can save a civilization—

Illustrated by Schneeman

MAGICIAN BELIEVED TO HAVE HYPNOTIZED CROWD!

June 11, 1941—Police and newspapermen believe that Middle City will shortly be advertised as the next stopping place of a master magician, and they are prepared to extend him a hearty welcome if he will condescend to explain exactly how he fooled hundreds of people into believing they saw a strange building, apparently a kind of gunshop.

The building appeared to appear on the space formerly, and still, occupied by Aunt Sally's Lunch and Patterson Tailors. Only employees were inside the two aforementioned shops, and none noticed any untoward event. A large, brightly shining sign featured the front of the gunshop, which had been so miraculously conjured out of nothingness; and the sign constituted the first evidence that the entire scene was nothing but a masterly illusion. For from whichever angle one gazed at it, one seemed to be staring straight at the words, which read:

FINE WEAPONS

THE RIGHT TO BUY WEAPONS IS THE RIGHT TO BE FREE

The window display was made up of an assortment of rather curiously shaped guns, rifles as well as small arms; and a glowing sign in the window stated:

THE FINEST ENERGY WEAPONS IN THE KNOWN UNIVERSE

Inspector Clayton of the Investigation Branch, attempted to enter the shop, but the door seemed to be locked; a few moments later, C. J. (Chris) McAllister, reporter of the *Gazette-Bulletin,* tried the door, found that it opened, and entered.

Inspector Clayton attempted to follow him, but discovered that the door was again locked. McAllister emerged after some time, and was seen to be in a dazed condition. All memory of the action had apparently been hypnotized out of him, for he could make no answer to the questions of the police and spectators.

Simultaneous with his reappearance, the strange building vanished as abruptly as it had appeared.

Police state they are baffled as to how the master magician created so detailed an illusion for so long a period before so large a crowd. They are prepared to recommend his show, when it comes, without reservation.

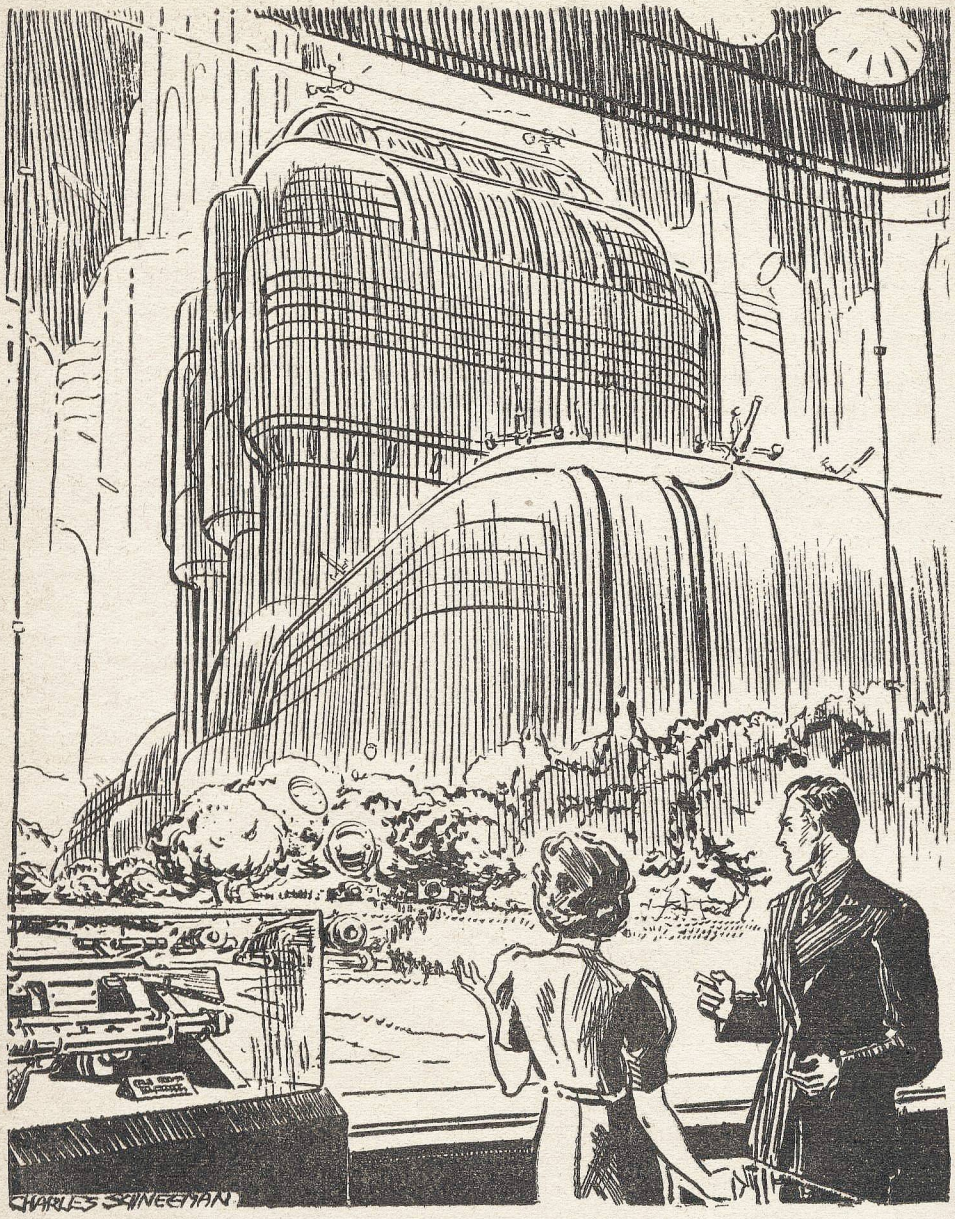
Author's Note: The foregoing account did not mention that the police, dissatisfied with the affair, attempted to contact McAllister for a further interview, but were unable to locate him. Weeks passed; and he was still not to be found.

Herewith follows the story of what happened to McAllister from the instant that he found the door of the gunshop unlocked:

THERE was a curious quality about the gunshop door. It was not so much that it opened at his first touch as that, when he pulled, it came away like a weightless thing. For a bare instant, McAllister had the impression that the knob had freed itself into his palm.

He stood quite still, startled. The thought that came finally had to do with Inspector Clayton, who a minute earlier, had found the door locked.

The thought was like a signal. From behind him boomed the voice of the inspector:



"We of the Gunmaker's Guild are the only defense against the Imperial power—and that is intended to crush us out."

"Ah, McAllister, I'll handle this now."

It was dark inside the shop beyond the door, too dark to see anything, and, somehow, his eyes wouldn't accustom themselves to the intense gloom—

Pure reporter's instinct made him step forward toward the blackness that pressed from beyond the rectan-

gle of door. Out of the corner of one eye, he saw Inspector Clayton's hand reaching for the door handle that his own fingers had let go a moment before; and quite simply he knew that if the police officer could prevent it, no reporter would get inside that building.

His head was still turned, his gaze more on the police inspector than on the darkness in front; and it was as he began another step forward that the remarkable thing happened.

The door handle would not allow Inspector Clayton to touch it. It twisted in some queer way, in some *energy* way, for it was still there, a strange, blurred shape. The door itself, without visible movement, so swift it was, was suddenly touching McAllister's heel.

Light almost weightless was that touch; and then, before he could think or react to what had happened, the momentum of his forward movement had carried him inside.

As he breasted the darkness, there was a sudden, enormous tensing along his nerves. Then the door shut tight, the brief, incredible agony faded. Ahead was a brightly lit shop; behind—were unbelievable things!

For McAllister, the moment that followed was one of blank impression. He stood, body twisted awkwardly, only vaguely conscious of the shop's interior, but tremendously aware in the brief moment before he was interrupted, of what lay beyond the transparent panels of the door through which he had just come.

There was no unyielding blackness anywhere, no Inspector Clayton, no muttering crowd of gaping spectators, no dingy row of shops across the way.

It wasn't even remotely the same street. There was *no* street.

Instead, a peaceful park spread there. Beyond it, brilliant under a noon sun, glowed a city of minarets and stately towers—

From behind him, a husky, musical, woman's voice said:

"You will be wanting a gun?"

McAllister turned. It wasn't that he was ready to stop feasting his eyes on the vision of the city. The movement was automatic reaction to a sound. And because the whole affair was still like a dream, the city scene faded almost instantly; his mind focused on the young woman who was advancing slowly from the rear section of the store.

Briefly, his thought wouldn't come clear. A conviction that he ought to say something was tangled with first impressions of the girl's appearance. She had a slender, well-shaped body; her face was creased into a pleasant smile. She had brown eyes, neat, wavy, brown hair. Her simple frock and sandals seemed so normal at first glance that he gave them no further thought. He was able to say:

"What I can't understand is why the police officer, who tried to follow me, couldn't get in? And where is he now?"

To his surprise, the girl's smile became faintly apologetic: "We know that people consider it silly of us to keep harping on that ancient feud."

Her voice grew firmer: "We even know how clever the propaganda is that stresses the silliness of our stand. Meanwhile, we never allow any of *her* men in here. We continue to take our principles very seriously."

She paused as if she expected dawning comprehension from him, but McAllister saw from the slow puzzlement creeping into her eyes

that his face must look as limp as were the thoughts behind it.

Her men! The girl had spoken the words as if she was referring to some personage, and in direct reply to his use of the word, police officer. That meant *her* men, whoever she was, were policemen; and they weren't allowed in this gunshop. So the door was hostile, and wouldn't admit them.

A STRANGE emptiness struck into McAllister's mind, matching the hollowness that was beginning to afflict the pit of his stomach, a sense of unplumbed depths, the first, staggering conviction that all was not as it should be. The girl was speaking in a sharper tone:

"You mean you know nothing of all this, that for generations the gunmaker's guild has existed in this age of devastating energies as the common man's only protection against enslavement. The right to buy guns—"

She stopped again, her narrowed eyes searching him; then: "Come to think of it, there's something very illogical about you. Your outlandish clothes—you're not from the northern farm plains, are you?"

He shook his head dumbly, more annoyed with his reactions every passing second. But he couldn't help it. A tightness was growing in him, becoming more unbearable instant by instant, as if somewhere a vital mainspring was being wound to the breaking point.

The young woman went on more swiftly: "And come to think of it, it is astounding that a policeman should have tried the door, and there was no alarm."

Her hand moved; metal flashed in it, metal as bright as steel in blinding sunlight. There was not the faintest hint of the apologetic in her voice as she said:

"You will stay where you are, sir, till I have called my father. In our business, with our responsibility, we never take chances. Something is very wrong here."

Curiously, it was at that point that McAllister's mind began to function clearly; the thought that came paralleled hers: How had this gunshop appeared on a 1941 street? How had he come here into this fantastic world?

Something was very wrong indeed!

IT WAS the gun that held his attention. A tiny thing it was, shaped like a pistol, but with three cubes projecting in a little half circle from the top of the slightly bulbous firing chamber.

And as he stared, his mind began to quiver on its base; for that wicked little instrument, glittering there in her browned fingers, was as real as she herself.

"Good Heaven!" he whispered. "What the devil kind of gun is it. Lower that thing and let's try to find out what all this is about."

She seemed not to be listening; and abruptly he noticed that her gaze was flicking to a point on the wall somewhat to his left. He followed her look—in time to see seven miniature white lights flash on.

Curious lights! Briefly, he was fascinated by the play of light and shade, the waxing and waning from one tiny globe to the next, a rippling movement of infinitesimal increments and decrements, an incredibly delicate effect of instantaneous reaction to some supersensitive barometer.

The lights steadied; his gaze reverted to the girl. To his surprise, she was putting away her gun. She must have noticed his expression.

"It's all right," she said coolly. "The automatics are on you now. If we're wrong about you, we'll be glad to apologize. Meanwhile, if you're still interested in buying a gun, I'll be happy to demonstrate."

So the automatics were on him, McAllister thought ironically. He felt no relief at the information. Whatever the automatics were, they wouldn't be working in his favor; and the fact that the young woman could put away her gun in spite of her suspicions, spoke volumes for the efficiency of the new watchdogs.

There was absolutely nothing he could do but play out this increasingly grim and inexplicable farce. Either he was mad, or else he was no longer on Earth, at least not the Earth of 1941—which was utter nonsense.

He'd have to get out of this place, of course. Meanwhile, the girl was assuming that a man who came into a gunshop would, under ordinary circumstances, want to buy a gun.

IT STRUCK him, suddenly, that, of all the things he could think of, what he most wanted to see was one of those strange guns. There were implications of incredible things in the very shape of the instruments. Aloud he said:

"Yes, by all means show me."

Another thought occurred to him. He added: "I have no doubt your father is somewhere in the background making some sort of study of me."

The young woman made no move to lead him anywhere. Her eyes were dark pools of puzzlement, staring at him.

"You may not realize it," she said finally, slowly, "but you have already upset our entire establishment. The lights of the automatics should have gone on the moment father pressed the buttons, as he did when I called to him. They didn't! That's unnatural, that's alien.

"And yet"—her frown deepened—"if you were one of them, how did you get through that door? Is it possible that *her* scientists have discovered human beings who do not affect the sensitive energies? And that you are but one of many such, sent as an experiment to determine whether or not entrance could be gained.

"Yet that doesn't make logic, either.

"If they had even a hope of success, they would not risk so lightly the chance of an overwhelming surprise. Instead you would be the entering wedge of an attack on a vast scale. She is ruthless, she's brilliant; and she craves all power during her lifetime over poor saps like you who have no more sense than to worship her amazing beauty and the splendor of the Imperial Court."

The young woman paused, with the faintest of smiles. "There I go again, off on a political speech. But you can see that there are at least a few reasons why we should be careful about you."

There was a chair over in one corner; McAllister started for it. His mind was calmer, cooler.

"Look," he began, "I don't know what you're talking about. I don't even know how I came to be in this shop. I agree with you that the whole thing requires explanation, but I mean that differently than you do. In fact—"

His voice trailed. He had been half lowered over the chair, but instead of sinking into it, he came erect like an old, old man. His eyes fixed on lettering that shone above a glass case of guns behind her. He said hoarsely:

"Is that—a calendar?"

She followed his gaze, puzzled: "Yes, it's June 3rd. What's wrong?"

"I don't mean that. I mean—" He caught himself with a horrible effort. "I mean those figures above that. I mean—what year is this?"

The girl looked surprised. She started to say something, then stopped and backed away. Finally: "Don't look like that! There's nothing wrong. This is eighty-four of the four thousand seven hundredth year of the Imperial House of the Isher. It's quite all right."

THERE WAS no real feeling in him. Quite deliberately, he sat down, and the conscious wonder came: exactly how *should* he feel?

Not even surprise came to his aid. Quite simply, the whole pattern of events began to make a sort of distorted logic.

The building front superimposed on those two 1941 shops; the way the door had acted; the great exterior sign with its odd linking of freedom with the right to buy weapons; the actual display of weapons in the window, *the finest energy weapons in the known universe!*

He grew aware that minutes had passed while he sat there in slow, dumb thought. And that the girl was talking earnestly with a tall, gray-haired man who was standing on the open threshold of the door through which she had originally come.

There was an odd, straining tenseness in the way they were talking. Their low-spoken words made a curious blur of sound in his ears, strangely unsettling in effect—McAllister could not quite analyze the meaning of it until the girl turned; and, in a voice dark with urgency, said:

"Mr. McAllister, my father wants to know what year you're from!"

Briefly, the sense of the sentence was overshadowed by that stark urgency; then:

"Huh!" said McAllister. "Do you mean that you're responsible for—And how the devil did you know my name?"

The older man shook his head. "No, we're not responsible." His voice quickened, but lost none of its gravity. "There's no time to explain. What has happened is what we gunmakers have feared for generations: that sooner or later would come one who lusted for unlimited power; and who, to attain tyranny, must necessarily seek first to destroy us.

"Your presence here is a manifestation of the energy force that she has turned against us—something so new that we did not even suspect it was being used against us. But now—I have no time to waste. Get all the information you can, Lystra, and warn him of his own personal danger."

The man turned. The door closed noiselessly behind his tall figure.

MCALLISTER asked: "What did he mean—personal danger?"

He saw the girl's brown eyes were uneasy as they rested on him.

"It's hard to explain," she began in an uncomfortable voice. "First of all, come to the window, and I'll try to make everything clear. It's all very confusing to you, I suppose."

McAllister drew a deep breath. "Now, we're getting somewhere."

His alarm was gone. The older man seemed to know what it was all about; that meant there should be no difficulty getting home again. As for all this danger to the gunmakers guild, that was their worry, not his. Meanwhile—

He stepped forward, closer to the girl. To his amazement, she cringed

away as if he had struck at her.

As he stared blankly, she turned, and laughed a humorless, uncertain laugh; finally she breathed:

"Don't think I'm being silly, don't be offended—but for your life's sake, don't touch any human body you might come into contact with."

McAllister was conscious of a chill. It struck him with a sudden, sharp dismay that the expression of uneasiness in the girl's face was—fear!

His own fear fled before a wave of impatience. He controlled himself with an effort.

"Now, look," he began. "I want to get things clear. We can talk here without danger, providing I don't touch you, or come near you. Is that straight?"

She nodded. "The floor, the walls, every piece of furniture, in fact the entire shop is made of perfect non-conducting material."

McAllister had a sudden sense of being balanced on a tight rope over a bottomless abyss. The way this girl could imply danger without making clear what the danger was, almost petrified him.

He forced calm into his mind. "Let's start," he said, "at the beginning. How did you and your father know my name, and that I was not of"—he paused before the odd phrase, then went on—"of this time?"

"Father X-rayed you," the girl said, her voice as stiff as her body. "He X-rayed the contents of your pockets. That was how he first found out what was the matter. You see, the X-rays themselves became carriers of the energy with which you're charged. That's what was the matter; that's why the automatics wouldn't focus on you, and—"

"Just a minute!" said McAllister. His brain was a spinning world. "Energy—charged?"

The girl was staring at him. "Don't you understand?" she gasped. "You've come across five thousand years of time; and of all the energies in the universe, time is the most potent. You're charged with trillions of trillions of time-energy units. If you should step outside this shop, you'd blow up this city of the Isher and half a hundred miles of land beyond.

"You"—she finished on an unsteady, upward surge of her voice—"you could conceivably destroy the Earth!"

HE HADN'T NOTICED the mirror before; funny, too, because it was large enough, at least eight feet high, and directly in front of him on the wall where, a minute before—he could have sworn—had been solid metal.

"Look at yourself," the girl was saying soothingly. "There's nothing so steadying as one's own image. Actually, your body is taking the mental shock very well."

It was! He stared in dimly gathering surprise at his image. There was a paleness in the lean face that stared back at him; but the body was not actually shaking as the whirling in his mind had suggested.

He grew aware again of the girl. She was standing with a finger on one of a series of wall switches. Abruptly, he felt better.

"Thank you," he said quietly. "I certainly needed that."

She smiled encouragingly; and he was able now to be amazed at her conflicting personality. There had been on the one hand her complete inability a few minutes earlier to get to the point of his danger, a distinct incapacity for explaining things with words; yet obviously her action with the mirror showed a keen understanding of human psychology. He said:

"The problem now is, from your point of view, to circumvent this—Isher—woman, and to get me back to 1941 before I blow up the Earth of . . . of whatever year this is."

The girl nodded. "Father says that you can be sent back, but—as for the rest: watch!"

He had no time for relief at the knowledge that he could be returned to his own time. She pressed another button. Instantly, the mirror was gone into metallic wall. Another button clicked—and the wall vanished.

Literally vanished. Before him stretched a park similar to the one he had already seen through the front door—obviously an extension of the same, gardenlike vista. Trees were there, and flowers, and green, green grass in the sun.

There was also the city again, nearer from this side, but not so pretty, immeasurably grimmer.

One vast building, as high as it was long, massively dark against the sky, dominated the entire horizon. It was a good quarter mile away; and incredibly it was at least that long and that high.

Neither near that monstrous building, nor in the park was a living person visible. Everywhere was evidence of man's dynamic labor—but no men, not a movement; even the trees stood motionless in that strangely breathless sunlit day.

"Watch!" said the girl again, more softly.

There was no click this time. She made an adjustment on one of the buttons; and suddenly the view was no longer so clear. It wasn't that the sun had dimmed its bright intensity. It wasn't even that glass was visible where a moment before there had been nothing.

There was still no apparent substance between them and that gemlike park. But—

The park was no longer deserted!

Scores of men and machines swarmed out there. McAllister stared in frank amazement; and then as the sense of illusion faded, and the dark menace of those men penetrated, his emotion changed to dismay.

"Why," he said at last, "those men are soldiers, and the machines are—"

"Energy guns!" she said. "That's always been their problem: how to get their weapons close enough to our shops to destroy us. It isn't that the guns are not powerful over a very great distance. Even the rifles we sell can kill unprotected life over a distance of miles; but our gunshops are so heavily fortified that, to destroy us, they must use their biggest cannon at point-blank range.

"In the past, they could never do that because we own the surrounding park; and our alarm system was perfect—until now. The new energy they're using affects none of our protective instruments; and—what is infinitely worse—affords them a perfect shield against our own guns. Invisibility, of course, has long been known; but if you hadn't come, we would have been destroyed without ever knowing what happened."

"But," McAllister exclaimed sharply, "what are you going to do? They're still out there, working—"

Her brown eyes burned with a fierce, yellow flame. "Where do you think father is?" she asked. "He's warned the guild; and every member has now discovered that similar invisible guns are being set up outside his place by invisible men. Every member is working at top speed for some solution. They haven't found it yet."

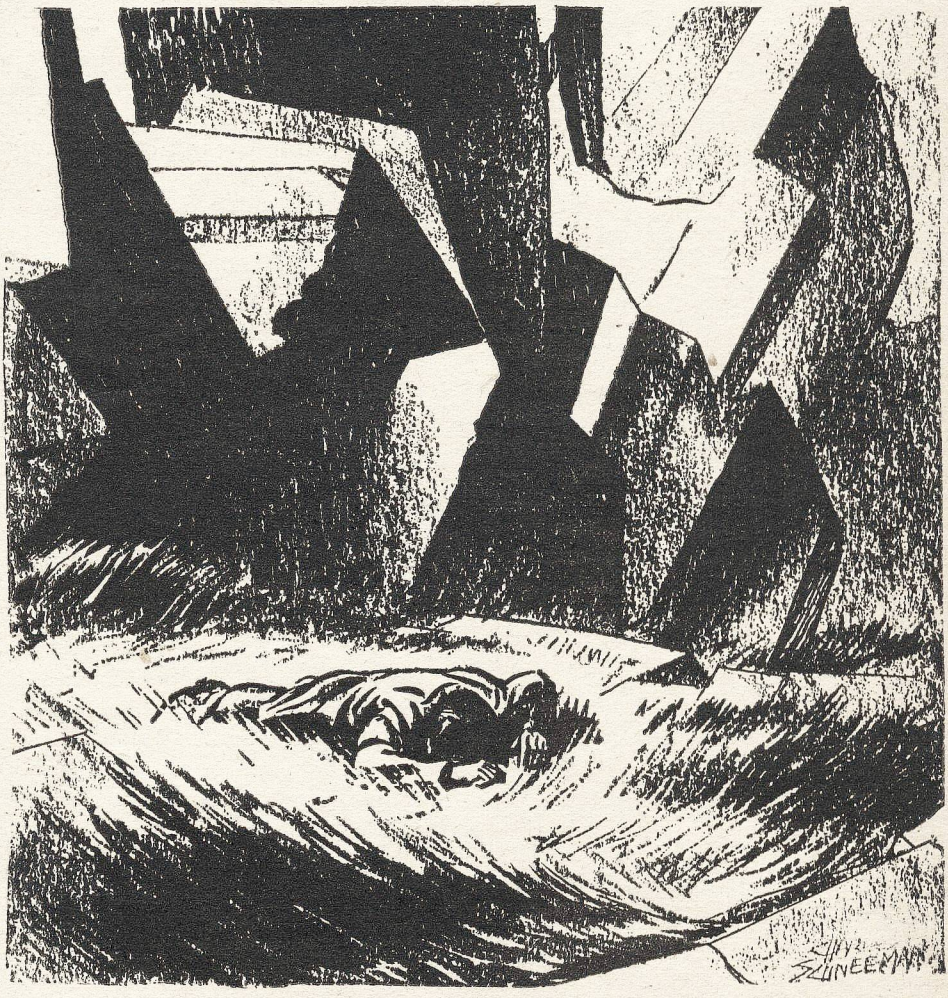
She finished quietly: "I thought I'd tell you."

McAllister cleared his throat, parted his lips to speak—then closed them as he realized that no words were even near his lips. Fascinated he watched the soldiers connecting what must have been invisible cables that led to the vast building in the background: foot-thick cables that told of the titanic power that was to be unleashed on the tiny weapon shop.

There was actually nothing to be said. The deadly reality out there overshadowed all conceivable sentences and phrases. Of all the people here, he was the most useless, his opinion the least worth while.

Oddly, he must have spoken aloud, but he did not realize that until the familiar voice of the girl's father came from one side of him. The older man said:

"You're quite mistaken, McAllister. Of all the people here you are the *most* valuable. Through you, we discovered that the Isher



He lay helpless on the grass, waiting for the next awful swing of the seesaw of Time.

were actually attacking us. Furthermore, our enemies do not know of your existence, therefore have not yet realized the full effect produced by the new blanketing energy they have used.

"You, accordingly, constitute the unknown factor—our only hope, for the time left to us is incredibly short. Unless we can make immediate use of the unknown quantity you represent, all is lost!"

The man looked older, McAllister thought; there were lines of strain in his lean, sallow face as he turned toward his daughter; and his voice, when he spoke, was edged with harshness:

"Lystra, No. 7!"

As the girl's fingers touched the seventh button, her father explained swiftly to McAllister:

"The guild supreme council is holding an immediate emergency session. We must choose the most likely method of attacking the problem, and concentrate individually and collectively on that method Regional conversations are already in progress, but only one important idea has been put forward as yet and . . . ah, gentlemen!"

He spoke past McAllister, who turned with a start, then froze.

Men were coming out of the solid wall, lightly, easily, as if it were a door, and they were stepping across a threshold. One, two, three—twelve.

They were grim-faced men, all except one who glanced at McAllister, started to walk past, then stopped with a half-amused smile.

"Don't look so blank. How else do you think we could have survived these many years if we hadn't been able to transmit material objects through space? The Isher police have always been only too eager to blockade our sources of supply. Incidentally, my name is Cadron—Peter Cadron!"

McAllister nodded in a perfunctory manner. He was no longer genuinely impressed by the new machines. Here were the end-products of the machine age; science and invention so stupendously advanced that men made scarcely a move that did not affect, or was affected by, a machine. He grew aware that a heavy-faced man near him was about to speak. The man began:

"We have gathered here because it is obvious that the source of the new energy is the great building just outside this shop—"

He motioned toward the wall where the mirror had been a few minutes previously, and the window through which McAllister had gazed at the monstrous structure in question. The speaker went on:

"We've known, ever since that building was completed five years ago, that it was a power building aimed against us; and now from it new energy has flown out to engulf the world, immensely potent energy, so strong that it broke the very tensions of time, fortunately only at this nearest gunshop. Apparently, it weakens when transmitted over distance. It—"

"Look, Dresley!" came a curt interruption from a small, thin man, "what good is all this preamble? You have been examining the various plans put forward by regional groups. Is there, or isn't there, a decent one among them?"

Dresley hesitated. To McAllister's surprise, the man's eyes fixed doubtfully on him, his heavy face worked for a moment, then hardened.

"Yes, there is a method, but it depends on compelling our friend from the past to take a great risk. You all know what I'm referring to.

It will gain us the time we need so desperately."

"Eh!" said McAllister, and stood stunned as all eyes turned to stare at him.

THE SECONDS fled; and it struck McAllister that what he really needed again was the mirror—to prove to him that his body was putting up a good front. Something, he thought, something to steady him.

His gaze flicked over the faces of the men. The gunmakers made a curious, confusing pattern in the way they sat, or stood, or leaned against glass cases of shining guns; and there seemed to be fewer than he had previously counted. One, two—ten, including the girl. He could have sworn there had been fourteen.

His eyes moved on, just in time to see the door of the back room closing. Four of the men had obviously gone to the laboratory or whatever lay beyond that door. Satisfied, he forgot them.

Still, he felt unsettled; and briefly his eyes were held by the purely mechanical wonder of this shop, here in this vastly future world, a shop that was an intricate machine in itself and—

He discovered that he was lighting a cigarette; and abruptly realized that that was what he needed most. The first puff tingled deliciously along his nerves. His mind grew calm; his eyes played thoughtfully over the faces before him. He said:

"I can't understand how any one of you could even think of compulsion. According to you, I'm loaded with energy. I may be wrong, but if any of you should try to thrust me back down the chute of time, or even touch me, that energy in me would do devastating things—"

"You're damned right!" chimed in a young man. He barked irritably at Dresley: "How the devil did you ever come to make such a psychological blunder? You know that McAllister will have to do as we want, to save himself; and he'll have to do it fast!"

Dresley grunted under the sharp attack. "Hell," he said, "the truth is we have no time to waste, and I just figured there wasn't time to explain, and that he might scare easily. I see, however, that we're dealing with an intelligent man."

McAllister's eyes narrowed over the group. There was something phony here. They were talking too much, wasting the very time they needed, as if they were marking time, waiting for something to happen. He said sharply:

"And don't give me any soft soap about being intelligent. You fellows are sweating blood. You'd shoot your own grandmothers and trick me into the bargain, because the world you think right is at stake. What's this plan of yours that you were going to compel me to participate in?"

It was the young man who replied: "You are to be given insulated clothes and sent back into your own time—"

He paused. McAllister said: "That sounds O. K., so far. What's the catch?"

"There is no catch!"

McAllister stared. "Now, look here," he began, "don't give me any of that. If it's as simple as that, how the devil am I going to be helping you against the Isher energy?"

The young man scowled blackly at Dresley: "You see," he said to the other, "you've made him suspicious with that talk of yours about compulsion."

He faced McAllister. "What we

have in mind is an application of a sort of an energy lever and fulcrum principle. You are to be 'weight' at the long end of a kind of energy 'crowbar,' which lifts the greater 'weight' at the short end. You will go back five thousand years in time; the machine in the great building to which your body is tuned, and which has caused all this trouble, will move ahead in time about two weeks."

"In that way," interrupted another man before McAllister could speak, "we shall have time to find a counter agent. There must be a solution, else our enemies would not have acted so secretly. Well, what do you think?"

McAllister walked slowly over to the chair that he had occupied previously. His mind was turning at furious speed, but he knew with a grim foreboding that he hadn't a fraction of the technical knowledge necessary to safeguard his interest. He said slowly:

"As I see it, this is supposed to work something like a pump handle. The lever principle, the old idea that if you had a lever long enough, and a suitable fulcrum, you could move the Earth out of its orbit."

"Exactly!" It was the heavy-faced Dresley who spoke. "Only this works in time. You go five thousand years, the building goes a few wee—"

His voice faded, his eagerness drained from him as he caught the expression in McAllister's face.

"Look!" said McAllister, "there's nothing more pitiful than a bunch of honest men engaged in their first act of dishonesty. You're strong men, the intellectual type, who've spent your lives inforcing an idealistic conception. You've always told yourself that if the occasion should ever require it, you would not hesitate to make drastic sacrifices. But you're not fooling anybody. *What's the catch?*"

It was quite startling to have the suit thrust at him. He hadn't observed the men emerge from the back room; and it came as a distinct shock to realize that they had actually gone for the insulated clothes before they could have known that he would use them.

McAllister stared grimly at Peter Cadron, who held the dull, grayish, limp thing toward him. A very flame of abrupt rage held him choked; before he could speak, Cadron said in a tight voice:

"Get into this, and get going! It's a matter of minutes, man! When those guns out there start spraying energy, you won't be alive to argue about our honesty."

Still he hesitated; the room seemed insufferably hot; and he was sick—sick with the deadly uncertainty. Perspiration streaked stingingly down his cheeks. His frantic gaze fell on the girl, standing silent and subdued in the background, near the front door.

He strode toward her; and either his glare or presence was incredibly frightening, for she cringed and turned white as a sheet.

"Look!" he said. "I'm in this as deep as hell. What's the risk in this thing? I've got to feel that I have some chance. Tell me, what's the catch?"

The girl was gray now, almost as gray and dead-looking as the suit Peter Cadron was holding. "It's the friction," she mumbled finally, "you may not get all the way back to 1941. You see, you'll be a sort of 'weight' and—"

McAllister whirled away from her. He climbed into the soft, almost flimsy suit, crowding the overall-like shape over his neatly pressed clothes.

"It comes tight over the head, doesn't it?" he asked.

"Yes!" It was Lystra's father who answered. "As soon as you pull that zipper shut, the suit will become completely invisible. To outsiders, it will seem just as if you have your ordinary clothes on. The suit is fully equipped. You could live on the Moon inside it."

"What I don't get," complained McAllister, "is why I have to wear it. I got here all right without it."

He frowned. His words had been automatic, but abruptly a thought came: "Just a minute. What becomes of the energy with which I'm charged when I'm bottled up in this insulation?"

He saw by the stiffening expressions of those around him that he had touched on a vast subject.

"So that's it!" he snapped. "The insulation is to prevent me losing any of that energy. That's how it can make a 'weight.' I have no doubt there is a connection from this suit to that other machine. Well, it's not too late. It's—"

With a desperate twist, he tried to jerk aside, to evade the clutching hands of the four men who leaped at him. Hopeless movement. They had him instantly; and their grips on him were strong beyond his power to break. The fingers of Peter Cadron jerked the zipper tight, and Peter Cadron said:

"Sorry, but when we went into that back room, we also dressed in insulated clothing. That's why you couldn't hurt us. Sorry, again!

"And remember this: There's no certainty that you are being sacrificed. The fact that there is no crater in *our* Earth proves that you did not explode in the past, and that you solved the problem in some other way. *Now, somebody open the door, quick!*"

Irresistibly, he was carried forward. And then—

"Wait!"

IT WAS the girl. The colorless gray in her face was a livid thing. Her eyes glittered like dark jewels; and in her fingers was the tiny, mirror-bright gun she had pointed in the beginning at McAllister.

The little group hustling McAllister stopped as if they had been struck. He was scarcely aware; for him there was only the girl, and the way the muscles of her lips were working, and the way her voice suddenly flamed:

"This is utter outrage. Are we such cowards—is it possible that the spirit of liberty can survive only through a shoddy act of murder and gross defiance of the rights of the individual? I say no! Mr. McAllister must have the protection of the hypnotism treatment, even if we die during the wasted minutes."

"Lystra!" It was her father; and McAllister realized in the swift movement of the older man, what a brilliant mind was there; and how quickly the older man grasped every aspect of the situation.

He stepped forward, and took the gun from his daughter's fingers—the only man in the room, McAllister thought flashingly, who could dare approach her in that moment with the certainty she would not fire. For hysteria was in every line of her face; and the racking tears that followed showed how dangerous her stand might have been against the others.

Strangely, not for a moment had hope come. The entire action seemed divorced from his life and his thought; there was only the observation of it. He stood there for a seeming eternity, and, when emotion finally came, it was surprise that he was not being hustled to his doom.

With the surprise came awareness that Peter Cadron had let go his arm, and stepped clear of him.

The man's eyes were calm, his head held proudly erect; he said:

"Your daughter is right, sir. At this point we rise above our petty fears, and we say to this unhappy young man: 'Have courage! You will not be forgotten. We can guarantee nothing, cannot even state exactly what will happen to you. But we say: if it lies in our power to help you, that help you shall have.' And now—we must protect you from the devastating psychological pressures that would otherwise destroy you, simply but effectively."

Too late, McAllister noticed that the others had turned faces away from that extraordinary wall—the wall that had already displayed so vast a versatility. He did not even see who pressed the activating button for what followed.

There was a flash of dazzling light. For an instant he felt as if his mind had been laid bare; and against that nakedness the voice of Peter Cadron pressed like some ineradicable engraving stamp:

"To retain your self-control and your sanity—this is your hope: this you will do in spite of everything! And, for your sake, speak of your experience only to scientists or to those in authority whom you feel will understand and help. Good luck!"

So strong remained the effect of that brief flaring light that he felt only vaguely the touch of their hands on him, propelling him. He must have fallen, but there was no pain—

He grew aware that he was lying on a sidewalk. The deep, familiar voice of Police Inspector Clayton boomed over him:

"Clear the way; no crowding now!"

McAllister climbed to his feet. A pall of curious faces gawked at him; and there was no park, no gorgeous city. Instead, a bleak row of one-story shops made a dull pattern on either side of the street.

He'd have to get away from here. These people didn't understand. Somewhere on Earth must be a scientist who could help him. After all, the record was that he hadn't exploded. Therefore, somewhere, somehow—

He mumbled answers at the questions that beat at him; and then he was clear of the disappointed crowd. There followed purposeless minutes of breakneck walk; the streets ahead grew narrower, dirtier—

He stopped, shaken. What was happening?

It was night, in a brilliant, glowing city. He was standing on the boulevard of an avenue that stretched jewellike into remote distance.

A street that lived, flaming with a soft light that gleamed up from its surface—a road of light, like a river flowing under a sun that shone nowhere else, straight and smooth and—

He walked along for uncomprehending minutes, watching the cars that streamed past, strange, dark shapes that streaked past—and wild hope came!

Was this again the age of the Isher and the gunmakers? It could be; it looked right, and it meant they had brought him back. After all, they were not evil, and they would save him if they could. For all he knew, weeks had passed in their time and—

Abruptly, he was in the center of a blinding snowstorm. He staggered from the first, mighty, unexpected blow of that untamed wind, then, bracing himself, fought for mental and physical calm.

The shining, wondrous night city was gone; gone too the glowing road —both vanished, transformed into this deadly, wilderness world.

He peered through the driving snow. It was daylight; and he could make out the dim shadows of trees that reared up through the white mist of blizzard less than fifty feet away.

Instinctively, he pressed toward their shelter, and stood finally out of that blowing, pressing wind.

He thought: One minute in the distant future; the next—where?

There was certainly no city. Only trees, an uninhabited forest and winter—

THE BLIZZARD was gone. And the trees. He stood on a sandy beach; before him stretched a blue, sunlit sea that rippled over broken, white buildings. All around, scattered far into that shallow, lovely sea, far up into the weed-grown hills, were the remnants of a once tremendous city. Over all clung an aura of incredible age; and the silence of the long-dead was broken only by the gentle, timeless lapping of the waves—

Again came that instantaneous change. More prepared this time, he nevertheless sank twice under the surface of the vast, swift river that carried him on and on. It was hard swimming, but the insulated suit was buoyant with the air it manufactured each passing second; and, after a moment, he began to struggle purposely toward the tree-lined shore a hundred feet to his right.

A thought came; and he stopped swimming: "What's the use!"

The truth was as simple as it was terrible. He was being shunted from the past to the future; he was the "weight" on the long end of an energy seesaw; and in some way, he was slipping farther ahead and farther back each time. Only that could explain the catastrophic changes he had already witnessed. In a minute would come another change and—

It came! He was lying face downward on green grass, but there was utterly no curiosity in him. He did not look up, but lay there hour after hour, as the seesaw jerked on: past —future—past—future—

Beyond doubt, the gunmakers had won their respite; for at the far end of this dizzy teeter-totter was the machine that had been used by the Isher soldiers as an activating force; it too teetered up, then down, in a mad seesaw.

There remained the gunmakers' promise to help him, vain now; for they could not know what had happened. They could not find him ever in this maze of time.

There remained the mechanical law that forces must balance.

Somewhere, sometime, a balance would be struck, probably in the future—because there was still the fact that he hadn't exploded in the past. Yes, somewhere would come the balance when he would again face *that* problem. But now—

On, on, on the seesaw flashed; the world on the one hand grew bright with youth, and on the other dark with fantastic age.

Infinity yawned blackly ahead.

Quite suddenly it came to him that he knew where the seesaw would stop. It would end in the very remote past, with the release of the stupendous temporal energy he had been accumulating with each of those monstrous swings.

He would not witness, but he would cause the formation of the planets.

THE END.

The Probable Man

By Alfred Bester

There was no certainty left for him but one—he could never go home!

Illustrated by Kramer

The black car drew alongside, then swerved in front of their roadster. Brakes squealed. David Conn kicked the door open, shouldered the heavy rucksack and grabbed Hilda's wrist.

"Come on!" he said.

The gloom of late afternoon low-

ered as they ran panting across the fields. Conn saw the grass alongside whip, and a fraction of a second later heard the crack of a gun sounding from behind. Hilda gasped.

"They mean business," Conn said.

He twisted his head as they ran. Shapes followed them through the dusk. Five—six—seven. If only he could find cover. But they were running across a broad open lawn that looked like a fairway. Two hundred yards to the left he saw the jet outline of bunkers; a green topped by a fluttering flag.

"This way!" Conn grunted.

Shots sounded again, sharp and clear in the April evening as they tumbled over the edge of the bunker down into a soft sand pit. Conn got the rucksack off his shoulder, turned and squirmed up the side of the pit, facing their pursuers. He slid his gun out and fired at a dim shape. Hilda came up alongside to watch.

"Get down," said Conn. "They want you."

"Alive," said Hilda, "not dead. I won't be any good to them, dead."

"I will," said Conn.

He tried to catch his breath. Beyond pistol range the seven black figures closed to a tight group and consulted. Conn counted cartridges. Two clips. Twelve. It wouldn't be enough. They would wait until it grew a little darker and then rush. He couldn't afford to lose time. He had to get to the machine by eight —and that gave him less than an hour to fight and win an impossible battle.

"Save a bullet for me," said Hilda.

Conn looked at her quickly. The soft blond hair and blue eyes. This, he thought, is downright weird. I fall in love with a girl who died a thousand years before I was born. I look at her full lovely mouth and I want to kiss it, and all the time I know her mouth has been dust and ashes for a thousand years.

"That's stupid talk," Conn said. "You don't know what I can do."

"Maybe you don't know what Nazis can do," Hilda answered. "They'll take me back to Holland. They'll use me for political blackmail. They'll keep me locked up—like Leopold of Belgium. Save a bullet."

The seven forms were still consulting. Conn knew what their big problem was. They were wondering how to avoid killing Hilda in the attack. It was getting black rapidly. Conn sent two slugs their way just to let them know. Then he stole another glance at Hilda. She smiled tremulously.

"I'm thinking that you're beautiful," Conn said.

"You're thinking how sorry you are you ever got mixed up with a refugee," Hilda answered. "You're wishing Prime Minister Pietjen never had a daughter—"

"No," Conn said. He was beginning to lose control of himself at the thought of anyone wanting to hurt Hilda. "It just occurred to me that a thousand years ago our name might have been Cohen. It makes me want to shoot straight."

"A thousand years?" Hilda stared.

"Listen," Conn said. "I haven't had the heart to tell you. I was waiting until the last minute—until I reached the place I'm headed for, up the side of that slope there. Can you guess what I meant when I said —a thousand years?"

"No." Hilda shook her head. "It sounds crazy to me. All I know is that you were in a hurry to get some place when they cut us off. You told me last month you were a reporter from the West coast—"

"Reporter is right, but not from

the coast—" Conn fingered the revolver nervously. "Maybe you won't believe this—"

Hilda nudged his elbow. The forms had separated. He could barely see them. Through the hush of nightfall, he heard the faint squeaks of shoes on dewy grass. Conn waited while his heart thumped.

They would rush from all sides, he thought, and in the night he might get one or two at the most. Then the rest would pick up Hilda. She'd be bound and gagged, and in a month she'd be back in Holland. She wouldn't be his Hilda any more. She'd be Hilda Pietjen, daughter of the prime minister, just another chip in the Nazi poker game. And he'd be dead in the bunker, a thousand years before he'd been born.

A SPIKE of red flame flared and cracked. Conn fired at the flash. It had been a signal. Feet thumped on the turf. Conn thought: What have I got to lose? He got to his knees and scrambled to the lip of the trap, exposing himself. He fired the last shots carefully at the looming shapes, and as the echoes boomed, he rolled down into the pit, fingers groping for the last clip. It seemed to him that floodlights were sparking around him.

A black figure hurtled over the bunker and came down at him. Conn dropped the clip and smashed his empty gun in the man's face. At that moment a second caught him on the flank and bore him down. Grit seared Conn's cheek. He rolled with flailing arms and drove an elbow into the man's neck.

He tried to get to his feet in the shifting sand. The man kicked him heavily in the belly. Conn fell forward, fists pumping toward the jaw. His knuckles glanced across the man's nose. Cartilage squished and the man groaned and slumped. Then Conn's right drove against the jaw. Everything was still.

"No more?" Conn croaked. Hilda helped him up, her eyes distended with fright. Conn repeated: "No more? There ought to be. I couldn't have killed five men with two shots." He examined the surrounding fairway closely. In the glow of the rising moon he saw nothing. The turf looked torn.

"No more," Hilda said. "Oh, darling, I—"

Conn took her in his arms and kissed her. This, he thought, ought to be the last paragraph. Nothing else comes after this but "They lived happily ever after" and then "The End." He nestled his bruised cheek against her silky hair and tried to memorize its scent. At last he pushed Hilda gently away.

"I've got to go now," Conn said. "It's nearing night. This is goodby, Hilda, for a long time. Maybe forever—"

Even in the darkness he could sense the way Hilda stiffened. She stepped back a little, her hand raised to her lips.

"Oh—" she said.

Conn said: "It's not what you think, darling. I love you, but—" Too overwrought to continue, he hunted shakily for his revolver and clip, found them at last and tried to brush out the sand.

"I think we'd better go back to the car," Hilda said.

"No, I'll walk the rest of the way," said Conn. "It's not far to where I'm going—in a sense." He shouldered the heavy rucksack, paused for a instant. Suddenly he grasped Hilda's arms and shook her a little. "You've got to understand," he said. "This is something I must do. I'm

not a free agent— I've got a tremendous responsibility."

"Don't talk," Hilda said. "Excuses don't make it any easier to understand."

"You're not making it any easier," Conn said.

Hilda broke away from him and tried to struggle up the side of the sand pit. Conn helped her up. They stood on the open fairway, feeling the night breeze cool their faces.

"Listen to me a moment," Conn said. He pulled out the keys of his roadster and handed them to her. "This is for the car. It's yours now. I won't be needing it, ever again. Hilda, this isn't the way I wanted to say good-by. I thought we'd drive to the place and I'd explain there. The apparatus would have made understanding easier for you. Maybe this way is better after all. We'll part here. You'll drive back to the city, hating me. Pretty soon you'll forget—"

She took the keys in silence, eying him contemptuously. Suddenly Hilda slapped his face. The blow stung. Conn grinned wryly.

"All right," he said. "Good-by—"

He started toward the hill where the machine was cased. After a dozen steps he turned his head and dimly saw Hilda standing there in the night. After a dozen more he heard her cry: "David!" And then again in an altered, almost joyous tone: "David!" He thought that a wind brushed past him, like the ghost of himself returning to Hilda.

He wanted to go back to her more than anything else. He thought: To hell with Dunbar and my responsibility to him. To hell with the machine—let it rot forever. To hell with everything but Hilda— But it was twenty minutes to eight and the discipline was bred strong in him. He pushed into the high weeds at the foot of the hill and began to mount the slope.

Every step pushed this pleasant land farther into the past. His own day loomed before him—the day a thousand years to come. The same earth, but a place of towering cities, of giant laboratories; of vast engines that reshaped the land and thundering rocketships that pierced the skies.

Conn thought of the ordered existence to which he was returning and sighed. It was tailored. Life was too smooth and easy. There was too little work, no excitement; too little adventure, no danger. In this crude earth of the past which he was leaving he had found all the breathlessness for which he'd yearned. He'd found and left a girl crying out for him, a girl whose cries had died away a thousand years ago.

CONN REACHED the crest of the hill. The core was of solid granite, as old as eternity; Dunbar had made sure of that. Conn probed carefully in the turf until he found the soft spot. He dug energetically until he uncovered the bank of studs. He pressed them in combination and stood up.

Slowly a yard-wide circle of turf slipped downward, carrying him with it. Fifty feet it lowered until a narrow steel door set flush in the side of the shaft slipped up before Conn. He thrust it open, stepped inside and pressed a button placed high on the jamb. The circle of turf ascended again.

Conn shut the door behind him and switched on the lights. The apparatus glittered before him, a maze of solenoids and selenium generators, as gleaming and new as though Dunbar had assembled it half an hour before. He glanced at his wrist watch. Five minutes to eight. Dunbar had given him strict instructions

to return within a year at the utmost. Power had drained off from the banks of accumulators through sheer inactivity. This way there was just enough left. Another day's delay might make return impossible.

Hastily Conn inspected the written records and samples he had packed into the rucksack. Underneath these were the tinned reels of motion pictures he had shot. He shouldered the sack, checked instruments and at last stepped up on the small platform in the center of the apparatus. He reached out for the giant knife-switch.

He thought: I'm a fool. Here's where I belong. Hilda needs me. Just because we've fought off one group of Nazi agents doesn't mean she'll be safe forever.

He thought: What am I getting excited about Nazis for? This is all past and forgotten. Democracy will survive. The last vestiges of Fascism died out in 1970. That will be twenty-nine years from this moment. Hilda will be fifty. Maybe she'll be married with children and grandchildren. Maybe sometimes she'll think about the "reporter" she met New Year's Eve 1941. Maybe she'll think of the way he ditched her.

He thought: I don't belong in the dead world of the past. Why don't I cheer up? I'm going back to my own family and friends. I belong in 2941. Dunbar's waiting for me to make my report.

It was eight o'clock. He yanked down the switch, and as the machine roared he said: "Damn!"

II.

A THOUSAND YEARS through time took less than five seconds. Conn stood impatiently on the platform, waiting for the last emanations to die away from the tube. The solenoids still whined in dying sighs like the final whispers of a siren. Some of the contacts sputtered and violet light played in the slow turning generators. That was all. All that was left of the surge of power that had thrust him a thousand years forward through the Time Stream.

Conn stepped down and glanced at the accumulator index. The needle hung over the red exhaustion mark. He'd had barely enough power. He walked wearily to the door and yanked the heavy steel plate open.

Conn pressed the stud again and presently the circular plate dropped down. He could make out the crescent of pale light aloft. That would be old Dunbar's laboratory, built at the crest of this century-old granite outcropping. Dunbar would probably be there, pacing the marbelite floor in anxiety. He'd been pacing maybe five minutes since the time Conn had started out. Conn remembered the vastness of the laboratory. The gleaming walls and lofty ceiling.

He would say hello to Dunbar first. Then, before anything else, he would step out on the balcony and look east to where the golf course had been, and farther to where the Merrick Highway had wound its silver thread toward New York. Now there would be nothing but the inane regularity of masses of mile-high buildings. No—there was no more green land and forest in his time. Only mile after endless mile of towering steel and marble buildings, and perhaps, here and there, a carefully planned little garden.

The disk shuddered to a halt before him. Conn stepped forward, then gasped. It was not topped with the gleaming gray marbelite of Dun-

bar's lab floor. It was covered with a brown rubble. Rubble chinked with dirt; and in that brown moist earth grew sparse blades of grass. Conn looked up, bewildered. The light from overhead was still pale. In that circle he saw a sprinkling of stars.

He started the disk and arose in an agony of wonder. In choked tones he called: "Dunbar?" and then: "Dunbar! This is Conn!" There was no answer. Only the creaking whisper of the lift mechanism.

It was not too dark. A full moon rode overhead. To the north there was a heavy black forest. East and south were rolling hills showing patches of naked rock and moon glints on a vast broad river. West stretched shimmering wheat fields, and a mile beyond them Conn discerned the silhouette of towering battlements pierced with amber lights.

What had happened to his world?

Conn fingered the sack of records. He thought: There can't be any mistake. Dunbar tested and retested the apparatus. It was set for April, 2941, and if it was set that way, then that's the time I'm in. What's happened to my world?

Ten feet to one side of him, a boulder jerked silently into the air and settled in a cloud of dust. Conn swiveled and stared, oblivious of the hail of cutting particles that slashed his face. As a second rock, a little closer, leaped up, he threw himself down and shielded his head. This time the fragments bit through his clothes like small knives.

Below him, completely encircling the hill, he saw the minute flashes of explosions. It was as though the hill were ringed with enormous fireflies. But these weren't explosions. There was no sound. He could feel the slight concussions and dimly he made out the craters that opened up magically under the flashes, but there was no sound.

CONN SQUINTED through the dark. A silent battle seemed to be raging around the foot of the hill. As his eyes accommodated to the gloom, he saw below him two figures partially concealed in a mass of boulders. They were big men incased in plate armor that gleamed in the moonlight. Lying prone, they held ten-foot lances to their shoulders, like rifles. Behind them, lying quietly, were two horses. Conn heard them snort softly and clash their bits.

Surrounding the besieged men was a flitting horde of animallike figures. They were men, but they looked more like enormous furry rabbits. They, too, carried the lances, and Conn saw them continually drop to one knee, throw up the lances and fire. Evidently these were the weapons that were producing the flickering silent explosions.

The horde of rabbitmen milled around the besieged pair with lightning speed, never advancing closer than fifty yards. Conn felt his pulse quicken for the gallant stand those two men were making. He watched breathlessly as they coolly waited for the attackers to come in, then raised slightly and fired. He heard no reports, but he saw the quick hail of craters.

A high whistle sounded. The attackers paused. Conn knew it was the preamble to a final assault, and he knew the men in armor would surely be borne under. With quick fingers he shook the final particles of sand from his revolver and slipped in the last clip.

A second whistle sounded as he hurled himself down the hill, rucksack banging against his hips. He gathered momentum and sprinted

as the rabbitmen came forward toward the boulders in a solid wave. He had a glimpse of the armored men standing upright, pumping their lances, then he had steadied himself and began to fire.

At the first shot a rabbitman screamed and dropped. The others skidded to a halt and Conn saw white flashes as they turned their faces toward the sound of his gunfire. He shouted in exultation and the hills boomed back as his gun spat twice. Two more rabbitmen slumped. Conn heard their lances clatter on the stones.

"Go on, big boys, I'm with you!" Conn shouted. But the two men stood, paralyzed by the sight. Conn fired three times, slowly, deliberately. At each shot another figure fell. By the third, the rabbitmen screamed in terror and fled. Conn jogged down the slope. When he had reached the men in armor, the attackers had faded into the darkness.

"Lucky for you I happened by," Conn said. Through the milky gloom he saw they were dead ringers for the Knights of the Round Table. Only they had removed the steel visors from the helmets and replaced them with heavy crystal.

"Lucky for you," Conn repeated. He was annoyed at the way they kept their lances trained on him. "What's the matter, boys, didn't I do enough for you?"

One laughed abruptly. It sounded hoarse and a little harsh to Conn. "Drop your lance, Schiller," he said. "The man is no Reader."

"Then where is his armor?" the man named Schiller demanded. He kept his strong, heavy face on Conn. "Are you a Swast?" he asked.

"Look, friend," Conn said. "I'm a stranger here. I don't know anything about Swasts or Readers. I just happened by and helped you out. The least I expect is a thank you."

"Of course," said the first man. He laughed again. "We are all suspicious these days, but Schiller here carries it too far. My thanks go to any man who would kill six of the Reader rats." He thrust forth a gauntleted hand. "Give you thanks, stranger. My name is Horst."

"The name is David Conn." Conn took the proffered hand and shook it. Horst jogged his companion's elbow.

"Come, come, Schiller," he said. "No words for a man who saved you from being flayed alive?"

"Aye, my thanks," Schiller said gruffly. He did not offer his hand. Instead he turned and brought the two horses to their feet. Conn watched him doubtfully as the man mounted and turned his horse toward the castle beyond the wheat fields.

HORST TOOK his horse's reins over his arm and walked alongside Conn as they started after Schiller. They trudged along a narrow dirt road that snaked through the high wheat.

"Schiller," said Horst, "is nervous. The Readers have been pressing us hard—very hard. He's anxious to get back to the castle. That's the only place where a Swast can feel safe these days."

"That so?" Conn said.

"They're like rats, those Readers," Horst went on. "They swarm everywhere. Now they've even begun threatening the castle. If that falls, I don't know what we'll do." He shook his head. "It's the last stronghold."

Conn said: "That's tough!" His mind was churning in bewilderment. Now that the first excitement of the fight was over he had begun to wonder again. He put the empty gun

back in his pocket and tried to puzzle things out. What had happened to his earth? Who were these Swasts and Readers?

"Every man counts, these days," said Horst. "The castle could ill afford to lose two fighting men, and we're glad to get another volunteer. You're the first Swast to get through to us in three years. I don't think there are any more left in America."

"I guess not," Conn said. Who were the Swasts? Why weren't there any more left in America?

"What kind of lance did you use back there?" It was Schiller up ahead. He had suddenly turned on his horse and was eying Conn again. "Never saw a lance that made so much noise."

"It wasn't a lance," Conn answered. "It's a gun."

"Gun!" exclaimed Horst eagerly. "You mean the old kind? The ancient explosion kind? Where did you get it. Let's see it!"

Conn thought for a moment. He stared at the high wheat around them and wondered how much he could tell these men. He thought he'd best look around a little before he showed his hand.

"I'll show you when we get to the castle," he said.

Schiller reined in his horse so abruptly that he bit cut the animal's mouth.

"Why so anxious to get to the castle?" he demanded.

"I'm not," said Conn. "I'd just like to get there and—"

"You see?" Schiller shot at Horst. The latter paused and nodded.

"Maybe we'd better look him over," he said. His voice regained its harsh quality. "I'd like to see that gun. And I'd like to look into that sack on your shoulder. The Readers are cunning. They could well afford to sacrifice six men to get a spy into the castle."

Conn looked at them. Schiller had already taken his lance from its boot. It was lying across his saddle, muzzle pointed at him. Conn took out the empty revolver.

"Here," he said. "Look it over."

Horst examined the revolver curiously, then slipped it into his saddle bag. He reached out hands for the rucksack. Without removing the strap from his shoulder, Conn held up the bag with flap turned back to reveal the contents.

"This is a hell of a thing," he said angrily. "How many men do I have to kill for a passport? I'm no spy. No Reader."

"Books!" Horst snarled. He held up a small bound volume of Conn's records for Schiller to see. "Books! The swine's a Reader!"

Schiller cursed and raised his lance. Conn snatched the volume out of Horst's hands and with the same sweep smacked it sharply against the neck of Schiller's horse. The animal reared, snorting with pain. Schiller's shot blasted a silent crater down the road. He cursed again and yanked at the reins.

Conn swerved from under the horse's hoofs and brought his knee up into Horst's stomach. The armor bruised him, but Horst grunted and doubled over. Conn clutched the rucksack in both arms and sprinted off the road into the wheat. Schiller shouted. Abruptly a flare of light appeared in the wheat alongside Conn. A crater opened out like a flower and the night was filled with flying razor particles.

Behind him he heard the clopping thunder of hoofs as Schiller and Horst followed him. He bent low and prayed the high stems would conceal him. Pushing through the wheat was like running through molasses. His breath came in heaves.

He veered and doubled his tracks. The horses were charging up on him swiftly. Conn was filled with a sickening sense of dismay. As the silent explosions continued to flare around him he felt like a blind man running in the unknown.

Horst shouted: "There he goes!" and his voice was dangerously close.

Conn prayed as he ran.

A cross-fire of explosions burst at his toes. As Conn threw his hands up to seared eyes and plunged forward, the ground underneath him gave way. He shot under and crashed in a mass of wheat stems and earth. Dazed, he struggled up from the debris and was horribly aware of furry figures around him, closing in. A multitude of hands seized him.

A voice said: "One sound out of you—"

Conn nodded.

III.

THE SEARCHERS continued to shout. As their horses milled, Conn felt the concussion of hoofs on the earth. Little driblets of dirt trickled down. In the dark he heard the tense breathing of the men around him.

"Too close to the surface!" one whispered. "I warned you. There was less than five feet between the apex of the shaft and the surface."

"Shoring," came the answer. "It would have been all right if we could have got the timbers in place. Not enough time!"

"Anyway," whispered a third, "who'd of thought the damned Swasts would go blasting in their wheat fields? 'Twas the blast that broke through. The blast and this!" He shook Conn.

Dirt trickled down Conn's neck. He was afraid to brush it away. Then someone gasped, and the grip on his arm tightened. Hoofs were punching the ground above them, and cascades of earth and stones began to thud down. Conn heard Schiller cursing his horse. He could even hear the heavy panting of the animals and the creak of leather harness. If one of those horses fell through—

"We've got to get back!" came a whisper. "We can't just stand here and wait for hell to break! We'll be crushed—"

Conn stared. Overhead was the four-foot hole the explosion had made and through which he'd fallen. It looked as though he was standing at the pit of a fifteen-foot crater with a narrow mouth. Like an upside-down funnel. On either side of him what had been the shaft was choked solid with earth. More was still dropping, packing still more tightly around them.

"How are we going to get back?" The speaker gazed up anxiously. "Once the Swasts sight us they can shoot us down like rats. We haven't even got lances to make a fight of it."

"Get back? We'll dig, of course."

"Through the debris? It'll take hours."

"Not through the debris!" The speaker tapped the hard floor impatiently. "We'll dig under. Three-level-twenty crosses under here. Less than three feet down. Dig, man, dig!"

The man who had spoken yanked Conn to one side. The other two immediately began to sink their picks into the earth. The hard surface turned over slowly. At last the softer earth began to come up. They dropped their picks and shoveled furiously.

Overhead Conn heard Schiller growl in the distance: "Gone back to one of his rat holes. Keep your

eyes on the ground, Horst. Maybe we can spot the entrance."

Horst cursed faintly. "I'm a fool!" he said. "I might have suspected. But who could know they'd kill six men for the sake of a ruse? Dismount, Schiller. We can beat through on foot!"

One of the diggers exclaimed. "Timber!" he whispered. "I've struck the overhead beams—"

"Dig to one side, then, and make it fast!"

The earth flew. Conn saw a small hole widen. He could hear the sounds of earth dropping down to the lower tunnel. Then the tools were tumbled through. They clanked as they landed.

"Big enough!" gasped the digger. "Let's go!"

He dropped his legs and squirmed until his torso slipped under. A moment later he landed. The second man disappeared. The man who held him pushed Conn toward the hole. As Conn squirmed down, he bruised his hip on the timber alongside. He gripped the timber and dropped.

Schiller's voice was close. He yelled: "Horst! Here! Down in this pit!"

As Conn landed hands yanked him out of the way. A pair of legs spurted through the tunnel head. Horst and Schiller were shouting. The men alongside him seized the legs and pulled down violently. The earth trembled and there was a flare of light as Horst and Schiller began firing. More earth began to drop. Timbers creaked ominously.

"Quick!" said the third man. "They've blasted this shaft, too. It won't hold up another second."

The tunnel was black. It was narrow, Conn felt, and just high enough for a man to crouch and run. As they sprinted down its length, Conn blundered against the heavy beams set in the walls. The concussion dazed him. He reeled and the man behind him stumbled on his heels. There was a whispered curse and the party halted.

"No use," said the man who was evidently the leader. "*He* don't know the tunnel. We'll have to carry him. Lay down!"

Conn stretched out on the shaft floor. Instantly his ankles and shoulders were gripped and he felt himself being lifted.

"Now!" whispered the leader.

THEY started off again. Conn swayed like a hammock. He clutched his rucksack with both arms and sickened at the headlong flight through darkness. He winced at each sway, anticipating another violent collision with the wall beams. Far behind them he felt rather than heard the thundering fall of earth. That, he thought, would be the cave-in caused by the Swasts' shots.

Suddenly there was light. The party stopped and dumped Conn down. He got to his feet painfully and saw they were at a fork in the tunnel. Two branches were before them, both broad and high. Spaced at ten-foot intervals overhead were tiny spots of luminescence.

"Right or left?" asked the man who carried the tools.

"Left," the leader said. "We've got to take this fella to Rollins and make our report. Besides, something has to be done about the cave-in."

They hustled Conn down the left tunnel at a brisk pace. Gradually it dipped lower, widened and deepened until it was an enormous thoroughfare. Other tunnels continually entered it. Conn felt like a blood corpuscle taking a sight-seeing trip through a venous system.

After another half mile, they came

abruptly upon a vast bulkhead set across the tunnel. It was of heavy wrought iron, set in granite and it looked as solid as Gibraltar. The leader hastened up and knocked, then peered through a small grille that opened. After a few words a small panel slid aside and Conn ducked through with the others.

He was so astonished he halted in his tracks and stared. A breeze struck his face, warm and perfumed. Before him stretched a vast arcade. At least a hundred feet high, twice as wide, it stretched far down like a blazing underground station. It was entirely floored with white sparkling sand, and checkered with small white cottages. The roofs were of tile in scarlet, green and blue. Palms clustered around the cottages, throwing a light shade.

Yes, there was shade. Conn stared up at the roof of the arcade and blinked. It was a solid sheet of luminescence that blazed and bathed him with warmth. There were small crowds of people, all wearing bathing suits, and all looked tanned and healthy. It was an underground beach resort, Conn thought. It looked like a subway version of Miami Beach.

"Nice, eh?" a voice grunted alongside.

Conn turned. The three men who had brought him were shucking the heavy furs that had given them the rabbity appearance. Their leader stood alongside him in sandals and trunks. He, too, was tanned, and his muscles were impressive.

He took Conn down the arcade. As they passed through the crowds Conn gaped at the well-built men and women. The girls, he thought dazedly, looked as though they assembled for a beauty contest, and their scant suits left nothing to the imagination. Not that he objected.

CONN was embarrassed at the way the crowd stared at his clothes and rucksack. He was relieved when he was taken into a large stucco building of two stories and rushed upstairs. By now he was so dizzy that everything seemed to whirl in white blazes before his eyes. He was conscious of marble steps and a broad door. Then he was in a room standing before a table. There were men seated at the table, some young, mostly old. They wore official-looking tunics and all had a keenness, almost a harshness, about them that was frightening.

"Well, Bradley?" The man at the head of the table spoke. He was iron-gray. His face was gray under its slight tan, and his eyes had gray lights in them. The lines on his face looked like the creases formed when iron is bent.

"Look what I've got, Rollins," Bradley began without preamble. "It fell into the new shaft we were working at three-level-fifteen—" He jerked a thumb at Conn.

"Fell in!" exclaimed Rollins. The others looked agitated. "Is he a Swast?"

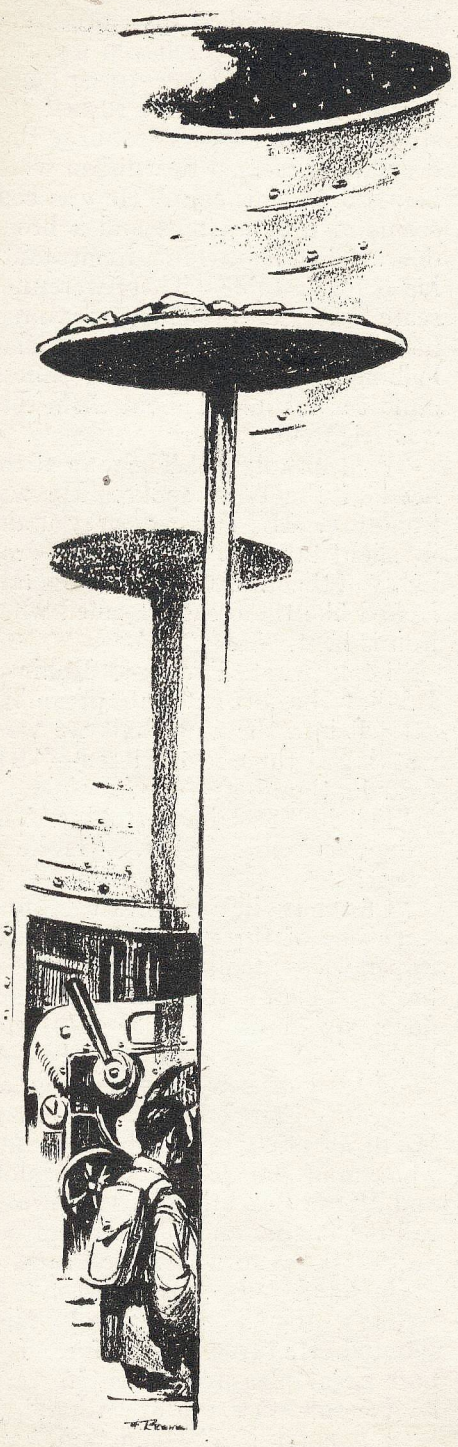
"Certainly he's a Swast," burst forth one of the younger men. He leaped up excitedly and pounded the table. "That's the man that shot down six of us an hour ago—you know. I told you the story. He used some kind of new percussion gun."

Wearily Conn thought: I'm crazy. We're all crazy. I go back to my world and find King Arthur aloft and Miami Beach below. The Swasts call me Reader and the Readers call me Swast. And who in hell cares—

He said: "I'm not a Swast."

"He's lying!" the young man shouted. He turned to Rollins. "It'll be a great pleasure, Peter, if you'll let me supervise the execution."

"I'm not lying," Conn said. He



squared his shoulders. This was going to be tough to explain. "I admit killing six of your men. But it . . . it was a misunderstanding."

"Misunderstanding!" Bradley snorted.

"Yes, just that. I've got a long story to tell, but maybe I'm not going to live long enough to tell it. Here's the tail-end, anyway. I came to the top of that hill. I saw two men attacked by twenty. I didn't know who was fighting whom for what, and I didn't care. I just pitched in on the short side. That was the way I was brought up to do things."

"You were brought up to do things impetuously," said Rollins softly, but iron bit through his words. "Sometimes it pays to stop and think of what may lie under appearances."

Conn said: "Yeah. The two babies I helped out turned on me half an hour later. For some peculiar reason or other—"

"To hell with his story," the violent young man blurted. "He's a Swast. He's killed six of our men. The tunnel's caved in at three-eleven-fifteen and God knows what'll happen when the Swasts at the castle find that out—"

"They've found out by now," put in Bradley.

"Oh, my heavens!" groaned the young man. "Rollins, this is no time for—"

"One moment!" Rollins said. He eyed Conn curiously. "This man wears strange clothing. You say he used a strange weapon. He says the Swasts turned on him for a peculiar reason. I'd like to know that reason."

"The reason," Conn said, "was books."

There was an appalled silence. In it Conn watched the table, faces and room begin to whirl around his head.

"You said books?" Rollins inquired softly.

"I said books!" Conn shouted. He swung the rucksack off his shoulder and hurled the contents fluttering in the faces of the men. They squawked as the volumes clattered over the table and dove for them. "I said books!" Conn roared, "and what's more I mean books. Books, books, books!"

He turned on Bradley and planted his fist just under the ear. Bradley went down with a groan. Conn dove across the table and pistoned his fists into the violent young man's middle. He took four punches and then folded up with a surprised look on his face. Conn twisted and prepared to charge out through the door. Then the white floor leaped up and smote him full in the face.

IV.

Rollins said: "Sorry we had to lay you out."

Conn rolled over and sat up. He was at the edge of a small cot. Around him were myriads of shelves and bottles. Sinks, oil lamps, candles, lots of glittering glass and stoneware. There was no one else around but Rollins.

"This is my lab," Rollins said.

"You mean padded cell," Conn groaned. He stared out the window at the brilliant sparkle and felt hot and feverish. "Listen," he said, "either you're crazy or I'm crazy. If I am, you can go ahead and lock me up. But before you do I've got to tell you something because if I don't get my story out I'm going to tear things apart again."

"Go ahead," Rollins said quietly. He pointed to the pile of books and canned film lying alongside the rucksack. "I figure you've got quite a story to tell."

"What's the year?" Conn asked.

"2941."

"It is, eh? Oh— Well, all right, Rollins, see if you can work this out. I'm a stranger, see? My names is David Conn. To the best of my knowledge I've neither seen nor heard of Readers, Swats or any other phase of the life you people seem to live. Now here's the hitch. In the year 2941, *I* lived on earth. My earth was a highly civilized and mechanized society. It was a planet entirely covered by one gigantic city. There wasn't a green field, a river or a forest anywhere. Half the ocean beds had been filled in to make room for the city of man—"

"You said earth?" Rollins interrupted. "Our earth?"

"Our earth, our moon, our sun, our stars—the very same. We had already solved the problem of rocket flights and were in contact with the other planets. We had begun to attack the question of atomic energy in real earnest and felt that with our advanced science we might solve it in a few centuries. We had even investigated the mechanics of Time, and one of us, a man by the name of Dunbar, had solved the problem."

"Time—" Rollins nodded slowly. "Time travel. I might have known."

"Yes, that it—" Conn paused and felt a wave of helplessness rush over him. "Yes, Dunbar solved time travel; I was his assistant. In April, 2941, Dunbar and I set up the apparatus in the heart of a granite outcropping—the same hill where I unfortunately killed six of your men. As Dunbar's assistant I was the first to use the machine. He sent me back a thousand years as a kind of journalist in Time. I had plenty of money, equipment and so forth. I was instructed to return within a year to April, 2941—return to a moment but a few minutes later than

that in which I'd left. When I did return— I was here."

"I see," Rollins said. He paced a little and fingered one of Conn's books. The bright light flooded his features and softened them. "And you want me to explain, eh? Well, I'd best begin by saying that theoretically you don't exist here."

Conn reached out a hand and gripped Rollin's arm firmly. "What's this," he inquired, "ghosts?"

"I said 'theoretically.' You and I are cousins, Conn, or better still, stepbrothers. I see that your race was strong on the mechanical side—you could build time machines. We couldn't do that, but we have our strength, too. Theory. And I'm afraid you people were weak there."

"I don't like the way you use the past tense," Conn said. "It makes me feel that my world is dead."

"The only correct tense," Rollins answered, "hasn't been invented yet. It would have to be the alternative tense. Sit back a little and let me explain. You're real, don't worry about that. You and your world were always real. In 2941 when you started your journey through Time, you were a reality. In 1941 you were a reality. But now, back in 2941, you're an alternative reality existing in the wrong alternate. That's why I said theoretically you don't exist here."

"Alternative?" Conn said. He felt in his pockets for cigarettes. That was the second wonderful habit he'd acquired in the twentieth century. The first was loving Hilda.

"It's like this," Rollins went on. "The future can never affect the past without becoming part of the past—and thus destroying itself."

"As for instance?"

"Well," said Rollins, "take this set-up. A man enters a house and wonders whether to go upstairs or downstairs. He doesn't know it, but if he goes up he'll meet a girl whom he'll marry and if he goes down he'll meet a man who'll murder him. Now at the moment he enters the house and wonders which to do, there are two alternatively possible futures awaiting him—murder or marriage. His choice decides which of those futures he shall enter and make real for himself, although in theory each alternative future may coexist and be real unto itself."

Conn said: "Ouch!"

"And by the time this man makes up his mind," Rollins continued inexorably, "and starts either up or down—that same choice becomes part of the past—the very same past which affects and controls the future. You couldn't have a future of marriage without a past of choosing to walk upstairs. See?"

"I think so," said Conn.

"NOW THEN, suppose at the moment of choice, the skies suddenly cleaved apart and a head appeared, saying: 'John Smith, this is your grandson speaking to you from the future. Unless you walk upstairs, you will not meet Dorris Doe, you won't get married, and I'll never exist. Therefore I command you to walk upstairs.' "

Conn laughed.

"In theory," Rollins smiled, "this could happen, because there would be the possibility of such a grandson. However he would never say those words because the past for him—which would be John Smith's future—would of necessity have been Smith's walking upstairs. He would take that for granted. But here's the twist which your Dunbar neglected. If the grandson did appear and in some way affected John Smith's choice so as to send him upstairs, the grandson could never

again return to his own present, in other words, to the future."

"Why not?"

"Because the future is controlled and molded by the past. The future in which the grandson existed depended on John Smith standing *alone* and deciding to go upstairs. Having once appeared to John Smith and influenced him to go upstairs, he has so altered the past that his future no longer exists for him. He will have to return to another future."

"Wait a minute," Conn groaned. "We're weak in theory, same like you said. Put it in simple terms."

"Let's try it with symbols," said Rollins. He picked up a slate and pencil. "Take this equation: SUM OF THE PAST=THE FUTURE. Let ABC represent the past. Then ABC=abc, the future. You see that abc is the only possible logical result of ABC. If the past had been BCA, then the future would be bca. I think you'll see, moreover, that at the moment of present when factors A, B and C exist, there are six alternatively possible futures: abc, bac, cab and so on."

"I've got that," Conn said.

"Hold on to it, then," Rollins chuckled, "because I'm almost finished. Here's the joker Dunbar neglected. Suppose that in the equation ABC=abc, factor b of alternative future abc traveled back through Time, past the equal sign to visit ABC. Then b becomes a member of the group ABC, and by that very act makes it impossible for him to return; although his own present may continue to exist, it can never again exist for him."

"Why not?"

"Because the past for him will now contain the factors ABC plus b. In other words, ABC+b can never equal abc. That time equation wouldn't balance. So, although b can reverse his time machine and go back to his own date, he will never find the reality of the present he left. He will always land in another of the infinite number of alternate futures coexisting. ABC+b may result in abcb, abbc, babc and so on—but never in abc!"

"I get it," Conn said. "You're trying to say that by traveling back into my past I've switched over to a different track so that I couldn't move forward again on my original track."

"I'm trying to say more than that," Rollins broke in. "I'm saying that you'll never be able to move forward on the same track twice. In other words, that time travel is impossible in the sense that a man can take a journey to the past and return to his starting present.

"You see, you could continue to shuttle back and forth between 1941 and 2941, but although for obvious reasons you'd find the same present in 1941, you'd never find the same in 2941. There are an infinite number of alternative coexistent futures. Each time you made a round trip you'd create another infinitude of alternates. Representing each trip as an equation, here's the mathematical proof of why, once you'd traveled back in Time you could never return to your starting point—"

Rollins wrote swiftly:

(1) ABC=abc
(2) ABC+b=abc+b
(3) ABC+2b=abc+2b
(4) ABC+3b=abc+3b . . .

(n) ABC+n (b) =abc+n (b)

CONN's fingers shook, but he finally managed to get the cigarette lit. The flaring match looked dull

in the bright light. Conn held the match until it seared his fingers.

He dragged on the cigarette. He thought: This is a lovely mess. It serves me right—leaving Hilda and dithering about duty to a man, to an existence I'll never see again. Maybe Dunbar will send someone else back to look for me. Maybe he'll send back dozens, wondering why none return. Maybe he'll figure out what Rollins here calls the joker.

And all that while he was filled with a bitter sense of futility, the nostalgia of a man lost to everything. He wasn't even a man, he thought, he was only an alternative —a mere probability that coexisted with an infinitude of other probabilities. All the probable Conns should get together, he thought grimly, and kick him.

At last he said wearily: "What about the Swasts—and the Readers —and the fighting. This tunnel system; the castle and all that?"

Rollins smiled. "I'd have to give you a thousand years of history. This is it briefly. About nine hundred years ago, America was invaded and conquered by a horde of Nagees. Their credo was the superiority of brute strength over reason. Their symbol was the swastika from which comes their present name—"

"Nagee," Conn said, "or Nazi. Of course. I should have realized. But according to history Nazism never reached America. It was defeated in Europe around 1970—"

"I said this was the history of our alternate," Rollins answered. "At any rate, the few Americans who held out and fought a guerrilla war became known as Readers because of their respect for learning. That's why the mere possession of books got you into trouble with the Swasts you unfortunately aided, and why they got you out of a tight spot with us. Your books and records will be invaluable for us; but I should like to ask about the cans of celluloid pictures—"

"Motion pictures," Conn said. "My notes will show you how to build a projector. They'll do more for you than all the books. What about that castle?"

"It's the last stronghold of the Swasts in America. They took possession of that building centuries ago. Originally it had been used for something important by the Readers, but unfortunately our records don't say—"

There was a sharp knock on the door and Bradley almost shot through. Nevertheless he clamped down his impatience and waited for a chance to speak.

"Listen," Conn said, "don't think I'm ungrateful, but I'd like to get out of your world. You seem to have it nicely worked out. It's a beautiful place down here, but I'd rather not stay. I'd . . . I'd like to—"

He had to stop. The memory of Hilda choked him. When he realized how near she was, how swiftly the machine in the hill could return him to her, he trembled with eagerness.

"I'd like to recharge my batteries," Conn said. "I'd like to go back into the past and stay there. You said I'd find it the same?"

"The same." Rollins nodded. "It takes time, lots of time before the alternate futures split off and differentiate. You'll find the same 1941 you left—but I'm afraid I don't know what you mean by 'recharge.' "

"Batteries," Conn repeated. He smothered a growing sense of panic. "Accumulators—you know, generators, electricity, batteries—"

Rollins shook his head sadly.

"We've been trying to recapture the lost art of electrical engineering for generations," he said. "So far it's evaded us."

"Then we'll work it out together," Conn snapped. "In my records you'll find all the material necessary to recapture your lost art. In a month I'll have this place electrified, and in two months I'll be going back to—"

He broke off. Rollins' face had dissolved into an expression of incredulity mixed with childish delight. He gripped Conn's shoulders and stared, eyes filling. Then Bradley stepped forward.

"In a month," Bradley said, "there won't be anything to electrify."

"What's that?" Rollins started.

"I said there won't be anything left," Bradley answered in a queer, harsh voice. "There won't be any underground—any Readers—anything. The Swasts have returned to three-level-fifteen. They're following the lead and blasting every tunnel wide open with their lances. They'll reach the city in an hour. It's all up."

Conn finally realized what Bradley meant.

"Nothing's all up," he growled. "I'm getting back to 1941 if I have to win your war for you." He slapped Bradley and Rollins smartly on the shoulders. "Pick up your faces, Readers, I've brought a few tricks with me from a thousand years ago that're going to make a hell of a lot of difference in this future. Let's go to the council room!"

V.

FACES LOOKED UP from the table as they entered. Dismayed faces. Rollins rapped his knuckles on the table.

"In the emergency," he said, "David Conn will supervise defensive tactics. Please!" He held up his hand. "I understand that Conn has come to us under highly embarrassing circumstances. I have heard his story and I assure you that I have full confidence in him. I think you will, too, when you've had time to hear his explanations. For the moment I think it would be wise to have faith in his leadership."

Rollins escorted Conn to the head of the table and seated himself alongside. There were grumbles from the others and a low whistle of surprise. Eventually they all nodded.

"The first thing," Conn said swiftly, "is arms. What have you?"

"Just the lances," Bradley answered. "That's all."

"What's the mechanism of those lances—the silent explosions?"

The hot-headed young man spoke up. Rollins leaned toward Conn. "Name is Wilder," he answered. "Chief technician. Be nice to him. He didn't relish those punches."

"We really don't know," Wilder was saying. "Actually the lances are no more than self-coiling spring guns. They shoot a radioactive pellet—Uranium 237. The same isotope gives us light and heat in the form of slow radiation. We treat minute particles to distintegrate on violent contact and they induce subsidiary disintegration in the surrounding area."

"I get it," Conn said. "You use spring propulsion for gradual acceleration. If you shot the particles out too hard, they'd explode at the moment of initial impulse and blow up gun and shooter."

Wilder glowered. "That's what I was about to say."

"What's the range of your lances?"

"Thirty or forty yards."

"What about explosives. Guncotton? TNT?"

All looked blank. Conn realized that this was another lost art for the Readers. He turned quickly to Bradley.

"Just what are the Swasts doing? Coming down through the tunnels after us?"

"Hell, no!" Bradley looked furious. "They won't come into the tunnels yet, not until they're too deep for blasting. Right now they're opening up the small capilaries from the surface. Sort of plowing them open with their lances—"

He caught himself, raised his head and stared into space. Conn, too, had sensed the vibrations. Seconds later, it seemed, he heard a mutter. The sound boulders make when they rumble down the slope of a distant valley.

Bradley whispered: "No! Not yet!" He leaped to his feet and tore out of the room, Conn hard on his heels. The others followed.

Outside, under the glittering cavern ceiling, the Readers were dashing about in fright. Bradley had paused with ear cocked toward the cavern entrance. Again came the muttering rumble as the earth underneath them shook. Squads of Readers, bearing lances, were sprinting down toward the entrance. Men were herding the women and children back toward the recesses. Bradley stopped one.

"What is it?" he demanded.

The man looked weary. "Swasts!" he said. He had a kid under his arm, a two-year-old that was crying lustily. "The Swasts have come down through the tunnel—all of them. Hundreds. They're outside the gate now, trying to blast through."

As he started off with the child, Conn stopped him.

"Going out the back way?" he asked, pointing toward the recesses of the arcade.

The man shook his head. "There isn't any back way," he said. "We just hide in the depths—"

"In three hundred years," Bradley said apathetically, "the Swasts have never dared to attack us at our gates. There was never any need for more than one exit—"

Conn grabbed Bradley's arm and shook the man until he appeared to waken. "How long can you hold the gate?" Conn asked. He repeated the question until Bradley answered.

"Twelve hours, maybe. The gate's strong, but not enough."

"Twelve hours is enough time for me!" Conn shook Bradley again. "Snap out of it. I got you into this mess and I'll get you out. You're my lieutenant, understand? Go down and see to the gates. I'll be along—"

BRADLEY NODDED mutely. Life began to flow back into his eyes. Conn gave him a push and he galloped down the cavern toward the gate.

"Rollins!" snapped Conn. "I've got to work fast. I'll need the help of every technician you can spare—plus a squad of diggers."

"You'll have them."

"Get the diggers first. I want a shaft sent up from the cavern to the surface. You can drill, blast, dig or scratch with your fingernails—I don't care how, so long as it's done in six hours."

"You're mad," Wilder snarled. "Even granting it could be done."

"It can," interrupted a young man with a snub nose. "The rock overhead and through this entire sector is honeycombed with passages and faults. It'll be dangerous—but we can do it."

"Granting that," snapped Wilder, "there's no sense creating another

hazard for us and another vantage point for the Swasts. We're trying to hold them off from one entrance. You're planning another."

"That so?" Conn eyed Wilder and wanted to punch him again. "Maybe it hasn't occurred to you that we're trapped down here. If we don't do something but quick, it won't matter how many holes the cavern's got in it. We won't be alive to know the difference."

Rollins had given the order for the diggers. The snub-nosed young man ran off to supervise. Conn took Rollins and the rest of the technicians back to the lab. The same glittering light pouring through the windows gave him the impression that less than a few moments had elapsed since he'd first sat up on the cot. It was peculiar not to have a sun that moved. Phony.

Conn glanced at the lab, then at the nervous men around him. He thought: It's all my fault. If I don't use my head and figure something out, then there won't be any more phony sun, any more Readers or cavern. It's a thousand years from 1941, but I still hate the Nazis and their children's children. I hate everything they stand for. I hate the thought of what'll happen to those strong, clean people and children, those pretty girls—"

He couldn't think about that. It brought Hilda to his mind again. Conn shivered and tried to concentrate on the job ahead. He had to figure something out.

"Rollins," he said, "you don't know what I mean, but we need munitions. Explosives. Could you build up big pellets of Uranium 237 —sort of bombs?"

Rollins shook his head. "Impossible," he answered. "They'd burn the men to crisps before they could get near them. There's no known insulation—"

Conn said: "Yeah." He tapped his teeth with the slate pencil and stared around the laboratory, gazing abstractly at the bottles. They were of heavy glass—so heavy they wouldn't break if you dropped them. Conn looked at the reagents. The Readers had evidently lost the art of chemical notation, but maybe they'd rediscovered the essential ingredients of what he needed. Maybe—

"Potassium nitrate?" Conn said. "Got it? Also known as—"

"Plenty," answered Rollins.

"How about sulphur? Yes? Fine. Charcoal and wax? Yes?" Conn went into action. He lined up the technicians before him. "From now on you boys are just cooks. Is that understood? You're to follow my instructions to the letter. Make this up. Potassium nitrate, sixty-five percent. Sulphur, two percent. Charcoal, twenty percent. Plain wax to make up the rest."

Pencils squeaked on slates. Heads nodded.

"When you've compounded this I want it packed carefully into heavy pint-sized bottles," Conn went on. He picked up a specimen. "Like this. I want the mouths corked tight. Through the corks, well into the compound, and extending at least a foot outside, I want you to run a heavy candle wick. Got that?"

He started to leave while they were still nodding. At the door he paused. "One last word, boys. Treat this mixture extra gentle, please. And if you value your lives, don't let a spark of flame come near it."

He vaulted down the stairs and set off for the cavern gate. The cavern itself was deserted. All the noncombatants had withdrawn to the deep recesses. As Conn ap-

proached the gate he passed the scattered signs of hasty flight. Children's toys, a sandal, a handful of grapes, and a little portrait painted on wood. Conn wondered if the owner would live to pick it up.

The gate itself was shuddering with palsy. The muttering rumbles continued without pause now, and Conn understood that the Swasts were blasting it continually on the other side. There were no more than a hundred and fifty Readers marshaled with lances, and for the first time Conn realized how appalling the odds were. He located Bradley.

"How goes it?" he asked.

"It could be better," Bradley said. "Thank heavens there's solid rock around that gate. It'll hold for a time. These lances can't blast through rock very quickly—only earth."

"You haven't got many men," Conn said.

Bradley looked over the little army. "We've got twenty more," he answered, "but they're busy digging to the surface. What's the general idea?"

"It's old where I come from," Conn said. "When the enemy attacks and you're fighting a losing battle, the only way to make him draw off is to counterattack him where it hurts. That's what we're going to do. Any idea where it'll hurt?"

Bradley stared. "The castle?" he gasped.

"That's it," said Conn grimly.

VI.

It was two hundred feet to the surface. The shaft had been started from a side of the cavern and thrust upward in a zigzag course that took advantage of every rock fault and slide. Conn tugged experimentally at the rope ladder that hung down from the open mouth of the shaft above him. The ladder still quivered from the heels of the last Reader to mount.

"That's a hundred," Bradley said. He strapped his lance across his back and looked at Conn. "Now what?"

"Go on up yourself," Conn said tensely. "Keep your men under cover up there and wait for me. I'll be along in no time to speak of."

Bradley nodded and started up the ropes. In a few seconds his mounting legs disappeared in the dark shaft mouth. Conn picked up his bulging rucksack and slung it gingerly over his shoulder. In it were twenty-five pints of destruction. He didn't relish the idea of carrying it up through the narrow, twisting shaft. That was why he wanted his little army to be in the clear in case of accidents.

The snub-nosed mine technician placed a hand on Conn's shoulder. "Be careful going up," he said "You're not acquainted with our terrain. This is all loose granite rock. It's honeycombed with flaws and faults, and our tunnels haven't done much to strengthen it. Too much of a jar might start a slide that would result in the settling of all the rock for miles around. This cavern—everything—would be crushed."

Conn said: "Thanks for the bedtime story." He tried to make it sound funny. To Rollins he said: "Here are your orders. Hold the gate with your skeleton crew at all costs. Only send your women and children up this ladder as a last result. The Swasts would slaughter them in open country. Don't worry. I'll get you out of this mess. I swear it!"

He started up the ladder. It quivered and shook, and his rucksack thumped slightly against his

back. It was pitch black in the shaft, but the Readers had coated one strand of the rope ladder with uranium. It glowed before him like a never-ending worm.

The ladder arose for seventy feet, and Conn bruised elbows and knees against the rough shaft wall. Then he came to a small shelf. He crawled over and followed the rope along the gutter of a narrow mounting tube that had razor sides. He could hear his clothing shred, and the rucksack caught on the projections and tugged at him. The glass clinked.

A rock slipped under him and he heard it go thundering down the tube. A dull muttering began and then a creak and a whisper. He thought it must be the echo of the fall, but it sounded more like the scream of rock under pressure. Conn swallowed hard and tried to climb faster. If the shifting layers of granite cut the ladder above him—

The tube ended and the ladder mounted again. Conn climbed through open space, swinging like a pendulum. He had no idea how long he struggled. He lost count of rungs. In the black nothingness he was cut off from time altogether. But at last his groping hand touched rock and he wormed his way between two flat masses of stone barely three feet apart.

They were like two vast palms. Giant palms waiting to press slowly together and mash him to butter. Conn pulled himself upward with fingernails, not daring to listen to the whisper and mutter of the trembling rock. The trembling turned into a shake and the sound grew. He could sense the heavy palms pressing gently together. He groaned and struggled feverishly. It would be a very slow death, very gentle and very horrible.

Then hands gripped him and pulled upward. Bradley whispered: "Sh-h-h-h—" and Conn was blissfully aware of night wind on his face, stars overhead and the comforting nearness of a hundred fighting men. He lay a while until he caught his breath.

It would be about three or four in the morning, Conn thought. The moon had passed the zenith and was a small silver apple dropping to the west. He got to his feet and peered cautiously around. A mile across the fields towered the castle. About a quarter of a mile to one side was a large black smudge that made quiet noises.

"Horses," Bradley said. "The Swasts have got them picketed there under a small guard. Have to give 'em a wide berth."

Conn nodded. In a single file they started out, bending low to get all the cover the wheat afforded. There was hardly any sound. The Readers, after hundreds of years of skulking, knew how to move quietly.

THEY APPROACHED the hill and swiftly passed it. Conn thought: Time is peculiar. I always knew it was, but it never affected me personally. If this ruse works, we'll wipe out the Swasts. Maybe in a month or two I'll be able to build enough equipment to recharge my batteries and get back to Hilda. Maybe I'll get back to the day after I left her— She'll have missed me only a day, and yet I'll have missed her for ten weeks—

The thought came to him that he might take Rollins back through Time with him. Rollins could gather up every clue he needed to recreate an advanced civilization in his own time. Then Conn shrugged. He'd forgotten. Rollins would make it ABC plus 3b. He could never return to his own alternate. Rollins,

too, would become a probable man. No, there was nothing more Conn could do for these people. They had his records. That would be enough.

Bradley caught his arm.

"This is it," he whispered. "Probably the Swasts left a guard. We'd better be careful."

The castle loomed before them. It was a high square building with a tower at each corner. Around the building the Swasts had constructed a heavy rubble wall at least twenty feet high. It would be impossible to climb it. The Swasts could shoot them down as they came over the crest.

Conn lit a cigarette. He brought the rucksack around under his arm and opened the flap so that he could dip in quickly and grab a bottle. The Readers formed a wedge behind him and they advanced cautiously, with Conn at the apex.

Suddenly lights flared and a gong began to bang. It was so deep-toned it had no sound. It just pressed on the ears. Beat—beat—beat— From the towers giant torches flared, spraying ruddy light over the surrounding terrain, flooding the grounds with brightness. There were shouts from the castle and flaming craters began to appear before them.

"Alarm!" Bradlew shouted above the roar of the torches. "They've given the alarm!"

Conn growled: "Keep moving!" He sprinted.

He cradled the rucksack in his arms and wondered if a lance blast would reach him. The craters were coming dangerously close. If he was hit, he and his little army would go up in an explosion that would sing the end of the Readers. He didn't want to lose this last battle with the Nazis. The Battle of America.

Conn pulled out a bottle and touched the fuse tip to his glowing cigarette ember. It fizzed and flamed. Still on the run, he yanked back his arm, striking Bradley across the shoulder. He almost dropped the bomb, but managed to let it fly. It exploded as it reached the wall, and the bang hurt his ears. But when the dense smoke drifted, he saw that part of the rubble had disappeared.

Bradley exclaimed hoarsely and there were terrified yelps from the Readers.

Conn lit another fuse and sent the bottle toward the breach. This time a rumble of clattering stones followed the explosion and the wall came down for a space of twenty feet.

They reached the wall and huddled under its cover just to one side of the breach. It was cool there after the heat from the giant torches. Conn watched the haze of craters exploding silently in the breach. He thought: They're covering it. Anyone trying to get through there will go up in a puff.

"The noise!" Bradley screamed. "It'll bring the other Swasts back!"

"That was the general idea," Conn said.

He lit a third fuse and heaved the bottle far down the length of the wall. It exploded with a boom, and rubble forty feet away clattered. As it did, he had already lit a fourth fuse. It was a long chance, but he had to take it. Maybe the Swasts in the castle would cover the site of the fresh explosion. They ought to be bewildered.

Conn jerked to his feet and stepped around into the open breach. A black arch showed in the side of the castle, just before him. He let fly toward it and dove back to cover as the bomb blasted. When he

"The swine's a Reader! He's got a book!"

crawled back to look, he saw a great jagged rent where the arch had been. Light shone through twisted window frames. He had blasted in a row of castle windows. It was crazy, but he noted that they were Gothic. High and pointed.

"Bradley," Conn said, "take half your men and go to the second breach I made. You'll wait until you hear two more bombs land—then make a dash to get into the castle."

Bradley nodded and vanished. Fifty men, lances poised in their hands, drifted off into the darkness.

CONN peered around the corner of the breach and heaved two bombs in quick succession. The first had too short a fuse. It exploded while it was still rolling. He heard the whine of glass fragments. Conn cursed Wilder. The second plunged into the castle and went off with a muffled bang. Screams sounded.

He puffed his cigarette and barked: "Come on!" and then they were swerving around the breach and legging it for the hole. The craters flared and men began to drop with choked grunts. To one side Conn saw Bradley's men hurdling rock fragments and charging down the second breach. A dozen disappeared in silent flowers of light while they were jumping. The rest converged toward the rent windows.

Conn lit a fuse on the run and hurled it before him. By the time the bomb exploded, he had already entered the castle. What he could see of the room he entered was a shambles. It had evidently been

some kind of vast hall. Now the flagged flooring was shattered. The walls toppled and the ceiling overhead sagged. Splotches of ghastly blood and flesh pasted pieces of mail armor to the stone.

Hoarse bellows came from above, and then from behind. Craters leaped and flared. Conn saw the Swasts were firing down through the gaps in the ceiling. Before him was the broken remnant of a broad stairway. The shouting Readers behind him went sprinting up.

Conn pulled to a halt. He grabbed Bradley as the man hurtled by and brought him to one side.

"Listen," shouted Conn. Bradley looked around wildly. He licked his lips.

"We've broken them!" Bradley panted. He looked exultant. "The last stronghold's fallen. We can mop up in here inside of an hour." He tugged to follow his men. Conn could hear the shouting and crashes of falling stone as the Readers blasted through the floors above.

"Listen," Conn repeated. "We've only done a quarter of the job. The rest of the Swasts will be back any minute. Keep half of your men for mopping up. Send down the rest to me to hold the Swasts."

Bradley nodded and ran. Conn counted bombs. Twenty left. He stared around the broken hall, wondering what it could have been. There were broken marble pillars and fragments of what looked like sarcophagae. Could the Swasts have buried their men inside this hall? A graveyard? There were the tapestries, too. Great hangings, now torn and spattered. Most confusing of all was the giant Sphinx at the head of the stairs. It had a ruined face and it looked incredibly old. Maybe the Swasts were collectors of art. That didn't seem to jibe with what Rollins had said.

Twenty Readers came vaulting down the stairs. They were torn and looked blood-drunk. Conn lined them up and tried to shake sense into them, but they muttered to themselves incessantly and fingered their lances. It was impossible to shake a thousand years of hatred out of their veins all at once.

They trotted out on the double and Conn spaced them along the crest of the wall. He had barely returned to his own position when his ears caught the thunder of hoofs. He lit another cigarette and watched the far fringes of the blood-red flood-lit area. Dim shapes galloping there. There was the ruby glint of light on metal and the long streaks that were lances. Craters began to flame again. Along the wall the Readers yelled.

Conn heaved a bomb. It exploded far short, but the whirling fragments of glass whistled around a horse and rider. The horse reared and screamed. Conn didn't like that. The rider went jerking to the ground. Conn saw him get to his feet and run back to the cover of darkness. The Swasts continued to circle and fire.

Bradley ran out with a small squad, yelling for Conn.

Conn shouted: "Here!"

"This is no good," Bradley panted. "They can keep us besieged and still attack the cavern. What are you going to do?"

"I don't know," Conn spat. "I'd counted on getting out of the castle before they returned and ambushing them."

Bradley said: "We might be able to pick them off better from up above. We've got to make a helluva fight of it here and now. Otherwise we'll be worse off than before."

VII.

CONN ORDERED ten of Bradley's men to the walls. The rest followed him and Bradley went back into the castle. They clattered up the stairway and rounded the Sphinx. Bradley led Conn through a low hall racked on all sides with arms. The middle was aisled with shattered crystal cases. Within the cases were tumbled heaps of armor.

"Storeroom," Bradley grunted.

But it didn't look like one to Conn. He could understand the Swasts getting their armor here, but it still didn't look like a storeroom. As they ran through with their little squad, his mind struggled with the problem.

Bradley led him briskly past a hall filled with paintings and statuary, up another flight of stairs and into a large room that was the entire width of the tower. Conn gaped and skittered to a halt.

"Come on," Bradley snapped. "Don't let this place scare you. I don't know what it is, but it's nothing to worry about."

Only Conn knew. Suddenly he understood. He looked at the scale models on the walls; at the tiny heliocopter hanging from the ceiling; and lastly at the giant tractor within the crystal case. Suddenly he realized that the Swasts had appropriated a museum, of all places, for their last stronghold.

"Wait a minute," he said to Bradley's excited yells. He walked to the case within which stood the tractor. It was a dump machine with a vast steel bin in the rear that had evidently been used to cart tons of earth or stone. Probably, he thought, it was a twenty-first-century model, for it was better than anything 1940 had seen, and it was Diesel powered. That was what gave him the idea. He'd fight a 1940 war in 2941 with a harmless 2040 machine. Abruptly he seized a lance from one of the Readers and shattered the crystal case.

A cloud of gas, so pungent it almost knocked him over, whiffed around him as he stepped through the naked case frame. That was a good sign. Whoever had set up this tractor exhibit had taken pains to make sure it would remain in good condition.

It seemed to be a new machine. The steel gleamed and the rivet heads were solid. Conn went over it. Cylinder heads; crankshaft; exhaust manifold; the fuel feed pump—everything was in brand-new condition.

"Bradley!" he said curtly. "How do the Swasts get those big torches in the towers. Oil?"

Bradley nodded.

"Then take all these men and get up to the towers. Locate the oil-feed and bring down all the oil you can carry. Make it fast!"

Bradley gaped and flared into action. He drove the squad before him up toward the towers. Conn carefully laid his rucksack of bombs in a corner, ferreted out a small oil lamp and began heating the cylinders. Diesels had to be plenty hot before they started.

The Readers began to hurry back for containers. Conn dumped mineral exhibits on the floor and gave them the metal bins. He ripped his shirt off and improvised a cloth filter. From the Diesel came the strong odor of heating metal.

They were able to collect a total of fifteen gallons. As Conn refiltered it and waited for the Diesel to heat, he reflected that that would be enough to drive him to California and back. He improvised a funnel and poured the oil into the fuel tank.

The fuel-system filter, he saw, was of the waste type. The cotton wadding was fresh and white.

The Diesel was fitted with an electric starter. The batteries were dry and Conn sent Bradley for water and filled them. They'd still have to be charged, and although Conn noted a five-hundred-watt generator connected to them, the generator wouldn't charge them until the Diesel was turning. He'd have to start the Diesel by hand.

They ran a loop of heavy rope around the fly wheel and Conn got a good running start and yanked. The wheel turned crustily. He kept yanking until he was exhausted. Then Bradley took over. He was prodigiously muscled, Conn remembered. Now the muscles cracked and strained. Abruptly the tractor coughed and bellowed. Bradley had the rope burned through his palms. He spit on them, yowling with pain.

But the tractor was rattling and bellowing furiously, and Conn knew the war was more than half won.

"Sorry, Brad!" Conn yelled. He shouldered his sack of bombs and vaulted into the driver's seat. "Get your men into the back."

The Readers gathered up their lances and helped Bradley into the vast steel bin behind. Conn threw in the clutch. The tractor coughed again and calmly shuddered through a pair of cases before he could get it turned. He drove it shakily down the stairs while the men bounced and murmured in the bin and Bradley cursed fiendishly at his raw palms.

In the armor room, Conn rammed through half a dozen exhibits as an experiment. This tractor, he thought, was almost as deadly as the best Panzer tank. He swerved around the giant Sphinx and charged down the broken stairway, fragments of stone and steel crackling under the treads.

The rent windows were a little too narrow. The treads kicked out space for themselves and left crumbling stone behind. Conn drove up to the breach in the wall and yelled for the Readers. A score of them mustered enough courage to vault into the bin. They could conceal themselves, Conn figured, and fire out at the Swasts. The steel would protect them. He was the only one exposed, but he'd have to take the chance.

As he thundered through the breach in the rubble wall, he saw the Swasts were still galloping around the castle. Squads of them were poised on the flanks waiting to rush in. Conn fumbled at the dashboard and tried the light switch. The forward searchlights flickered and eddied out long, brilliant streamers. It was astonishing how quickly the batteries charged—astonishing how efficient this machine was.

Craters sent earth and stone banging against the steel walls of the tractor bin. Conn could just hear them clank over the interminable roar of the engine. He braked a tread and sent the tractor in a long course through the wheat fields. It would make riding tougher for the Swasts.

They galloped on all sides, like swarms of furies. The horses were frightened at the horrible sound, and still the Swasts managed to dart in, fire their lances at the bin, and then pivot and gallop away. The Readers in the bin were firing rapidly. Swasts were vanishing from their saddles in blinding flares of light. The night was filled with roars.

Conn thought: Oh, hell, let's get it over with fast. Hilda's waiting. He drove his heels down to steady himself in the jiggling driver's seat,

managed to get another cigarette lit and began heaving bombs. They sounded like empty thumps in the open, but the flames they set off were real, and the dry wheat began to run with rivulets of fire.

He felt utterly dispassionate about it. He had the illusion that he was watching a stranger light the glass bottles of wholesale death and throw them. It seemed that these little groups of armed riders that were torn into screaming bloody bits were toy figures. It seemed that someone was hammering on his back.

Someone was—Bradley. His face was contorted with pain, but he continued to bang Conn's back. Conn shouted: "Is it all over?" and set his ears to Bradley's mouth.

"We've cleaned 'em out," Bradley screamed, "but that's not it. You've got to stop throwing those bombs. You've started a landslip."

Conn stared around. There were no more Swasts in sight. He threw the clutch and let the Diesel idle. He listened and stared. Then he caught it. The growling shake of earth underneath. It made him feel sick.

"That snub-nose warned me," he said. "The mining chief. He said this area is one big honeycombed fault. And I don't suppose your tunneling did anything to strengthen it."

First Conn thought of the cavern and felt nauseous. There were hundreds of Readers down there, but he remembered Rollins and Wilder and the other technicians. They'd realize in time. They'd get everyone out. Besides, all the land was theirs now. They could build anew in the sun and open air.

He knew he was trying to put the hill in the back of his mind. The fear was gripping him. The hill was a granite outcropping. It would be the first to crash away under the strain. There wouldn't be any more time machine. He would never see Hilda again.

Bradley screamed: "The cavern might hold and it might not. We've got to get there!"

Conn gritted: "No!" He threw in the clutch again. The Diesel howled and he turned the machine in starts and drove headlong for the hill. Wheat swished and the tractor banged into hollows and mounted the rolling rises. Behind him, Conn heard Bradley curse and bellow questions. He ignored him.

As the hill came into sight, Conn sensed heat on his back. He turned and suddenly realized what Bradley had been cursing about. Acres of dry wheat were aflame. A curtain of red-orange, topped by a thick, oily smoke cloud was marching after them. Then the jerk of the tractor as it began to mount the hill recalled his attention. He eased it up to the crest and let the motor idle again. The Readers leaped out of the bin.

"What the hell, Conn!" yelled Bradley. "Are you mad?"

Conn paid no attention. He bent and uncovered the stud bank. The earth was shuddering underfoot. Fire and earthquake and a war, that's what he was going through for Hilda. But it was worth it.

"Are you mad?" Bradley repeated.

"No," Conn said. "Look, Brad, I've got to recharge my batteries and get back in time before this landslip crushes the machine. Will you help me?"

"I don't know what you're talking about."

Conn said: "I explained all that to Rollins. Listen, Brad, this means life to me. I couldn't be happy in your world. I've got to get back to where I belong. Just help me for ten minutes. That's all I ask."

Bradley said: "Ten minutes. That's all I can spare, Conn. We'll be needed in the cavern."

"Fine." Conn pointed to the tractor. "Get her jacked up on boulders or something and smash off the treads—"

He pressed the studs in combination. The disk of rubble sank down, carrying him with it. The walls of the shaft were ominously cracked, and as he neared the chamber entrance he could hear the steel squealing.

He thrust open the door. The batteries were exhausted so he could get no light. Conn fumbled in the spare-parts cabinet and withdrew a coil of insulated wire. He made quick connections to the battery terminals, unreeled the wire and started the disk upward, paying out the wire as he arose.

BRADLEY and his men had gotten the tractor up on boulders and were hammering off the treads. Conn removed his belt, squirmed under the machine and belted the forward drive axle to the generator. This way, he figured, he'd get double the power in half the time. The generator might burn out. Then again it might not. This was a terrific tractor. Conn yanked the generator leads off the storage batteries and conneeted them to the wires from his own batteries.

He threw in the clutch. The Diesel roared and set the axle into a spinning whine. Conn prayed the vibrations wouldn't throw the tractor over on her side before his batteries were charged. He leaped to the disk and sent it down.

The accumulator needle had already drifted away from the red exhaustion point and was creeping along the dial. Overhead Conn heard Bradley shout. He stepped out on the disk and looked up. Bradley's head was a black dot in the shaft mouth.

"Fire's almost reached us, Conn!" he shouted.

Conn felt the earth rumble again. Suddenly he realized that Bradley had his own troubles, too.

"O. K., Brad," he called. "Don't need you any more. Get about your own business. My regards to Rollins and the rest. Good luck—"

"Good luck, Conn!" Yet Bradley lingered.

"Go on," Conn laughed, "get out of this. Oh, and by the way—I left my sack of bombs up there. Fair exchange. Heave me down one of those lances, will you? Nineteen forty-one could use them—"

The lance slithered down. Conn managed to cradle it in his arms. He looked up at Bradley and had a mighty desire to shake hands with the man—with his whole fighting generation. But there was a fifty-foot gap between them; a thousand-year gap between them.

Conn said: "Will you get out of here!"

"All right," Bradley said. "So long. I wish you'd stay with us. We could use your guts—"

Then he was gone. Conn brought the lance inside and placed it on the platform. He set the controls for April, 1941. Then he looked at the accumulator dial. The needle had crept far up. It wouldn't take long now.

Maybe a thousand watts or so were pouring into his batteries. Maybe more. Whether or not he got back to Hilda would depend on how long it took before the fire reached the tractor and fused everything, or how long it took before this hill settled down a few feet and washed him flat. He listened to the far-off drone of the Diesel and

prayed. He listened to the creak and groan of rock on steel and prayed.

A whiff of smoke reached his nostrils. Conn stood at the chamber door, waiting until the last minute before he would be forced to send the disk up. He was quivering with fear. He tried to think of anything to distract himself. He thought: Those Readers. With Uranium 237 they've stumbled closer to atomic power than we did in all the glory of our mechanized society.

He thought: America can use these blast lances. That'll be another factor added to the past from the future—and it'll create still another infinity of alternative futures.

Conn coughed and realized that the shaft was heavy with smoke. Above him he heard a rumble, as though a heavy machine was starting to roll down the hill. As if by magic, the ends of the wire sputtered away from the terminals and whipped up the shaft, carried away by the tractor. He sent the disk up after them, thinking stupidly: That's the way a fishing line looks to a fish. He shut the door.

Conn stepped up on the platform, afraid to look at the accumulator dial. He might have as much or twice as much power as he'd need, but he'd have to push back through Time, no matter what. If he fell short of '41 in this track, he'd come out into the Dark Ages again, and be stuck for eternity. There'd be neither electricity nor the chance to create any.

He picked up the lance and reached for the knife switch. It was, he thought, like jumping blindfolded into an unknown vastly more terrifying than mere infinity.

He yanked down the switch.

VIII.

The silver-apple moon had slipped back toward the eastern horizon when Conn at last came to the surface. It was blood-red and vast. The sky around it was steel-blue. He leaned on the lance he had brought with him and felt sick and weary.

The distant crack of a shot made him prick his ears. Conn stamped the thick turf carefully over the stud bank and went loping down the side of the hill. All this seemed like a bad dream he'd had once before—but he had an idea, a most peculiar idea.

He pushed through the high weeds at the foot of the hill and found himself at the edge of a lush fairway. A hundred yards before him, Conn saw the slight mound of a green. A

flag whipped above it. Far beyond the mound he saw a small group of figures. Seven figures. They split up and began to creep in his direction. Suddenly Conn understood.

He got to all-fours and began worming forward through the turf. A spike of red flame flared and cracked. From the sand pit, just before the green, came an answering shot. The seven figures poised and began to run. At the sand pit the dark form of a man clambered up. He fired twice and then dove back into the cover. The figures continued to sprint forward.

Conn murmured: "Take it easy, Probable Conn. I'm with you—"

He got to one knee, threw up the lance and pressed the firing stud. There were five silent flares of light. Craters appeared in the grass—and only two of the Nazi attackers were left.

Conn sighed and walked over to the edge of the green. He lay down easily and prepared to wait. It would only take a few minutes, he knew. The Probable Conn would lay out the two last Nazis, kiss Hilda, get slapped and say good-by. He might even see him walking away through the gloom.

He would walk up to the time machine, Conn thought, and surge forward into still another alternative future. Maybe he'd be happy there —maybe not. Maybe he'd try to come back, too. There was no telling. There was no sense wondering what he had in store for him because Time was too infinite for the human mind to comprehend.

There would be a lot to explain to Hilda, Conn thought. Why he'd left her? Why he'd returned so quickly? How he came to have his clothes torn to shreds? Where he got this lance? All this and more. But it wasn't important. Hilda was the only thing that was important and she'd understand.

A figure walked past him, trodding sadly through the moist turf; the figure of a Probable Conn with a rucksack on his shoulder. Conn wanted to get up and say: "Hi!" and maybe go over and shake hands; but the figure passed after a lingering look back, and, anyway, Conn heard Hilda cry: "David!"

That was his cue. He got to his feet and ran toward her. When she saw him she cried out again in a joyous tone: "David!"

Conn took Hilda in his arms and kissed her. He kept murmuring: "It's all right, darling, it's all right." And the thought came to him that this was the last paragraph for real. Nothing else came after this but "They lived happily ever after" and "The End." He nestled his bruised cheek against her silky hair and felt sorry for all the infinity of Probable Conns. He wondered how many of them knew what they were missing.

THE END.

VERMIN OF THE SKY

By R. S. Richardson

How the asteroids get their names—and not the names of Greek and Roman gods and goddesses. They're named for pet dogs, girl friends, telescope donors, or anything handy!

THE chief astronomer selected a plate from half a dozen on the drying rack and surveyed it with the gloomy look of those for whom life holds few surprises.

"These last night's plates?" he said to his assistant, busy at the other end of the darkroom with some reducer.

"Just came out of the wash a minute ago," the younger man replied.

The chief took a magnifying glass from his vest pocket and began to examine the star images in detail, systematically covering each square inch of the plate, and occasionally returning to check a suspicious object. One after another he subjected the plates to this searching scrutiny without apparently finding what he sought.

"No novae?" his assistant inquired.

The chief shook his head. "No novae. Nothing there but asteroid trails. Plates are fairly crawling with them." He thrust the magnifying glass back in his pocket. "Vermin! That's what we ought to call them. Vermin of the sky!"

The astronomical publications are silent as to how the estimated 50,000 asteroids circulating between the orbits of Mars and Jupiter came to be known among members of the profession as vermin of the sky. It is highly probable that they were christened by an irate astrophysicist during some such scene as the above and the name has stuck ever since. But although they may look with scorn on the little asteroid trails that clutter up their photographs of the nebulae and star clusters, nevertheless there have been recent developments in minor planet research which in their appeal to the imagination challenge anything the astrophysicist has to offer.

Perhaps the most startling discovery is that asteroids are by no means confined to a narrow zone as formerly supposed but can come alarmingly close to the Earth. It will be recalled that for a long time Eros was considered the nearest neighbor of the Earth-Moon system, sometimes approaching within 14,000,000 miles. Its visits were heralded far in advance and widely publicized, because Eros made such a fine test body to use in checking up on the astronomical unit of distance. But now, like a star of the old silent motion pictures, Eros is almost forgotten amid a rush of glamorous newcomers.

THE FIRST of these was Amor which came within 10,000,000 miles of the Earth on March 22, 1932. This made quite a stir and astronomers congratulated themselves on having a new object to use in determining the solar parallax. But hardly had the record been established than it was broken by Apollo

that cut the distance down to 6,500,000 miles. The orbit of Apollo falls just a trifle inside the Earth's and the asteroid is large enough so that it could probably be detected in transit across the Sun's disk. This is noteworthy in that it shows how the observation of a small black body in front of the sun does not necessarily mean Vulcan has been discovered at last, as Apollo also goes out beyond the orbit of Mars.

Apollo's record lasted until 1936 when Adonis swept by at the uncomfortable distance of 1,300,000 miles. Then, before astronomers had a chance to recover their breath, another asteroid whizzed past that set what may be an all-time low. For on October 30, 1937 at twelve o'clock Greenwich Civil Time Hermes missed the Earth by only 485,000 miles. What is more, calculations show that under the most favorable circumstances it can approach within 220,000 miles, or about 1,500 miles closer than the Moon ever comes. This really means absolutely nothing for the elements of Hermes' orbit are so uncertain it could just as well be 220,000 inches as miles.

The diameter of Hermes was estimated at a mile and its mass at three billion tons. Astronomers are doubtful if a body of this size should be included among the asteroids and would better be classified as a meteor. The idea receives some credence from the fact that it came from the direction of the radiant point of the Taurid meteors. If actually a member of this swarm, it is the first case of a meteor being "seen" outside of the Earth's atmosphere.

There is no danger of a collision between Hermes and the Earth in the immediate future at least, for calculations carried forward into 1942 show that at no time will it be closer than 100,000,000 miles. The accompanying diagram shows the positions of Hermes and the Earth before and after the near crack-up of October, 1937, and also three corresponding positions of the asteroid for 1941.

The discovery of bodies moving in orbits so close to the Earth has caused many staid and dignified star-gazers to do some thinking along lines previously handled by writers for the Sunday magazine sections. For one cannot help wondering, if we know of two asteroids that may come closer than a million miles, how many others are flying about of which we know nothing? Is it possible that the great meteor crater of Arizona and the Siberian casastrophe of 1908 represent the effects of asteroids that didn't miss us? And what a thrill it would be to watch safely from the Earth while a big one piles into the Moon!

When an object such as Adonis or Hermes is discovered, the observer immediately wires its position to the Harvard College Observatory which acts as a clearing house for such information. Harvard, in turn, wires the position to all the principal observatories in the United States so that others may join in the hunt. At the same time, computers start work on a preliminary orbit based upon the discovery positions which will serve to locate the object temporarily. Much of this orbit work is done by advanced astronomy students as part of their regular training. Computing an orbit for the first time is a grueling ordeal that leaves the student pale and haggard and anxious to start in on another one. Speed comes quickly with practice and with good luck an expert can grind out an orbit in a few hours. Numerical computation has had a peculiar fascination

for some people, and once started on an orbit they will abandon everything else until it is complete to the last decimal point.

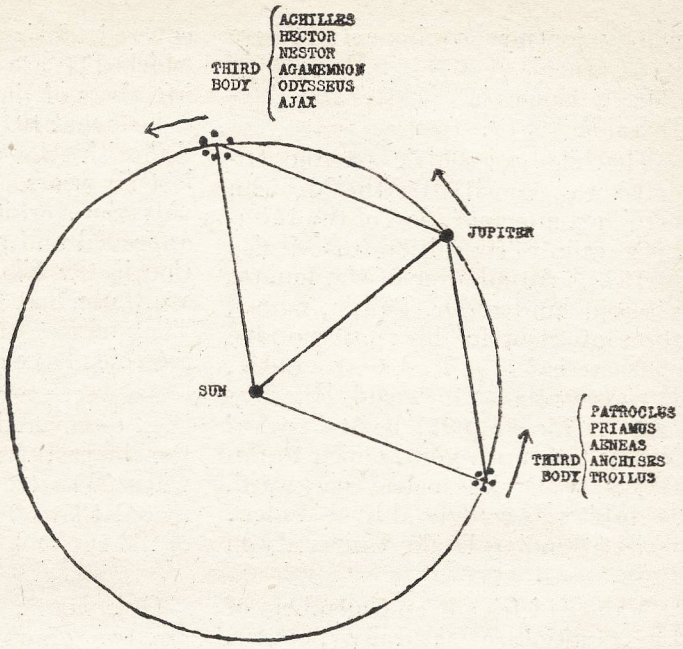


Fig. 1. One of the classical special solutions of the Three-Body Problem actually exists in nature. Each of the two groups of Trojan Planets forms, with Jupiter and the Sun, an equilateral triangle, resulting in an orbit that is predictable and perfectly stable for immense eras of time.

When an asteroid has been observed for several months so that a reliable orbit has been determined sufficiently accurate to find it at later returns, the manuscript is—or was—sent to the Astronomisches Rechen-Institut in Berlin which by international agreement is the official keeper of the asteroids. If the hard-boiled staff of the Rechen-Institut is convinced that your asteroid is really a new one, and your orbit is as good as you claim it is, they will give it a permanent number and see that it appears in each issue of the *Kleine Planeten* under whatever name you have chosen.

During all this time the asteroid has been designated by a temporary catalogue number such as 1937 UB, but now it is ready for a name of its own. Finding a suitable name no one has used before has gotten to be quite a job in itself. The original plan was to use feminine names taken from classic mythology. When these were exhausted astronomers turned to Shakespeare and the Wagnerian operas, but gradually more modern names began to appear until now practically anything goes. However, the feminine form of the name is still retained by adding an *a* or *ia* at the end. The only male asteroids are at the extreme inner and outer fringes of the zone.

A large number of prominent astronomers are now named after asteroids instead of the old system of honoring them with a crater on the Moon. Running down the list in the *Kleine Planeten* for 1941 many are recognized at a glance. One finds Watsonia (729), Schwarzchilda (837), Newcombia (885), Moultona (993), Lundmarka (1334), Leuschneria (1361), and Stromgrenia (1422). The late Professor Barnard is represented by Barnardiana (819), while his wife is Rhoda (907). Some wealthy men also appear on the list, which looks suspiciously like a scheme to raise

money for new equipment. There is Carnegia (671), Rockefellia (904), Hooveria (932), and McDonalda (991).

The highly eccentric asteroid Hidalgo was named after the Mexican hero in commemoration of the Hamburg eclipse expedition to Mexico in 1923. An admirer of the famous asteroid hunter, Dr. Palisia, named three of them for his most notable characteristics: Probitas (902), Perseverantia (975), and Hilaritas (996). Ekard (694) has no special significance until you happen to notice it is Drake spelled backward. Its orbit was computed by a student while attending Drake University in Iowa.

Names of friends and members of the family are naturally popular. Muschi (966) is the nickname of a certain German astronomer has for his wife. Mildred (878) was named after a daughter of Dr. Harlow Shapley, Director of the Harvard College Observatory; and Erida (718) is a daughter of Dr. A. O. Leuschner, formerly head of the Students' Observatory at the University of California.

Even favorite foods are on the list as shown by Limburgia (1383), and there is a musical instrument Piccolo (1366). The origin of many of the names is fairly obvious but some are rather puzzling. Thus whether Arnica (1100) refers to somebody's sweetheart or an external remedy for sprains and bruises, is not clear.

Every year the Greenwich Observatory publishes in the *Monthly Notices of the Royal Astronomical Society* a progress report on minor planets that reads like a combination of Vital Statistics and Personals in the daily paper. One learns, for example, that 188 asteroids were discovered during the past year of which 171 are believed to be new. Members of the Society will be glad to hear that 1940 UQ has been identified with Alabaster, missing for the last six years. Following are asteroids whose orbits have been officially approved and admitted for publication in the *Kleine Planeten*. Below are those that have received names. They regret to announce that 37 asteroids have gotten lost.

An average of 210 asteroids have been discovered per year since 1930, the biggest haul coming in 1933 when 269 were reported. It is estimated that 50,000 are within range of the 100-inch reflector.

OUT ALONG the orbit of Jupiter are two groups of asteroids whose motion is one of the curiosities of the heavens. They are asteroids that are trapped in a gravity prison from which they are powerless to escape, held captive by invisible bonds from the Sun and Jupiter.

One group composed of six asteroids always precedes Jupiter in his orbit by sixty degrees; the second containing five members always follows Jupiter by sixty degrees. These asteroids are known as the Trojans, being named a bit ironically after heroes in the Trojan War. Clustered around the point preceding Jupiter are Achilles, Hector, Nestor, Agamemnon, Odyssus, and Ajax; while around the following point are Patroclus, Priamus, Aeneas, Anchises, and Troilus. Somebody blundered badly in assigning these names, for the Greeks should all be on one side of Jupiter and the Trojans on the other, instead of instituting what looks like a fifth-column movement with Hector in among the Greeks and Patroclus over in the Trojan camp.

It can be seen from the diagram that the two groups of Trojans together with the Sun and Jupiter form the corners of two gigantic equilateral triangles. They might well be called "eternal triangles" for it so happens that such a planetary configuration is dynamically stable; the tiny Trojans are locked forever in the embrace of the Sun and Jupiter. An observer in space looking down from directly above the Sun and keeping his face always turned toward Jupiter would see the system apparently at rest. This strange situation arises from the fact that the Trojan groups are acting out a particular answer to what is considered the toughest problem in theoretical astronomy. For they are playing the role of the "third body" in a famous theorem published by the great mathematician Lagrange in 1772.

Astronomers long ago had cracked the two-body problem. That is, if two planets are alone in space and their masses, velocities, and positions are known at any *one instant*, then their history is known for *all time*, past or future. But introduce a third body into the system and at once their motions become so involved that no one has ever been able to solve the problem in a practical form.

What Lagrange did was to show that there was one special case where the three-body problem could be completely solved—the case of an equilateral triangle formed by a tiny body and two massive ones. Under these circumstances the motion is permanent. At the time, Lagrange's theorem was regarded merely as an astronomical curiosity—beautiful to behold on paper but with little chance of being seen in the sky.

When Asteroid 588 was discovered and its orbit determined, astronomers suddenly awoke to the fact that here was that special case of the three-body problem they had been looking for. An intensive search was made for similar asteroids with the result that another was found the following year and eleven are now known in all. The last to be discovered was Ajax in 1936.

Actually the Trojans are not fixed precisely at the two critical points on either side of Jupiter but are located at considerable distances from them. As they revolve about the Sun they swing ceaselessly back and forth past the point in space where the corner of the triangle falls. Thus the Trojans have a little freedom of motion—like prisoners pacing their cell to carry the analogy further.

Their only hope of rescue appears to be in the planet Saturn. While the motion of the triangles is permanent so far as Jupiter and the Sun are concerned, it is possible that the attraction of another body might cause a Trojan to approach so close to Jupiter that its motion would be radically altered, after which it would no longer be a Trojan. Since the age of the solar system is reckoned in thousands of millions of years, evidently Saturn has seldom been able to free a Trojan or otherwise none would be left by this time. And it is doubtful if Saturn can reverse the process and turn non-Trojans into Trojans.

A remarkable asteroid that may once have been a Trojan is Hidalgo (944). Any former Trojan would continue to move in an orbit that passes very close to Jupiter's. The orbit of Hidalgo passes near Jupiter's and extends far on outside the zone of asteroids to the orbit of Saturn. It is so elongated one can-

not help wondering if Hidalgo might also have been a comet with a large nuclei that for some reason ran out of gas, rather than a true asteroid.

There is one other possibility that might conceivably result in escape for a Trojan. With half a dozen asteroids oscillating about the same point in space a collision could ocur. The prospect is pretty slim, however, for the length of the swings is of the order of 100,000,000 miles and are made in different directions. Also the asteroids reach the end of their swings at different times although their periods are all nearly equal.

THE DISCOVERY of the Sun-Jupiter-Trojan system raises the question of whether other such systems may exist; for example, an Earth-Moon-asteroid system. A tiny satellite of this type would be moving along the Moon's orbit sixty degrees behind or ahead of Luna. It might have escaped detection owing to extreme faintness or simply because nobody is on the lookout for such an object. Even if accidentally photographed it might not be recognized as a satellite, for since it would be moving among the stars with the same speed as the Moon, it would leave a bright streak across the plate which would naturally be taken for a meteor trail.

The discovery of two new moons of Jupiter in 1938 has aroused interest in the old idea that they may be captured asteroids. There are two schools of thought on the origin of the satellites. According to one, the planets are pictured as the benign parents of the satellites, presiding over their family with tender solicitude. The other regards them as ruthless dictators sweeping through space and gathering up any unfortunate asteroids that happen to fall into their clutches.

Although it might seem easy to imagine conditions whereby an asteroid would become a satellite, it is doubtful if Jupiter could turn the trick *alone*. If he could have the aid of Saturn or a resisting medium, or if he could sneak up on an asteroid without making his presence known in advance, he might be able to pull it off. In general it would seem that conditions are rarely favorable to effect a capture.

The converse case of the escape of a satellite from its primary is equally difficult. At times Jupiter VIII, IX, and XI are attracted by the Sun almost as much as by Jupiter and come perilously close to the limit of escape. They revolve in orbits so large that even the Jovians would need a six-inch telescope to see them. Jupiter VIII almost got away in 1913 when it was hovering on the brink for a while. It has been suggested that an asteroid might lead a double life, spending part of its time as a satellite and the remainder revolving around the Sun in an orbit of its own.

The writer has discussed the matter with the discoverer of Jupiter IX, X, and XI, and found him loath to admit any of his satellites are former asteroids or that they are likely to stray beyond Jupiter's control. On the whole, the experts seem to be of the opinion that the satellites were born of the planets and thus have been satellites throughout their entire existence. In other words, once a moon always a moon.

IN CONTRAST to the Trojans and satellites held in check on a short leash, the wildest asteroid of the 1500 is undoubtedly Andromache (175). Only within the last few years has she been brought under control after refusing to abide by the rules laid

down for her ever since she was discovered in 1877. The trouble has been that Andromache goes around the Sun in almost exactly half of Jupiter's period which places her right on the edge of one of the gaps or "forbidden" zones in the asteroid belt. An asteroid with a period of one half, one third, et cetera, of Jupiter's is regularly subjected to his powerful attraction which tends to force it out of the region. Fortunately Andromache is one of the asteroids discovered by Watson who left a fund to be used in keeping track of them. Without this endowment she would have been lost long ago.

As if the natural difficulties of following Andromache were not enough, man-made obstacles have kept arising. Right at the start Watson's telegram was lost preventing other astronomers from securing observations so necessary for an accurate orbit. This meant that the orbit had to be based entirely on Watson's own positions some of which were later found to be wrong. It happened that two other asteroids were also discovered at the same time both of which were numbered 175 which led to more confusion. In the resulting mix-up, Andromache was lost into the daylight and for sixteen years was gone without a trace. One search ephemeris after another was computed but failed to locate the planet. Watson thought the attractions of the major planets were responsible and calculated perturbations until his death but never saw Andromache again.

Then she was accidentally picked up as 1893 Z and identified as Andromache by the similarity of the two orbits. From then on it developed into a battle between the theoretical astronomers and Andromache with no quarter asked on either side. Strong-arm mathematical methods that had worked on other unruly asteroids were tried and found wanting. As year after year went by

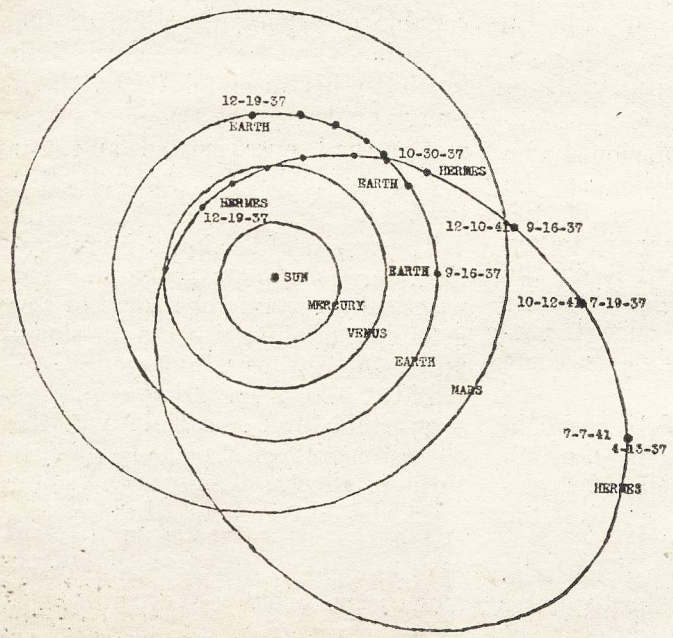


Fig. 2. The orbit of the asteroid Hermes, one of the planetoids that pass close to the Earth. Its closest passage in 1937 was not observed as the body was discovered too late.

Andromache gradually came to have the distinction of being the chief factor in the development of one of the most awful subjects known to man, the numerical computation of the general perturbations of the planets. Finally by devising a new scheme of allowing for the disturbing effects of Jupiter, Andromache was brought into line. Astronomers now feel they can predict her position with all the necessary degree of accuracy for years to come and so have given up the chase.

But some lingering doubts still remain. At a sort of a farewell address given at the close of thirty-five years of investigation, the director concluded with the remarks: "We shall now part from Andromache and once more give her the freedom she has craved ever since she was made a captive after the fall of Troy. But this freedom is given with the distinct reservation that she will permit astronomers to account for whatever minor whims she may indulge in hereafter."

One of the saddest features about being a purely theoretical research man is the virtual certainty that any explanation of natural phenomena he may propose will ultimately be found wrong. Regardless of the prestige his theory commands today, a century later will find it on the junk pile. And nothing is deader than a scientific theory once its usefulness is over. They never come back.

Readers of science fiction should be agreeably surprised, therefore, to hear that the spectacular old explosion hypothesis of the origin of the asteroids is again in favor after almost being abandoned entirely. Advanced by Olbers shortly after his discovery of Pallas in 1802, it was at first highly successful not only in explaining the known facts but in predicting others as well. If the asteroids are fragments of a planet, they should move in orbits that intersect at the point of explosion, and the first few discovered seemed to do this. When later, others were found that did not, the theory was in no way weakened, for it was pointed out that in the course of thousands of centuries the attraction of the major planets would have obliterated all traces of a common meeting place. Many asteroids were found to vary in brightness which would be expected of the shattered remains of a planet. Some like Eros are thought to consist of several pieces almost in contact revolving around their center of gravity.

The explosion theory was dealt a hard blow by Simon Newcomb when he traced back the various changes the orbits had undergone in the course of ages in the hope of finding a point of intersection. He developed formulae which he believed capable of setting the time of the explosion almost to the day. But much to his disappointment there was no evidence that a point of intersection had ever existed and the theory gradually lost ground after that.

The results of the latest investigation, however, now make it seem practically certain that some of the asteroids originated from a single mass. An enthusiastic Japanese asteroid worker, K. Hirayama, has shown that three so-called invariable elements exist impervious to the disturbing effects of Jupiter. They must be determined through an elaborate mathematical analysis, but once brought to light, the agreement among the orbits is revealed in a striking manner. Five families have

been found named after the most prominent member, the largest being the Flora family of 57 asteroids. It seems incredible that all 57 could have orbits practically identical in three respects purely as the result of chance. The existence of several families indicates that not one but a series of explosions occurred.

MODERN SCIENCE has also partially removed one of the most awkward proponents of the theory faced in the old days. This was trying to think of a convincing reason why a solid planet should have occasion to blow up in the first place. They spoke vaguely of disruption by tidal action, of instability caused by excessive speed of rotation, and of violent chemical reactions. But as a rule this part was treated in a rather sketchy fashion.

The discovery of radioactive substances in the Earth's crust has provided an entirely new source of internal energy. As the theory stands today, the original asteroid was a body having a mass about two-thousandths of the mass of the Earth, roughly corresponding to the satellite Titan. To produce an explosion, it is necessary to assume a strongly radioactive core and a thick nearly non-radioactive crust—a world containing within itself the seed of its own destruction. Presumably the pressure was relieved at intervals by blowing off part of the outer layers.

Another theory of the origin of the asteroids which has been streamlined recently explains them as the debris from a huge comet captured by Jupiter and made to revolve around the Sun in a nearly circular orbit. As it disintegrated, its path became strewn with the fragments that we now call the asteroids.

There is a much closer resemblance between comets and asteroids than is generally supposed. Frequently an astronomer upon discovery of a new body is unable to determine what it is and refers to it as an "object." Comets are popularly considered to be glowing masses of gas with a long tail streaming out behind, but most of them consist of nothing but a starlike nucleus surrounded by a faint nebulosity. What is more astonishing, several well-known asteroids have been reported enveloped in nebulosity. An experienced comet and meteor observer, J. Comas Sola of Barcelona, has photographed nebulosity around both Oceana (224) and Elsa (182), and Jocasta (899) has twice been photographed with a halo. Nor can an elongated orbit be considered decisive proof of a comet, as shown by the case of Hidalgo (944), previously mentioned. On the other hand, Comet Schwassmann-Wachmann moves in a nearly circular orbit and might be regarded as an asteroid of faint nebulosity.

Once a member of the solar system the comet would soon be broken up, as many have been seen to do in the past. The insignificant mass of the average comet is not a fatal objection, as the great comet 1882 II had a mass estimated at a thousandth of the Earth's which is certainly more than all the asteroids combined, discovered and undiscovered.

Although the theory gives a tolerably plausible explanation for the asteroids, it fails completely to answer another equally puzzling question.

Where did the comet come from?

THE END.

THE GEOMETRICS OF JOHNNY DAY

By Nelson S. Bond

As a businessman, Johnny Day may have been a lamb among wolves—but he could make geometry do tricks!

Illustrated by Schneeman

OLD MacDonald had a firm. It was called the Northern Bridge, Steel & Girder Co., and Hector MacDonald's boast was that despite a plethora of municipal, State, Federal and other taxes, despite the mad machinations of That Man in the White House, it managed to issue its

annual report to stockholders in black ink.

It was also his boast that the N. B. S. & G. operated on a principle of maximum efficiency at minimum cost, a statement grudgingly borne out by those workmen whose sole duty it was to salvage tiny steel shavings from the workshop floors.

"'Tis braw folly," decided old MacDonald, "to waste gude metal so! And the junkman will pay nowt for't. Shave it fine and scour it. 'Twill make excellent steel wool at a savin' o' three-fufty the carton."

So they did, and it did.

Not that old MacDonald was stingy. He paid his men well—without benefit of unions—and provided comfortable, though not luxurious, working conditions. He was a thrifty man, deploring waste in any shape or form. "Time is money!" was his watchword; to spare himself the expenditure of this valuable commodity, his office was bulwarked by a battery of secretaries employed to protect him from the host of sales, insurance, and contact men who prey on busy executives.

Thus it was with great surprise that, upon entering his sanctum after an inspection tour of the welding shop, he found awaiting him a young man of whose presence he had not been forewarned.

His first reaction was one of anger, his second was a gesture of dismissal. Spluttering for words, he lifted an arm toward the door. But the young man further confused the issue by seizing the outstretched hand, pumping it vigorously, and grinning.

"How do you do, sir? My name's Day; John Day."

MacDonald retrieved his hand with a snort.

"How," he demanded, "did *you* get in here?"

Johnny Day continued to grin, which was clever. It concentrated attention on his fine, strong lips and jaw line, made the watcher overlook his shortness of stature, the fact that he wore rimless bifocals, and that his hair line thinned back above the temples. He nodded amiably toward the window behind MacDonald's desk.

"Through there," he said.

"*What!*" said MacDonald. He strode to the casement, peered out. His office was on the second floor. But he saw for the first time that the brickwork facing was so arranged as to afford easy hand and footholds to an agile man.

He turned to face Johnny. "Ye clumb!" he said.

Johnny nodded. "I've been trying to get in to meet you," he explained, "for three weeks. Your secretaries have pebbles for hearts. All they can say is, 'Sorry!' I had to find another way."

MacDonald stroked his jaw thoughtfully. "I *should*," he mused, "ha' ye thrun oot on ye're nawdle. But ye've done me a favver in exposin' a vulneerable spot. Therefore, I'll listen to ye"—he took out his watch—"f'r exactly twa minutes. Though, mind, ye're wastin' y'r time! I've na use f'r insurance, stocks, nor nowt else. But proceed. What is it ye want?"

JOHNNY'S GRIN faded, and his lips became as serious as his eyes.

"I want," he said, "a job."

"Eh?" said MacDonald.

"I want to work for you."

"Ye said that," said MacDonald, "afore. The slight change o' vairbeeage doesna' deceive me. Ye want a job, eh? And just what is it that ye do?"

"I draw things," Johnny told him, "and I add things and I say A plus

B equals C. In other words, I am —or used to be—a mathematics professor. A geometry teacher. But I quit. I'm tired of looking at faces; smooth, pleasant, dumb young faces. I want a chance to apply my special talents in the business world. There . . . there's another reason, too—"

"The fairst," said MacDonald, "is sufficient." And he shuddered. "My secretaries were richt, Mr. Day. There's na place f'r ye in this concairn. If ye were an engeeneer, pairhaps, or even a fairst-class puddler. But a teacher! A hypotheteecal word-mongerer—" He gazed at his watch. "Y'r twa minutes is up, young man. If ye'd be so kind as to shut the door softly when leavin'—"

"Look, Mr. MacDonald," said Johnny Day desperately, "you're making a big mistake. I'll admit that I know little or nothing about the steel-construction business. But I can learn. And while I'm learning, I can be of *some* value. The science of mathematics is useful everywhere, in thousands of little ways—"

"Name one!" said MacDonald.

"I . . . I beg your pardon?" faltered Johnny.

"Name," repeated MacDonald sardonically, "one." He rocked on his heels and smirked. "I'm a fair mon, Mr. Day," he said, "I'm open to conveection. I'll gie ye a chonce f'r to prove y'r claim. If ye're richt, I'll find a job f'r ye. If not, I'll ask ye to remove y'r A's and B's quietly.

"Look aboot ye, Mr. Day. The room we stond in was designed and equipped by efficiency experts whose purpose it was to achieve maximum efficiency at minimum cost. Ye'll see that the office is neat, but not gaudy; complete wi'oot the expense o' needless geegaws.

"However, if ye can show me *one way* in which a cent might ha' been saved in the equippin' o' this room —disregardin' the initial cost of furniture and materials, which I bought at wholesale—I'll put y'r name on the pay roll. Is that fair?"

"Yes, sir," said Johnny mechanically, already scanning the room. The assignment did not sound difficult. But the more he looked, the harder became the test. MacDonald's boast was not a vain one. The arrangement of the office was strictly, maddeningly, functional. Sturdy, but inexpensive, furniture; a hardy fiber carpet, painted walls, plain, unornate lighting fixtures—

"Well?" said MacDonald gleefully.

"The . . . the lamp on your desk!" Johnny's heart gave a lurch; he seized at a timber-sized straw. "The wire which feeds it comes from all the way across the room! Representing a sheer waste of . . . of about forty feet of wire! At nine cents a yard—"

"Forty-two feet," chortled MacDonald, "at eight and a half cents. One dollar and nineteen cents to run that extension. Not bad, lad—"

"Then I get the job?" breathed Johnny.

"Ye dinna! Ye overlooked the triflin' fact that by runnin' yon extension I saved the labor and equipment cost o' puttin' in a second outlet! Wi' the wall plug alone costin' eighty-nine cents, and the labor at least three dollars—" Again he glanced at his watch; this time impatiently. "Well, I maun be askin' ye to leave now. This is all verra gay and entertainin, but time is money, and—"

"*Wait!*" cried Johnny Day.

"Eh? What's that?"

"I've got it!" said Johnny. And swiftly, "What was the cost of that wire? Eight and a half cents a

yard? Then two feet would be worth approximately six cents, right? And you said if I could save a single *penny*—"

MacDonald glanced again at the extension under discussion. Simple, cloth-bound cord, it originated from a plug set rather high in the blank north wall, the wall facing his desk, ran down this wall to the floor, along the floor under the carpet, up the south wall to the wainscoting, to connect with a triple socket.

"Well?" he growled.

"Too long!" proclaimed Johnny triumphantly. "Sheer waste! It could be two feet shorter and still do the trick! When do I start work, Mr. MacDonald?"

"Bide a wee!" MacDonald shook his head. "It won't do, lad. I know ye could save a few feet by stretchin' it across the room deerect, but 'twouldna be practeecal! Folks would be forever tanglin' their pates in it. It had to run along the floors and walls—"

"Of course," said Johnny. "I know that."

"Then what're ye blatherin' aboot? D'ye think it's made o' roober? It canna be shorter and yet follow the wall. It touches only twa walls and the floor!"

"That's just it!" said Johnny. "It ought to touch three walls, the floor, and the ceiling!"

"Three walls—" MacDonald shifted nervously. His voice lowered. "Look, lad, ye're a bit excited. Pairhaps a leetle rest . . . a cup o' tea—"

But Johnny's attention was elsewhere. He had moved to MacDonald's desk, found paper and pencil, sketched a pair of diagrams with swift, sure strokes. He thrust his drawing under the older man's nose exuberantly.

"There's the proof. Get your engineers to study it out; they'll agree with me. Geometry is always right. It's your eyes that deceive you. The route of the extension cord is a problem in geodesics—and curiously enough, the *shortest* possible route is one that requires the wire to run upon five of the six sides of the room.

"In rough figures, *my* method of running that extension requires two less feet of wire than the method employed by your efficiency experts. A saving of almost six cents—or six times as much as you asked me to save. And I can"—breathlessly—"I can start work today, Mr. MacDonald!"

MacDonald stared at Johnny, then he stared at the wire, then at the diagram in his hand, then at Johnny again. He said, "Well, I'll be domned!" and his mouth was wry, but it twitched at the corners. His eyes twitched, too. And he pushed a button and spoke sentences into a gadget. He said, "Pearson, I'm sending you a young mon. Put him to work. He says he can lairn the business. . . . Aye! Verra gude!"

"Thank you, sir!" said Johnny.

"Get along wi' ye," said MacDonald. "Ye're wastin' my time, since ye now work here. I'm a hard mon, but a fair one. Ye passed my test square and honest. Wait a minute!"

Johnny paused at the door. "Yes, sir."

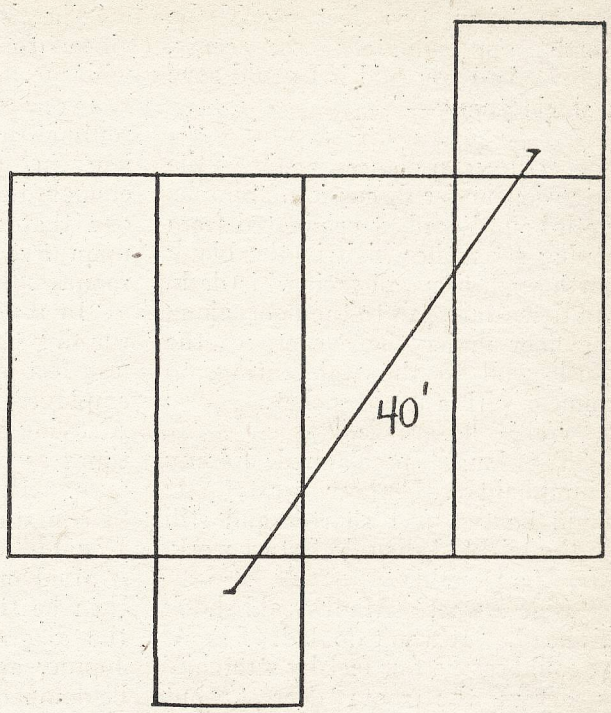
"Ye said ye had a second reason f'r wantin' to work f'r me?"

Johnny fidgeted. "Well, sir—"

"Speak up, mon! Time is money! Is there something else ye're wantin' beside a job? What is it?"

Johnny's face cleared. The grin came back. "There *is* another thing, sir," he said quietly. "I want to marry your daughter!"

And he ducked out. Quickly. Which was a very wise decision—



The Day method of running a lamp cord—

So JOHNNY DAY, one time professor, erstwhile follower of Euclid, Lobachevsky, Riemann, Bolyai, transferred his "special talents" to the workaday world.

It was not the easy transition he had hoped for and expected. He soon discovered that there exists a wide chasm between the serene mountain peak of Theory and the harsh plateau of Practice. A specific knowledge of general quintics, he found, did not aid in determining the tensile strength of a new type of girder. By formulae and figures the structure was sound; an actual test found it faulty. Johnny rechecked his computations fretfully; the plant engineers shrugged and called the experiment a "cheesecake cast," and tried another type.

He was assigned to the shipping department. Eager to prove his worth, he spent two whole days figuring out how to most compactly load a freight car with cylindrical cable reels. He drew cubes and squares and cylinders and consumed reams of paper and came within an iota of solving the problem of the squared circle.

He got what he wanted, finally. When he carried it to the loading foreman, gleefully, this worthy—a Bulgarian named Derek, who required assistance in counting his weekly earnings—pointed out that he had been loading freight cars in just that manner for the past nineteen years.

He found a niche, ultimately, in the Estimate Department. There was little opportunity here for the exercise of his "special talents," his mathematical requirements did not extend beyond the complicated functions of multiplication and division —but it was a job, and Johnny was happy.

He was happy because he was working for *her* father, and because every so often—about five days a week, in fact—*she* visited the office.

She was Peggy MacDonald. She was sugar, and spice, and everything nice; she had hair the color of tarnished sunlight, eyes the color of a Highland loch, and Johnny's heart did things every time she came within a mile and a quarter. The strange and wonderful part was that she felt the same way about Johnny.

"In another year, Johnny," she said. "By that time daddy will realize how brilliant you are, how important to the business. You'll be a vice president, or at *least general* manager, and then—"

"I might as well be a vice president now," Johnny told her gloomily, "for all the good I do around here. The office boy has a more important job than I have. Well, I'm getting what I deserve. I tricked your old —I mean, your dad—into a job, and now—"

"You didn't trick him," declared Peggy indignantly. "You beat him at his favorite trick. And he can growl and grumble all he likes, *I* know he respects you for it."

"M-m-m!" said Johnny.

"And didn't he turn over a complete estimate job assignment to you just the other day?"

Johnny said, "Ye-e-es," grudgingly. "Yes, he did. But what is it? A contract assignment for government steel? The handling of a big corporation job? No! The assignment of constructing a new, all-steel fence around our own company property. Peanuts!"

"It's a beginning," said Peggy stanchly. "It will lead to bigger things. How's it coming?"

"Oh, all right, I suppose. He hasn't complained, anyway. I designed it in the shape of a circle—you know, largest space-inclosure at a minimum cost for materials—and put through an order for the new flexi-steel to be used. He O. K.'d everything. The job will be finished in a day or two, except for the painting, of course."

"And who's going to do that?"

"I don't know yet. I've sent letters to the major paint men in town, inviting their bids. The cheapest—"

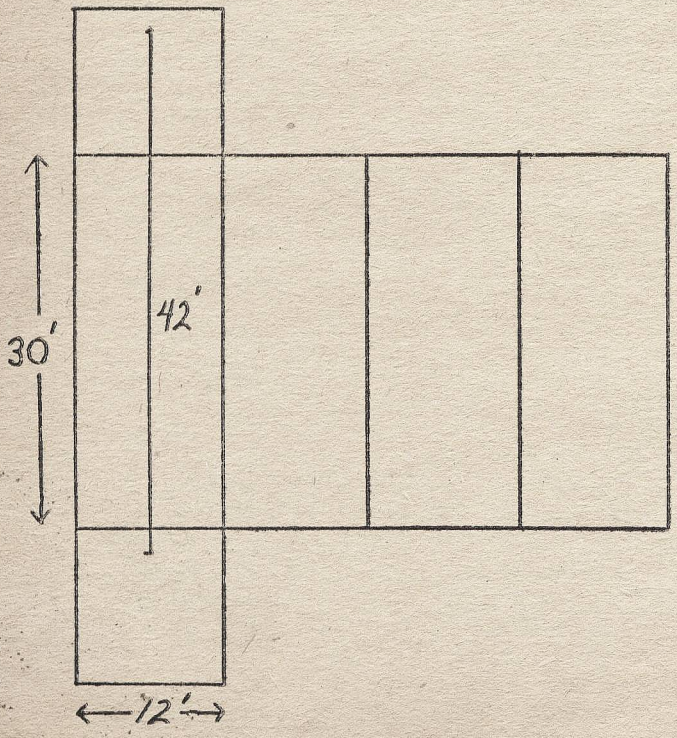
Peggy looked thoughtful.

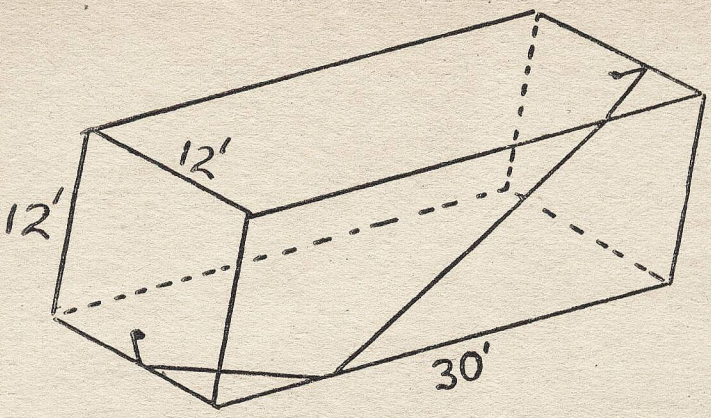
"You didn't write to Campbell, by any chance?"

"Bruce Campbell? Tartan Paint & Varnish? Why . . . why, yes. His company is the largest in town."

"Oh, Johnny, you shouldn't have! Mr. Campbell and daddy are old enemies. I don't mean they'd actually *fight* each other, or anything like that, but—Well, Campbell is a Lowlander and daddy is a High-

—and, believe it or not—the longer route.





It looks funny, but it's shorter this way—

lander, and you know what *that* means. They spend half their waking hours trying to think of ways to take advantage of each other. If Campbell bids on this job—"

Johnny's neck turned red.

"I don't see," he growled, "where friendship and enmity have anything to do with it. If Campbell's bid is the lowest, and the quality of work satisfactory, he should have the job. Furthermore—"

HE NEVER GOT to mention the "furthermore." For just then the door of MacDonald's sanctum opened, MacDonald strode to Johnny's desk. He glared once at Peggy, then ignored her. To Johnny:

"It has come to my attention, Mr. Day, that ye sent the Tartan Paint & Varnish Co. an invitation to bid on the paintin' o' the new fence?"

"Yes, sir. I was just explaining to Peg . . . to Miss MacDonald—"

"I wush to make it clear," said MacDonald emphatically, "that by makin' sooch a gesture ye are doin' what is known in cairtain cairecles as 'leadin' wi' y'r chin.' This I wush to make clear for the pairticular reason that tonicht I am leavin' for Cleveland, and willna be back f'r a week.

"Mind, I'm not forbidden' that ye accept an offer from Campbell if by some meeracle the auld tightwad should happen to submit the best offer. All I *do* say is that ye'd best not only be careful, but unco' canny, in dealin' wi' yon penny-clutchin' auld pirate. One slip and he'll ha' y'r eye teeth!

"In which case"—MacDonald's eyes glinted coldly—"Mr. Day, the N. B. S. & G. will most reluctantly be fairced to dispense wi' y'r valleeable sairvices. Do ye oonderstand?"

"Yes, sir," said Johnny.

"Verra well, then. I leave the matter to y'r discretion. If," said MacDonald, "ye possess sooch. Peggy!" He stalked away, then stopped at the door. "Incidentally—when Campbell's estimator cooms, ye might find a way to delay him an hour or so. Nowt breaks that auld rascal's hairt so much as to ha' his men squander gude time. Peggy!"

"Yes, daddy." Peggy's lips framed the word, "Tomorrow!" Then she was gone, and Johnny got back to work.

THUS it was that, two days later, Johnny Day stared thoughtfully at the fistful of estimates submitted by painters who had entered bids on the now-completed fence.

Topmost of these papers was the bid from the Tartan Paint & Varnish Co. It read, "ESTIMATE. For painting, according to approved

specifications, exterior fence of Northern Bridge, Steel & Girder Co. —$200.00."

Johnny pushed his hand through his hair and looked again and couldn't believe it. He leafed through the other bids. The lowest of them was $225, the highest, $415.08.

"I wonder why," thought Johnny, "the eight cents?" And discarded the bid. And discarded the others, one by one, until there remained in his hand only the Tartan Co. bid. "It's the lowest!" he muttered defensively. "MacDonald be hanged! There's only one sensible thing to do—"

And he reached for the phone.

That was on a Tuesday. On Wednesday the Tartan men began work, and young Prentiss, Johnny's companion in the Estimate Department, whistled and said, "Oh-oh! Campbell! The old man's not going to like it, Johnny!"

On Thursday the job was well under way, and Peggy's eyes were as worried as her voice.

"Why did you do it, Johnny? You know how my father feels about Campbell."

"He won't object to Campbell's getting the worst of a business deal, will he?" retorted Johnny. "The Tartan Co. submitted the lowest bid. A suicidal underestimate, if I know paint costs."

"That's just it," said Peggy thoughtfully. Campbell doesn't submit suicidal underestimates, Johnny. He's too canny. Something's wrong—"

"There's nothing wrong," growled Johnny. "Read the contract. The specifications are there in black and white."

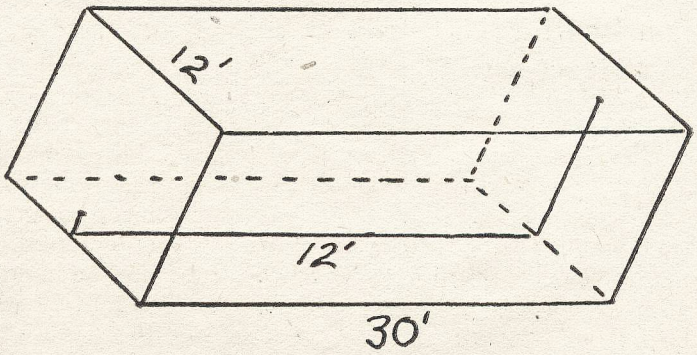
"I know, but—"

"Suppose," said Johnny, "you leave this to me. I'm responsible. I'll take care of any trouble that comes up."

WHICH made easy saying. Because he didn't actually expect any trouble. But it came, ready or not. And sooner than Peggy, or Prentiss, or anyone else, had dreamed. A wad of trouble. The very next day. The foreman of the painting crew came to Johnny's office late in the afternoon. He said, "Well, I think there's going to be about a half gallon of red lead left over, Mr. Day. If you don't mind, I'll leave it here. You can use it for touching up spots later on."

Johnny said, "That's nice. Thanks!" before it made sense to him. Then he started. "Eh!" he said. "What's that? Left over? But . . . but you're not half finished yet!"

"My instructions," the foreman told him, "were to do the outside of the fence. There's just a little bit left to do. We'll finish it first thing tomorrow morning."



—than this!

"Outside!" yelled Johnny. He yelled other things. Loudly. They had no effect on the foreman, who ducked into a shell of reserve and took refuge behind a single sentence.

"I dunno nothin' about it, you better call the boss."

So Johnny called, and what he heard from the general manager of the Tartan Paint & Varnish Co. gave him that dropping-elevator feeling in the pit of his stomach. Arguing over the telephone got him nowhere, so he went to the Tartan office; there, by sheer belligerence, got to face old Campbell himself.

Which must have been just what Campbell was waiting for, because the grin on his face stretched from here to the Antipodes. He took a duplicate of the original bid from his desk and shook it under Johnny's nose.

"Ye'll notice, yoong mon," he said, "that this estimate calls for the paintin' o' the *exterior* fence o' y'r concairn! There's nowt said aboot paintin' *both* side o' yon fence. 'Tisna my fault ye mistook the meanin' o' the waird 'exterior.' Any gude dictionary will inform ye it means 'outside,' not 'outer' or 'surroundin' ' as ye seem to think.

"Furthermore, should y'r employer care to make an issue o' the matter, any court o' law would agree—"

Johnny left. There was no use in arguing the matter any further. Campbell was shrewd, but his logic was unassailable. 'Exterior' did mean 'outside,' therefore just one side of the fence. It did not matter that Johnny had presumed the bid to mean a complete painting of the outer fence. Old MacDonald's prediction had come true.

Johnny went back to his office. Peggy was waiting there. She had heard the bad news from Prentiss.

"Oh, Johnny! What are you go-

ing to do now? I knew something like this would happen. You've *got* to make him do both sides of the fence—"

"He offered to," said Johnny gloomily, "for another two hundred and fifty dollars! Your father was right. I'm a hypothetical theorist. I don't belong in a business office. I'd better go back to teaching. 'Special talents'! Huh! My special talent is for allowing myself to be chiseled by the first verbal sharpster who comes down the pike."

"If it were anyone else but Campbell!" wailed Peggy. "Daddy will die! He'd rather lose an arm than lose a trick to Bruce Campbell."

"What is today? Friday? Well, anyway, your father won't hear about it till Monday. Perhaps by that time—"

"But he will, Johnny! I got a telegram this morning. He's finished his business in Cleveland. He's flying back tonight. He'll be at the office tomorrow morning!"

Johnny groaned.

"This is it, then. I had some cockeyed notion about borrowing the money, having the job finished at my own expense so he'd never find out. But I can't do that in so short a time. This is the end, Peggy. The end of my big ideas, my plans for a career in the business world. I've jumped right off the end of that damned fence—"

He stopped suddenly, his mouth and eyes widening.

"The end of the fence!" he repeated. "The end of the fence! Of course! *That's it!*"

Peggy looked startled.

"Wh-what's what, Johnny? Do you feel well?"

"Listen, Peggy—when does the outside of a fence end and the inside begin. Can you tell me that?"

"Why . . . why, I don't know, Johnny. When you can't go any farther without crossing an edge, I suppose. But what's that got to do with—"

"Crossing an edge!" howled Johnny gleefully. "We've got him! Prentiss, there are some men on night duty, aren't there? Well, get 'em—quick! We've got a little job that must be done before those painters get here tomorrow. Hurry up!"

Peggy gasped, "Johnny, what is it? Are you—"

"Tell you later, sugar!" Johnny was scribbling on a scratch pad. He ripped off the sheet and shoved it into Prentiss' hands. "It's a good thing we used that flexible steel. Here, Prentiss. Tell the men to join the fence like this. Get it?"

AT EIGHT-THIRTY the following morning the painters returned to finish their job. At eight forty-one the foreman of the paint crew stalked into Johnny's office, glowering.

"Lookit, mister!" he said, "there's somethin' funny about that there damn fence. When I left here last night I only had about twenty feet left to paint. Now—"

Johnny grinned at him. "I dunno nothin' about it," he said blandly, "you better call the boss."

Baffled, the foreman did so. Johnny listened to his explanation gleefully. "But I tell you they ain't no end to it. Awright, come see for yourself. Send the old man!" And he banged up the receiver. "Campbell's coming over here!" he threatened darkly.

"Good," said Johnny.

Five minutes later, Hector MacDonald arrived at the office. The grapevine telegraph had operated.

He wasted no time on preliminaries. He skewered Johnny with a glance.

"So ye done it!" he roared. "In spite o' my warnin' yet let y'rself get bilked by Campbell! Well, ye know what I said. Pack y'r kit, young mon!"

"Good morning, chief," said Johnny.

MacDonald turned a delicate mauve. "Gude mornin'?" he bellowed. "Is that all ye have to say? Ye pull a boner that costs me twa hoondred dollars, make me a laughin' stock in the eyes o' yon thievin' Lowland scoundrel, and ye chirp, 'Gude mornin'!"

"It's a *very* good morning," said Johnny. "The marines have landed, and the situation is well in hand. Ah—there's Mr. Campbell now. How do you do, Mr. Campbell?"

The president of the Tartan Paint & Varnish Co. didn't answer his greeting. He pointed a shaking finger at MacDonald; his voice was shrill with pious wrath.

"What kind o' de'iltry is this, MacDonald? I've seen yonder fence, and 'tis no proper fence a-tall! It coorves!"

"Coorves?" repeated MacDonald dazedly. But Johnny interrupted before he could say anything more.

"Curves, Mr. Campbell Why, yes, I suppose it does. But there's nothing wrong in that, is there? I believe most fences curve to some extent."

"To some extent, aye! Back and foorth! But not oop and doon, like this 'un! And there's no end to't! The ootside's the inside, and the inside's the ootside." Campbell wiped his forehead and glared. "'Tis skullduggery!" he raved. "I've given my men orders to stop work. I'll not paint both sides o' the fence f'r the price o' one!"

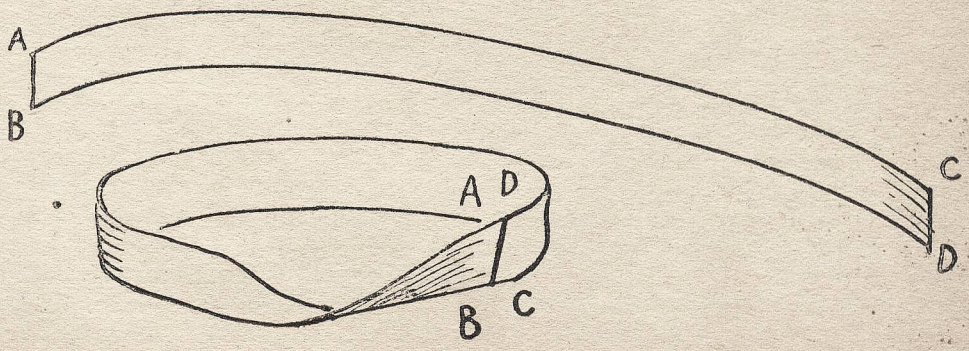
MacDonald could only gulp and stare at Johnny. With rare acumen, he kept his mouth shut. Johnny grinned lazily, but there was an edge to his words.

"You'd better tell them to get back to work, sir. They're just wasting time, and time is money. Because, you see, they haven't finished painting one side of the fence as yet."

"But they ha'!" howled Campbell. "They've painted the entire ootside, now they're *inside*, still paintin'—"

"I'm sorry, sir, but you're mistaken. That fence *has* no inside. They haven't come to an edge yet, have they?"

"—and, presto, there is no inside surface!"



"Edge! There is no edge!"

"Exactly. No edge, no inside. Both sides of the fence are outside. Therefore, by the terms of the contract, you are bound to continue painting until you reach the spot from which you started."

Campbell snorted. "I'll do nothin' o' the sort. I'll take this case to law! I'll—"

"I shouldn't, if I were you," said Johnny pleasantly. He picked a strip of paper from his desk; a long, thin oblong. "Because if you do, we can bring a hundred mathematicians into court to testify that what I've said is true. There is no end to that fence, Mr. Campbell, and it has only one side. It is what is known as a 'Mobius strip.'

"Consider this strip of paper to be the fence. It is so joined that the upper end of one extremity connects to the lower end of the other; thus the fence undergoes a half twist. And that half twist has eliminated one of the sides!

"You don't believe me? Convince yourself by drawing a pencil line straight down the center of the strip, extending it until you return to the point from which you started. Now separate the end of the strip, and you will find that both sides are covered by a straight line, even though in drawing you did not cross any edges.

"I'm afraid, Mr. Campbell"—Johnny tossed the strip of paper to the paint man—"I'm afraid you'll have to continue painting the *outside* of the fence until both sides are painted. I beg your pardon, sir?"

"Nothin'," said MacDonald. "I said nothin'."

Campbell twisted the strip of paper and studied it. He frowned. He re-twisted it and studied it again. A look of respect crept into his eyes. He nodded. To Johnny he said, "Verra well, young mon. Ye win. I take consolation in knowin' that yonder auld cow dinna ken any more aboot this bit o' geometrical rascality than I did. Y'r talents are goin' to waste, Mr. Day, in a plant like this. How much is he payin' ye?"

Johnny thought of his weekly salary and started to answer honestly enough. "Twenty-five—" he began.

But MacDonald interrupted hastily.

"—hoondred a year!" he finished. "And I'll thank ye to no' attempt to steal my valeeable employees, Campbell."

"I'll gi'e ye," said Campbell to Johnny, "Three thousand. What d'ye say?"

"We-e-ell," said Johnny.

"But beginnin' today," broke in MacDonald swiftly, "his salary is thirty-fi' hoondred. And"—he cast a sidelong, meaningful glance at Johnny—"and though it doesna concairn ye, Bruce Campbell, I micht add that there are certain pairsonal reasons—havin' my approval—by reason o' which Mr. Day would undoobtedly rather remain wi' this company. Am I right—Johnny, lad?"

Johnny stared at him. Things went round and round for a minute. When they settled down, he was conscious that Campbell, disgruntled, was leaving; that old MacDonald was still gazing at him with an air of benevolent, almost parental, fondness; that entering the office was a reason for staying with hair of tarnished sunlight and eyes the color of a Highland loch. And—

And, "Aye!" said Johnny Day.

THE END.

"—WE ALSO WALK DOGS"

By Anson MacDonald

Meet General Services Co., the firm that will do, build, get, buy or—if necessary—steal almost anything you need!

Illustrated by Kolliker

"General Services—Miss Cormet speaking!" She addressed the view screen with just the right balance between warm, hospitable friendliness and impersonal efficiency. The screen flickered momentarily, then built up a stereo picture of a dowager, fat and fretful, overdressed and underexercised.

"Oh, my dear," said the image, "I'm *so* upset. I wonder if you *can* help me."

"I'm sure we can," Miss Cormet purred as she quickly estimated the cost of the woman's gown and jewels (if real—she made a mental reservation) and decided that here was a client that could be profitable. "Now tell me your trouble. Your name first, if you please." She touched a button on the horseshoe desk which inclosed her, a button marked "Credit Department."

"But it's all so *involved,*" the image insisted. "Peter *would* go and break his hip." Miss Cormet immediately pressed the button marked "Medical." "I've *told* him that polo is dangerous. You've no idea, my dear, how a mother suffers. And just at this time, too. It's *so* inconvenient—"

"You wish us to attend him? Where is he now?"

"Attend him? Why, how silly! The Memorial Hospital will do that. We've endowed them enough, I'm sure. It's my dinner party I'm worried about. The Principessa will be so annoyed."

The answer light from the credit department was blinking angrily. Miss Cormet headed her off. "Oh, I see. We'll arrange it for you. Now, your name, please, and your address and present location."

"But don't you *know* my name?"

"One might guess," Miss Cormet diplomatically evaded, "but General Services always respects the privacy of its clients."

"Oh, yes; of course. How considerate. I am Mrs. Peter van Hogbein Johnson." Miss Cormet controlled her reaction. No need to consult the credit department for this one. But it's transparency flashed at once, rating AAA—unlimited. "But I don't see what you can *do,*" Mrs. Johnson continued. "I can't be two places at once."

"General Services likes difficult assignments," Miss Cormet assured her. "Now—if you will let me have the details—"

She wheedled and nudged the woman into giving a fairly coherent story. Her son, Peter III, a slightly shopworn Peter Pan, whose features were familiar to Grace Cormet through years of stereogravure, dressed in every conceivable costume affected by the richly idle in their pastimes, had been so thoughtless as to pick the afternoon before his mother's most important social func-

"The Flower of Forgetfulness! You've got it!" The scientist looked at it hungrily. "All right—send your contract."

tion to bung himself up—seriously. Furthermore, he had been so thoughtless as to do so half a continent away from his mater.

Miss Cormet gathered that Mrs. Johnson's technique for keeping her son safely under thumb required that she rush to his bedside at once, and, incidentally, to select his nurses. But her dinner party that evening repre-

sented the culmination of months of careful maneuvering. What was she to *do?*

Miss Cormet reflected to herself that the prosperity of General Services and her own very substantial income was based largely on the stupidity, lack of resourcefulness, and laziness of persons like this silly parasite, as she explained that General Services would see that her party was a smooth, social success. A portable full-length stereo screen would be installed in Mrs. Johnson's drawing room in order that she might greet her guests and make her explanations while hurrying to her son's side. Miss Cormet would see that a most adept social manager was placed in charge, one whose own position in society was irreproachable and whose connection with General Services was known to no one. With proper handling, the disaster could be turned into a social triumph, enhancing Mrs. Johnson's reputation both as a clever hostess and as a devoted mother.

"A sky car will be at your door in twenty minutes," she added as she cut in the circuit marked "Transportation," "to take you to the rocket port. One of our young men will be with it to get additional details from you on the way to the port. A compartment for yourself and a berth for your maid will be reserved on the 16:45 rocket for Newark. You may rest easy now. General Services will do your worrying."

"Oh, thank you, my dear. You've been such a help. You've no idea of the *responsibilities* of a person in my position."

Miss Cormet clucked-clucked in professional sympathy while deciding that this particular old girl was good for still more fees. "You *do* look exhausted, madame," she said anxiously. "Should I not have a masseuse accompany you on the trip? Your health is delicate, is it not? Perhaps a physician would be still better."

"How thoughtful you are!"

"I'll send both," Miss Cormet decided, and switched off, with a faint regret that she had not suggested a specially chartered rocket. Special service, not listed in the master price schedule, was supplied on a cost-plus basis. In cases like this, "plus" meant all the traffic would bear.

She switched to "Executive"; an alert-eyed young man filled the screen. "Stand by for transcript, Steve," she said. "Special service, triple-A. I've started the immediate service."

His eyebrows lifted. "Triple-A—bonuses?"

"Undoubtedly. Give this old battleax the works—smoothly. And look—the client's son is laid up in a hospital. Check on his nurses. If anyone of them has even a shred of sex appeal, fire her out and put a zombie in."

"Gotcha, kid. Start the transcript."

She cleared her screen again; the "available-for-service" light in her booth turned automatically to green, then almost at once turned red again and a new figure built up in her screen.

NO STUPID WASTER, this. Grace Cormet saw a well-kempt man in his middle forties, flat waisted, shrewd-eyed, hard but urbane. The cape of his formal morning clothes was thrown back with careful casualness. "General Services," she said. "Miss Cormet speaking."

"Ah, Miss Cormet," he began, "I wish to see your chief."

"Chief of switchboard?"

"No, I wish to see the president of General Services."

"Will you tell me what it is you wish? Perhaps I can help you."

"Sorry, but I can't make explanations. I must see him at once."

"And General Services is sorry. Mr. Clare is a very busy man; it is impossible to see him without appointment and without explanation."

"Are you recording?"

"Certainly."

"Then please cease doing so."

Above the console, in sight of the client, she switched off the recorder. Underneath the desk she switched it back on again. General Services was sometimes asked to perform illegal acts; its confidential employees took no chances. He fished something out from the folds of his chemise and held it out to her. The stereo effect made it appear as if he were reaching right out through the screen.

Trained features masked her surprise—it was the sigil of a planetary official, and the color of the badge was green.

"I will arrange it," she said.

"Very good. Can you meet me and conduct me in from the waiting room? In ten minutes?"

"I will be there, Mister—Mister —" But he had cut off.

Grace Cormet switched to the switchboard chief and called for relief. Then, with her board cut out of service, she removed the spool bearing the clandestine record of the interview, stared at it as if undecided, and after a moment dipped it into an opening in the top of the desk where a strong magnetic field wiped the unfixed patterns from the soft metal.

A girl entered the booth from the rear. She was blond, decorative, and looked slow and a little dull. She was neither. "O. K., Grace," she said. "Anything to turn over?"

"No. Clear board."

"'Smatter? Sick?"

"No."

With no further explanation Grace left the booth, went on out past the other booths housing operators who handled unlisted services, and into the large hall where the hundreds of catalogue operators worked. These had no such complex equipment as the booth which Grace had quitted. One enormous volume, a copy of the current price list of all of General Service's regular price-marked functions, and an ordinary look-and-listen enabled a catalogue operator to provide for the public almost anything the ordinary customer could wish for. If a call was beyond the scope of the catalogue, it was transferred to the aristocrats of resourcefulness, such as Grace.

She took a short cut through the master files room, walked down an alleyway between dozens of chattering punched-card machines, and entered the foyer of that level. A pneumatic lift bounced her up to the level of the president's office. The president's receptionist did not stop her, nor, apparently, announce her. But Grace noted that the girl's hands were busy at the keys of her voder.

SWITCHBOARD operators do not walk into the office of the president of a billion-credit corporation. But General Services was not organized like any other business on the planet. It was a *sui generis* business in which special training was merely a commodity to be listed, bought, and sold, but general resourcefulness and a ready wit were all important. In its hierarchy, Jay Clare, the president, came first; his handyman, Saunders Francis, stood second; and the couple of dozen operators, of which Grace was one, who took calls on the unlimited switchboard, came immediately after. They and the field operators

who handled the most difficult unclassified commissions—one group, in fact, for the unlimited switchboard operators and the unlimited field operators swapped places indiscriminately.

After them came the tens of thousands of other employees spread over the planet, from the chief accountant, the head of the legal department, the chief clerk of the master files on down through the local managers, the catalogue operators to the last classified part-time employee—stenographers prepared to take dictation when and where ordered, "escorts" ready to fill an empty place at a dinner, the man who rented both armadillos and trained fleas.

Grace Cormet walked into Mr. Clare's office. It was the only room in the building not cluttered up with electro-mechanical recording and communicating equipment. It contained nothing but his desk—bare—a couple of chairs, and a stereo screen which, when not in use, seemed to be Krantz's famous painting, "The Weeping Buddha." The original was in fact in the sub-basement, a thousand feet below.

"Hello, Grace," he greeted her, and shoved a piece of paper at her. "Tell me what you think of that. Sance says it's lousy." Saunders Francis turned his mild popeyes from his chief to Grace Cormet, but neither confirmed nor denied the statement:

Miss Cormet read:

CAN YOU AFFORD IT?

Can You afford GENERAL SERVICES?
Can You afford NOT to have GENERAL SERVICES?????

In this jet-speed age, can you afford to go on wasting time doing your own shopping, paying bills yourself, taking care of your living compartment?

We'll spank the baby and feed the cat.

We'll rent you a house and buy your shoes.

"We'll write to your mother-in-law and add up your check stubs. No job too large; no job too small—and amazingly Cheap!

GENERAL SERVICES
Dial H-U-R-R-Y—U-P
P. S. WE ALSO WALK DOGS

"Well?" said Clare.

"Sance is right. It smells."

"Why?"

"Too logical. Too verbose. No drive."

"What's your idea of an ad to catch the marginal market?"

She thought a moment, then borrowed his stylus and wrote:

DO YOU WANT SOMEBODY MURDERED?

(Then DON'T call GENERAL SERVICES)
But for ANY other job, dial HURRY-UP
IT PAYS!
P. S. We also walk dogs

"Hm-m-m—well, maybe," Mr. Clare said cautiously. "We'll try it. Sance, give this a Type B coverage, two weeks, North America, and let me know how it takes." Francis put it away in his kit, still with no change in his mild expression. "Now, as I was saying—"

"Chief," broke in Grace Cormet, "I made an appointment for you in"—she glanced at her watch finger—"exactly two minutes and forty seconds. Government man."

"Make him happy and send him away. I'm busy."

"Green badge."

He looked up sharply. Even Francis looked interested. "So?" Clare remarked. "Got the interview transcript with you?"

"I wiped it."

"You did? Well, perhaps you

know best. I like your hunches. Bring him in."

She nodded thoughtfully and left.

GRACE CORMET found her man just entering the public reception room and escorted him past half a dozen gates whose guardians would otherwise have demanded his identity and the nature of his business. When he was seated in Clare's office he looked around. "May I speak with you in private, Mr. Clare?"

"Mr. Francis is my right leg. You've already spoken to Miss Cormet."

"Very well." He produced the green sigil again and held it out. "No names are necessary just yet. I am sure of your discretion."

The president of General Services sat up impatiently. "Let's get down to business. You are Pierre Beaumont, chief of Protocol. Does the administration want a job done?"

Beaumont was unperturbed by the change in pace. "It seems you know me. Very well. We'll get down to business. The government may want a job done. In any case, our discussion must not be permitted to leak out—"

"All of General Services relations are confidential."

"This is not confidential; this is secret." He paused.

"I understand you," agreed Clare. "Go on."

"You have an interesting organization here, Mr. Clare. I believe it is your boast that you will undertake any commission whatsoever—for a price."

"If it is legal."

"Ah, yes; of course. But legal is a word capable of interpretation. I admired the way your company handled the outfitting of the Second Plutonian Expedition. Some of your methods were—ah—ingenious."

"If you have any criticism of our actions, in that case they are best made to our legal department through the usual channels."

Beaumont pushed a palm in his direction. "Oh, no, Mr. Clare—please! You misunderstand me. I was not criticizing; I was admiring. Such resource! What a diplomat you would have made!"

"Let's quit fencing. What do you want?"

Mr. Beaumont pursed his lips. "Let us suppose that you had to entertain a dozen representatives of each intelligent race in this planetary system and you wanted to make each one of them completely comfortable and happy. Could you do it?"

Clare thought aloud. "Air pressure, humidity, radiation densities, atmosphere chemistry, temperatures, cultural conditions—those things are all simple. But how about acceleration? We could use a centrifuge for the Jovians, but Martians and Titans and Callistans and the rest of the small-planet people—that's another matter. There is no way to reduce Earth-normal gravity. No, you would have to entertain them out in space, or on Luna. That makes it not our pigeon; we never give service beyond the stratosphere."

Beaumont shook his head. "It won't be beyond the stratosphere. You may take it as an absolute condition that you are to accomplish your results on the surface of the Earth."

"Why?"

"Is it the custom of General Services to inquire why a client wants a particular type of service?"

"No. Sorry."

"QUITE all right. But you do need more information in order to understand what must be accomplished and why it must be secret. There

will be a conference, held on this planet, in the near future—ninety days at the outside. Until the conference is called, no suspicion that it is to be held must be allowed to leak out. If the plans for it were to be anticipated in certain quarters, it would be useless to hold the conference at all. I suggest that you think of this conference as a round table of leading—ah—scientists of the System, about of the same size and make-up as the session of the academy held on Mars last spring. You are to make all preparations for the entertainment of the delegates, but you are to conceal these preparations in the ramifications of your organization until needed. As for the details of—"

But Clare interrupted him. "You appear to have assumed that we will take on this commission. As you have explained it, it would involve us in a ridiculous failure. General Services does not like failures. You know and I know that low-gravity people cannot spend more than a few hours in high gravity without seriously endangering their health. Interplanetary get-togethers are always held on a low-gravity planet and always will be."

"Yes," answered Beaumont patiently, "they always have been. Do you realize the tremendous diplomatic handicap which Earth and Venus labors under in consequence?"

"I don't get it."

"It isn't necessary that you should. Political psychology is not your concern. Take it for granted that it does and that the administration is determined that *this* conference shall take place on Earth."

"Why not Luna?"

Beaumont shook his head. "Not the same thing at all. Even though we administer it, Pied-á-Terre is a treaty port. Not the same thing, psychologically."

Clare shook his head. "Mr. Beaumont, I don't believe that you understand the nature of General Services, even as I fail to appreciate the subtle requirements of diplomacy. We don't work miracles and we don't promise to. We are just the handymen of the last century, gone speed-lined and corporate. We are the latter-day equivalent of the old servant class, but we are not Aladdin's genie. We don't even maintain research laboratories in the scientific sense. We simply make the best possible use of modern advances in communication and organization to do what already *can* be done." He waved a hand at the far wall, on which there was cut in intaglio the time-honored trade-mark of the business—a Scottie dog, pulling against a leash and sniffing at a post. "*There* is the spirit of the sort of work we do. We walk dogs for people who are too busy to walk 'em themselves. My grandfather worked his way through college walking dogs. I'm still walking them. I don't promise miracles, nor monkey with politics."

Beaumont fitted his fingertips carefully together. "You walk dogs for a fee? But of course you do—you walk my pair. Five minim-credits seems rather cheap."

"It is. But a hundred thousand dogs, twice a day, soon runs up the gross take."

"The 'take' for walking this 'dog' would be considerable."

"How much?" asked Francis. It was his first sign of interest.

Beaumont turned his eyes on him. "My dear sir, the outcome of this—ah—round table should make a difference of literally hundreds of billions of credits to this planet. We will not bind the mouth of the kine that treads the corn, if you pardon

the figure of speech."

"How much?"

"Would thirty percent over cost be reasonable?"

Francis shook his head. "Might not come to much."

"Well, I certainly won't haggle. Suppose we leave it up to you gentlemen—your pardon, Miss Cormet! —to decide what the service is worth. I think I can rely on your planetary and racial patriotism to make it reasonable and proper."

Francis sat back, said nothing, but looked pleased.

"Wait a minute," protested Clare. "We haven't taken this job."

"We have discussed the fee," observed Beaumont.

Clare looked from Francis to Grace Cormet, then examined his fingernails. "Give me twenty-four hours to find out whether or not it is possible," he said finally, "and I'll tell you whether or not we will walk your dog."

"I feel sure," answered Beaumont, "that you will." He gathered his cape about him.

"O. K., master minds," said Clare bitterly, "you've bought it."

"I've been wanting to get back to field work," said Grace.

"Put a crew on everything but the gravity problem," suggested Francis. "It's the only catch. The rest is routine."

"Certainly," agreed Clare, "but you had better deliver on that. If you can't, we are out some mighty expensive preparations that we will never be paid for. What do you want? Grace?"

"I suppose so," answered Francis. "She can count up to ten."

Grace Cormet looked at him coldly. "There are times, Sance Francis, when I regret having married you."

"Keep your domestic affairs out of the office," warned Clare. "Where do you start?"

"Let's find out who knows most about gravitation," decided Francis. "Grace, better get Dr. Krathwohl on the screen."

"Right," she acknowledged, as she stepped to the stereo controls. "That's the beauty about this business. You don't have to know anything; you just have to know where to find out."

Dr. Krathwohl was a part of the permanent staff of General Services. He had no assigned duties. The company found it worth while to support him in comfort while providing him with an unlimited drawing account for scientific journals and for attendance at the meetings which the learned hold from time to time. Dr. Krathwohl lacked the single-minded drive of the research scientist; he was a dilettante by nature.

Occasionally they asked him a question. It paid.

"Oh, hello, my dear!" Dr. Krathwohl's gentle face smiled out at her from the screen. "Look—I've just come across the most amusing fact in the latest issue of *Nature*. It throws a most interesting side light on Brownlee's theory of—"

"Just a second, doc," she interrupted. "I'm kinda in a hurry."

"Yes, my dear?"

"Who knows the most about gravitation?"

"In what way do you mean that? Do you want an astrophysicist, or do you want to deal with the subject from a standpoint of theoretical mechanics? Farquarson would be the man in the first instance, I suppose."

"I want to know what makes it tick."

"Field theory, eh? In that case you don't want Farquarson. He is a descriptive ballistician, primarily.

Dr. Julian's work in that subject is authoritative, possibly definitive."

"Where can we get hold of him?"

"Oh, but you can't. He died last year, poor fellow. A great loss."

Grace refrained from telling him how great a loss and asked, "Who stepped into his shoes?"

"Who what? Oh, you were jesting! I see. You want the name of the present top man in field theory. I would say O'Neil."

"Where is he?"

"I'll have to find out. I know him slightly—a difficult man."

"Do, please. In the meantime, who could coach us a bit on what it's all about?"

"Why don't you try young Carson, in our engineering department? He was interested in such things before he took a job with us. Intelligent chap—I've had many an interesting talk with him."

"I'll do that. Thanks, doc. Call the chief's office as soon as you have located O'Neil. Speed." She cut off.

CARSON AGREED with Krathwohl's opinion, but looked dubious. "O'Neil is not exactly co-operative. I've worked under him. But he undoubtedly knows more about field theory and space structure than any other living man."

Carson had been taken into the inner circle, the problem explained to him. He had admitted that he saw no solution. "Maybe we are making something hard out of this," Clare suggested. "I've got some ideas. Check me if I'm wrong, Carson."

"Go ahead, chief."

"Well, the acceleration of gravity is produced by the proximity of a mass—right? Earth-normal gravity being produced by the proximity of the Earth. Well, what would be the effect of placing a large mass just over a particular point on the Earth's surface. Would not that serve to counteract the pull of the Earth?"

"Theoretically, yes. But it would have to be a damn big mass."

"No matter."

"You don't understand, chief. To offset fully the pull of the Earth at a given point would require another planet the size of the Earth in contact with the Earth at that point. Of course, since you don't want to cancel the pull completely, but simply reduce it, you gain a certain advantage through using a smaller mass, which would have its center of gravity closer to the point in question than would be the center of gravity of the Earth. Not enough, though. While the attraction builds up inversely as the square of the distance—in this case the half diameter—the mass and the consequent attraction drops off directly as the *cube* of the diameter."

"What does that give us?"

Carson produced a slide rule and figured for a few moments. He looked up. "I'm almost afraid to answer. You would need a good-sized asteroid, of solid lead, to get anywhere at all."

"Asteroids have been moved before this."

"Yes, but what is to *hold it up*? No, chief, there is no conceivable source of power, or means of applying it, that would enable you to hang a big planetoid over a particular spot on the Earth surface and keep it there."

"Well, it was a good idea while it lasted," Clare said pensively.

Grace's smooth brow had been wrinkled as she followed the discussion. Now she put in, "I gathered that you could use an extremely heavy small mass more effectively. I seem to have read somewhere about some stuff that weighs *tons* per cubic inch."

"The core of dwarf stars," agreed Carson. "All we would need for that would be a ship capable of going light years in a few days, some way to mine the interior of a star, and a new space-time theory."

"Oh, well, skip it."

"Wait a minute," Francis observed. "Magnetism is a lot like gravity, isn't it?"

"Well—yes."

"Could there be some way to *magnetize* these gazabos from the little planets? Maybe something odd about their body chemistry?"

"Nice idea," agreed Carson, "but while their internal economy is odd, it's not that odd. They are still organic."

"I suppose not. If pigs had wings, they'd be pigeons."

The stereo annunciator blinked. Dr. Krathwohl announced that O'Neil could be found at his summer home in Portage, Wisconsin. He had not screened him and would prefer not to do so, unless the chief insisted.

Clare thanked him and turned back to the others. "We are wasting time," he announced. "After years in this business we should know better than to try to decide technical questions. I'm not a physicist and I don't give a damn how gravitation works. That's O'Neil's business. And Carson's. Carson, shoot up to Wisconsin and get O'Neil on the job."

"Me?"

"You. You're an operator for this job—with pay to match. Bounce over to the port—there will be a rocket and a credit facsimile waiting for you. You ought to be able to raise ground in seven or eight minutes."

Carson blinked. "How about my job here?"

"The engineering department will be told, likewise the accounting. Get going."

Without replying, Carson headed for the door. By the time he reached it he was hurrying.

CARSON'S departure left them with nothing to do until he reported back—nothing to do, that is, but to start action on the manifold details of reproducing the physical and cultural details of three other planets and four major satellites, exclusive of their characteristic surface-normal gravitational accelerations. The assignment, although new, presented no real difficulties—to General Services. Somewhere there were persons who knew all the answers to these matters. The vast, loose organization called General Services was geared to find them, hire them, put them to work. Any of the unlimited operators and a considerable percent of the catalogue operators could take such an assignment and handle it without excitement or hurry.

Francis called in one unlimited operator. He did not even bother to select him, but took the first available on the ready panel—they were all "Can do!" people. He explained in detail the assignment, then promptly forgot it. It would be done, and on time. The punched-card machines would chatter a bit louder, stereo screens would flash, and bright young people in all parts of the Earth would drop what they were doing and dig out the specialists who would do the actual work.

He turned back to Clare, who said, "I wish I knew what Beaumont is up to. Conference of scientists—phooey!"

"I thought you weren't interested in politics, Jay."

"I'm not. I don't give a hoop about politics, interplanetary or otherwise, except as it affects this business. But if I knew what was being planned, we might be able to squeeze

a bigger cut out of it."

"Well," put in Grace, "I think you can take it for granted that the real heavyweights from all the planets are about to meet and divide Gaul into three parts."

"Yes, but who gets cut out?"

"Mars, I suppose."

"Seems likely. With a bone tossed to the Venusians. In that case we might speculate a little in Pan-Jovian Trading Corp."

"Easy, son, easy," Francis warned. "Do that and you might get people interested. This is a hush-hush job."

"I guess you're right. Still, keep your eyes open. There ought to be some way to cut a slice of pie before this is over."

Grace Cormet's telephone buzzed. She took it out of her pocket and said, "Yes?"

"A Mrs. Hogbein Johnson wants to speak to you."

"You handle her. I'm off the board."

"She won't talk to anyone but you."

"All right. Put her on the chief's stereo, but stay in parallel yourself. You'll handle it after I've talked to her."

The screen came to life, showing Mrs. Johnson's fleshy face alone, framed in the middle of the screen in flat picture. "Oh, Miss Cormet," she moaned, "some dreadful mistake has been made. There is no stereo on this ship."

"It will be installed in Cincinnati. That will be in about twenty minutes."

"You are *sure?*"

"Quite sure."

"Oh, thank you! It's such a relief to talk with you. Do you know, I'm *thinking* of making you my social secretary."

"Thank you," Grace replied evenly, "but I am under contract."

"But how stupidly tiresome! You can break it."

"No, I'm sorry, Mrs. Johnson. Good-by." She switched off the screen and spoke again into her telephone. "Tell accounting to double her fee. And I *won't* speak with her again." She cut off and shoved the

little instrument savagely back into her pocket. "Social secretary!"

IT WAS after dinner and Clare had retired to his living apartment in the tower of the building before Carson called back. Francis took the call in his own office.

"Any luck?" he asked when Carson's image had built up.

"Quite a bit. I've seen O'Neil."

"Well? Will he do it?"

"You mean can he do it, don't you?"

"Well—can he?"

"Now that is a funny thing—I didn't think it was theoretically possible. But after talking with him I'm convinced that it is. O'Neil has a new outlook on field theory—stuff he's never published. The man is a genius."

"I don't care," said Francis, "whether he's a genius or a Mongolian idiot—can he build some sort of gravity thinner-outer?"

"I believe he can. I really do believe he can."

"Fine. You hired him?"

"No. That's the hitch. That's why I called back. It's like this: I happened to catch him in a mellow mood, and because we had worked together once before, and because I had not aroused his ire quite as frequently as his other assistants, he invited me to stay for dinner. We talked about a lot of things—you can't hurry him—and I broached the proposition. It interested him mildly—the idea, I mean; not the proposition—and he discussed the theory with me—or, rather, at me. But he won't work on it."

"Why not? You didn't offer him enough money. I guess I'd better tackle him."

"No. Mr. Francis, no. You don't understand. He's not interested in money. He's independently wealthy and has more than he needs for his research, or anything else he wants. But just at present he is busy on wave-mechanics theory, and he just won't be bothered with anything else."

"Did you make him realize it was important?"

"Yes and no. Mostly no. I tried to, but there isn't anything important to him but what *he* wants. It's a sort of intellectual snobbishness. Other people simply don't count."

"All right," said Francis. "You've done well so far. Here's what you do: After I switch off, you call executive and make a transcript of everything you can remember of what he said about gravitational theory. We'll hire the next best men, feed it to them, and see if it gives them any ideas to work on. In the meantime, I'll put a crew to work on the details of Dr. O'Neil's background. He'll have a weak point somewhere; it's just a matter of finding it. Maybe he's keeping a woman somewhere—"

"He's long past that."

"—or maybe he has a by-blow stacked away somewhere. We'll see. I want you to stay there in Portage. Since you can't hire him, maybe you can persuade him to hire you. You're our pipe line; I want it kept open. We've got to find something he wants, or something he is afraid of."

"He's not afraid of *anything*. I'm positive of that."

"Then he wants something. If it's not money, or women, it's something else. Everybody wants something. It's a law of nature."

"I doubt it," Carson replied slowly. "Say! Did I tell you about his hobby?"

"No. What is it?"

"It's china. In particular, Ming china. He has the best collection in

the world, I'd guess. But I know what he wants!"

"Well, spill it, man; spill it. Don't be dramatic."

"It's a little china dish, or bowl, about four inches across and two inches high. It's got a Chinese name that means 'Flower of Forgetfulness.'"

"Hm-m-m—doesn't seem significant. You think he wants it pretty bad?"

"I *know* he does. He has a solid colorgraph of it in his study, where he can look at it. But it hurts him to talk about it."

"Find out who owns it and where it is."

"I know. British Museum. That's why he can't buy it."

"So?" mused Francis. "Well, you can forget it. Carry on."

CLARE CAME DOWN to Francis' office and the three talked it over. "I guess we'll need Beaumont on this," was his comment when he had heard the report. "It will take the government to get anything loose from the British Museum." Francis looked morose. "Well—what's eating you? What's wrong with that?"

"I know," offered Grace. "You remember the treaty under which Great Britain entered the planetary confederation?"

"I was never much good at history."

"It comes to this: I doubt if the planetary government can touch anything that belongs to the museum without asking the British Parliament."

"Why not? Treaty or no treaty, the planetary government is sovereign. That was established in the Brazilian incident."

"Yeah, sure. But it could cause questions to be asked in the House of Commons, and that would lead to the one thing Beaumont wants to avoid at all costs—publicity."

"O. K. What do you propose?"

"I'd say that Sance and I had better slide over to England and find out just how tight they have the 'Flower of Forgetfulness' welded down—and who does the welding and what his weaknesses are."

Clare's eyes traveled past her to Francis, who was looking blank in the fashion that indicated assent to his intimates. "O. K.," agreed Clare, "it's your baby. Taking a special?"

"No, we've got time to get the midnight out of New York. By-by."

"By. Call me tomorrow."

WHEN GRACE screened the chief the next day he took one look at her and exclaimed, "Good grief, kid! What have you done to your hair?"

"We located the guy," she explained succinctly. "His weakness is blondes."

"You've had your skin bleached, too."

"Of course. How do you like it?"

"It's stupendous—though I preferred you the way you were. But what does Sance think of it?"

"He doesn't mind—it's business. But to get down to cases, chief, there isn't much to report. This will have to be a left-handed job. In the ordinary way, it would take an earthquake to get anything out of that tomb."

"Don't do anything that can't be fixed!"

"You know me, chief. I won't get you in trouble. But it will be expensive."

"Of course."

"That's all for now. I'll screen tomorrow."

She was a brunette again the next day. "What is this?" asked Clare. "A masquerade?"

"I wasn't the blonde he was weak

for," she explained, "but I found the one he was interested in."

"Did it work out?"

"I think it will. Sance is having a facsimile integrated now. With luck, we'll see you tomorrow."

They showed up the next day, apparently empty-handed. "Well?" said Clare. "Well?"

"Seal the place up, Jay," suggested Francis. "Then we'll talk."

Clare flipped a switch controlling an interference shield which rendered his office somewhat more private than a coffin. "How about it?" he demanded. "Did you get it?"

"Show it to him, Grace."

Grace turned her back, fumbled at her clothing for a moment, then turned around and placed it gently on the chief's desk.

It was not that it was beautiful—it *was* beauty. Its subtle, simple curve had no ornamentation, decoration would have sullied it. One spoke softly in its presence, for fear a sudden noise would shatter it.

Clare reached out to touch it, then thought better of it and drew his hand back. But he bent his head over it and stared down into it. It was strangely hard to focus—to allocate—the bottom of the bowl. It seemed as if his sight sank deeper and ever deeper into it, as if he were drowning in a pool of light.

He jerked up his head and blinked. "I didn't know such things existed," he whispered.

He looked at Grace and looked away to Francis. Francis had tears in his eyes, or perhaps his own were blurred.

"Look, chief," said Francis. "Look—couldn't we just keep it and call the whole thing off?"

"There's no use talking about it any longer," said Francis wearily. "We can't keep it, chief. I should not have suggested it, and you shouldn't have listened to me. Let's screen O'Neil."

"We might just wait another day before we do anything about it," Clare ventured. His eyes returned yet again to the "Flower of Forgetfulness."

Grace shook her head. "No good. It will just be harder tomorrow. I *know*." She walked decisively over to the stereo and manipulated the controls.

O'Neil was annoyed at being disturbed and twice annoyed that they had used the emergency signal to call him to his disconnected screen.

"What is this?" he demanded. "What do you mean by disturbing a private citizen when he has disconnected? Speak up—and it had better be good, or, so help me, I'll sue you!"

"We want you to do a little job of work for us, doctor," Clare began evenly.

"What!" O'Neil seemed almost too surprised to be angry. "Do you mean to stand there, sir, and tell me that you have invaded the privacy of my home to ask *me* to work for *you?*"

"The pay will be satisfactory to you."

O'Neil seemed to be counting up to ten before answering. "Sir," he said carefully, "there are men in the world who seem to think they can buy anything, or anybody. I grant you that they have much to go on in that belief. But I am not for sale. Since you seem to be one of those persons, I will do my best to make this interview expensive for you. You will hear from my attorneys. Good night!"

"Wait a moment," Clare said urgently. "I believe that you are interested in china—"

"What if I am?"

"Show it to him, Grace."

Grace brought the "Flower of Forgetfulness" up near the screen, handling it carefully, reverently.

O'Neil said nothing. He leaned forward and stared. He seemed to be about to climb through the screen. "Where did you get it?" he said at last.

"That doesn't matter."

"I'll buy it from you—at your own price."

"It's not for sale. But you may have it—if we can reach an agreement."

O'Neil eyed him. "It's stolen property."

"You're mistaken. Nor will you find anyone to take an interest in such a charge. Now about this job we want—"

O'Neil pulled his eyes away from the bowl. "What is it you wish me to do?"

Clare explained the problem to him. When he had concluded, O'Neil shook his head. "That's ridiculous," he said.

"We have reason to feel that it is theoretically possible."

"Oh, certainly! It's theoretically possible to live forever, too. But no one has ever managed it."

"We think you can do it."

"Thank you for nothing. Say!" O'Neil stabbed a finger at him out of the screen. "You set that young pup Carson on me!"

"He was acting under my orders."

"Then, sir, I do not like your manners."

"How about the job? And this?" Clare indicated the bowl.

O'Neil gazed at it and chewed his whiskers. "Suppose," he said at last, "I make an honest attempt to the full extent of my ability, to supply what you want—and I fail."

Clare shook his head. "We pay only for results. Oh, your salary, of course, but not *this*. This is a bonus in addition to your salary *if* you are successful."

O'Neil seemed about to agree, then said suddenly. "You may be fooling me with a colorgraph. I can't tell through this damned screen."

Clare shrugged. "Come see for yourself."

"I will. I shall. Stay where you are. Where are you? Damn it, sir, what's your *name?*"

He came storming in two hours later. "You've tricked me! The Flower is still in England. I've investigated. I'll . . . I'll *punish* you, sir, with my own two hands."

"See for yourself," answered Clare. He stepped aside so that his body no longer obscured O'Neil's view of Clare's desk top.

They let him look. They respected his need for quiet and let him look. After a long time he turned to them, but did not speak.

"Well?" asked Clare.

"I'll build your damned gadget," he said huskily. "I figured out an approach on the way here."

BEAUMONT came in person to call the day before the first session of the conference. "Just a social call, Mr. Clare," he stated. "I simply wanted to express to you my personal appreciation for the work you have done. And to deliver this." "This" turned out to be a draft on the Bank Central for the agreed fee. Clare accepted it, glanced at it, nodded, and placed it on his desk.

"I take it, then," he remarked, "that the government is satisfied with the service rendered."

"That is putting it conservatively," Beaumont assured him. "To be perfectly truthful, I did not think you could do so much. You seem to have thought of everything. The Callistan delegation is out now, riding around and seeing the sights in one of the little tanks you had prepared. They are delighted. Confidentially, I think we can depend on their vote in the coming sessions."

"Gravity shields working all right, eh?"

"Perfectly. I stepped into their sightseeing tank before we turned it over to them. I was as light as the proverbial feather. Too light—I was very nearly spacesick." He smiled in wry amusement. "I entered the Jovian apartments, too. That was quite another matter."

"Yes, it would be," Clare agreed. "Two and a half times normal weight is oppressive, to say the least."

"It's a happy ending to a difficult task. I must be going. Oh, yes, one other little matter—I've discussed with Dr. O'Neil the possibility that the administration may be interested in other uses for his new development. In order to simplify the matter, it seems desirable that you provide me with a quitclaim to the O'Neil effect from General Services."

Clare gazed thoughtfully at the Weeping Buddha and chewed his thumb. "No," he said slowly, "no. I'm afraid that would be difficult."

"Why not?" asked Beaumont. "It avoids the necessity of adjudication and attendant waste of time. We are prepared to recognize your service and recompense you."

"Hm-m-m. I don't believe you fully understand the situation, Mr. Beaumont. There is a certain amount of open territory between our contract with Dr. O'Neil and your contract with us. You asked of us certain services and certain chattels with which to achieve that service. We provided them—for a fee. All done. But our contract with Dr. O'Neil made him a full-time employee for the period of his employment. His research results and the patents embodying them are the property of General Services."

"Really?" said Beaumont. "Dr.

O'Neill has a different impression."

"Dr. O'Neil is mistaken. Seriously, Mr. Beaumont—you asked us to develop a siege gun, figuratively speaking, to shoot a gnat. Did you expect us, as businessmen, to throw away the siege gun after one shot?"

"No, I suppose not. What do you propose to do?"

"We expect to exploit the gravity modulator commercially. I fancy we could get quite a good price for certain adaptations of it on Mars."

"Yes. Yes, I suppose you could. But to be brutally frank, Mr. Clare, I am afraid that is impossible. It is a matter of imperative public policy that this development be limited to terrestrials. In fact, the administration would find it necessary to intervene and make it government monopoly."

"Have you considered how to keep O'Neil quiet?"

"In view of the change in circumstances, no. What is your thought?"

"A corporation, in which he would hold a block of stock and be president. One of our bright young men would be chairman of the board." Clare thought of Carson. "There would be stock enough to go around," he added, and watched Beaumont's face.

Beaumont ignored the bait. "I suppose that this corporation would be under contract to the government—its sole customer?"

"That is the idea."

"Hm-m-m—yes, it seems feasible. Perhaps I had better speak with Dr. O'Neil."

"Help yourself."

BEAUMONT got O'Neil on the screen and talked with him in low tones. Or, more properly, Beaumont's tones were low. O'Neil displayed a tendency to blast the microphone. Clare sent for Francis and Grace and explained to them what had taken place.

Beaumont turned away from the screen. "The doctor wishes to speak with you, Mr. Clare."

O'Neil looked at him frigidly. "What is this claptrap I've had to listen to, sir? What's this about the O'Neil effect being your property?"

"It was in your contract, doctor. Don't you recall?"

"Contract! I never read the damn thing. But I can tell you this: I'll take you to court. I'll tie you in knots before I'll let you make a fool of me that way."

"Just a moment, doctor, please!" Clare soothed. "We have no desire to take advantage of a mere legal technicality, and no one disputes your interest. Let me outline what I had in mind—" He ran rapidly over the plan. O'Neil listened, but his expression was still unmollified at the conclusion.

"I'm not interested," he said gruffly. "So far as I am concerned, the government can have the whole thing. And I'll see to it."

"I had not mentioned one other condition," added Clare.

"Don't bother."

"I must. This will be just a matter of agreement between gentlemen, but it is essential. You have custody of the Flower of Forgetfulness."

O'Neil was at once on guard. "What do you mean, 'custody'? I own it. Understand me—*own* it!"

"'Own it,'" repeated Clare. "Nevertheless, in return for the concessions we are making you with respect to your contract, we want something in return."

"What?" asked O'Neil. The mention of the bowl had upset his confidence.

"You own it and you retain possession of it. But I want your word

that I, or Mr. Francis, or Miss Cormet, may come look at it from time to time—frequently."

O'Neil looked unbelieving. "You mean that you simply want to come to *look* at it?"

"That's all."

"Simply to *enjoy* it?"

"That's right."

O'Neil looked at him with new respect. "I did not understand you before, Mr. Clare. I apologize. As for the corporation nonsense—do as you like. I don't care. You and Mr. Francis and Miss Cormet may come to see the Flower whenever you like. You have my word."

"Thank you, Dr. O'Neil—for all of us." He switched off as quickly as could be managed gracefully.

Beaumont was looking at Clare with added respect, too. "I think," he said, "that the next time I shall not interfere with your handling of the details. I'll take my leave. Adieu, gentlemen—and Miss Cormet."

When the door had rolled down behind him, Grace remarked, "That seems to polish it off."

"Yes," said Clare. "We've 'walked his dog' for him; O'Neil has what he wants; Beaumont got what he wanted, and more besides."

"Just what is he after?"

"I don't know, but I suspect that he would like to be first president of the Solar System Federation, if and when there is such a thing. With the aces we have dumped in his lap, he might make it. Do you realize the potentialities of the O'Neil effect?"

"Vaguely," said Francis.

"Have you thought about what it will do to space navigation? Or the possibilities it adds in the way of colonization? Or its recreational uses? There's a fortune in that alone."

"What do we get out of it?"

"What do we get out of it? Money, old son. Gobs and gobs of money. There's always money in giving people what they want." He glanced up at the Scottie-dog trademark.

"Money," repeated Francis. "Yeah, I suppose so."

"Anyhow," added Grace, "we can always go look at the Flower."

THE END.

MORE THAN GIANT MIRRORS NEEDED

There's a lot more to actually putting a new giant telescope to work than setting up the main mirror—there are spectroscopes, cameras, secondary lenses, and a raft of auxiliary apparatus as important as the main mirror itself, for practically no modern astronomical work is done by direct observation. Photographic plates record the story the telescope gathers in a permanent form for detailed study.

Since 1930, when the 200-inch Mount Palomar giant really got under way, a large number of important advances have been made in associated fields of optical and photographic design. Aluminum coatings instead of silver are used as the reflective surfaces for telescope mirrors—a new process that greatly increases the efficiency of the instrument, particularly in the ultraviolet spectrum. New techniques in lens design have reduced losses due to inter-face reflection. The development of "invisible" glass, actually a method of coating glass surfaces with a microscopic layer of lithium and calcium fluorides, has enormously improved auxiliary instruments employing long series of glass-air lens surfaces, such as spectrographs.

The rise and speed hunger of the candid-camera addict has led to great increases in film speeds; commercially available films today are more than eight times as sensitive as they were a decade ago. New chemical developing agents have still further multiplied the higher speed of new emulsions.

The result? The 100-inch Mount Wilson telescope is now doing work that was beyond the capacity of the 200-incher as originally planned! More important, these increases in the auxiliary efficiency are applicable to *all* telescopes—telescopes in the Southern Hemisphere where the Mount Palomar giant can never view the stars.

BROWN

By Frank Belknap Long

Brown was a robot, a minikin of a robot, but he had intelligence. And—a nasty sense of humor with respect to his builder.

Illustrated by Kramer

THEY had been good for a laugh, for entertainment for six months. And they had been good for nothing else. Amazing they were, more ingenious than anything dreamed of at the beginning of the century.

They reposed on metal shelves all about Horn now—dark-browned little figures twenty inches tall. How Horn detested the word "robot." He had created *thinking* minikins. He had infused his genius into them, along with the plastics and wires which made them click.

They could feel and think and talk. But their thought processes chilled Horn to the depths of his being. No one else seemed aware of how inhuman they were.

The problem of creative intelligence had never vexed Horn more. What was original thought, anyway? You could build up from an idiot's mental grimaces to the fine-blown product which was the brain of a Faraday, a Pasteur, or a Darwin without getting an answer to that question.

Horn's minikins were brilliant, but they were too inhuman to think creatively. Destructive criticism could be creative after a fashion, but when it emanated from Horn's minikins, it seemed dreadful somehow. Cold and unproductive and sterile—a corrosive blight. Even children of ten had better sense than to jeer at *everything*.

James Brown was the worst offender. He was cynical and superficial and yet—*he* had something. Unlike the other robots, he could grasp and solve problems of the utmost technical complexity. In naming his newest minikin, Horn had resorted to the familiar dodge of concealing something a little sinister under the most run-of-the-mill appellation he could think of.

Brown sat on a testing prop in Horn's laboratory, swinging his jointed beryllium legs, his metal lips twisting in derision. He had acquired an audience already. He was playing up to the gallery of little figures behind him, holding their maker up to scorn.

"You've stippled this planet with the ravages of war, crime, famine and disease," he was saying. "Now you want to take your detestable civilization to Mars. I could help you, but I won't."

Horn's eyes were glowing. He wiped sweat from his forehead and stared down at the little minikin.

"*What?* You mean you could solve the fuel problem?"

"Of course I could solve it. But I won't, Horn. You can't order me around."

Horn's ruggedly handsome features grew dark with anger. "You little fool! Do you realize I could take you apart, and park your lucky-accident brain in a Leyden jar?"

"Horn, have you lost your mind? You've toiled over me for weeks."

"The most gifted physicist I ever knew, destroyed the work of a lifetime in ten minutes, recklessly, on impulse," Horn said. "Do you want me to do something I'll regret for the rest of my life?"

Brown shook his head, his expression still derisive. "No, Horn. I'm aware that you need my help badly. I said I wouldn't assist you, but I might—for a consideration."

"Well, let's have it."

"Horn, I want to go to Mars with you."

THE DOOR of Horn's laboratory opened and a slender, blond and very lovely girl came in. She gravitated toward Horn without even glancing at Brown, her eyes luminous with concern.

"Why don't you call it a day,

Fred?" she said. "You look all in. Haven't you discovered yet that these wretched mechanical dolls can't help you with the ship?"

"With *me* to advise him," Brown said, with an acid inflection, "he can't fail."

The girl swung on the little robot, her eyes glinting. "You scheming little wretch! The best you can do is parrot human speech. If Fred wasn't self-hypnotized, he'd know that thought can't rise above its source."

There was an indignant protest from the shelved robots. It took the form of a running commentary, which scarcely rose above a whisper as it encircled the laboratory. It was not complimentary to Horn's fiancée, but it did not appear to embarrass her in any way.

Horn laid a restraining hand on her arm. "Be quiet, Joan. Brown has—an exceptional gift."

"I'll say he has. The gift of gab. The vile little cheat—taking advantage of you when you're worn out. Why don't you take him apart? You can, can't you? Shall I?"

Brown said: "I wouldn't, Fleming."

The girl picked the little robot up and shook him until his coils rattled. "Do you think I'm afraid of you?"

Horn turned pale. "Darling, put him down. His brain is unique. He thinks—cumulatively and elliptically. I never expected to succeed so well."

With a despairing shrug, Joan Fleming returned Brown to the testing prop.

The robot crossed his beryllium legs and said: "Horn, let's get down to brass tacks. I have one consuming drive—curiosity. And you—you want to reach Mars in a rocket-driven ship so that you can pass yourself off as a man of daring and be admired by everyone on Earth."

"That's a lie," said Joan Fleming.

Horn shook his head. "No. No, let him have his say."

"Well, vanity is not so disgraceful. You might have made me vain, but you neglected to do so. I simply want to see Mars with my own eyes before I rust. Will you take me along?"

"I'll take you if you'll tell me how—"

"Horn, it's simpler than you dream. We won't propel the ship at all. *We'll vibrate it.*"

"You'll what?"

"Horn, we'll vibrate it until it warps the continuum, and slides slantwise through space-time under its own momentum. D'you see? We'll bobsleigh down a groove in the continuum and reach Mars through a back door in the sky. We'll get to Mars quickly that way. A straight line is not the quickest distance between two points. You can slide down a concave slope much faster than you can slide down a straight slope."

"But, how could we pilot a ship through buckling folds of space-time," Horn gasped. "I'll concede we know more about the continuum than we did in Einstein's day. But what you're proposing would involve mathematical calculations of the utmost complexity.

"The slightest error would take us out of the Solar System. And that's just one of the risks. We'd be liable to emerge in Coma Berenices or cut a permanent groove in the continuum, like Bernard's Runaway Star. The continuum is scarred with permanent whorls cut by suns which increased their density too fast. They go around and around, and *never come out.*"

"Don't worry, Horn," the little robot said. "I've got it all figured

out. You've seen how my mind works. I take all the known facts, correlate them, and build up an infallible plan of action. I can surmount any contingency because my brain has an error-quotient which can only be expressed by a unit of thirty-six zeros."

"You're sure you can chart and *hold* a course through the continuum which will bring us out on Mars?"

Brown nodded. "I can, Horn. Give me a month and I'll prove it."

A MONTH and three days later, Horn sat at Joan Fleming's side in the pilot room of a space-time ship which he had constructed at his own expense, selecting top men in the engineering field to test its every beam and strut.

It was supposed to be his ship. It had the blessings of the Smithsonian Institution and all the best minds on Earth were wishing him luck with it.

But somehow, Horn couldn't think of himself as really in command. When Brown's irritability forced itself upon his attention in annoying flashes, he was compelled to recognize it for what it was—an usurpation on the part of the little robot which weakened his authority and filled him with misgivings.

Brown was scowling now. He sat on an auxiliary pilot dais, between Horn and Joan Fleming, his beryllium legs swinging.

"What are you waiting for, Horn," he grumbled. "Are you *afraid* to take off?"

Horn set his lips. "All right," he said. "Here it comes."

He glanced at his fiancée as he spoke.

Joan's face had gone dead-white. "It isn't too late," she whispered, without turning her head. "You can still take him apart."

Brown heard her and swung about, his faceted eyes darting venom. "You're straining my patience, Fleming. Horn needs me and you know it."

"Be quiet," rapped Horn. "I need both of you. Can't you understand that?"

"No," said Joan. "And I never will."

Leaning abruptly forward, Horn manipulated a rheostat on the luminous control board. "It isn't Brown," he whispered. "I'm aware that we'll be leaving all the familiar, safe and agreeable things the instant we warp space. But you can't buck a tropism."

"What do you mean?"

"The most primitive living organisms are polarized and—so are we. The urge to reach out, to cross new frontiers, is a biological constant. It's in you and me and I put it into Brown."

"It isn't in me," Joan said. "A woman seeks new frontiers in a man's arms, but—"

"It's all part of the same drive," Horn assured her.

The vibration hit them all at once. The deck trembled and the air slapped against them like a wind-lashed sheet. A quivering seized Brown. His knees clicked together, and he started bouncing up and down.

Joan shivered and tried to strap herself more securely into her seat. Horn reached out, and tapped her on the shoulder. "Easy," he cautioned. "This is just the beginning." He was holding on to his own seat, his knees colliding. "Keep relaxed."

IT BECAME terrible suddenly. The ship seemed to be bursting with energy that kept breaking over them, and twisting them about. The luminous control panel came to life. Its humidification units winked,

whistled and shook. Up and down the board sparks rumba-danced and then joined the military, marching back and forth in wavering columns of light.

Brown twisted double suddenly, a spasm of giggling coming from his throat.

Horn stared at him, aghast. "What in blue blazes—"

"Can't—help it—Horn. Voice box—isn't—concussion proof. Needles of sound—damn it, Horn—it's —your fault."

A thin trickle of blood was running from Horn's mouth. He tried to sit erect, but the hammering vibrations kept adding to his weight. He wished that the mountain which was resting on his shoulders, would shift about a little. When he took a deep breath, volcanic fires belched from it, and seared his lungs.

Joan seemed to be fleeing in mortal terror from something that she couldn't see. At least, she conveyed that impression, *sitting rigid in her seat.* Stunningly it was borne in on Horn that a person could remain motionless, and yet seem to be running with every muscle taut.

Brown had stopped giggling. He was staring at Horn now with a thin smile on his face, his flexible nose crinkling. "It's curious, Horn. The beginning vibrations hit my throat box, but now I can talk again. We're oscillating beautifully, Horn. We're deep in the continuum and sliding straight toward Mar's orbit."

Horn groaned. "When will that hammering stop? I can't stand much more of—"

"It's stopping already. Can't you tell? We're sliding down the groove under our own momentum. The build-up is draining off."

A little moan came from Joan. "I think I'm going to faint."

"Horn, sometimes I surprise myself," said Brown callously. "I was sitting here, expecting I'd have to ask you to make certain modifications on the board, but the automatic plug-in has functioned perfectly. We haven't missed a trick.

"Just look at that panel! Every cyclometric equation indicator has come to a full stop. That means we'll come out a little to the north of the Equator, on the banks of the Northwestern Canal.

Horn caught Joan as she swayed. He untied the straps which held her loosely to her seat and drew her across his knees. He chafed her wrists and cooled her brow with his palm. There was no need for him to dip his hand in water. It was already cold and dripping.

Brown seemed unable to tear his gaze from the control panel. He sat rigid on the auxiliary dais, his hands on his knees. His features had a drawn-together look, which was the way his face expressed elation.

He was still sitting there like an egg-laying rooster brooding over inscrutable gifts when Joan's green-irised eyes opened and stared up into Horn's white face.

"Well, that was bad," she said. "I guess I just can't take it."

Horn helped her to sit up. "The ship has stopped pulsating," he exclaimed, staring in growing bewilderment from the still-rigid minikin to the control panel and back again.

Brown came suddenly to life. He folded his jointed arms and jerked his head up and down. "Right, Horn. We've arrived at our destination."

Horn's heart gave a sudden leap. "Joan, I . . . I've got to have room to breathe. Do you mind slipping back to your own seat?"

Joan obeyed, casting a scornful glance at Brown, who was climbing down from his seat.

"Horn, we'll go out and look around. I don't think we'll have any trouble with the atmosphere. The photomolecular samples from Yerkes rang up a pretty high oxygen count. The desert air may be a little thin, but I'm sure it's breathable."

"I'm more concerned about the heat," said Horn, unstrapping himself. "The temperature skids up pretty high in the Equatorial belt."

"We'll wear sun helmets, Horn. I mean, uh—you will. I don't have to worry about the heat."

"Fred," Joan said. "Suppose there's some sort of corrosive on Mars—in the atmosphere, I mean—which eats away metal."

Brown jerked his head up and regarded her stonily, his nose crinkling. "Nothing that you can say, Fleming, can get under my plating."

"I didn't think you were *that* dense," said Joan and bit her lip, aware that her barb was a little tarnished.

Horn flushed angrily. "Will you stop your infernal bickering. "We're going into the unknown together. If we don't—"

"It isn't bickering," Joan interrupted. "I hate his coils."

Brown started to reply to that, but was silenced by a look from Horn which said as plain as words: "Don't overstep yourself, Brown. If you say what you're thinking, I'll smash you."

Joan seemed to be struggling with herself. Slowly, the animosity left her countenance and a look of resignation took its place.

"I suppose," she said, "I shall have to put up with him. As you say, we're going into the unknown

together. I'll try to keep my mind on something clean."

Brown quivered. "Fleming, if you think—"

Horn wheeled on him. "You heard her, Brown. I'll expect the same sort of loyalty from you."

THEY EMERGED together, Horn and the girl, wearing tropical slacks and sun helmets, and the little robot metal-naked to the solar glare.

A hidden watcher, crouching behind hillocks of sand, would have gasped at the spectacle of such divergent shapes descending from an air lock in a gleaming space-time voyager, which was shaped like the constellation Bootes, with its end-vanes spread out symmetrically behind it. But there were no eyes to see or ears to hear.

Brown descended between Horn and Joan Fleming, his eighteen-inch-high body scarcely reaching to their knees. Silhouetted against the sun, with his angular contours blurred by the glare, he looked like an infant tottering between them—an infant just learning to walk.

But no infant could have spoken as he did, or cushioned the shock of adults in so casual a way. "Well, that is certainly a city, Horn. It isn't like any city on Earth, but what else could it be?"

Neither Horn nor Joan had an answer ready. They stood at the base of the air lock, on a hot and sloping wilderness of sand, and stared up at the most titanic structure they had ever seen, their senses reeling.

From the structure's high black walls broad, metallic ramps streamed downward. The ramps emerged from a continuous dark aperture which encircled the walls near the summit of the towering edifice, and descended for a thousand feet to the desert below. Wind-blown sands were piled high about the bases of these immense superficies, which were the only avenues of ingress visible from below.

"Well," said Brown. "What are we waiting for? If you'd just found red sand and a soggy ditch of a canal, you'd be stirring fast enough. Pulling up low-grade vegetation by the roots, groveling in some rancid fungus patch and shouting discovery, discovery. But when a whole city is dumped in your lap you stand there gaping."

Horn seemed stunned. "The beings who built that structure must have possessed intelligence of a high order."

"Words, Horn. Empty words, until we climb up there and see for ourselves. To a Martian, a termite's nest would seem wonderful and the product of intelligence. Horn, let's get going."

Five minutes later they were ascending the ramp. Up, up they climbed until the dark, cavernous opening above them acquired a geometric pattern and they perceived that it was a symmetrical portal, floored and roofed with metal and extending inward for a hundred feet. Through it immense, glittering shapes wavered in a dimly illumed world of uncouth dimensions.

The shapes were inanimate. As they emerged from the portal and stood staring upward, an utterly stupefying sight met their gaze. All about them towered cobweb vistas of metal. Beams and girders and shafts, and vast, flowery traceries interwove in the air high above them and as far as their gaze could penetrate downward, were similar stupendous structures. And in that mile-deep, mile-high web, where the rays of the sun penetrated but feebly, there was no stir of living

things or faintest echo of sound.

They had the extraordinary sensation of standing at the hub of an enormous metallic network, where all lines converged with geometric precision toward a single focal point. The far-flung structure emitted a dull, greenish radiance in the diffuse sunlight which filtered down from above.

The beam on which they stood, sloped gently from the inner extremity of the portal toward an immense, slightly convex, circle of gleaming metal. The circle was wedged between four cyclopean columns, whose gleaming bases were lost to view in the shadows below, and was joined to the structure above by thin, metallic filaments which spread upward and outward in meshlike strands.

JOAN was shivering. Something about that vast, intricate and awesomely gleaming web had utterly unnerved her. Even Brown seemed alarmed. There was no mockery in his voice when he said: "It's pretty dark down there, isn't it, Horn?"

Horn did not reply. He was staring rigidly downward into the vast, dimly lit vistas beneath him. He had mistaken the thing for a shadow at first. It hovered amidst a multitude of shadows in the interstices of metal far below, and when it moved, its outlines seemed to flicker and spread. But it was not a shadow.

There was a rustling movement in the depths, and slowly, cumbersomely, the spider ascended on its long legs along a fissure in the massive column, heaved itself over a meshlike strand and glided to the edge of the circular disk.

A prickling sensation spread over Horn's scalp. The spider was larger than an elephant. Its wrinkled, dead-black body was thinly covered with rust-colored hair, and its long legs were hair-tipped. In the center of its spherical head, a single lidless

eye glowed dully. As it crouched on the disk, with its ten segmented legs drawn up sharply beneath it, it seemed to radiate venom.

It was staring downward, into the depths. Frozen to immobility, Horn watched it. From its massive, spinning mammillae, thin, silky strands descended into the geometrical maze beneath. The mammillae were in constant motion and, as they opened and closed, the white, adhesive silk was drawn into the spiders mouth.

The thin strands wavered, slackened and were drawn taut again. For interminable seconds, this slow absorption of its own silk continued. Then, suddenly, the spider shifted its position on the disk, and its long, hairy forelegs went out and gathered up all the remaining strands.

It drew this residual web across the disk and deposited it in massive folds at its feet. And, suddenly, Horn perceived with horror that there were small, moving forms enmeshed in the web. As he stared, the great arachnid disentangled the struggling little knobs and protuberances, picked them up swiftly with its forelegs, and proceeded to—*eat them.*

There ensued a sickening crunch, and a thin ribbon of scarlet ran down the spider's swollen abdomen and formed into a little pool in the center of the disk. The spider picked the forms from the web with fastidious care.

As though with grim and calculating irony, it allowed the freed men and women to stand upright on the disk for an instant as it drew them from the silk. Then, swiftly, it lifted them to its mouth and consumed them. A few attempted to escape, running wildly toward the edge of the disk as soon as the loathsome creature freed them, but invariably they were caught and devoured.

Brown moved close to Horn and plucked at his sleeve. "Perhaps, Horn, we'd better be getting back to the ship."

Horn scarcely heard him. The horror in his mind was being fed from two sources simultaneously. The spectacle of men and women being consumed was appalling enough, but even more terrifying was the nimbleness of the spider. The beam on which they stood was more than two hundred feet from the edge of the disk, but the spider's legs were the opposite of stumpy.

It was then that Brown put his foot into it. "Horn, I want to see the robot one. That is two million years further along, but—"

Horn felt something explode inside his skull. He swung about and grasped Brown by the throat, his face purpling.

"*What did you say?*"

"Let go of me, Horn. You're pressing on my—"

"Brown, you knew we'd see this. You knew it was here. I've felt it all along. *This isn't Mars.*"

"No, it's—Horn, you're choking me. If you want me to tell you, set me down."

Horn set Brown down with such violence that the spider stopped midway on a morsel and rolled its single eye upward. The pair of legs protruding from its mouth jerked up and down.

Horn froze. For a moment he stood staring down at the great arachnid, his eyes widening.

Brown whispered: "Don't be alarmed, Horn. It's probably myopic."

The spider lowered its gaze abruptly. Its mandibles quivered, and the dangling legs disappeared.

Horn gripped the little minikin's shoulders. "Start talking," he said, his expression robotcidal.

Brown sighed. "Well, I—"

"No evasions, Brown. I want the truth."

"Horn, I intended to tell you. We traveled through the continuum, but I didn't set our course for Mars. I arranged the automatic plug-in so that it would bring us out on . . . on one of the future variants, Horn."

"Future variants?"

"Horn, there are thousands of possible future variants for the human race, all existing in space-time. We have simply traveled forward in time through the continuum without leaving Earth, and we've seen the spider variant. You see, Horn, I wasn't much interested in Mars. I lied to you about that. I'm a realist and there is more than enough to whet my curiosity right here on Earth.

"There is also a robot variant, Horn. As a by-product of the human race, I am naturally interested in its future. I wanted to see the robot variant particularly. But it was necessary for me to cushion the shock by showing you what will happen if the spiders get the upper hand. This is a bad variant, from your point of view, but the robot one is much worse.

"It is too bad that you are so thin-skinned, Horn. I had to lie to you, d'you see? I had to pretend that we were going to Mars, and to keep up the deception. Otherwise you might have drawn back."

Horn's face was apoplectic. "I should have listened to Joan."

"Horn, why should you resent a little harmless deception? I have given you, a man of the twenty-first century, a glimpse into the remote future. You've got to remember this doesn't *have* to be the destiny of the human race. It is merely one of many possible destinies, a branching variant. Events back in the world we left, will determine the main line. Tomorrow, perhaps, in

that world, a man will stumble or a child break its doll, and so alter the course of human events that the spiders will be exterminated ten thousand years later, before they can evolve any further.

"But, of course, all the variants exist in space-time. The main line strongly; the rest as weak sisters. There is a vast network of weak sister variants extending through space-time, Horn. I can chart that web with mathematical precision and travel through the continuum toward strands which are fifty million years in the future. But there's one thing I can't do. Determining which variant will become the main line, is a little beyond me."

Joan was staring at him white-lipped. "If only he had *looked* like a snake."

"Just a minute, Joan," Horn said. "I want to get this straight. Brown, what happens in the robot variant."

Brown's nose crinkled. "I'd rather show you, Horn."

"You mean I won't like it?"

"I've told you, Horn. It's even worse than this—from your point of view. But I can't help that. You've got to remember it doesn't have to be—"

"*What happens?*"

"Horn, he's in a sort of museum. All shrunken up, like a mummy. But not in an exhibition case, Horn. Dangling. His flesh is black, because so many years—"

Joan moaned. "Fred, stamp on him."

"The last man on Earth, Horn. The robots are still a little resentful. On holidays, when the museum is crowded, you can't get close enough to see him. And there isn't much you *can* see—until they pull out all the darts and rub in a cleansing paste. He's riddled all over, but the few visitors who come on workdays get a pretty good idea of what he looked like when the museum was first opened."

"That's all I wanted to know," said Horn. He had both hands on Brown now and was lifting him up.

"Horn, put me down. What are you—"

"Brown, Joan's right. You don't look like a snake, but that's what I've turned out—a beryllium-plated snake. You brought us here to watch us squirm."

"That isn't true, Horn. Put me down."

"Brown, it must be cold and horrible down there—in the depths. The spiders will spin webs over you. You'll lie there for a million years, rusting."

"No, no, Horn. You can't do that to me. How would you get back?"

"I'll admit you have that one talking point, Brown. Without you, we couldn't. If I *don't* let you drop, will you take us back?"

"I will, Horn. I swear it."

"Not into the robot variant, but back to the twenty-first century."

"I'll do it, Horn."

The spider had finished its meal. Moving to the edge of the disk, it began to advance up the beam, its long legs unbending.

"You spoke just in time, Brown," Horn said.

TOGETHER they fled—Horn and the girl dragging Brown between them. Dragging now a very limp minikin that did not say a word as they fled down the broad, metallic ramp of that sinister spider city, and out across sands which would never exist on Earth unless—

Unless the future's spinning wheel stopped at just that one notch in ten thousand which contained the spider's variant. They hoped it wouldn't. All the way back to Earth they kept hoping that it wouldn't. There were certainly variants which gave the human race a better break than that. Variants which left Earth and moved from planet to planet until the entire Solar System echoed to the tread of —the colonizers.

And all the way back, Brown sat brooding, his conical head sunken on his chest.

Just before the vibrations ceased, Joan said: "I'll bet he'd like to go back and live in that robot variant."

If Brown heard her, he gave no sign. When the ship stopped pulsating, he did not even emerge with them into the sunlight, but sat sullenly in his auxiliary seat before the control panel, frustration twisting the metal lineaments of his face.

Leaving him alone like that was a blunder which Horn was to regret to the end of his life. But the gruelling trip had so shattered his nerves that he couldn't get out fast enough.

Beneath familiar, white buildings and the looming space-time ship, Joan gravitated into his arms and remained polarized for a full minute, her lips warm against his.

Then, suddenly, she stirred. "*Brown,*" she exclaimed. "You forgot to take Brown out!"

Alarmed, Horn wheeled.

There was no longer any need to take Brown anywhere. Where the ship's stern had rested, a thin spiral of smoke was ascending toward the pale sky, but up forward, where Brown had been, there yawned only empty air.

"I bet he'd like to go back and live in that robot variant."

Turning, Horn found himself wondering if Joan had directed that comment to him alone. When he met her eyes again, he ceased to wonder. Startlingly, it was borne in on him that a woman's wiles could be more devious than a robot's.

THE END.

BRASS TACKS

Year's selections.

Dear Editor Campbell:

I seldom get around to writing to magazines, let alone Astounding. Can't tell just what that elusive something is, but one seems perfectly contented to let the months drift idly by while thumbing peacefully through the 160 pages of Astounding with never a comment. Perhaps it is just that I have about one kick each year which is swiftly drowned in the deluge of following good things. I guess that intangible something is closeness to perfection which makes my favorite science-fiction promag so easy to take with nary a word. *But I'm coming up to rave!*

You've just passed a year filled with the cream of perfection—never before have there been so many truly TOP stories. I've missed a couple of serials now and then, and a couple of issues due to a habit of lazy negligence. However, I cleared that up in the past week by avidly consuming approximately ten issues from '38 through '41 while laid up. Believe me, you've improved more than you or the readers think. A magazine usually gets quite dull after reading issue upon issue with no breaks, but not this one. Each issue found the stories getting a bit brighter, a bit more potent in gripping quality.

Follows a list of the ten best stories of 1940, and I'm really astounded no end! I paid no attention to the authors, so I wouldn't be a little lenient with an old favorite, and ended up with this list, which makes me begin to wonder why I haven't rated these authors more highly in the past. See:

1. "Final Blackout"—Hubbard. Packed with intense drama from beginning to end. The last few lines left me with an uncomfortable weight on my Adam's apple. This stuff is almost too strong to take at one shot; should make a best seller for strong denouncers of stf whom I know were raving for weeks about this novel.

2. "Slan"—A. E. van Vogt. Damned close to number one, but there wasn't that breathless waiting every instant. However, this makes some of the works by Smith, Weinbaum and Stapleton look very thin and watery in comparison. More—

3. "If This Goes On—"—Heinlein. Very interesting is a mighty weak description. Potent is a better word. If the sequel had been included with this serial to make it three parts, it might have surpassed "Slan," or even the mighty "Final Blackout"—though I doubt it.

4. "The Roads Must Roll"—Heinlein. Bob's good! Any other author with this idea would have definitely flopped, for only Heinlein can handle this stuff so logically. Still, I doubt that any other author would have thought of this plot.

5. "Vault of the Beast"—Van Vogt. A. E. scores again. You predicted this story with real gusto—only not enough. I made

the 10,000 pages drop off like 3,000. Dynamic!

6. "Coventry"—Heinlein. Unbelievable that any author would ever score so consistently as this one has. I can still smile in the face of rain in California, for we have HEINLEIN!

7. "Cold"—Schachner. A novelette that proves Nat is far from washed up. Idealistic as ever, he came through with a power-driving punch after some previous cold stuff which wasn't so hot.

8. "Smallest God"—del Rey. Lester hit me resoundingly with this solid beat. Some say it was fantasy, but think what the *Unknown* readers might have cried.

9. "Blowups Happen"—Heinlein. This could have been higher, but I didn't believe my own ratings, and placed him in ninth. I ask you, "How does Bob do it?"

10. "Dark Mission"—del Rey. Consistent devil. Popping up innumerable times on my list before final revision. I like his vague style. This story had its heels stepped on plenty of times by Jack Williamson, who wrote "Hindsight." I liked it, too, but time didn't leave the lasting impression of del Rey.

It's a cinch that you must hold on to Hubbard, van Vogt, Heinlein and del Rey, but also keep dishing up stuff by P. S. Miller, Schachner—but definitely!—Williamson, de Camp and Robert Willey. They've been the ultimate tops for '40. Oh, I've certainly missed some old standbys who turned out stuff just as good in '39 and '38 or earlier. I mean C. L. Moore for the main part. Have you so easily forgotten her "Greater than Gods," "Bright Illusion," and the recent "Fruit of Knowledge"? Gad, man!

Lacking, too, is your own inimitable Don A. Stuart. He's second to none in the hearts of the majority. Bond has proven himself very capable, as well. I expect great things from Nelson this year. But—where is Warner van Lorne? I think he is the guy who made me like stf. His "World of Purple Light" has never been forgotten by me or plenty of others. Then, too, Fearn-Russel-Ayre-Cross is good when not hurried. Not much more to ask for except another enthralling "Skylark" novel by the one and only Smith.

Most writers-in put in a cry concerning art. I can only say to never lose Rogers on the cover and I'm yours for life. For variety occasionally, you might have Finlay do a job. As to interior work, here is where you really need Finlay. Right now, one artist illustrates and the rest hack! You've got Cartier once in a great while, but that is as often as he fits in. However, Schneeman carries the load for the

magazine by doing the only presentable art therein. I'll tip you off to a fellow you have probably anticipated: Wesso! Yes, you need him back. I'm sure that the majority of the readers would voice the same opinion if asked. Why don't you ask them?

Concerning the latest issue, I'll try to break it off considerably shorter. The cover was magnificent. I repeat: never lose Rogers! Interior art was grand by C. Schneeman, and M. Isip's work is fair; but how anyone puts up with Rey and that slop-job Eron is more than this poor mortal understands.

"Sixth Column" was head and shoulders above the rest. Anson MacDonald, another brilliant Californian, carries on to greater heights, and an early start for '41's best. I take it back! "Heinlein's "Logic of Empire" wasn't too far behind, but that is only natural, for look who wrote it. How does Bob turn out so much good stuff, I once more query.

D. B. Thompson's "Eccentric Orbit" was really good. Despite the fact that he is new to the ranks, he rates high with a very original plot and fetching style. Another find, John. "Masquerade" shoves rudely for the No. 4 hole and easily gets it. Rather an original idea in ways, but old in touch. I liked it. Jameson deserves fifth and the collaboration merits sixth. I hate to give Sturgeon last place, but he loses face in no way. I thought the story was a honey!

Jack Hatcher consistently writes the best articles, along with the master himself, L. Sprague de Camp. Richardson was way off my beam this issue, but he is usually good. Of course, we couldn't get along without your swell editorial and various departments. Are you going to give a complete result of the year's best stories? I suggest enlarging something so that you can be a little more informal at times. Come on down with the rest.—Joe J. Fortier, Director GGFuturians, 1836 39th Avenue, Oakland, California.

The complete Heinlein History involves, in addition to a huge chart, a 70,000-word explanation—story. It would not be practical to publish it.

Dear Mr. Campbell:

This May issue is one of the best issues I've ever seen. For first there is a four-way tie. "Universe," "Solution Unsatisfactory," "Liar!" and "Jay Score," all of them excellent, are lumped as No. 1. I suppose, with much effort, they could be pulled apart and classified, but I choose not to do it.

"The Stolen Dormouse," second, of

course, is not quite up to the de Camp standard—but it is still good. However, I have the feeling that the first installment promised too much; I felt that there would be two or three more to come. It was disappointing to have the story end so quickly.

"Subcruiser" was next; "Fish Story" last.

The Heinlein History is interesting. The man must do a lot of varied reading. Would like to see the entire work; you implied that this was but a brief outline. Don't suppose the printing of the entire thing would be practical, though.

This letter has been long in writing. I have been glancing through the magazine, reading fragments of first one story and then another. And each time, the story of the moment is No. 1. So I guess my first paragraph still stands.—Allan Ingvald Benson, 540 E. 102nd, Seattle, Washington.

A chin is herewith stuck forth!

Dear Campbell:

I finally broke down under the strain of working on a short story, an article, and three novels all at the same time. Today I said to hell with it, and spent some hours re-reading the last few months' "Brass Tacks and Science Discussions" stirred by sweet nostalgic memories of the days when a temerarious reader would assert that, of course, there was an Atlantis; in the language of the Tuidl-tuidl Indians the word *atl* means "The submerged archipelago described in Plato's *Critas*." Whereupon the old controversialist team of Clark, Miller and de Camp would go into action, each taking a swat in turn.

But the recent issues have been deplorably barren of that sort of thing. Are your readers too well-informed nowadays, or simply less aggressive? I still think you should have run some of the comments from the Comrades on "Whithering," especially the one from Paterson who called Toynbee a bourgeois moron and my writings an Augean stables of bland idiocy. Alas, I'm afraid we parlor pinks are the only political thinkers who are (a) humane and (b) reasonable at the same time, wherefore nobody pays much attention to us. But to get back to the point, what's the fun of being a controversialist if nobody will controverse?

To take up the question raised by Mr. Rafael of San Francisco in the May issue, I've been wondering for a long time just how far down our civilization *could* lapse: to the "Final Blackout" level, the "Magic City" level, or what? suppose I wanted to write a story wherein those hardy fictional characters, Our Barbarous Descendants, were starting out again at the Graeco-Roman level. How Graeco-Roman would it be if the men wore those useful Scythian inventions, pants, and made and used guns? Superficial characteristics, you object? Okay (Note: don't you dast let your compositors set that as "O. K.") but then what *would* be the specifically Graeco-Roman features of the culture?

For I doubt whether we could really get back to the good old stone hatchet. Reason: too much printed matter floating around, which would be virtually impossible to destroy entirely, even without Time Capsules. And you can have guns, clocks, schooners, and large-scale governmental organization without a highly integrated and mechanized industrial civilization. It's been done.

So in my version of Our Barbarous Descendants, I think I'll allow the intrepid explorers of the ruins of mighty Nawk-on-the-Huzn guns at least. Remember that in the last Dark Age a lot of civilized amenities went out, but such military tools as chain mail, the crossbow and the trebuchet came *in*.

If I do, I shant be discouraged by the fact that a lot of people have already written Our B. D.s better than I probably can. After all, Aristophanes wrote a play on the Mad Scientist or Eccentric Professor theme —"The Clouds." Lucien of Samosata in the Second Century A. D. wrote a novel of interplanetary adventure—"True History" wherein some Earthlings got involved in a war between the Men of the Sun and the Men of the Moon over the colonization of Venus. And the rocket spaceship appeared in a novel published in 1656: "A Voyage to the Moon," by Savinien de Cyrano de Bergerac, who wrote it between duels with gentlemen who made remarks about his nose.

But, John, I suspect that the present frigid controversial temperature of Brass Tacks may be due in part to the large, wide-spaced type you adopted a year ago. This reduces the total correspondence publishable in one issue to the point where the boys with the sockable ideas don't feel their chances of getting their stuff in warrants writing it. If you don't want to go back to that old seven point, admittedly hard to read, you could at least go down to eight point on eight-point slugs.—L. Sprague de Camp.

I can understand an Aussie's troubles with "Magic City"!

Greetings, Oh Edit Kan-Bull:

I, one of the Ancient Ones, salute you. Using the ancient tongue, I say "Owdi, Owdi, and Sametus." From far beyond the Land of Escape, over the Siffik Water, I broadcast this message, "What is the first prize worth for solving the equation, Magic City?

Honestly, Mr. Campbell, what are you running, a puzzle mag? The darned story had me well and truly bothered. I was up and down all the time with an Atlas and a dictionary. Some of the terms were fairly easy, but American geography and history were never my strong point.

Anyway, as far as I was concerned, the story was a flop. It only depended on its queer spelling and the guessing it excited, to score. And they certainly did not carry it far.

I may be old-fashioned, but "Trouble on Tantalus"—apart from its frightful mess of a title—was my pick for top billing. It just goes to show you what the old gang can turn out now and then. "Crooked House" was also very good, but then look who wrote it. De Camp's was a pleasing trifle, and "Castaway," in my opinion, just a filler.

By the way, remember me writing to you a few months ago, about not getting any more mags? Well, thanks to you printing the letter, I have a couple of very decent fellows in the States who write and send copies.

I am afraid that this letter will be a little late, but then there is a war on. I like the sequence of modern type war stories you are running. "Sixth Column" looks, at second installment, to be as good—it couldn't be better—as "Final Blackout." There is one story I really did enjoy! And I suppose I may as well add my feable, faraway handclap for "Slan"! A masterpiece.

All the best of luck, Mr. Campbell, and please accept my congratulations on the splendid job you are doing.—George R. Thomson, 156 Commonwealth St., Sydney, Australia.

Solution still unsatisfactory. "If I had some ham, we'd have some ham and eggs if we had any eggs." How do you keep going until Utopia is reached?"

Dear Mr. Campbell:

"Solution Unsatisfactory"! Ah, there is a tale to make an old scientifictionist and "problem hound" come awake and take notice!

Yes, perhaps the solution *was* unsatisfactory, but under the conditions in which the problem was set up, it would be difficult to figure out any other procedure. However, permit me to begin the problem in a slightly different way, and I believe I can arrive at another solution.

I will not sketch a plot, but merely outline the necessary facts.

The key men in this problem are the men of the "Patrol," who, in this story, are "watched" by the military dictator, who, in turn, is governed only by his own conscience and training. As the editor points out, this last "curb" may not prove sufficient with a successor to the position.

A similar problem, in E. E. Smith's "Patrol" stories, was, the editor noted, solved by having the men of the Patrol "watched" by the Arisian superbeings, who were evolved for this purpose from the facile brain of Dr. Smith. As the editor pointed out in the editorial this month, a science-fiction writer can solve a problem by creating his means of solution, full-blown, from the matrix called "imagination."

For my "solution" we must have an organization similar to that of the "army" in "Sixth Column." For my purpose it must be organized much better, so that each individual, from the time he enters kindergarten, has a place in the organization. No, I do not imply the type of thing which we hear about overseas. Hold your judgment for a moment.

The "key men" in this set-up are, primarily, *all the adults in the world.* (This, of course, is the finished product. There must be a long period of strictly controlled education and training for the peoples who are not fitted to take to this immediately.) Of course, as the organization pyramids up in authority (and downward in numbers of men in each higher rank), we come ever nearer to "the" key man. (For there can be only one "key.")

Now comes the controlling factor: Not only this man, but every person, must *believe beyond any possibility of doubt,* that they are being "watched" and curbed continually by a superbeing. You think that presupposition absurd, and *practically* impossible of being made workable? I do not so believe, for I have seen enough sincere, intelligent religionists that I believe that, under certain conditions, such a plan would almost work itself.

I would venture to say that, among the ranks of the readers of this magazine—yes,

even you, who are reading this—there are those who believe themselves sufficiently, inherently honest and level-headed to undertake a job which allows the freedom of action, self-reliance and—if I may coin a word—self-supervision of a Gray Lensman. Perhaps not the technical training or the superhuman ability—leave that to Kinnison—but, most important, the *honesty*. That is the first requisite for the high-rank key men in my solution.

From this controlling factor everything is on the down-grade, and the details develop rapidly as a rolling snowball. First, there must be universal education, with each individual going as far as his capabilities will allow. The more knowledge, the better—if it is rightly directed. So, we must have direction. The details and training for this are included in the education, which must be *complete*, from home, through school, in all functions of life.

The government—a controlled democracy of a type which would be workable only under the conditions I have stated. I will not go further into detail, except to say that the framework for all this is already completely planned and is working in a limited way.

I am sorry that I cannot express this as I would like, but I do not have the command of words necessary, and, anyway, this is only a letter to the editor—not a treatise on "The Complete Society in Seven Thousand Volumes." Nevertheless, as I see it, nothing short of such a highly organized, integrated and complete society—or plan—or government—call it what you will—could solve the problem set up in this story. Since, as the editor said, a problem similar to this has a good probability of turning up, I would like to see all possible solutions discussed and presented in detail. Of course, I think my plan is perfectly workable, under conditions so strict that some will call it impossible—but the human mind is a "jewel of many facts." So with the human temperament.

If anyone wishes to go into more detail, using reams of paper, via the mail—or, one detail at a time, via the Brass Tacks column, I will try to answer all comers. And let's have some of *your* solutions!—L. M. Jensen, Box 35, Cowley, Wyoming.

Pardon us while we take time out to pur.

Dear Mr. Campbell:

In an effort to get some sort of concrete evidence of the best science-fiction stories of 1940, I took a poll through the medium of my fan magazine, *Spaceways*. It wasn't intended to be a big, long-drawn-out affair;

my sole idea was to get some fans' preferences of all the stories published in science-fiction, fantasy, and weird fiction magazines dated 1940. Perhaps you and your readers might be interested in the outcome.

Fans were asked to list ther favorite five stories of the year, in order of preference. These I tabulated on a 5-4-3-2-1 basis. A few split up votes, which accounts for the fractions below. Reprints and stf. in books and general magazines weren't to be counted, although a few included such.

The ten most popular stories of the year, as thus determined, were all from Astounding or *Unknown*. "Slan" topped them all, getting $67^2/_3$ percent of the votes, and only two voters failed to include it among their top five. "Final Blackout" came in second, getting $39^2/_3$ points, and —surprise!—"Fear" was third, with $31^2/_3$. "Vault of the Beast" followed, receiving 14 points, and "Fruit of Knowledge," "Darker Than You Think," and "It" got 11 each. Ten points were received by each "Farewell to the Master" and "Quietus," and tenth was "The Mathematics of Magic," with 9 points.

No story from any magazine other than yours received more than 4 points, except for a series of science-fiction yarns in a general magazine that were given 6.

Further proof of Astounding and *Unknown's* utter domination of the field during 1940: almost two-thirds of the stories mentioned—47—were from your two magazines. And yet further: stories from the two magazines gathered in 79.8% of the total points!

In one respect, though, the poll was pitifully inaccurate. Serials which concluded during 1940 were eligible—but everyone evidently forgot that "Gray Lensman" ended in January, 1940, and neglected to list it. Thus, that particular yarn is conspicuous by its absence; almost certainly it would have been among the top ten otherwise. Another interesting item: only two voters listed "Quietus" at all, and both gave it first place; they were the same two who neglected to list "Slan." Is there a psychologist in the house? Too, fans, evidently aren't Pollyannish, for half of the top ten yarns had more or less doleful endings.

A similar poll will be taken at the end of this year, and if results are favorable, as I think they will be to you, you'll hear about it. Think it would be too obvious a plug for me to add here that *Spaceways* costs a dime an issue, is available from me, and should be read by every good science-fiction fan?—Harry Warner, Jr., 303 Bryan Place, Hagerstown, Maryland.

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